ARCADIS

Appendix H

Boring Logs and Well Construction Details

Appendix H – Boring Logs and Well constructions Details

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Appendix H – Boring Logs and Well constructions Details

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Section 1

Production Well Logs

Production Well 9	Production Well 28
Production Well 10	Production Well 29
Production Well 11	Production Well 30
Production Well 11A	Production Well 31
Production Well 11B	Production Well 32
Production Well 12 (tunnel)	Production Well 33
Production Well 12A	Production Well 34
Production Well 13	Production Well 35
Production Well 14	Production Well 36
Production Well 15	Production Well 37
Production Well 17	Production Well 38
Production Well 19	Production Well 39
Production Well 20	Production Well 40
Production Well 21	Production Well 41
Production Well 22	Production Well 42
Production Well 23	Production Well 43 (Well A)
Production Well 24	Production Well 45
Production Well 25	Production Well 46
Production Well 26	Observation Well MT-51
Production Well 27	Return Well 562

Frigidaire Strip Logs: Production Wells 9-17, 19-30, 33-41

Note: Information not available for Well 16 (near Well 40), Well 18 and Well 44.

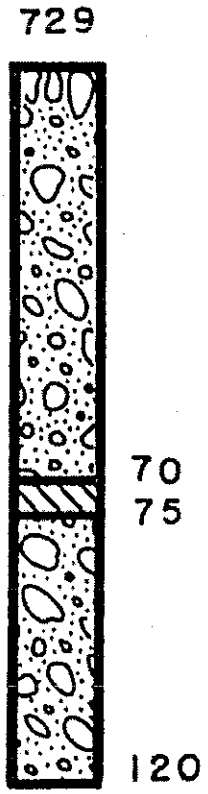
Production Well 9

PRODUCTION WELL	9
USGS LOG NUMBER	535
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	728.5
DATE DRILLED	1937
DEPTH (ft)	120
WATER LEVEL DEPTH	26
DATE	1/18/37
YIELD RATE (gpm)	1,000
DRAWDOWN (ft)	-----
TYPE OF PUMP	Turbine
DIAMETER OF WELL (in)	12
USE	Industrial
COMMENT	-----

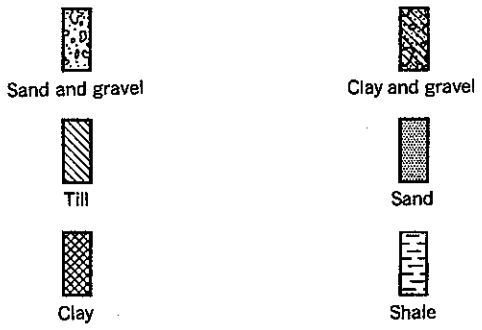
INFO FROM FRIGIDAIRE STRIP LOGS:

SCREEN INTERVAL (ft BGS)	90-120
DATE OF COMPLETION	-----

535



EXPLANATION



SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

PRODUCTION WELL 9
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

Production Well 10

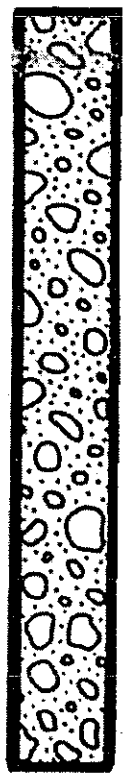
PRODUCTION WELL	10
USGS LOG NUMBER	536
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	730.3
DATE DRILLED	1942
DEPTH (ft)	122
WATER LEVEL DEPTH	24.8
DATE	5/20/49
YIELD RATE (gpm)	800
DRAWDOWN (ft)	-----
TYPE OF PUMP	Turbine
DIAMETER OF WELL (in)	16
USE	Industrial
COMMENT	Not used

INFO FROM FRIGIDAIRE STRIP LOGS:

SCREEN INTERVAL (ft BGS)	90-112
DATE OF COMPLETION	3/4/42

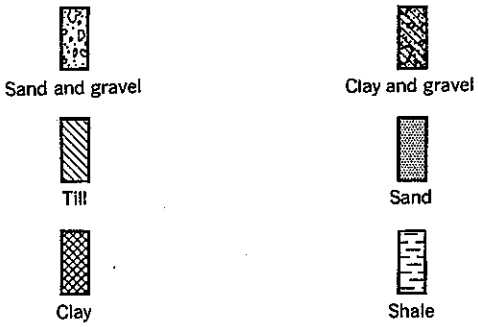
536

730



122

EXPLANATION



SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

PRODUCTION WELL 10
GENERAL MOTORS CORPORATION
Moraine, Ohio

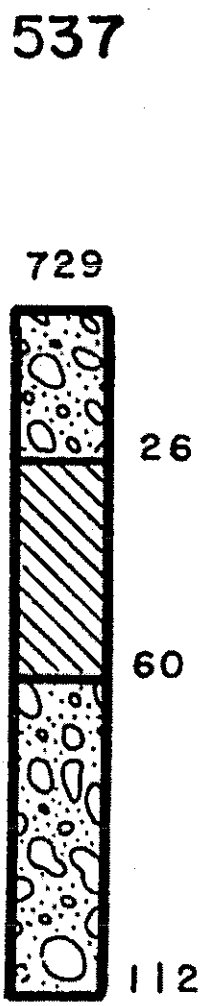
CRA

Production Well 11

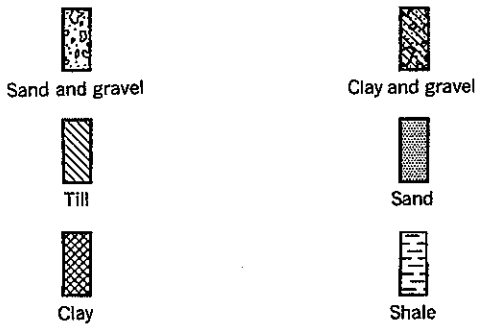
PRODUCTION WELL	11
USGS LOG NUMBER	537
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	729
DATE DRILLED	1/45
DEPTH (ft)	112
WATER LEVEL DEPTH	27
DATE	1945
YIELD RATE (gpm)	1,200
DRAWDOWN (ft)	-----
TYPE OF PUMP	Turbine
DIAMETER OF WELL (in)	16
USE	-----
COMMENT	Abandoned

INFO FROM FRIGIDAIRE STRIP LOGS:

SCREEN INTERVAL (ft BGS)	82-112
DATE OF COMPLETION	1/26/45



EXPLANATION

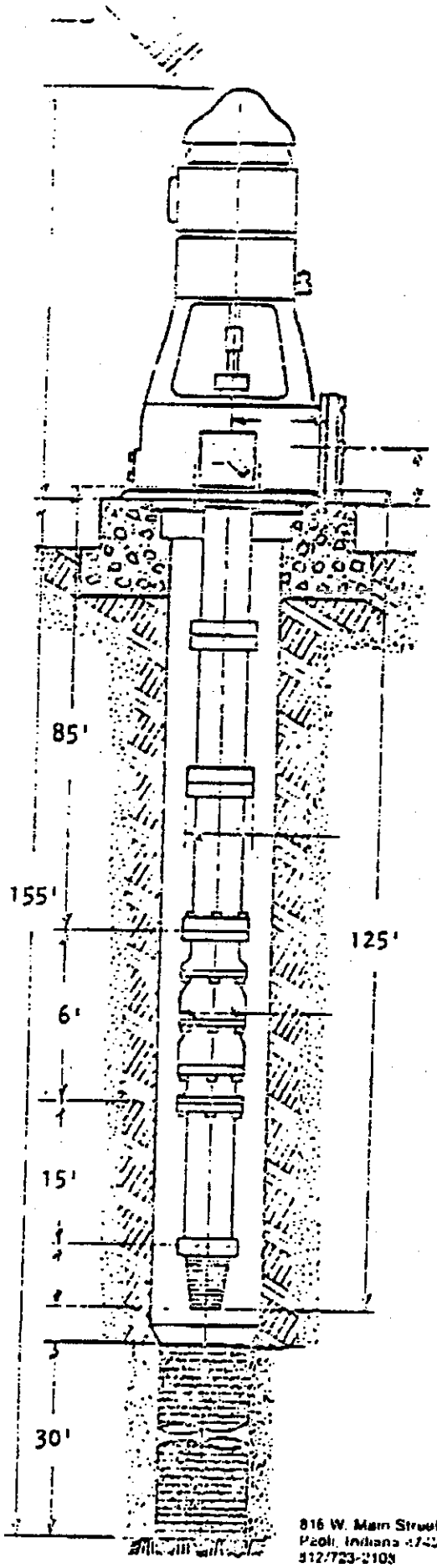


SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

PRODUCTION WELL 11
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

Production Well 11A



TURBINE PUMP INSTALLATION FOR:

GM Truck and Bus Group
Moraine, Ohio

WELL DESIGNATION NO. 11-A

GM Existing Equipment

N/A SERIAL NUMBER
N/A GALLONS PER MINUTE
N/A TOTAL HEAD IN FEET
6 STAGES
1760 MOTOR SPEED
106 OAL FEET OF SETTING
10" SIZE COLUMN
N/A OIL TUBE
1-1/2" LINE SHAFT stainless steel
15' 8" SUCTION PIPE
125 H.P. 460 VOLT. CURRENT
Water LUBRICATION
90 FEET OF AIRLINE
April '86 DATE INSTALLED

18-inch I.D. OF WELL
155 FEET DEEP FROM FOUNDATION
155 FEET DEEP FROM GRADE
30' STRAINER LENGTH — SLOT See Below
45.5' STATIC LEVEL — DATE March '86
" " — "
" " — "
" " — "
DATE DRILLED

PUMP REPAIRED — DATE
" " — "
" " — "

WELL ACID TREATED — DATE
" " — "

COMMENTS —

Well Screen - 18" telescoping
Bottom 5 feet - 50 slot
13 feet - 150 slot
Top 12 feet - 40 slot

816 W. Main Street
Paoli, Indiana 47454
812/723-2103

Highway 60 East
Owensboro, Ky. 42301
502/685-5572

1421 Mellwood Ave.
Louisville, Ky. 40208
502/585-1241

6451 Germantown Road
Middletown, Ohio 45042
513-424-7237

Reynolds Supply, Inc.

COMPLETE MUNICIPAL & INDUSTRIAL WATER SYSTEMS

FORMATION LOG OF WELL

Starting Date _____ Finished _____ Well Number 11-A

Owner General Motors Location General Motors Truck & Bus Group

FROM	TO	FORMATION
0	2	Top soil - fill
2	4	Gravel
4	7	Coarse gravel
7	10	Hard pan
10	35	Gravel and clay - hard drilling
35	71	Gray clay
71	74	Clay and pea gravel
74	80	Gravel and clay
80	86	Sand and clay mix
86	90	Sand and gravel
90	108	Sand and big gravel
108	119	Sand and gravel
119	134	Sand and gravel
134	146	Coarse gravel
146	152	Coarse gravel
152	155	Sand and gravel and trace of clay
155	160	Fine sand with clay balls
160	162	Fine sand with clay balls
162	166	Fine sand with clay balls
166		Shale

Water Level _____ Draw Down

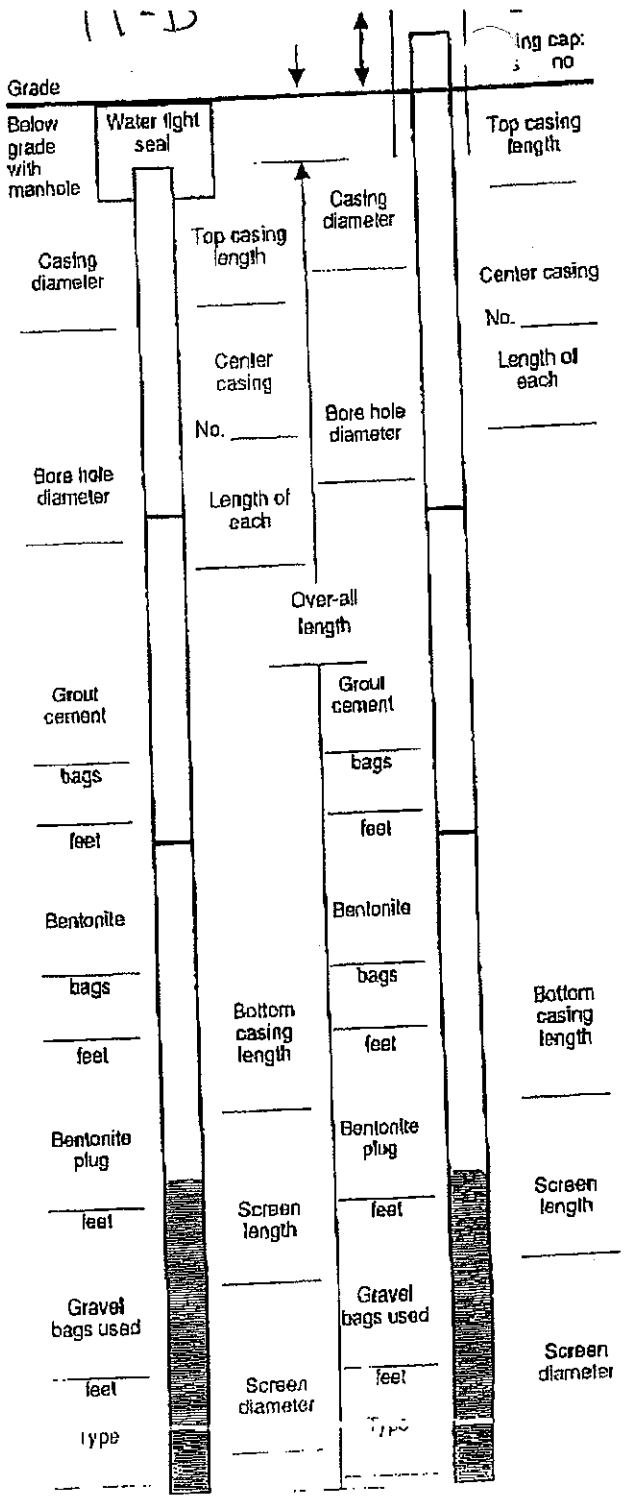
Production Well 11B

Reynolds, Inc.
Orleans, IN · Louisville, KY · Middletown, OH · Indianapolis, IN · Fairburn, GA.

Job no. 6637
Well no. TW #4 GM Moraine
Well depth 158'
Size of casing _____ type _____ slot _____
Length of screen _____ I.D. _____
I.D. of augers used 7 1/4 HSA
Number of split spoons taken _____
Development time _____ hrs.
Steam cleaning time _____ hrs.
Class level A B C D
Stand by time _____ hrs.
Reason _____

Engineer approval _____
Date approved _____
Driller's signature Jeff Jones
Date 11/17/00

Depth	Formation log	Blow counts
0-26	fill - concrete and gravel	
26-33	gray sand and gravel with little clay seams	
33-105	gray wet fine to medium sand and gravel	
105-142	gray and brown medium to coarse	
142-156	gray wet fine to medium sand and gravel with little cobbles	
156-158	gray soft shale	
	bottom 156'	
	static water level 32.5'	



04/18/07 WED 14:47 [TX/RX NO 7223]
8/2007 14:39 FAX 513 424 1189 REYNOLDS INC

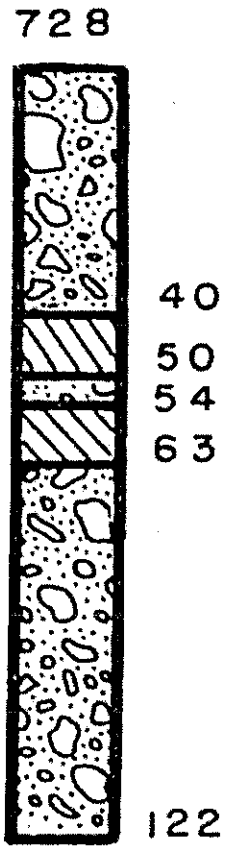
Production Well 12 (Tunnel)

PRODUCTION WELL	12 (Tunnel)
USGS LOG NUMBER	538
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	728.4
DATE DRILLED	7/46
DEPTH (ft)	122
WATER LEVEL DEPTH	23
DATE	7/19/46
YIELD RATE (gpm)	1,200
DRAWDOWN (ft)	7
TYPE OF PUMP	Turbine
DIAMETER OF WELL (in)	20
USE	Industrial
COMMENT	-----

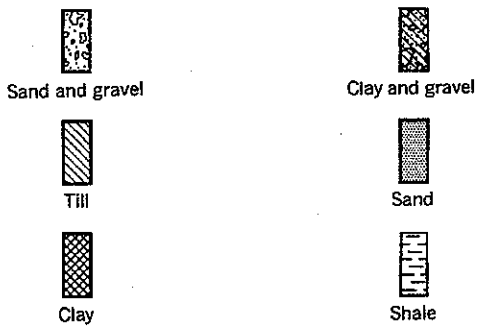
INFO FROM FRIGIDAIRE STRIP LOGS:

SCREEN INTERVAL (ft BGS)	90-120
DATE OF COMPLETION	7/19/46

538



EXPLANATION



SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

PRODUCTION WELL 12 (Tunnel)
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

Production Well 12A

Sheet ____ of ____

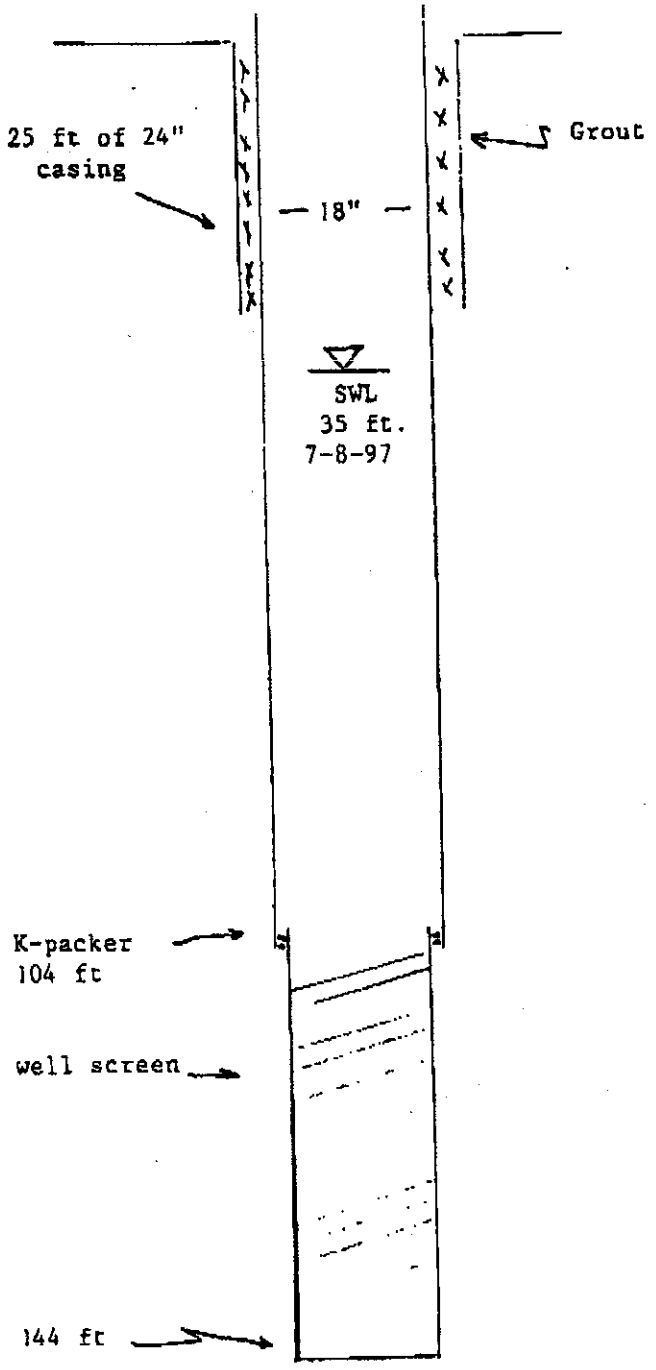
Reynolds, Inc.
Municipal & Industrial Water & Sewer Systems • Gravel Pack Wells • Treatment Plants

Project GM Truck Group

Subject Industrial Well 12 A

By L.S. Date ____ Ckd ____ Date ____

Well 12 A



Not to scale

Drillers Log

0-8ft	Fill, Gravel
8-42	Gray gravel, clay
42-48	Dry gravel
48-61	Gray clay gravel, sand
61-77	Gray clay
77-94	Gray clay with gravel and sand
94-145	Sand and gravel
145-154	Black clay

Well screen slot size

top 0-2 feet	100 slot
6 feet	130 slot
32 feet	150 slot

size 18 inch telescoping
304 stainless steel

Figure 1

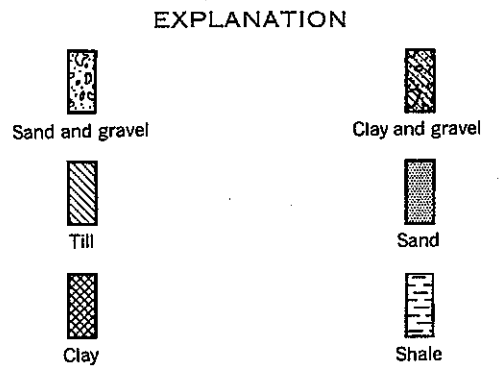
Production Well 13

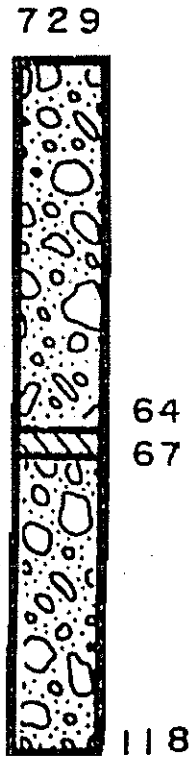
PRODUCTION WELL	13
USGS LOG NUMBER	539
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	728.7
DATE DRILLED	5/46
DEPTH (ft)	118
WATER LEVEL DEPTH	37.8
DATE	-----
YIELD RATE (gpm)	1,000
DRAWDOWN (ft)	29
TYPE OF PUMP	Turbine
DIAMETER OF WELL (in)	20
USE	Industrial
COMMENT	-----

INFO FROM FRIGIDAIRE STRIP LOGS:

SCREEN INTERVAL (ft BGS)	88-118
DATE OF COMPLETION	11/1/45

539





SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

PRODUCTION WELL 13
GENERAL MOTORS CORPORATION
Moraine, Ohio

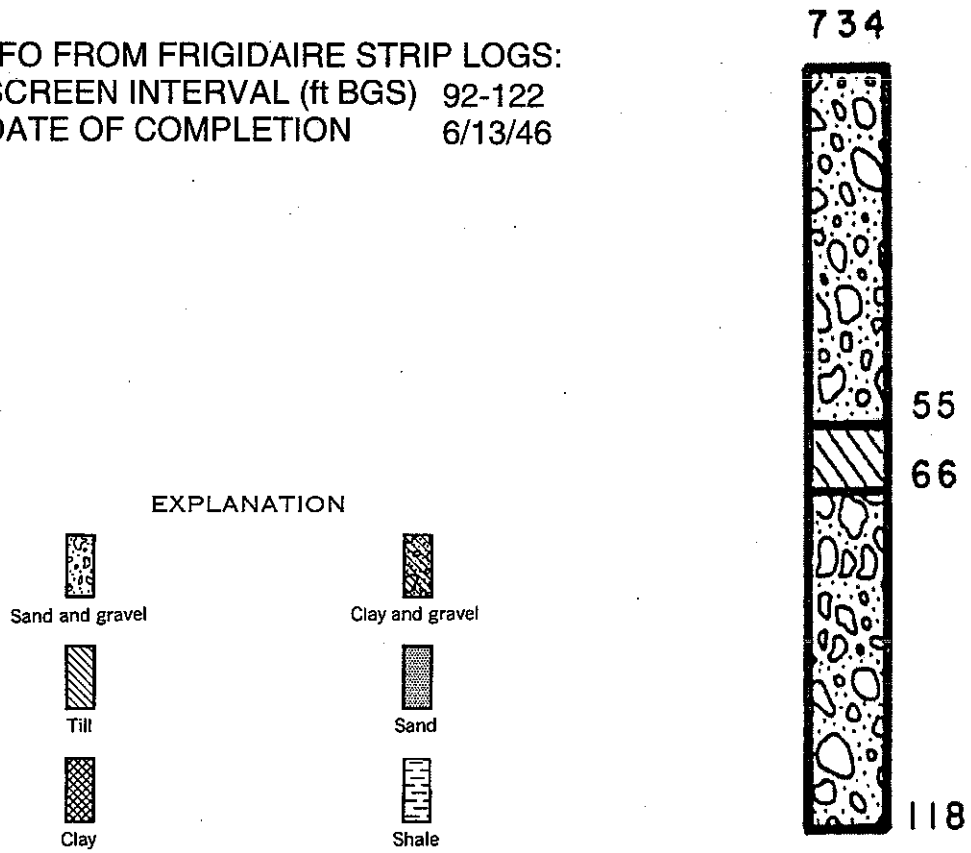
CRA

Production Well 14

PRODUCTION WELL	14
USGS LOG NUMBER	540
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	733.8
DATE DRILLED	6/46
DEPTH (ft)	118
WATER LEVEL DEPTH	26
DATE	6/13/46
YIELD RATE (gpm)	1,500
DRAWDOWN (ft)	7.25
TYPE OF PUMP	Turbine
DIAMETER OF WELL (in)	20
USE	Industrial
COMMENT	-----

INFO FROM FRIGIDAIRE STRIP LOGS:

SCREEN INTERVAL (ft BGS)	92-122
DATE OF COMPLETION	6/13/46



SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

PRODUCTION WELL 14
GENERAL MOTORS CORPORATION
Moraine, Ohio

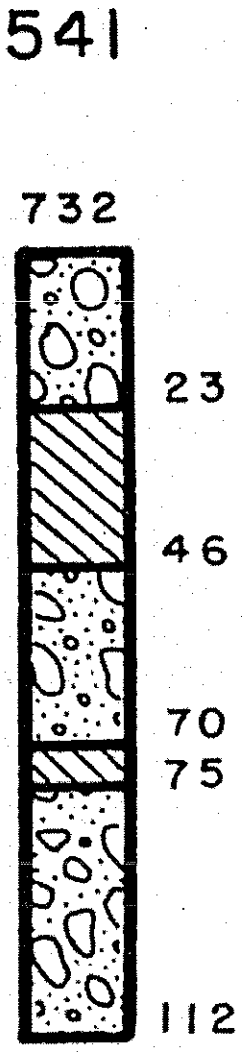
CRA

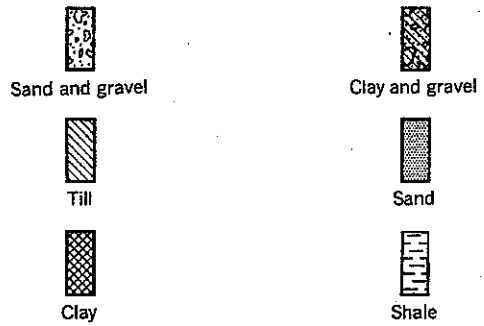
Production Well 15

PRODUCTION WELL	15
USGS LOG NUMBER	541
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	731.6
DATE DRILLED	11/49
DEPTH (ft)	111
WATER LEVEL DEPTH	27
DATE	11/12/49
YIELD RATE (gpm)	1,200
DRAWDOWN (ft)	10
TYPE OF PUMP	Turbine
DIAMETER OF WELL (in)	20
USE	Industrial
COMMENT	-----

INFO FROM FRIGIDAIRE STRIP LOGS:

SCREEN INTERVAL (ft BGS)	81-111
DATE OF COMPLETION	8/17/49





SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

PRODUCTION WELL 15
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

Production Well 17

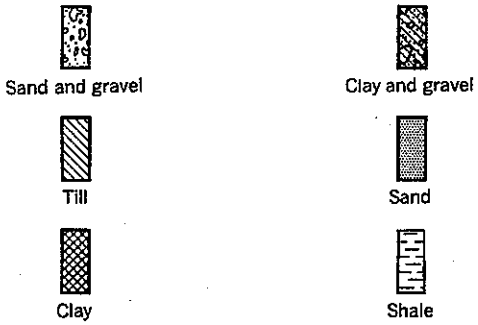
PRODUCTION WELL	17
USGS LOG NUMBER	543
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	729.79
DATE DRILLED	1/24
DEPTH (ft)	113
WATER LEVEL DEPTH	47.75
DATE	8/17/54
YIELD RATE (gpm)	460
DRAWDOWN (ft)	-----
TYPE OF PUMP	Turbine
DIAMETER OF WELL (in)	8
USE	Industrial
COMMENT	-----

INFO FROM FRIGIDAIRE STRIP LOGS:

SCREEN INTERVAL (ft BGS)	90-100 (est.)
DATE OF COMPLETION	-----



EXPLANATION



SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

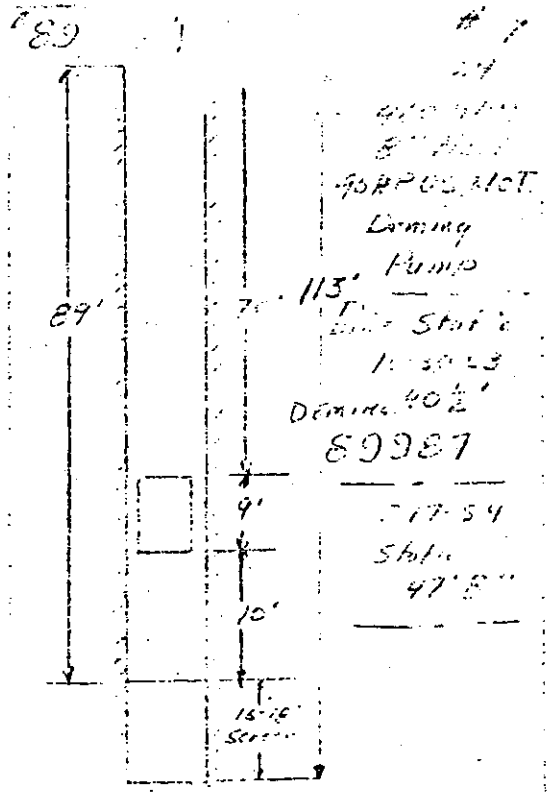
PRODUCTION WELL 17
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

Air Line – 12"
+5'-8" Gr. Level

Pump Disch – 722.5

Curb Above Pump – 729.7



U.S Motor 89988

CITY OF DAYTON, WATER RESOURCES INVENTORY

WELL NO. 17

OWNER Frigidaire Division, GMC

ADDRESS AND PHONE NO. Plant #2 Moraine City, O. - ADams 1161 - EXT 7-423

INDIVIDUAL CONTACTED H.S. Kline

LOCATION OF WELL Southeast corner of Power House basement Bldg. #1

DRILLER AND DATE Ira Barnes - prior to January 1924

LOG NO., OHIO DIVISION OF WATER _____ OWNER'S NO. 17

CONSTRUCTION DETAILS:

DEPTH OF WELL 113 FT. DIAMETER OF WELL 8"

LENGTH OF CASING 98 FT. LENGTH OF SCREEN 15 ft. ???

REMARKS Data not clear as to screen length

GEOLOGIC DATA

WATER-BEARING MATERIAL Sand and gravel

DEPTH TO WATER 31 ft. DATE November 9, 1949

MEASURING POINT 730 ft. Elevation above sea level

PUMPAGE DATA:

TYPE AND MAKE OF PUMP Deming

CAPACITY OF PUMP (RATED AND ACTUAL) 460 gpm

YIELD OF WELL 825 GPM DURATION OF TEST 6 hours

METHOD OF DETERMINING YIELD Pipeline orifice

AMOUNT OF DRAWDOWN 16-1/2 ft. DATE November 1949

METHOD OF MEASURING WATER LEVELS Altimeter Gauge

CAN WELL BE CONVENIENTLY MEASURED WITH TAPE? No

WATER UTILIZATION DATA:

MAIN USE OF WATER Power Plant

CHEMICAL ANALYSIS _____

METHOD OF TREATMENT None

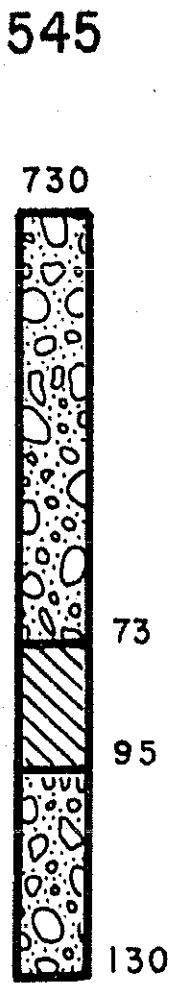
REMARKS (WATER TEMPERATURE, ETC.) 56°F.

Production Well 19

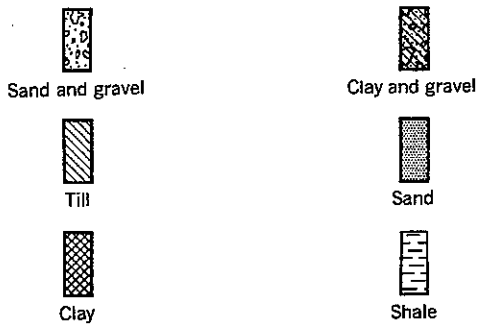
PRODUCTION WELL	19
USGS LOG NUMBER	545
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	729.95
DATE DRILLED	12/47
DEPTH (ft)	120
WATER LEVEL DEPTH	40
DATE	12/47
YIELD RATE (gpm)	1,000
DRAWDOWN (ft)	-----
TYPE OF PUMP	Turbine
DIAMETER OF WELL (in)	18
USE	Industrial
COMMENT	-----

INFO FROM FRIGIDAIRE STRIP LOGS:

SCREEN INTERVAL (ft BGS)	95-120
DATE OF COMPLETION	-----



EXPLANATION



SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

PRODUCTION WELL 19
GENERAL MOTORS CORPORATION
Moraine, Ohio

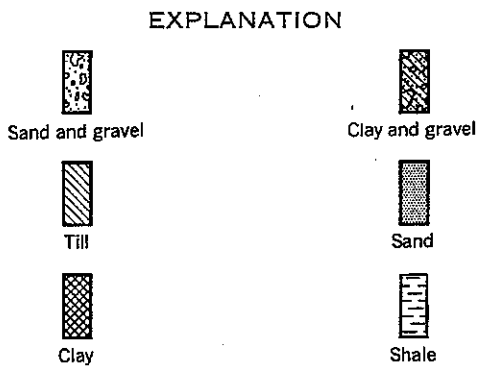
CRA

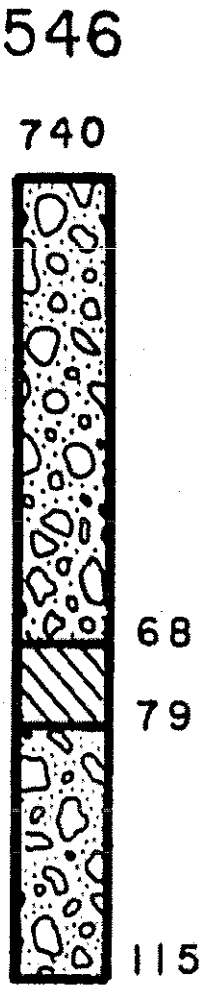
Production Well 20

PRODUCTION WELL	20
USGS LOG NUMBER	546
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	739.77
DATE DRILLED	4/51
DEPTH (ft)	174
WATER LEVEL DEPTH	40
DATE	5/22/52
YIELD RATE (gpm)	1,785
DRAWDOWN (ft)	10.5
TYPE OF PUMP	Turbine
DIAMETER OF WELL (in)	20
USE	Industrial
COMMENT	-----

INFO FROM FRIGIDAIRE STRIP LOGS:

SCREEN INTERVAL (ft BGS)	84-114
DATE OF COMPLETION	-----



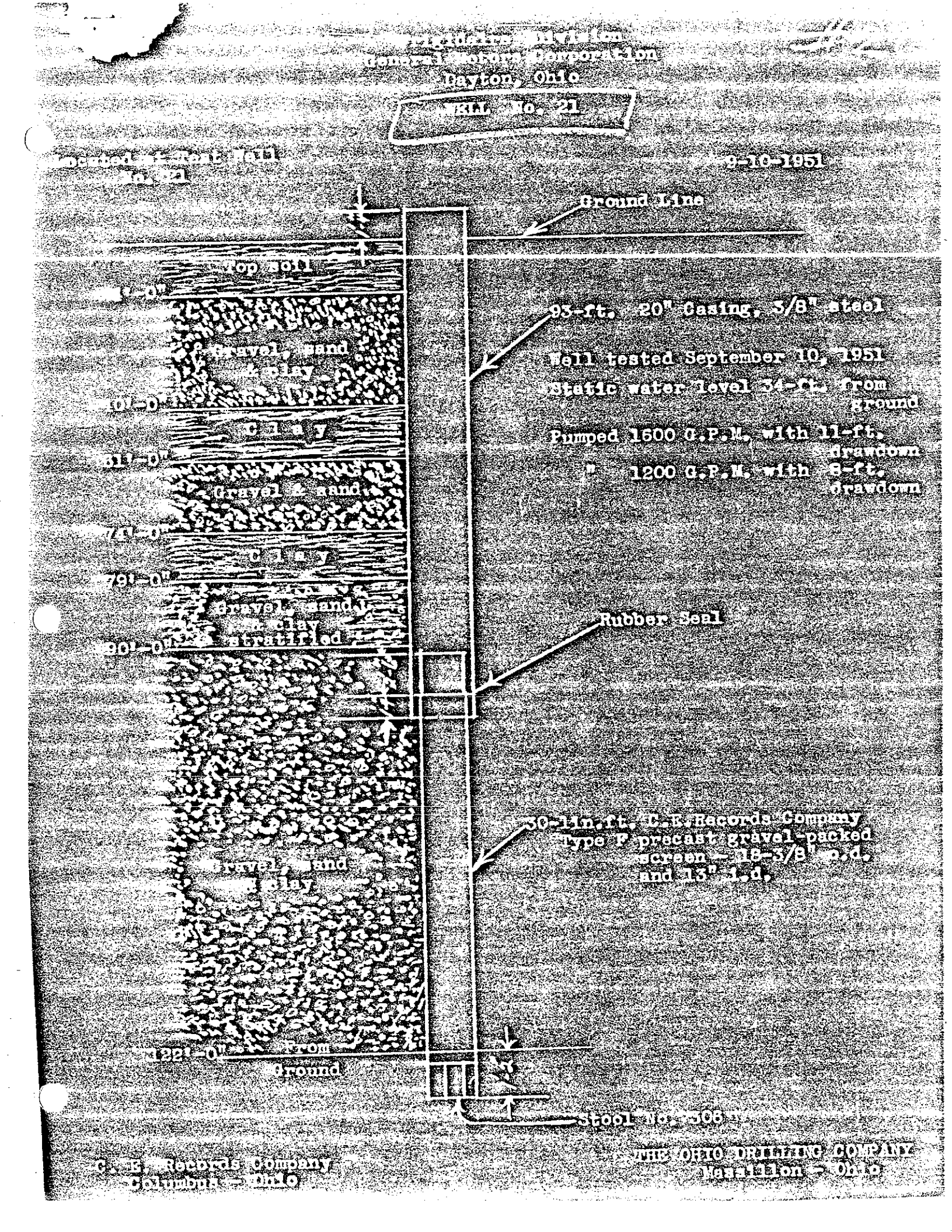


SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

PRODUCTION WELL 20
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

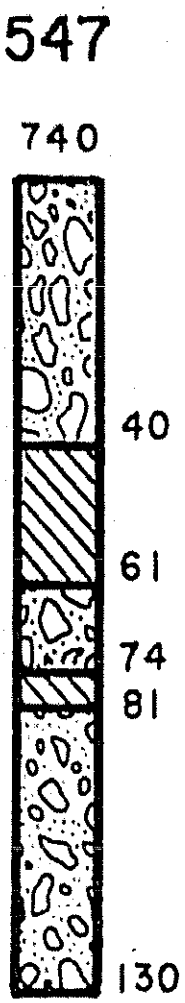
Production Well 21


Dayton, Ohio
Test No. 21
9-10-1951
Ground line
Top soil
0'-0"
Gravel & sand
Clay
61'-0"
Gravel & sand
74'-0"
Clay
79'-0"
Gravel & sand
Clay
stratified
90'-0"
Gravel & sand
Clay
122'-0"
Bottom
Ground
93-ft. 20" casing, 3/8" steel
Well tested September 10, 1951
Static water level 34-ft. from ground
Pumped 1600 G.P.M. with 11-ft. drawdown
" 1200 G.P.M. with 8-ft. drawdown
Rubber Seal
30-1in-ft. C.K.Records Company type P precast gravel-packed screen - 16-3/8" O.D. and 13" I.D.
Stool No. 100
C.K. Records Company
Columbus - Ohio
Water Well Drilling Company
Massillon - Ohio

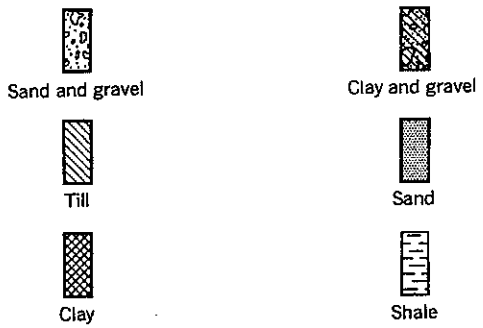
PRODUCTION WELL	21
USGS LOG NUMBER	547
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	740.06
DATE DRILLED	9/51
DEPTH (ft)	122
WATER LEVEL DEPTH	34
DATE	9/6/51
YIELD RATE (gpm)	1,200
DRAWDOWN (ft)	8
TYPE OF PUMP	Turbine
DIAMETER OF WELL (in)	20
USE	Industrial
COMMENT	-----

INFO FROM FRIGIDAIRE STRIP LOGS:

SCREEN INTERVAL (ft BGS)	98-128
DATE OF COMPLETION	9/10/51



EXPLANATION

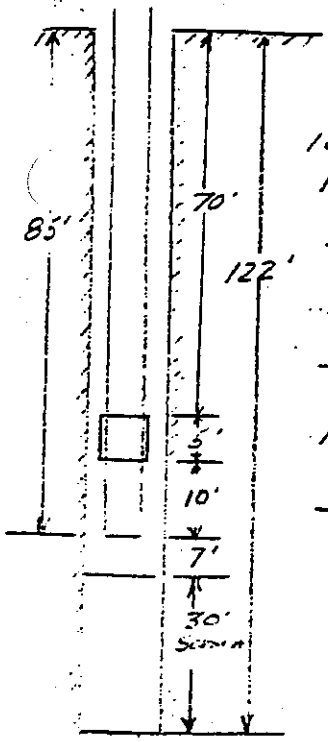


SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

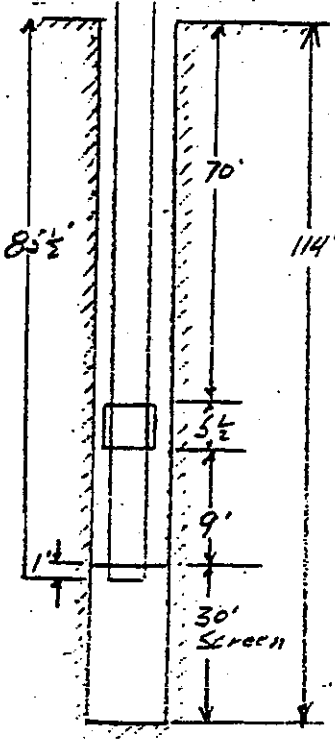
PRODUCTION WELL 21
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

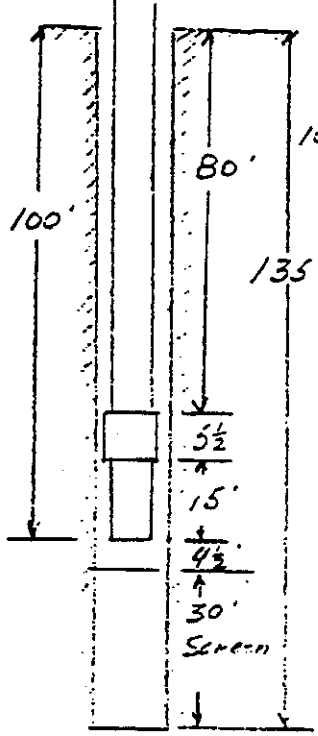
Well #21
9-10-51
20" Well
1200 GPM
100 HP US Mot
Deming
Pump
Static
34'
8' D.D.
8-17-54
Running
62'



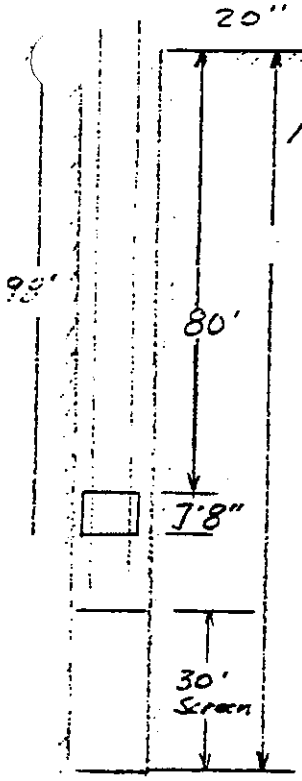
Well #22
9-17-51
1200 GPM
20" Well
100 HP US Mot
Peerless
Pump
Static
30'
7' DD
8-17-54
Running
56'



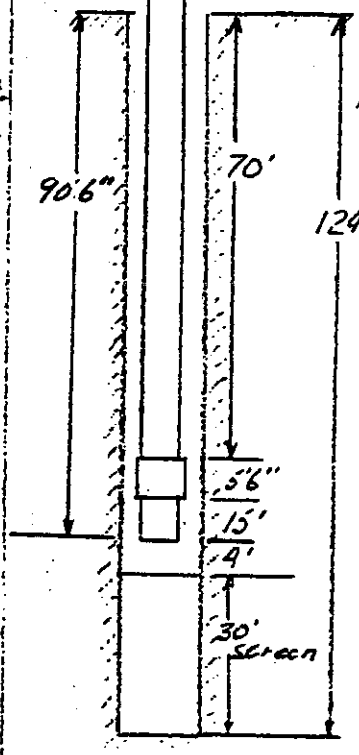
Well # 23
3-6-52
1200 GPM
20" Well
100 HP US Mot
Peerless
Pump
Static
36½'
12' DD
Static
46'



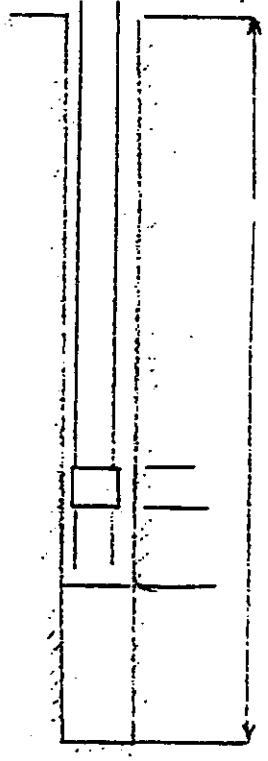
20" Well #24
8-19-53
1200 GPM
100 HP US Mot.
Deming
Pump
Static
43'
8' D.D.



20" Well #25
8-25-53
1200 GPM
100 HP US Mot.
Peerless
Pump
Static
33'
8' DD
8-17-54
Running
53'



Well #26

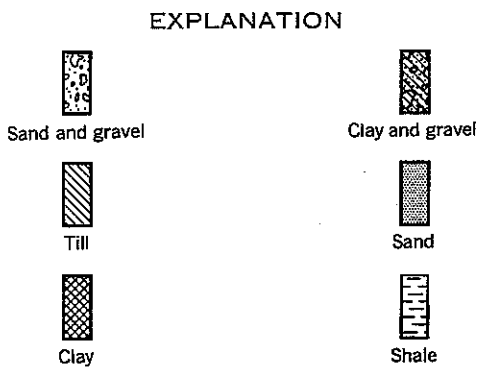


Production Well 22

PRODUCTION WELL	22
USGS LOG NUMBER	548
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	734.62
DATE DRILLED	4/51
DEPTH (ft)	114
WATER LEVEL DEPTH	30
DATE	4/17/51
YIELD RATE (gpm)	1,760
DRAWDOWN (ft)	10
TYPE OF PUMP	Turbine
DIAMETER OF WELL (in)	20
USE	Industrial
COMMENT	-----

INFO FROM FRIGIDAIRE STRIP LOGS:

SCREEN INTERVAL (ft BGS)	84-114
DATE OF COMPLETION	4/30/51





SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

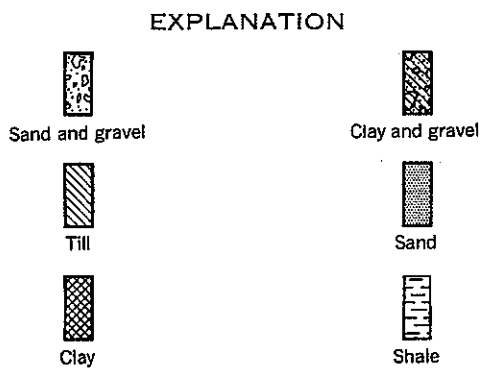
PRODUCTION WELL 22
GENERAL MOTORS CORPORATION
Moraine, Ohio

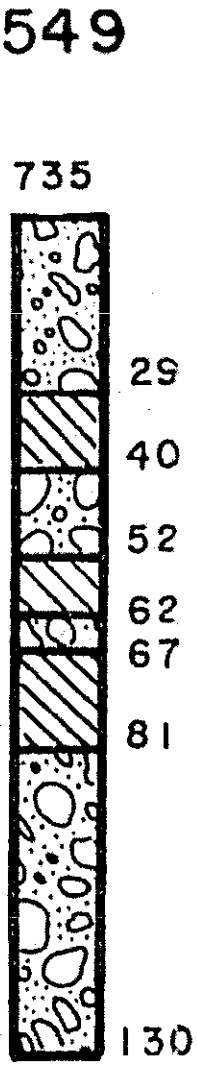
CRA

PRODUCTION WELL	-----
USGS LOG NUMBER	549
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	734.62
DATE DRILLED	1951
DEPTH (ft)	130
WATER LEVEL DEPTH	-----
DATE	-----
YIELD RATE (gpm)	-----
DRAWDOWN (ft)	-----
TYPE OF PUMP	-----
DIAMETER OF WELL (in)	-----
USE	Test
COMMENT	-----

INFO FROM FRIGIDAIRE STRIP LOGS:

SCREEN INTERVAL (ft BGS)	-----
DATE OF COMPLETION	-----





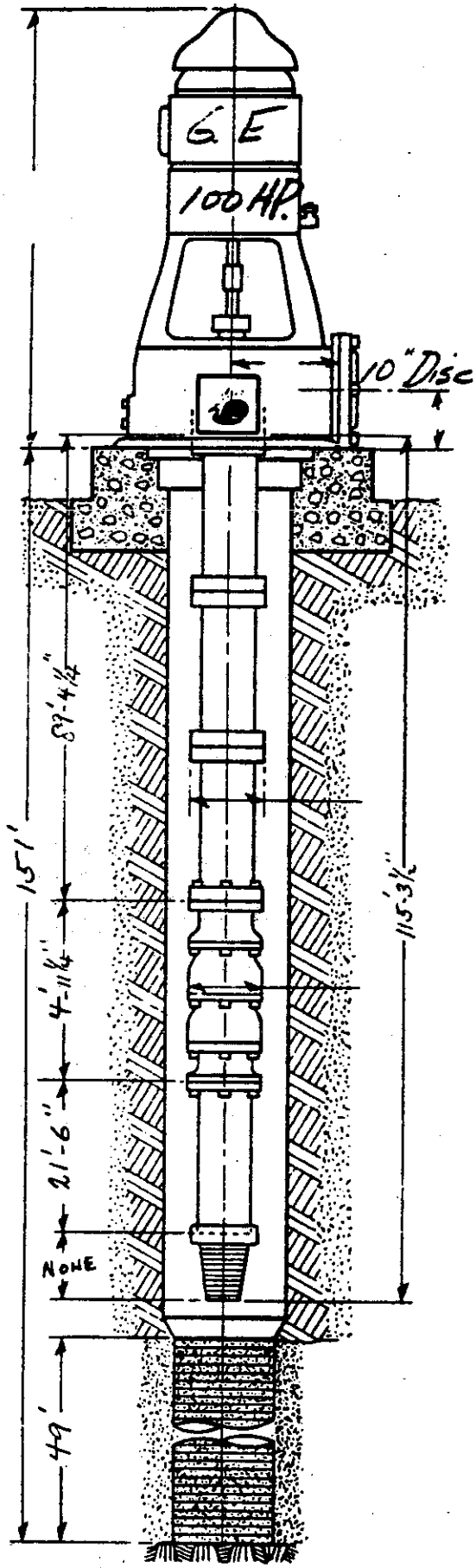
SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

TEST BORING 22
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

Production Well 23

MOODY'S OF DAYTON, INC.
VANDALIA, OHIO



TURBINE PUMP INSTALLATION FOR:
FRIGIDAIRE

WELL DESIGNATION NO. #23.

721-C-1690 SERIAL NUMBER
800 GALLONS PER MINUTE
320 TOTAL HEAD IN FEET
12GM 5 STAGES
1760 MOTOR SPEED RPM
89'-4¼" FEET OF SETTING
10" SIZE COLUMN - FLANGED.
— OIL TUBE
1 1/16" LINE SHAFT
21'-6" 8" SUCTION PIPE
100 H.P. 480 VOLT. 3 CURRENT 60
WATER LUBRICATION
105' FEET OF AIRLINE - GALVANIZED
8/16/72 DATE INSTALLED

20" O.D. OF WELL
151' FEET DEEP FROM FOUNDATION
— FEET DEEP FROM GRADE
49' STRAINER LENGTH — SLOT 70 & 90
88' STATIC LEVEL — DATE 9/5/72.
" " — " —
" " — " —
" " — " —
8/21/72 DATE DRILLED

PUMP REPAIRED — DATE 8/21/72
" " — " —
" " — " —

WELL ACID TREATED — DATE —
" " " — " —

COMMENTS —
(1.) USED 10 GALLONS OF MURIATIC ACID WHEN DRILLING OUT CONCRETE SCREEN.
(2.) SET COOK KEY PACKED SCREEN.
(3.) USE CAUTION WHEN LOWERING BAILER THROUGH LEAD PACKER.

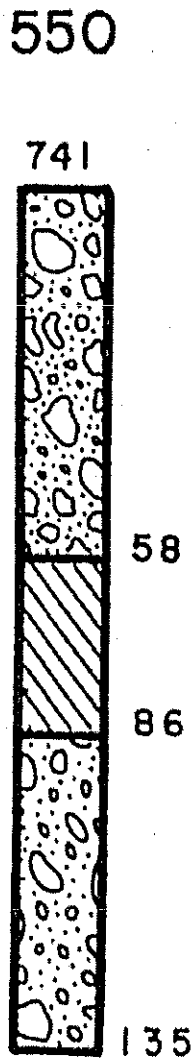
FORM TPI-762

LITHO IN U.S.A.

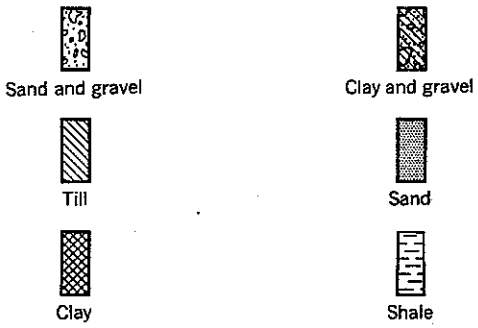
PRODUCTION WELL	23
USGS LOG NUMBER	550
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	741.27
DATE DRILLED	3/52
DEPTH (ft)	135
WATER LEVEL DEPTH	36
DATE	3/16/52
YIELD RATE (gpm)	1,200
DRAWDOWN (ft)	12
TYPE OF PUMP	Turbine
DIAMETER OF WELL (in)	20
USE	Industrial
COMMENT	-----

INFO FROM FRIGIDAIRE STRIP LOGS:

SCREEN INTERVAL (ft BGS)	105-135
DATE OF COMPLETION	3/6/52



EXPLANATION



SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

PRODUCTION WELL 23
GENERAL MOTORS CORPORATION
Moraine, Ohio

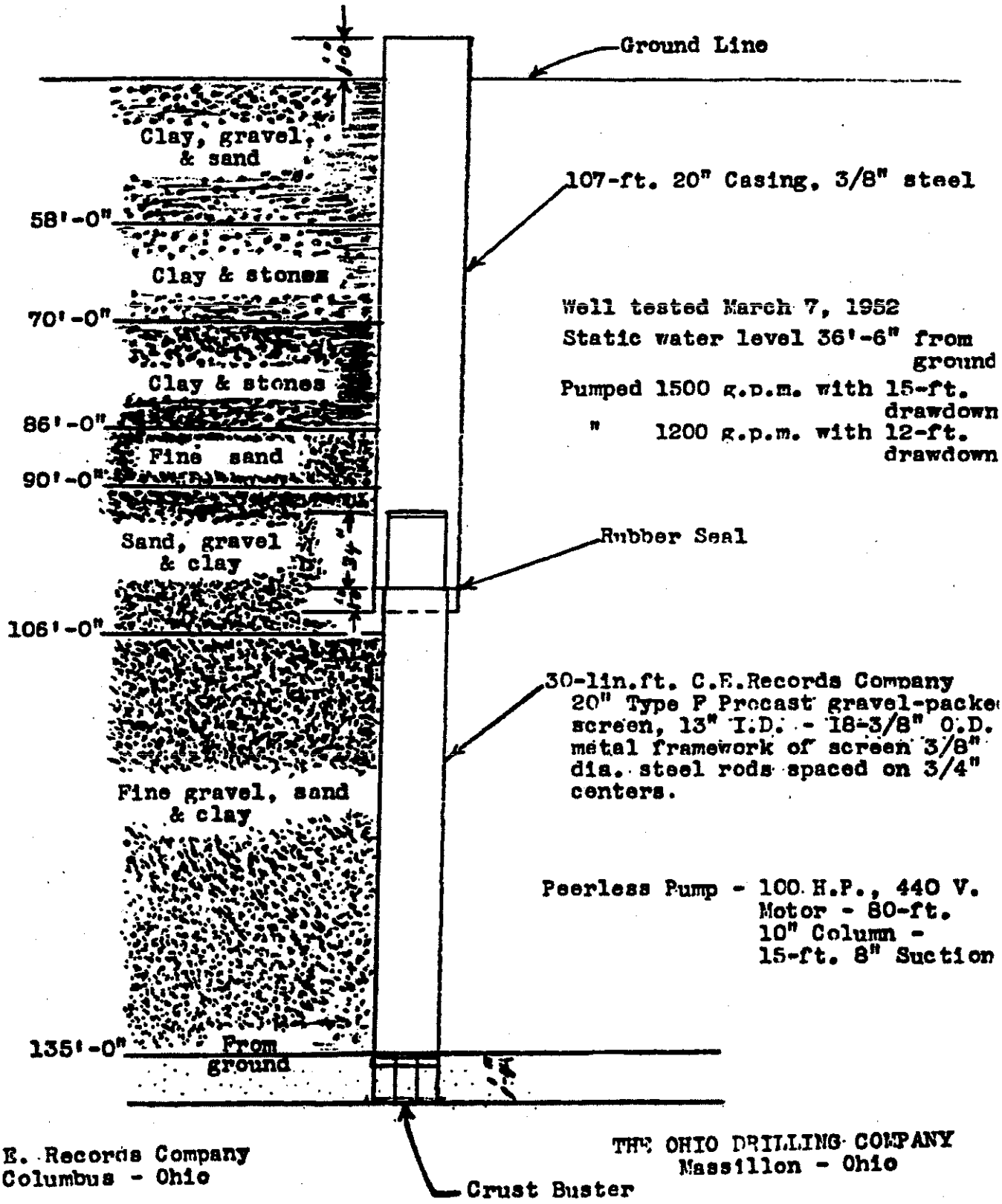
CRA

Frigidaire Division
General Motors Corporation
Dayton - Ohio

...ted at Test Well
. 23 at Stoop Road
...nd Pt. 25

WELL No. 23

3-6-1952



C. E. Records Company
Columbus - Ohio

THE OHIO DRILLING COMPANY
Massillon - Ohio

Plant #3

Located 100-ft. south of property line & 270-ft. west of Kettering Blvd.

Frigidaire Division

General Motors Corporation

Dayton - Ohio

TEST WELL No.23

1-21-1952

44'-0"	Gravel, sand & clay, large stones
58'-0"	Clay & stones
70'-0"	Clay, sand & stones
86'-0"	Gravel, sand & clay - Static 42-ft.
90'-0"	Fine sand - Static 42-ft.
106'-0"	Sand, gravel & clay - Static 42-ft.
126'-0"	Gravel, sand & little clay (good) - Static 42-ft.
136'-0"	Gravel, sand & clay stratified - Static 42-ft
146'-0"	Gravel, sand & blue clay - Static 42-ft.
	Stopped drilling in this material

E. Records Company
Columbus - Ohio

THE OHIO DRILLING COMPANY
Massillon - Ohio

Frigidaire Division
General Motors Corporation
Dayton * Ohio

TEST WELL No.23

SIEVE ANALYSES

Sample, 95- to 101-ft. -	Clay	12-1/2 %
	Coarse gravel	18-3/4 %
	Medium "	10-7/8 %
	Fine "	17-1/8 %
	Coarse sand	18-3/4 %
	Medium "	15-5/8 %
	Fine "	6-1/4 %
Sample, 101- to 106-ft. -	Clay	7-7/8 %
	Coarse gravel	14- %
	Medium "	12-1/2 %
	Fine "	23-3/8 %
	Coarse sand	26-1/2 %
	Medium "	9-3/8 %
	Fine "	6-1/4 %
Sample, 106- to 111-ft. -	Clay	6-1/4 %
	Coarse gravel	4-5/8 %
	Medium "	14- %
	Fine "	43-3/4 %
	Coarse sand	20-3/8 %
	Medium "	6-1/4 %
	Fine "	4-5/8 %
Sample, 111- to 116-ft. -	Clay	4-5/8 %
	Coarse gravel	7-7/8 %
	Medium "	15-5/8 %
	Fine "	35-7/8 %
	Coarse sand	25- %
	Medium "	7-7/8 %
	Fine "	3-1/8 %
Sample, 116- to 121-ft. -	Clay	4-5/8 %
	Coarse gravel	9-3/8 %
	Medium "	14- %
	Fine "	42-1/8 %
	Coarse sand	20-3/8 %
	Medium "	6-1/4 %
	Fine "	3-1/8 %
Sample, 121- to 126-ft. -	Clay	3-1/8 %
	Coarse gravel	10-7/8 %
	Medium "	25- %
	Fine "	39- %
	Coarse sand	14- %
	Medium "	4-5/8 %
	Fine "	3-1/8 %

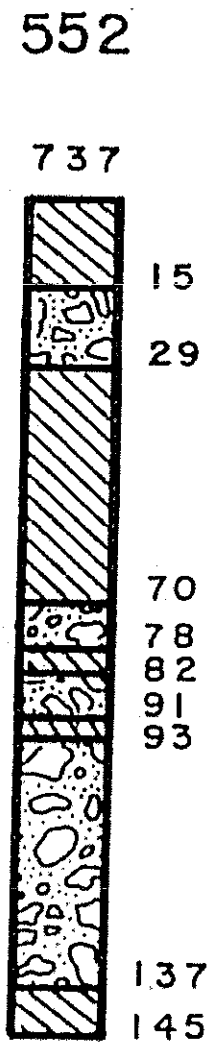
Production Well 24

PRODUCTION WELL	24
USGS LOG NUMBER	551
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	737.4
DATE DRILLED	9/53
DEPTH (ft)	-----
WATER LEVEL DEPTH	43
DATE	8/19/53
YIELD RATE (gpm)	1,830
DRAWDOWN (ft)	13
TYPE OF PUMP	Turbine
DIAMETER OF WELL (in)	20
USE	Industrial
COMMENT	-----

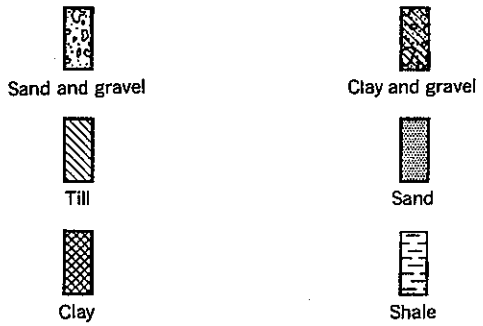
INFO FROM FRIGIDAIRE STRIP LOGS:

SCREEN INTERVAL (ft BGS)	105-137
DATE OF COMPLETION	6/12/53

NOTE: Well log not available test boring log substituted



EXPLANATION



SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

PRODUCTION WELL 24
GENERAL MOTORS CORPORATION
Moraine, Ohio

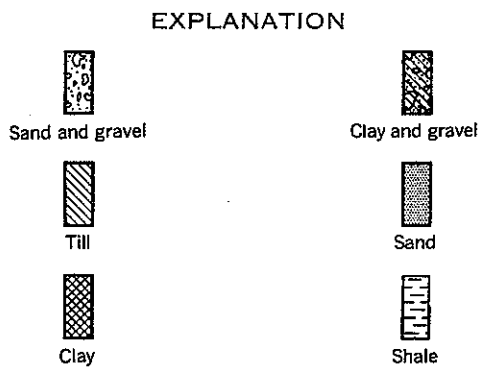
CRA

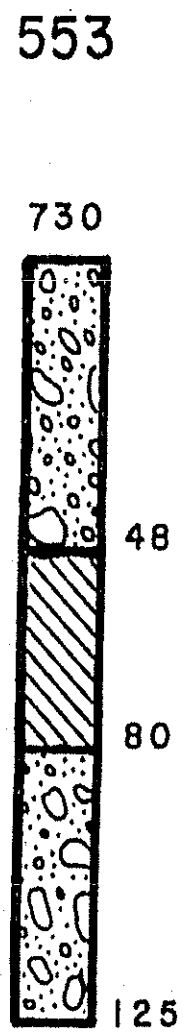
Production Well 25

PRODUCTION WELL	25
USGS LOG NUMBER	553
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	729.79
DATE DRILLED	7/53
DEPTH (ft)	125
WATER LEVEL DEPTH	37.93
DATE	12/18/57
YIELD RATE (gpm)	1,200
DRAWDOWN (ft)	8
TYPE OF PUMP	Turbine
DIAMETER OF WELL (in)	20
USE	Industrial
COMMENT	-----

INFO FROM FRIGIDAIRE STRIP LOGS:

SCREEN INTERVAL (ft BGS)	94-124
DATE OF COMPLETION	6/12/53





SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

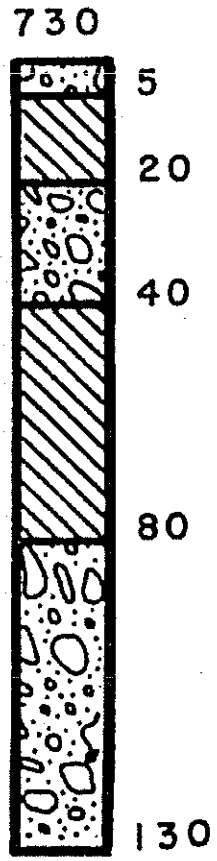
PRODUCTION WELL 25
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

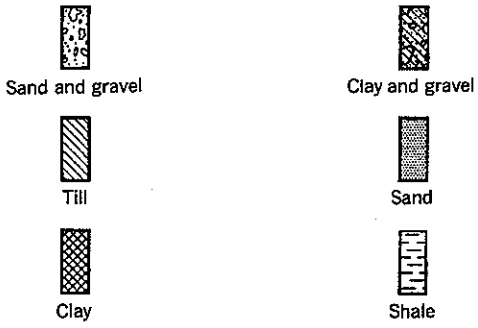
PRODUCTION WELL	-----
USGS LOG NUMBER	554
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	729.8
DATE DRILLED	6/53
DEPTH (ft)	130
WATER LEVEL DEPTH	35
DATE	6/12/53
YIELD RATE (gpm)	-----
DRAWDOWN (ft)	-----
TYPE OF PUMP	-----
DIAMETER OF WELL (in)	-----
USE	Test
COMMENT	-----

INFO FROM FRIGIDAIRE STRIP LOGS:
SCREEN INTERVAL (ft BGS) -----
DATE OF COMPLETION -----

554



EXPLANATION



SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

TEST BORING 25
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

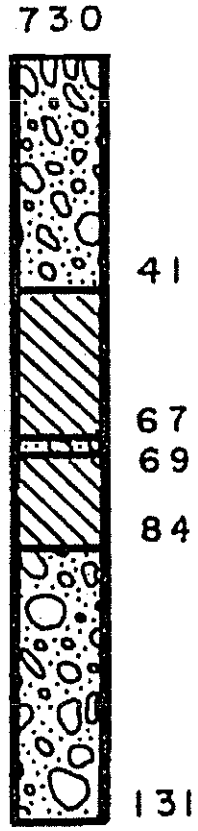
Production Well 26

PRODUCTION WELL	26
USGS LOG NUMBER	555
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	729.37
DATE DRILLED	6/55
DEPTH (ft)	131
WATER LEVEL DEPTH	33
DATE	8/12/55
YIELD RATE (gpm)	1,600
DRAWDOWN (ft)	19
TYPE OF PUMP	Turbine
DIAMETER OF WELL (in)	20
USE	Industrial
COMMENT	-----

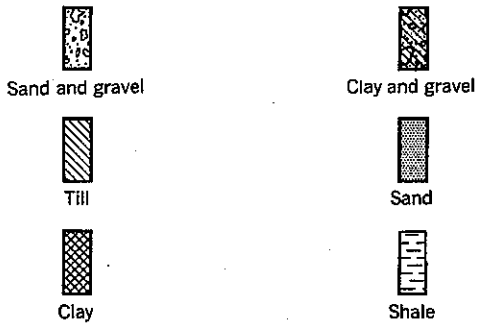
INFO FROM FRIGIDAIRE STRIP LOGS:

SCREEN INTERVAL (ft BGS)	85-135
DATE OF COMPLETION	5/4/55

555



EXPLANATION



SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

PRODUCTION WELL 26
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

WELL LOG AND DRILLING REPORT

ORIGINAL

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1500 Dublin Road
Columbus, Ohio

No. 179355

County Montgomery Township Moraine Section of Township

Owner Frigidaire Div. G.M.Corp Address

Well #1

Location of property Frigidaire Plant Moraine City - Dayton Ohio

CONSTRUCTION DETAILS

Casing diameter 20" Length of casing 100'

Type of screen R. Brass Length of screen 30'

Type of pump

Capacity of pump

Depth of pump setting

Date of completion

BAILING OR PUMPING TEST

1016 GPM. 147 DD. 7 Hrs.
1600 G.P.M. 9 DD

Pumping rate 1600 G.P.M. Duration of test 12 hrs.

Drawdown 7 11 ft. Date 6/6/55

Developed capacity

Static level—depth to water 35' 9" ft.

Pump installed by

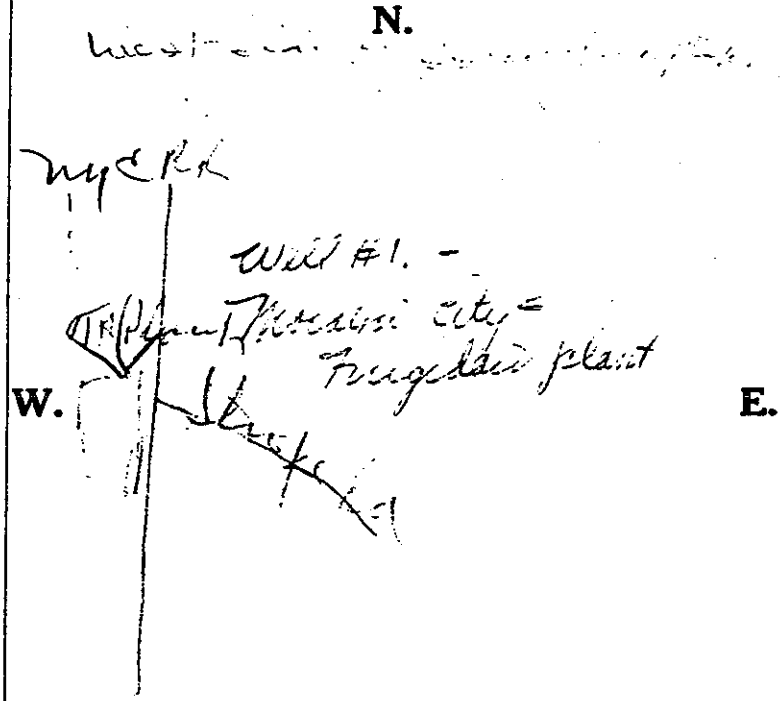
WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
Gravel	0 Feet	25 Ft.
Gravel	25	30
Gravel	30	41
Gravel	41	52
Till	52	67
Till	67	69
Gravel	69	84
Till	84	90
Gravel	90	115
Gravel	115	128
Gravel	128	131

4059

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm Donald J Roe Date 6/6/55

Address Rt a Box 211 Vandalia Ohio Signed Don Roe

Well #1

36

Production Well 27

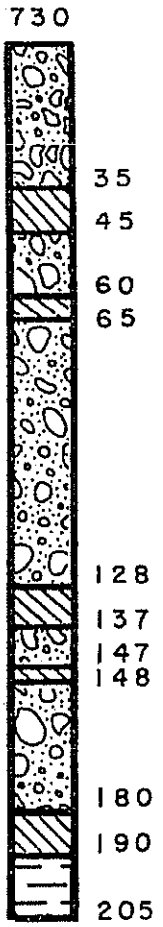
PRODUCTION WELL	27
USGS LOG NUMBER	556
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	729.37
DATE DRILLED	8/55
DEPTH (ft)	135
WATER LEVEL DEPTH	43
DATE	8/17/55
YIELD RATE (gpm)	1,200
DRAWDOWN (ft)	10
TYPE OF PUMP	Turbine
DIAMETER OF WELL (in)	16
USE	Industrial
COMMENT	-----

INFO FROM FRIGIDAIRE STRIP LOGS:

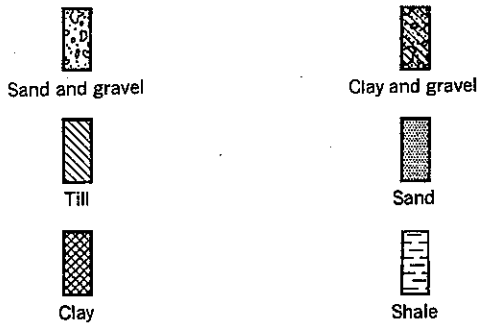
SCREEN INTERVAL (ft BGS)	65-128
DATE OF COMPLETION	7/9/55

NOTE: Well log not available test boring log substituted

557



EXPLANATION



SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

PRODUCTION WELL 27
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

WELL LOG AND DRILLING REPORT

ORIGINAL

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1500 Dublin Road
Columbus, Ohio

No. 179357

County Montgomery Township Madison Section of Township

Owner Frigidaire Div. GMC Address 300 Taylor St Dayton, Ohio
#2

Location of property Moraine City plant, Dayton, Ohio

CONSTRUCTION DETAILS

Casing diameter 16" Length of casing 102'

Type of screen Red Brass Length of screen 20'

Type of pump —

Capacity of pump —

Depth of pump setting —

Date of completion —

BAILING OR PUMPING TEST

Pumping rate 120 G.P.M. Duration of test 8 hrs.

Drawdown 10 ft. Date 5/16/55

Developed capacity 12 cu yd/min

Static level—depth to water 431 ft.

Pump installed by

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
Gravel	0 Feet	18 Ft.
Dirty Gravel	18	35
Gravel	35	37
Till	37	41
Gravel	41	57
Till	57	60
Gravel	60	174
Gravel	174	105
Gravel	105	128
Till	125	135

4059

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.

N.

W. E.

Moraine City plant
Dayton, Ohio.

S.

See reverse side for instructions

Drilling Firm Howard Kae

Address Vandalia, Ohio

Date 5/16/55

Signed Howard Kae

Well #2

27

Production Well 28

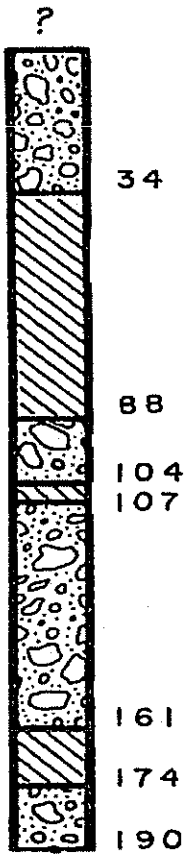
PRODUCTION WELL	28
USGS LOG NUMBER	558
ODNR NUMBER	179360
ALTITUDE (ft AMSL)	735
DATE DRILLED	12/55
DEPTH (ft)	123
WATER LEVEL DEPTH	45
DATE	12/22/55
YIELD RATE (gpm)	1,200
DRAWDOWN (ft)	10
TYPE OF PUMP	Turbine
DIAMETER OF WELL (in)	16
USE	Industrial
COMMENT	-----

INFO FROM FRIGIDAIRE STRIP LOGS:

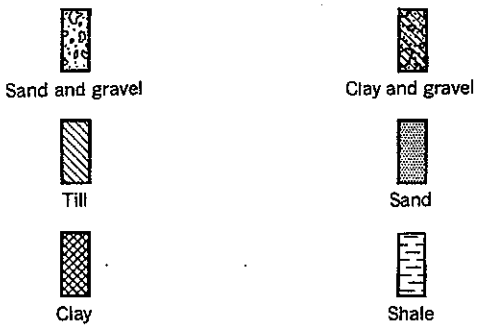
SCREEN INTERVAL (ft BGS)	88-117
DATE OF COMPLETION	-----

NOTE: Well log not available test boring log substituted

559



EXPLANATION



SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

PRODUCTION WELL 28
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

MOODY'S of Dayton, Inc.

WELL LOG AND DRILLING REPORT

ADDRESS REPLY TO
P.O. BOX 123
MIAMISBURG, OHIO 45342
PHONE AC 513-859-4482

Customer: Detroit Diesel - Engine Plant

Address:

Location of Well: Front of Engine Plant WELL #28 Job No. 45050

Date Started: Date Finished

Driller: Bill Woollet Helper Doug Jones

Old screen - Red brass - 26'7-3/4" - 14-3/4 O.D. 13⅜ I.D. Well 121' Deep.

Formation Description	From	To
Dirty sand & gravel	121	135'
Sand & Gravel w/water	135	146'
Layer clay sand & gravel	146	150'
Sand & gravel w/water	150	163'
Yellow clay fine sand	163	176'
Sand & Gravel w/water	176	208'
Gray limestone	208	214
SCREEN Cook		
1. 16'4½" 100#		
2. 14'3-3/4" - 7'2" 60# & 7'1-3/4" 80#		
3. 9'11-3/4" s.s. blank pipe		
4. 5'3" close rad & 6'3" 40#	5'2" 20#	
Total length screen -57'½"		
(put 10# HTH in well)		
Well making 3' sand hour -	fine to med.	

LENGTH OF PIECES OF CASING

(First listed is bottom section)

Pipe left above or below ground

Total Length of casing

152' 14" pipe in well

No. 1 Ft. Inches
No. 2 Ft. Inches
No. 3 Ft. Inches
No. 4 Ft. Inches
No. 5 Ft. Inches
No. 6 Ft. Inches
No. 7 Ft. Inches
No. 8 Ft. Inches
No. 9 Ft. Inches
No. 10 Ft. Inches
No. 11 Ft. Inches
No. 12 Ft. Inches
No. 13 Ft. Inches
No. 14 Ft. Inches
No. 15 Ft. Inches
No. 16 Ft. Inches
No. 17 Ft. Inches
No. 18 Ft. Inches

LENGTH OF PIECES OF CASING PULLED OUT TO EXPOSE SCREEN

(First listed is TOP section)

No. 1 pull 56' Ft. 14" pipe Inches
No. 2 Ft. Inches
No. 3 Ft. Inches
No. 4 Ft. Inches
No. 5 Ft. Inches

Time spent in developing well

CONSTRUCTION DETAILS

Casing Diam: 14" Length 152'

Type of screen Cook s.s. lead packer

Length 57'½"

Static level (depth to water) 40' + or -

Well top screen 151'.

Total depth 207 top pad

Cut 14" pipe 21" below pad
Well to 16" pipe

MOODY'S of Dayton, Inc.

ADDRESS REPLY TO:
P.O. BOX 123
MIAMISBURG, OHIO 45342
PHONE AC 513-859-4482

February 6, 1984

Chevrolet Motor Division G.M.C.
Moraine Plants
P.O. Box 1291
Dayton, Ohio 45401

Attention: Herman A. Myers
Buyer

Subject: Well #28 - Release #07068
Purchase Order #MO-06643

Gentlemen:

On January 25th a pumping test was conducted on Well #28 to determine the condition of the well and pump. Two (2) copies of the production test are enclosed for your files and perusal.

A short history on Well #28 is as follows:

Drilled in 1955. 16" diameter, 120' deep with 25' screen.

1959 - Pump repaired.
1962 - Well revitalized and pump repaired.
1964 - Pump repaired.
1966 - Well revitalized and pump repaired.
1970 - Well revitalized and pump repaired.
1975 - Minor motor repairs.
1976 - Well revitalized and pump repaired.
1979 - Minor motor repairs.
1980 - Well tested.
1982 - Pump repairs.

Based upon the test data the well specific capacity is about 27 GPM/ft. of draw down. The original specific capacity when drilled was about 108 GPM/ft. of draw down. Also, repairs required over the last 7-8 years are becoming excessive. This well is only 120' deep and has a short screen, only 25 feet long. Due to the age of the well, shallow depth, short screen, and recent higher than normal maintenance costs, we recommend that this well be deepened.

WELL LOG AND DRILLING REPORT

ORIGINAL

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1500 Dublin Road
Columbus, Ohio

No. 179360

County Montgomery Township Moraine Section of Township

Owner Frigidaire Div. GMC Address 300 Taylor St Dayton 6

NE 1/4

Location of property Moraine City plant, Dayton Ohio

CONSTRUCTION DETAILS

Casing diameter 16" Length of casing 93'

Type of screen Red Brass Length of screen 25'

Type of pump —

Capacity of pump —

Depth of pump setting —

Date of completion

BAILING OR PUMPING TEST

Pumping rate 120 G.P.M. Duration of test 5 hrs.

Drawdown 10' ft. Date 12/23/55

Developed capacity 120 G.P.M.

Static level—depth to water 45' ft.

Pump installed by

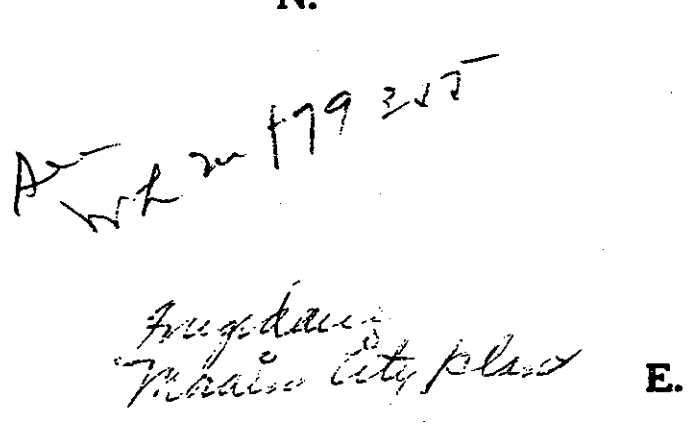
WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
Topsoil	0 Feet	2 Ft.
Fill	2	7
Gravel	7	25
Gravel	25	31
Silt	31	35
Gravel	35	71
Silt	71	73
Silt	73	89
Gravel	89	112
Silt	112	118
Silt	118	123

1059

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm Ronald J. Rau Date 12/22/55

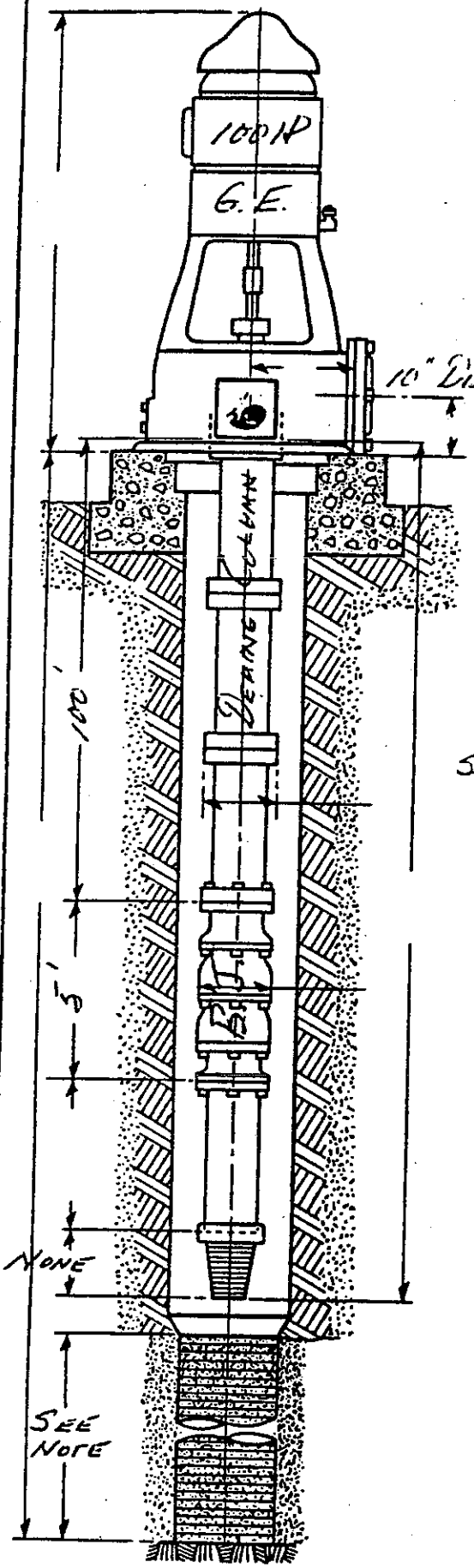
Address Jamestown, Ohio Signed Ronald Rau

Well #4

28

MOODY'S OF DAYTON, INC.

P.O. BOX 123, MIAMISBURG, OH.



TURBINE PUMP INSTALLATION FOR:

Detroit Diesel - Engine Plant

WELL DESIGNATION NO. 28

_____ SERIAL NUMBER
700 GALLONS PER MINUTE
295 TOTAL HEAD IN FEET
12 - 6M - 5 STAGES B.J.
1760 MOTOR SPEED RPM
100 FEET OF SETTING
8" SIZE COLUMN FLG.
NONE OIL TUBE
1 15/16" LINE SHAFT
_____ _____ SUCTION PIPE
100 H.P. 460 VOLT. 3 CURRENT 60
WATER LUBRICATION
_____ FEET OF AIRLINE
6/25/85 DATE INSTALLED

121 Amps.

14 O.D. I.D. OF WELL
207 FEET DEEP FROM FOUNDATION
205 FEET DEEP FROM GRADE
See Below STRAINER LENGTH — SLOT _____
38 STATIC LEVEL — DATE 6/25/85
_____ " " — " _____
_____ " " — " _____
_____ " " — " _____
6/25/85 DATE DRILLED

PUMP REPAIRED — DATE 6/25/85
" " — " _____
" " — " _____

WELL ACID TREATED — DATE _____
" " " — " _____

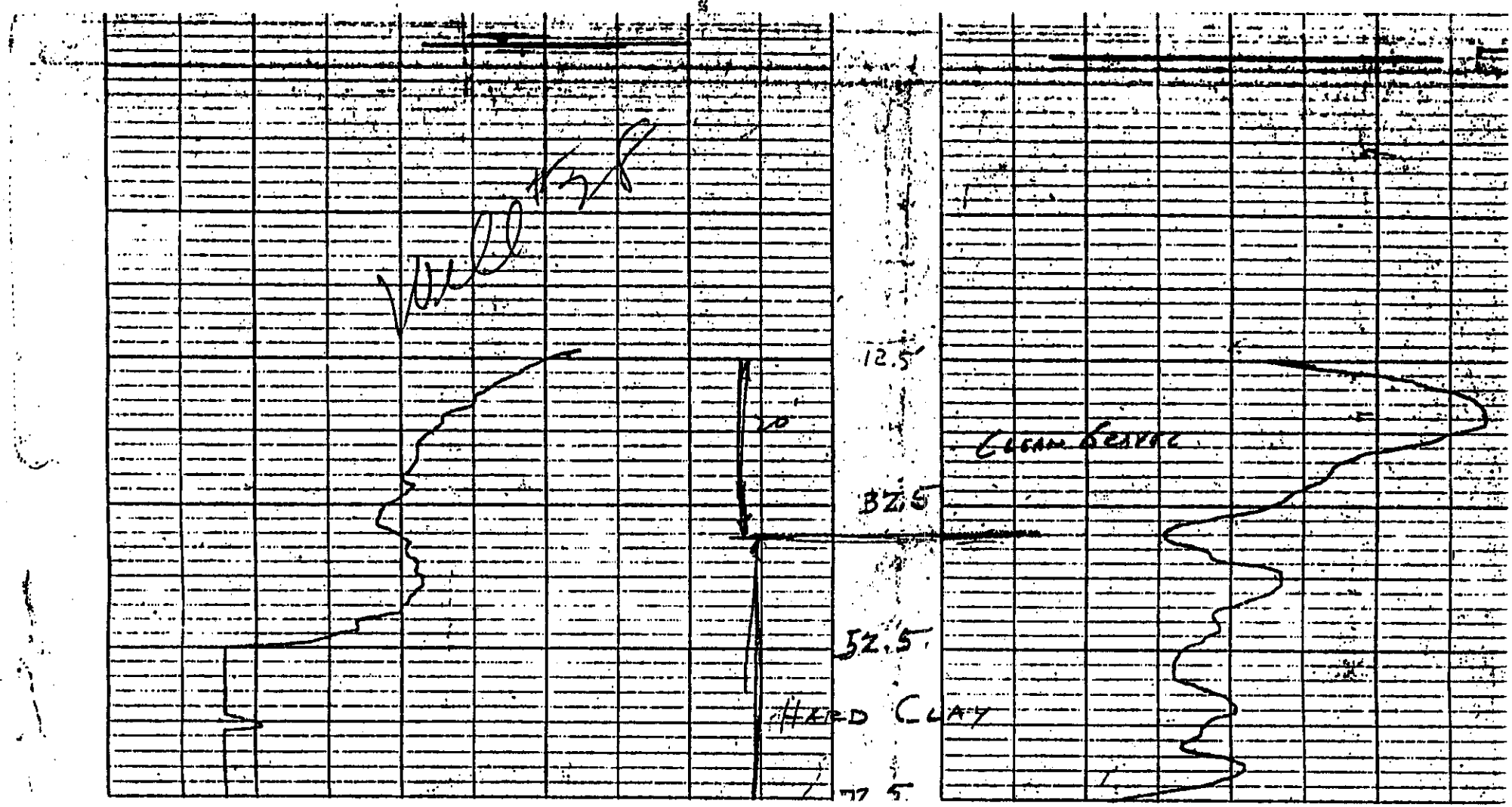
COMMENTS —

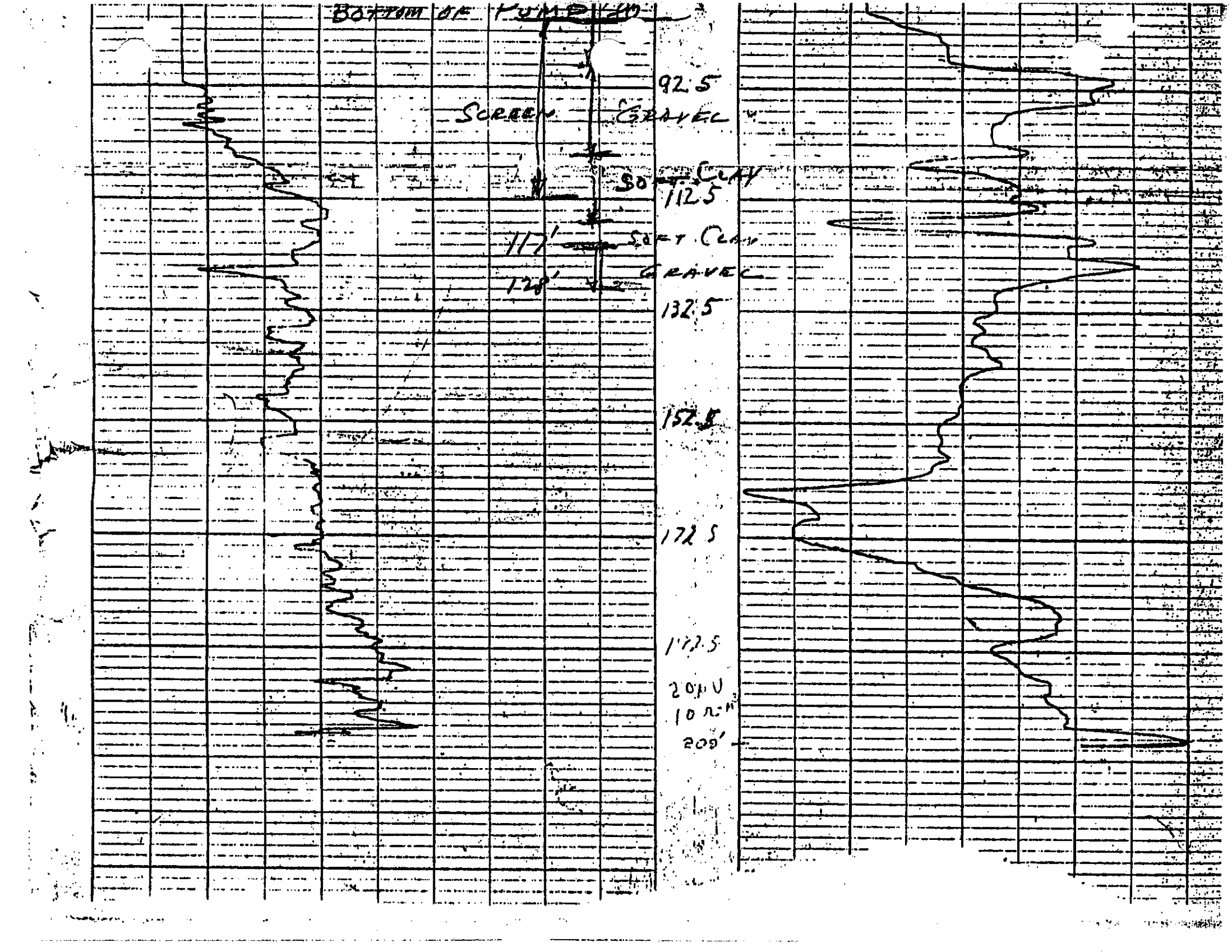
Screen Comprised as follows:

150' - 161' - 6' - 40 Slot + 3' - 20 Slot
161' - 177' - 16' Blank - 1/4" S.S. Pipe
177' - 191' - 7' - 60 Slot + 7' - 80 Slot
191' - 207' - 16' - 100 Slot

FORM TPI-762

LITHO IN U.S.A.


12.5'
20
BZ.5
52.5'
HARD CLAY
77.5'


BOTTOM OF PUMP 110'
92.5
SCREEN
GRAVEL
SOFT CLAY
112.5
117'
SOFT CLAY
GRAVEL
128'
132.5
152.5
172.5
177.5
200 V
10 AMP
200'

34	to 85½	Clay Hard
58½	to 104	Gravel
104	to 107	Clay
107	to 1[illegible]	[illegible]
11[illegible]	to 117	[illegible] 120'
117	to 125	Gravel Clean
125	to 130	Cemented Gravel
130	to 161	Gravel Very Dirty
161	to 174	Clay
174	to 181	Gravel Dirty Water
181	to 193	Gravel

100 Gal

Pump 125 GPM

1955

Production Well 29

PRODUCTION WELL	29
USGS LOG NUMBER	560
ODNR NUMBER	179359
ALTITUDE (ft AMSL)	729.79
DATE DRILLED	10/55
DEPTH (ft)	115
WATER LEVEL DEPTH	36
DATE	10/10/55
YIELD RATE (gpm)	1,000
DRAWDOWN (ft)	10
TYPE OF PUMP	Turbine
DIAMETER OF WELL (in)	16
USE	Industrial
COMMENT	-----

INFO FROM FRIGIDAIRE STRIP LOGS:

SCREEN INTERVAL (ft BGS)	136-162
DATE OF COMPLETION	10/10/55

NOTE: Well log not available test boring log substituted

EXPLANATION

Sand and gravel

Clay and gravel

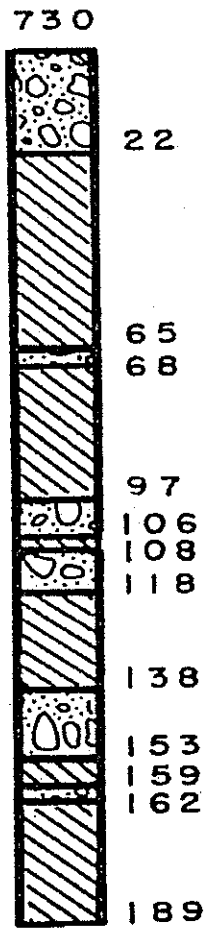
Till

Sand

Clay

Shale

561



SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

PRODUCTION WELL 29
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

WELL LOG AND DRILLING REPORT

ORIGINAL

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1500 Dublin Road
Columbus, Ohio

No. 179359

County Montgomery Township Harrison Section of Township

Owner Frigidaire Div. GMC #3 Address 300 Taylor St. Dayton, Ohio

Location of property Moraine City Plant Dayton Ohio

CONSTRUCTION DETAILS

Casing diameter 16" Length of casing 103'
Type of screen Red Brass Length of screen 20'
Type of pump
Capacity of pump
Depth of pump setting
Date of completion

BAILING OR PUMPING TEST

Pumping rate 1200 G.P.M. Duration of test 8 hrs.
Drawdown 16 ft. Date 11/7/55
Developed capacity 1200 GPM
Static level—depth to water 36' ft.
Pump installed by

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
Top Soil	0 Feet	2 Ft.
Gravel	2	9
Sand	9	23
Gravel	23	29
Gravel	29	32
Clay	32	37
Till	37	51
Till	51	66
Gravel	66	69
Till	69	50
Till	50	92
Till	92	95
Gravel	95	105
Gravel	105	115

4059 •

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.

N.

W. E.

S.

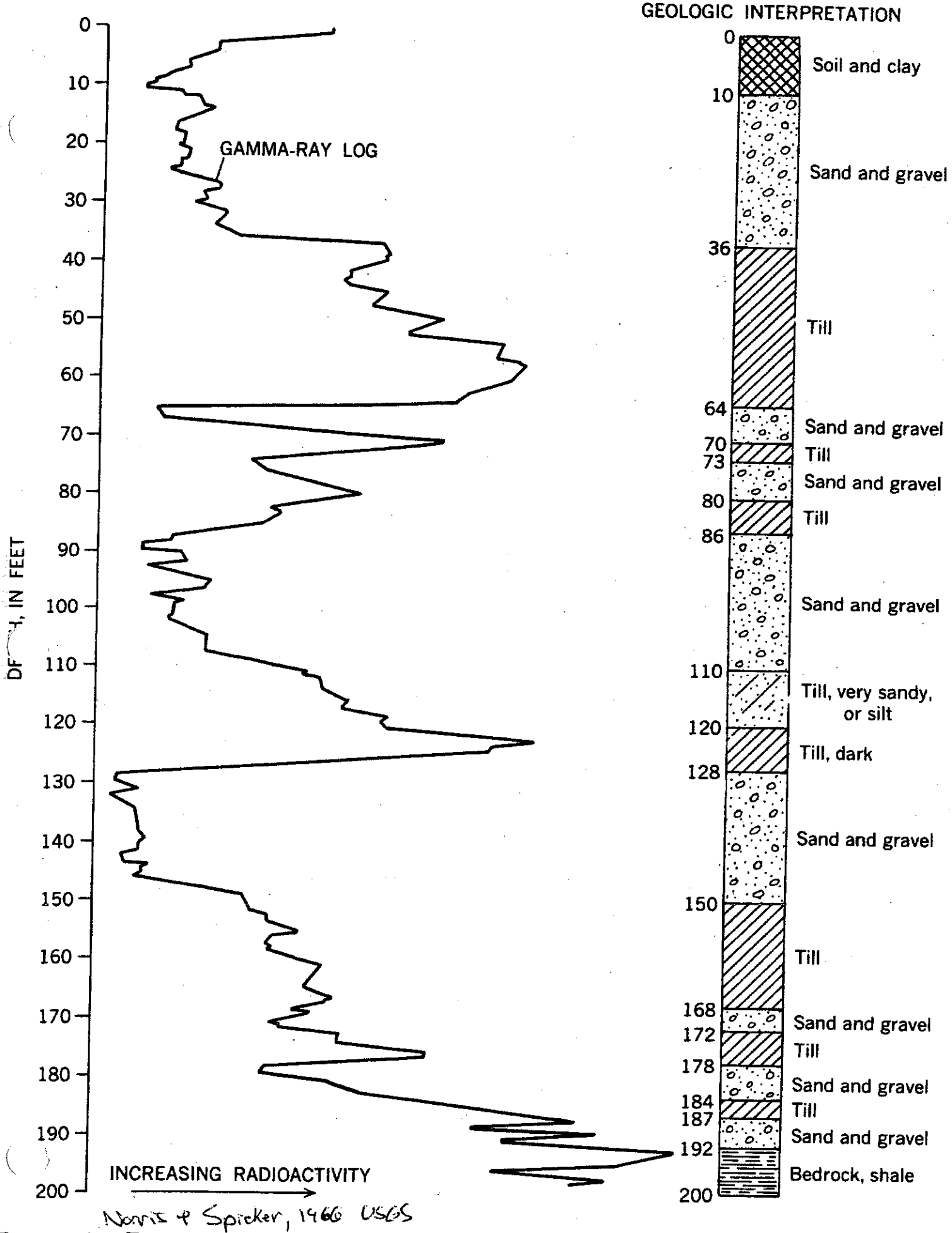
See reverse side for instructions

Drilling Firm Wenzel Bros. Date 11/7/55
Address Vandalia Ohio Signed Wm. Roe

Well #3

29

Production Well 30



Norris & Spicker, 1966 USGS

FIGURE 4.—Representative gamma-ray log and geologic interpretation of uncased test hole, drilled at the Frigidaire Division plant at Moraine City.

Well #30

ORIGINAL

WELL LOG AND DRILLING REPORT

Groups

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1500 Dublin Road
Columbus, Ohio

No. 210162

County Montgomery Township ~~[illegible]~~ Moraine Section of Township

Owner Frigidaire Div. Gmc Address Dayton, Ohio

Location of property Well # 30 - Moraine Plant

CONSTRUCTION DETAILS

Casing diameter 20" Length of casing 148'
Type of screen Red Brass Length of screen 30'
Type of pump —
Capacity of pump —
Depth of pump setting —
Date of completion —

BAILING OR PUMPING TEST

Pumping rate 1600 G.P.M. Duration of test 1/2 hrs.
Drawdown 4 1/2' ft. Date 11/7/59
Developed capacity 1000 GPM
Static level—depth to water 32' ft.
Pump installed by —

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
Fill	0 Feet	10 Ft.
Gravel	10	36
Till	36	73
Silt - Little gravel	73	86
Gravel & Sandy Silt	86	120
Silt	120	128
gravel	128	150

4059

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.

N.

Well # 30
Moraine plant
Frigidaire Div.
Gmc
Dayton, Ohio

W. E.

S.

See reverse side for instructions

Drilling Firm Don Rice Date 11/7/59

Address Vandalia, Ohio Signed Don Rice

C62

Production Well 31

Reynolds
Supply, Inc.

December 31, 1982

Harrison Radiator
P.O. Box 824
Dayton, Ohio 45401

Attention: Mr, Mike Hrosso

Reference: Well 31 - Compressor Building

Dear Mr. Hrosso:

In accordance with Harrison Radiator's Purchase Order MN-34518-D, Reynolds Supply, Inc. (Reynolds) has completed rehabilitation of Harrison's Well 31. Because of leakage noticed in the immediate vicinity of the well head when the pump was operating, it was decided to televise the well to inspect the casing and well screen for damage. No structural failures were observed. The video tape of the well is on file with Harrison.

The well was rehabilitated using a double disc surge block with high volume compressed air. The discharge was conveyed around the building to the sump pit. Following initial surging, the well was chemically treated with 1000 gallons of inhibited muratic acid. The acid was installed through Reynolds blow-off head to prevent spray on the building and equipment. Following approximately an 18-hour contact period, the well was surged and discharged to waste. The process continued until the well returned to its maximum efficiency.

A new pump was installed using the existing discharge head and motor. The information including pump curve is attached. To meet low volume water requirements and avoid operating the large pump, a small submersible booster pump was installed. The pump information is attached. Because of all the equipment in the well, it was not possible to get water level measurements. However, the large pump was operated to check well performance. Thus, the following is presented in Table 1.

Table 1 Pump Performance - Well 31 Harrison Radiator

Step	Qgpm	Discharge (pounds)
1	360	135
2	775	125
3	975	120
4	1182	100
5	1295+	80

- Rate well pumped at 1182 gpm for 2 hours.

P O Box 230
816 W Main Street
Paoli, Indiana 47454
812 723-2108

P O Box 120
Highway 60 East
Owensboro Ky 42301
502 684-5075

1421 Mellwood Ave
Louisville Ky 40206
502-585-1241

6451 Germantown Road
Middletown Ohio 45042
513 424-7287

1730 South Harding St
Indianapolis, Ind 46221
317 636-1996

The well responded very favorably to the rehabilitation efforts employed and should be more than capable of providing the required 1200 gpm the pump is designed for.

If you have any questions or desire clarification please feel free to call.

Respectfully submitted,

Leon Simpson
Ohio District Manager

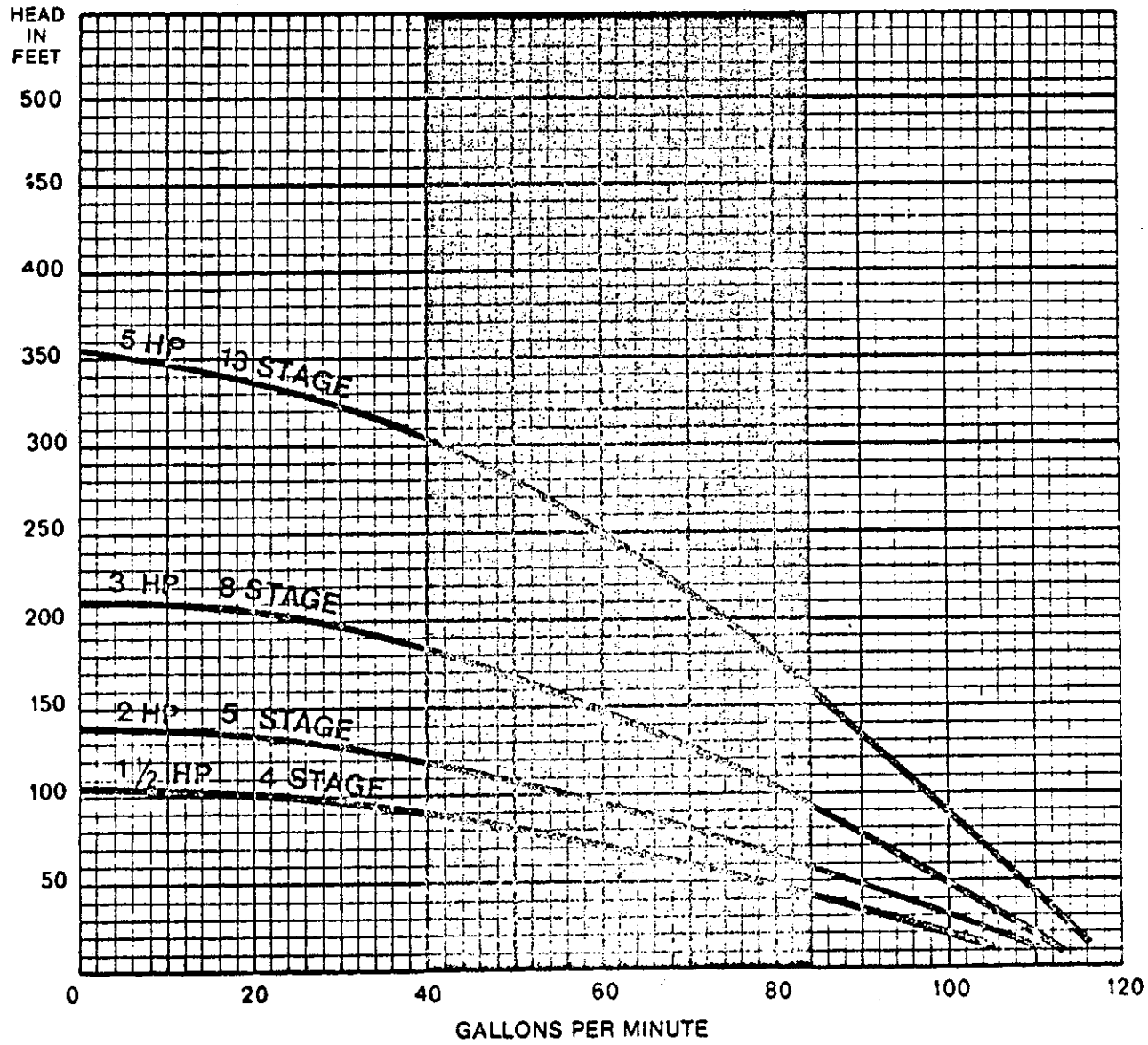
Enc. Well log form
2- pump curves

LS/ct

SELECTION CHART

	DIS-CHARGE PRESSURE	HEAD IN FEET																								
	0	45	50	60	70	80	90	100	120	140	160	170	180	200	225	250	275	300	400	450	500	600	700	800	900	1000
PUMP TYPE	HP	GALLONS PER MINUTE																								
N70-4	1½	83	79	70	62	52	40																			
N70-5	2			84	77	71	64	57	40																	
N70-8	3							81	73	65	55	49	42													
N70-13	5										83	81	79	73	67	60	50	42								

H.P.	VOLT	NO. WR'S	NO. STG'S	"P" LENGTH	"M" LENGTH	"L" LENGTH
1 1/2	230	2	7	22"	30 9/16"	52 9/16"
1 1/2	230	3	7	22"	22 7/16"	52 9/16"
2	230	3	10	25"	25 7/16"	50 7/16"
2	440	3	10	25"	25 7/16"	50 7/16"
3	230	3	13	34"	28 7/16"	62 7/16"
3	440	3	13	34"	28 7/16"	62 7/16"
5	230	3	17	49"	48 5/8"	97 5/8"
5	440	3	17	49"	48 5/8"	97 5/8"



THREE PHASE
60 CYCLE

2 POLE & 4 POLE

12-3 Cable

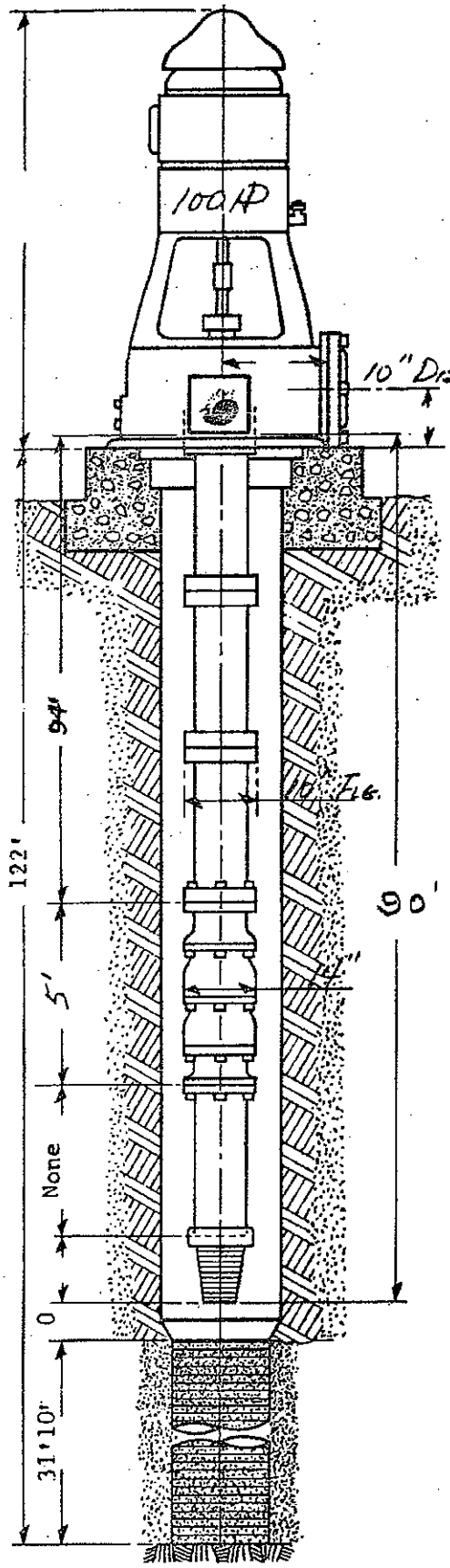
WIRE SIZE A.W.G.	*MAX. LENGTH CABLE—MOTOR TO STARTER—FEET																	
	5 H.P.			7½ H.P.			10 H.P.			15 H.P.			20 H.P.			25 H.P.		
	230V	460V	575V	230V	460V	575V	230V	460V	575V	230V	460V	575V	230V	460V	575V	230V	460V	575V
NO. 14		620	956		434	694		331	518									
12	246	960	1470		687	1095		511	800		351	532						
10	390	1560	2400	270	1083	1730	208	830	1300		554	865		430	677			
8	685	2740		477	1910	3045	365	1460	2280	244	975	1520		756	1190		565	895
6	953			663	2650		508	2030		339	1350	2110	258	1050	1655		885	1390
4	1465			1020			781			521	2080		398	1615	2545	325	1350	2125
2				1550			1180			790			602			520	2050	3240
1							1450			965			736			640	2775	
0										1070			816			700		
00										1280			975			860		
000										1500			1145			1000		
0000													1348			1180		

WIRE SIZE A.W.G.	*MAX. LENGTH CABLE—MOTOR TO STARTER—FEET																	
	30 H.P.			40 H.P.			50 H.P.			60 H.P.			75 H.P.			90 H.P.		
	230V	460V	575V	230V	460V	575V	230V	460V	575V	230V	460V	575V	230V	460V	575V	230V	460V	575V
No. 14																		
12																		
10																		
8		476	740			625			927									
6		662	1030		555	865		680	1288		530	935			745			
4		1020	1584		855	1335	670	1045	1980	525	820	1520		655	1210			
2	386	1543	2400	285	1295	2025	1015	1585	3050	800	1250	2320	640	1000	1850		840	1550
1	472	1890	2940	347	1580	2470	1240	1935		975	1520	2825	780	1220	2260	650	1020	1885
0	524			386	1750	2735	1377	2151		1080	1685	3130	870	1360	2525	730	1140	2115
00	625			460	2090		1640	2560		1280	2000		1020	1600	2960	875	1365	2540
000	735			540	2460		1932	3020		1520	2375		1200	1875	3480	1025	1600	2970
0000	863			636	2890		2270			1790	2800		1430	2235	4150	1200	1875	3480

Based on a 5% voltage drop at motor whjile motor is running assuming full rated voltage at control terminals @ 75°C.

MOODY'S, INC.

VANDALIA, OHIO — MEADVILLE, PA.



TURBINE PUMP INSTALLATION FOR:
Frigidaire, Plant#2

WELL DESIGNATION NO. 31
Deming Base & Column

32183	SERIAL NUMBER
1200	GALLONS PER MINUTE
270	TOTAL HEAD IN FEET
14M-160 - 3	STAGES Worthington Bowl.
1750	MOTOR SPEED
95	FEET OF SETTING
10"	SIZE COLUMN Flanged
No	OIL TUBE
1 13/16"	LINE SHAFT
No	SUCTION PIPE
100	H.P. 440 VOLT 3/60 CURRENT
Water	LUBRICATION
95	FEET OF AIRLINE ¼" Galv.
1/10/68	DATE INSTALLED

20"	I.D. OF WELL
122	FEET DEEP FROM FOUNDATION 2'-#70
120'	FEET DEEP FROM GRADE 8'-#125
30'	STRAINER LENGTH — SLOT 7'-#40
36'	STATIC LEVEL — DATE 13'-#125
43'	" " — " 6/30/60
60' 10"	" " — " 2/10/68
71'	" " — " 12/4/70
6/1/60	DATE DRILLED

Top of Screen 90'

PUMP REPAIRED — DATE 1/10/68
" " — " 12/4/70
" " — " _____

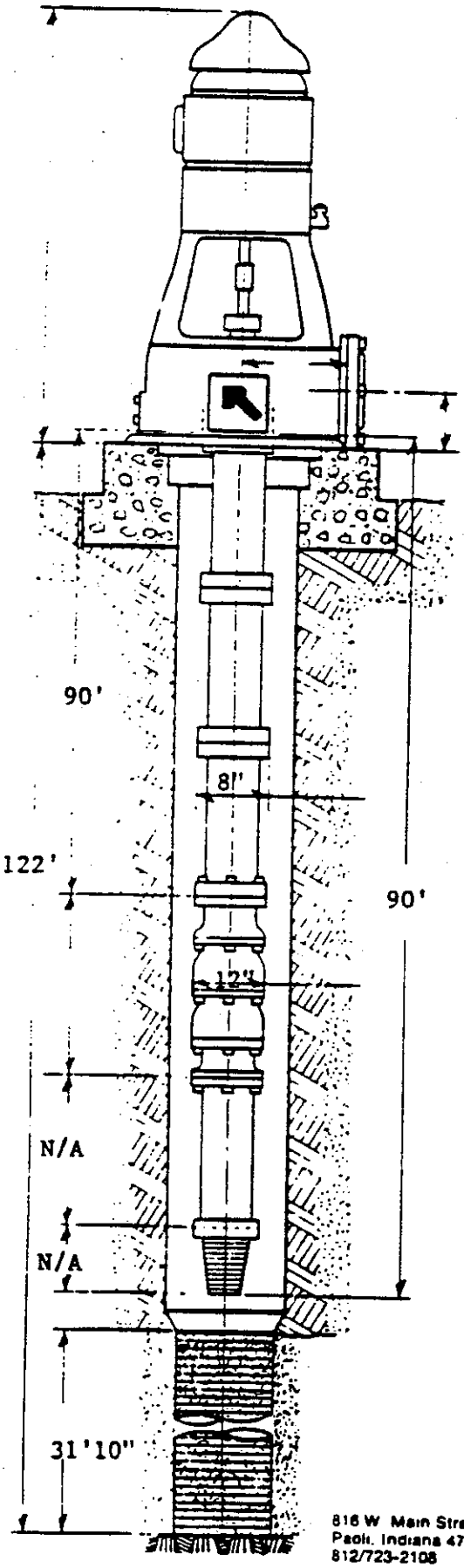
WELL ACID TREATED — DATE 1/10/68
" " " — " 12/4/70

COMMENTS — Note - Worthington Impellers Cut 9" Dia.

MOODY'S, INC.
Phones
VANDALIA, OHIO: 898-4514
MEADVILLE, PA.: 6-1128

FORM TPI-762
LITHO IN U.S.A.

Reynolds Supply, Inc.



TURBINE PUMP INSTALLATION FOR:
Harrison Radiator
Compressor Building

WELL DESIGNATION NO. 31

12-H-135-5 SERIAL NUMBER
1200 GALLONS PER MINUTE
270 TOTAL HEAD IN FEET
5 STAGES
1760 MOTOR SPEED
90 FEET OF SETTING
8" SIZE COLUMN
1 11/16" OIL TUBE
LINE SHAFT
SUCTION PIPE
100 H.P. 460 VOLT 34 CURRENT 60 cycl
water LUBRICATION
90 FEET OF AIRLINE
6/82 DATE INSTALLED

20" I.D. OF WELL
122 FEET DEEP FROM FOUNDATION
120 FEET DEEP FROM GRADE
30 STRAINER LENGTH — SLOT
STATIC LEVEL — DATE
" " — "
" " — "
" " — "
6-1-60 DATE DRILLED

PUMP REPAIRED — DATE
" " — "
" " — "

WELL ACID TREATED — DATE
" " " — "

COMMENTS —

Screen slot size top to bottom 2' - 70
8' = 125
7' - 40
13' - 125

Booster pump set to 50' on 2" plastic
Standard pump N-70-13 5 Hp

816 W Main Street
Paoli, Indiana 47454
812/723-2108

Highway 60 East
Owensboro, Ky 42301
502/685-5572

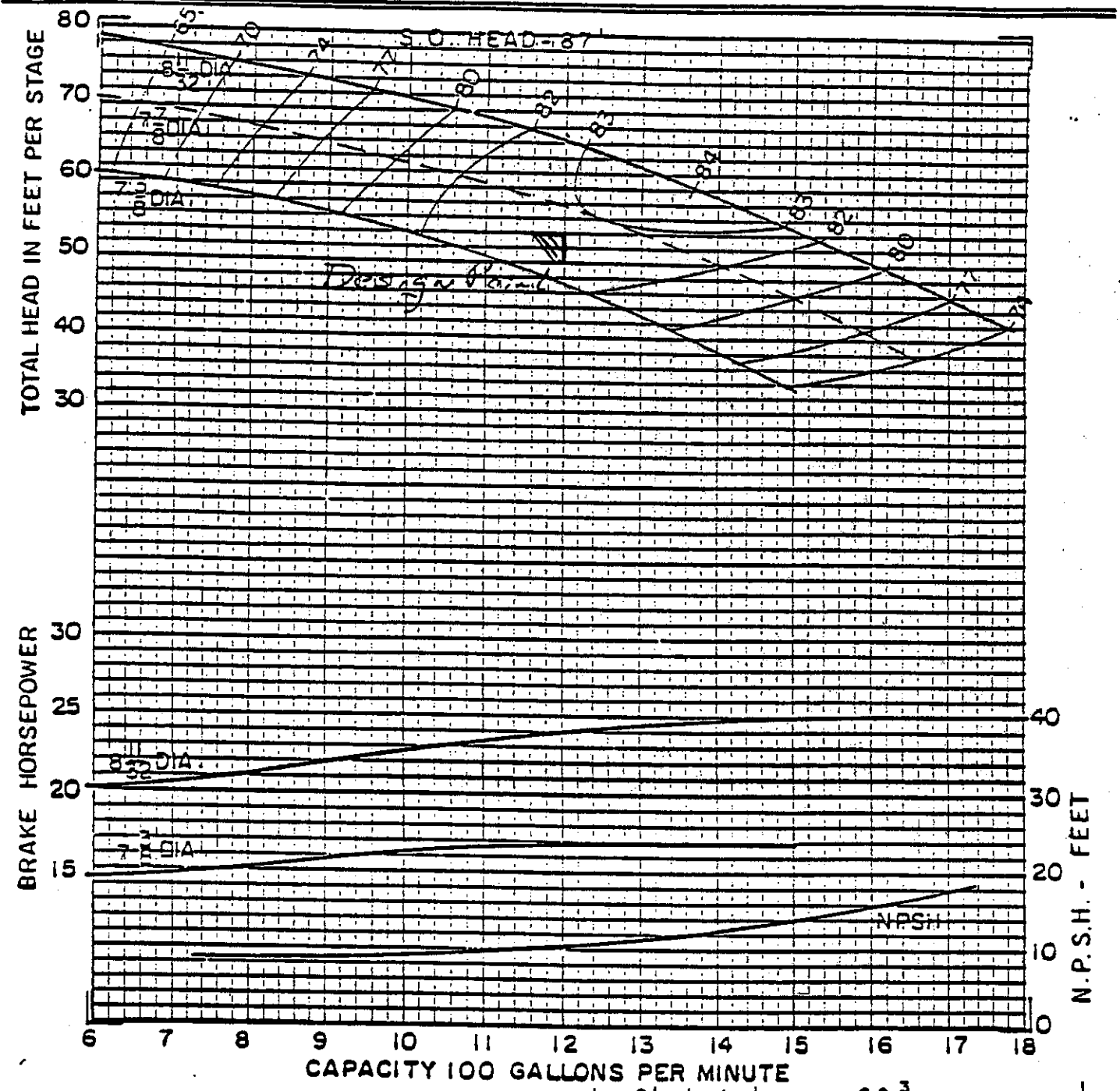
1421 Mellwood Ave.
Louisville, Ky 40206
502/585-1241

6451 Germantown
Middletown Ohio
513 424-7287

12H-135
1760 RPM

RATING CURVES
(60 CYCLES)

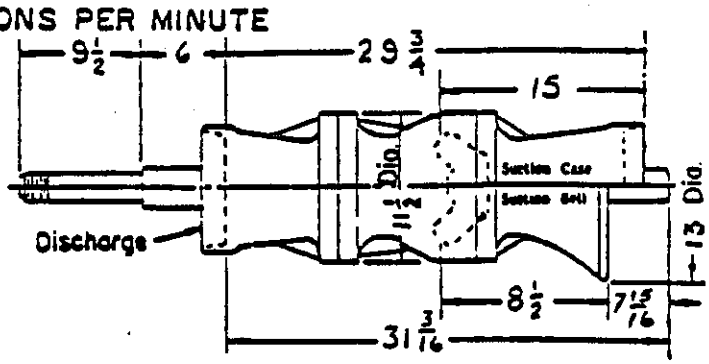
Harrison Radiator
Pump Performance Curve
Well 31



Efficiency shown is for 3 stages or more, with standard materials. For fewer stages or other materials change efficiency as shown.

No of stages	Eff. change	MATERIAL	Eff. change
6	—	Impeller – bronze	—
5	—	Impeller – c.i.	-1
4	—	Impeller – c.i. enm.	-1.5
3	—	Bowl – c.i. enm.	—
2	-1	Bowl – cast iron	-2
1	-2	Bowl – bronze	-1.5

Standard materials	
Impeller – bronze	
Bowl – cast iron / enamelled	
Thrust factor	9.8
Rotor wt. per stage (lbs.)	27
Bowl wt. 1st stage (lbs.)	249
Bowl wt. add'l. stage (lbs.)	97
Max. bowl horsepower	24.0
Impeller eye area (sq.in.)	21.3



For additional stages add 10 1/2 per stage.

Impeller shaft diameter	1.75	Column pipe	8	10
Minimum impeller shaft end play	.53	Suction pipe		10

Litho'd in U.S.A.

Production Well 32

MOODY'S of Dayton, Inc.

ADDRESS REPLY TO:
P.O. BOX 155
VANDALIA, OHIO 45377
AC 513-898-3969

January 25, 1972

Frigidaire Division
General Motors Corporation
Dayton, Ohio 45401
ATTN: Mr. Ed Oda

C

Subject: Well Repairs # 32
P.O. # FMD-06907-B

Gentlemen:

O

We are sorry for the delay in forwarding the attached information pertaining to the subject job. Enclosed are two (2) copies of our pump and well data sheets giving pertinent dimensions and details on the well and pump. This information is for your files and future reference.

A short pumping test was conducted prior to hooking the pump into your system. Results were as follows.

P

Capacity	Disc Press.	Pumping Level
600 GPM	95 psi	78'-6"
1200 GPM	78 psi	87'

The pump produced 1600 GPM with an open valve and the recorded static level was 71 feet below the base. If you have any questions, or need more information, please advise.

Y

Very truly yours,

MOODY'S OF DAYTON, INC.

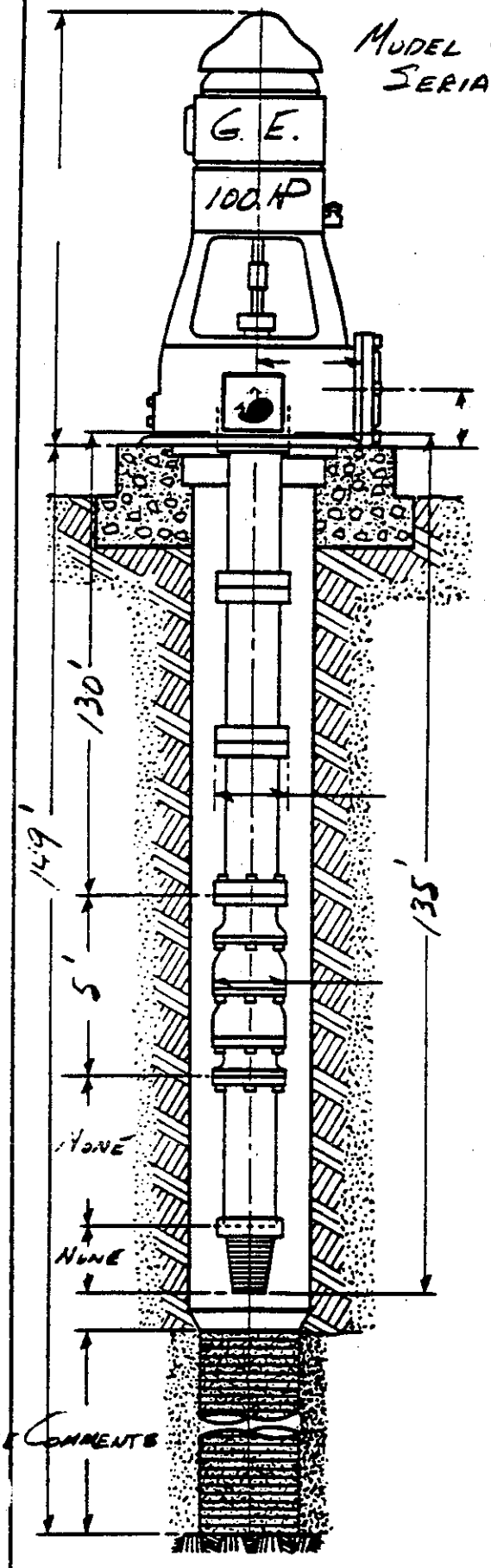
Ed Wagner

Edward B. Wagner
President

EBW:/jld

MOODY'S, INC.

VANDALIA, OHIO — MEADVILLE, PA.



MODEL 5K 4444 XG 2E11
SERIAL # KSJ-1016112

TURBINE PUMP INSTALLATION FOR:
FRIGIDAIRE DIV - G.M.C.

WELL DESIGNATION NO. 32

106041 SERIAL NUMBER PEERLESS
1000 GALLONS PER MINUTE
183 TOTAL HEAD IN FEET
12" - 5 STAGES
1750 MOTOR SPEED RPM
130 FEET OF SETTING
10" SIZE COLUMN FLANGED
NONE OIL TUBE
1 13/16" LINE SHAFT
NONE SUCTION PIPE
100 H.P. 460 VOLT. 3 CURRENT 60
WATER LUBRICATION
FEET OF AIRLINE
12/5/60 DATE INSTALLED

20" O.D.
~~I.D.~~ OF WELL
149 FEET DEEP FROM FOUNDATION
147 FEET DEEP FROM GRADE
25' STRAINER LENGTH — ~~SIZE~~ SEE BELOW
44' STATIC LEVEL — DATE 12/8/1960
40' " " — " 9/66
71' " " — " 4/21/71
" " — "
12/5/60 DATE DRILLED

PUMP REPAIRED — DATE 5/9/66
" " — " 4/21/71
" " — "

WELL ACID TREATED — DATE 5/9/66
" " " — " 4/21/71

COMMENTS — TOP OF SCREEN 94'
15' SCREEN AT TOP.
30' 18" DIA SCREEN AT BOTTOM.
10' SCREEN AT BOTTOM.

MOODY'S, INC.
Phones
VANDALIA, OHIO: 898-4514
MEADVILLE, PA.: 6-1128

Production Well 33

WELL LOG AND DRILLING REPORT

ORIGINAL

PLEASE USE PENCIL OR TYPEWRITER DO NOT USE INK.

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus 12, Ohio

No 279278

County Montomery Township [illegible] Section of Township

Owner Frigidaire Div. - GMC Address Dayton, Ohio

Location of property

CONSTRUCTION DETAILS

Casing diameter 6" Length of casing

Type of screen Length of screen

Type of pump Exploratory Well

Capacity of pump

Depth of pump setting

Date of completion 10-12-64

BAILING OR PUMPING TEST

Pumping Rate G.P.M. Duration of test hrs.

Drawdown ft. Date

Static level-depth to water ft.

Quality (clear, cloudy, taste, odor)

Pump installed by

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
Top soil	0 Feet	9 Ft.
ry coarse gravel	9'	49'
ard pan	49'	54'
Blue clay	54'	68'
Coarse gravel	68'	79'
Sand, gravel, & clay	79'	84'
Sand & medium gravel	84'	100'
Coarse gravel	100'	116'
Fine sand & boulders	116'	124'
Fine sand & clay	124'	126'
Blue clay & sand	126'	136'
Hard pan	136'	149'
Coarse gravel	149'	150'
Blue clay w/gravel streaks	150'	177'
Soft blue clay	184'	197'
Hard blue clay	197'	199'
Shale	199'	202'

1190

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.

N.

W. E.

S.

See reverse side for instructions

Drilling Firm Diehl Pump & Supply Co.

Address 3985 Race Road Cincinnati 11, Ohio

Test Bore

Date

Signed

33

WELL LOG AND DRILLING REPORT

ORIGIN.

PLEASE USE PENCIL OR TYPEWRITER DO NOT USE INK.

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus 12, Ohio

No 279272

County Montgomery Township Miami Section of Township

Owner Frigidaire Div. - GMC Address Dayton, Ohio

Location of property

CONSTRUCTION DETAILS

Casing diameter 20' Length of casing 86'
Type of screen red brass Length of screen 30'
Type of pump 15L-110
Capacity of pump 1200 GPM
Depth of pump setting 105'
Date of completion September 30, 1964

BAILING OR PUMPING TEST

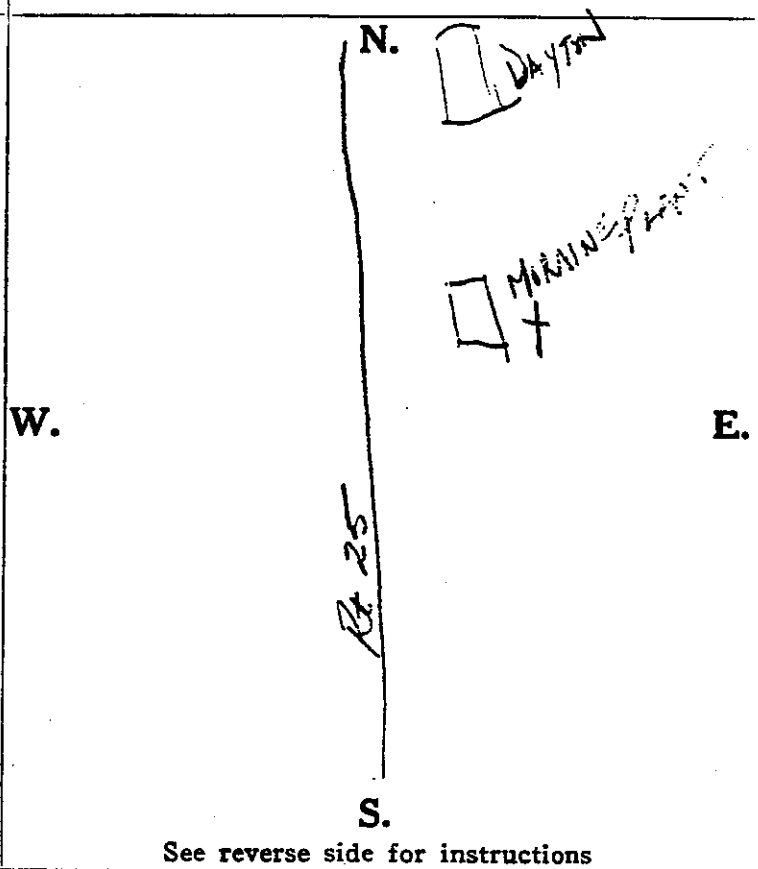
Pumping Rate 1200 G.P.M. Duration of test 8 hrs.
Drawdown 5' ft. Date September 15, 196
Static level-depth to water 40 ft.
Quality (clear, cloudy, taste, odor) Clear, good taste, no odor.
Pump installed by Diehl Pump & Supply Co.,

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
Gravel & yellow clay ixed	0 Feet	56 Ft.
Blue clay & gravel mixed	56'	83'
Sand & gravel coarse to fine	83'	116'
Fine sand	116'	

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm Diehl Pump & Supply Co., Inc Date October 13, 1964

Address 3985 Race Road Signed Edward C. Smith

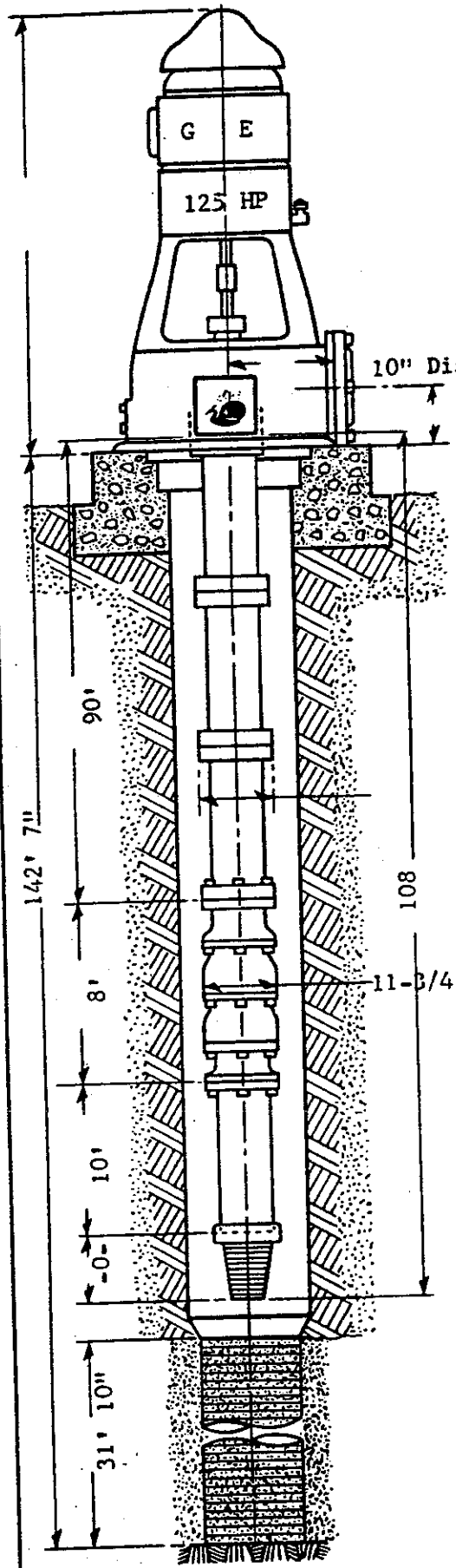
Well Cincinnati, Ohio 45211 Edward C. Smith
Ohio Branch Manager

33

Production Well 34

MOODY'S, INC.

VANDALIA, OHIO — MEADVILLE, PA.



TURBINE PUMP INSTALLATION FOR:

WELL DESIGNATION NO. Frig. #34

T-3853	SERIAL NUMBER Deming
1200	GALLONS PER MINUTE
255	TOTAL HEAD IN FEET
12" — 5	STAGES all bronze
1760	MOTOR SPEED
92'	FEET OF SETTING
10"	SIZE COLUMN flanged
none	OIL TUBE
1-11/16"	LINE SHAFT
10' — 10"	SUCTION PIPE
125	H.P. 440 VOLT. 3 CURRENT 60
water	LUBRICATION
105'	FEET OF AIRLINE
6/23/69	DATE INSTALLED

20" O.D.	DIA. OF WELL
142'7"	FEET DEEP FROM FOUNDATION
140	FEET DEEP FROM GRADE
31'10"	STRAINER LENGTH — SLOT
61'10"	STATIC LEVEL — DATE 6/23/69
	" " — "
	" " — "
	" " — "
9/15/65	DATE DRILLED by Diehl Pump

Pulled 2/15/69

PUMP REPAIRED — DATE ? by Diehl
" " — " 6/23/69
" " — "

WELL ACID TREATED — DATE 6/23/69
" " " — "

COMMENTS — Bottom column has special Phenolic gasket and magnesium anodes and painted for added protection.

MOODY'S, INC.
Phones
VANDALIA, OHIO: 898-4514
MEADVILLE, PA.: 6-1128

LITHO IN U.S.A.
FORM TPI-762

PUMPS
COOLING TOWERS
PIPE LINES

DREDGI
CONTRACTING
EXPLORATION

DIEHL PUMP & SUPPLY CO.
INCORPORATED

Industrial Water Contracting

ROBARDS LANE
LOUISVILLE 18, KENTUCKY
CINCINNATI 37, OHIO

Log of Well No. 34 Size 20'

For ~~Frigidaire Division~~ Location ~~Dayton, Ohio~~ Date ~~8/16/65~~

Formation Description	Depth to Top	Depth to Bottom	Thickness of Stratum	Feet of Casing	Length of Strainer	Slot Number
Yellow clay	0'	3'		32' x 20" Red Brass Strainer		
Dirty sand with large gravel	3'	15'		125 Slot		
Large rock - gravel	15'	22'		107' Top of Screen from grade		
Large gravel with sand	22'	43'				
~~ty~~ clay with small gravel	43'	63'				
Coarse sand and gravel	63'	79'				
Coarse gray sand with gravel	79'	104'				
Large gravel with coarse sand (clean)	104'	138'				
Medium sand -little gravel -dirty	138'	140'				

Results of test	GPM	Drawdown
	3000	26'

WELL LOG AND DRILLING REPORT

ORIGINAL

PLEASE USE PENCIL OR TYPEWRITER DO NOT USE INK.

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus 12, Ohio

No 279287

County Montgomery Township Miami Section of Township

Owner Frigidaire Div. of GMC Address Dayton, Ohio

Location of property

Well #34 CONSTRUCTION DETAILS

Casing diameter 20" Length of casing

Type of screen Red Brass Length of screen 32'

Type of pump WORTHINGTON

Capacity of pump 1200

Depth of pump setting 90'

Date of completion

BAILING OR PUMPING TEST

Pumping Rate 3000 G.P.M. Duration of test 2 hrs.

Drawdown 26 ft. Date 8-13--65

Static level-depth to water 56 ft.

Quality (clear, cloudy, taste, odor) Clear

Pump installed by Diehl Pump & Supply Co.

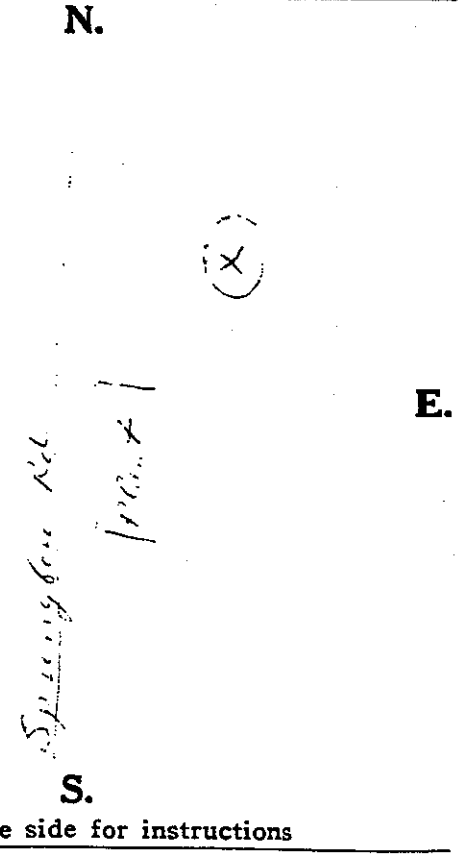
WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
Yellow clay	0 Feet	3 Ft.
Dirty sand with large gravel	3'	15'
Large rock - gravel	15'	22'
Large gravel with sand	22'	43'
Gray clay with small gravel	43'	63'
Coarse sand and gravel	63'	79'
Coarse gray sand with gravel	79'	104'
Large gravel with coarse sand (clean)	104'	138'
Medium sand - little gravel - dirty	138'	140'

1190

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm Diehl Pump & Supply Co.

Address 3985 Race Road
Cincinnati, Ohio 45211

Date August 16, 1965

Signed
Edward C. Smith
Ohio Branch Manager

THE H. C. NUTTING COMPANY

4120 AIRPORT ROAD
CINCINNATI 26, OHIO

TESTING ENGINEERS AND SOILS CONSULTANTS

"AS A MUTUAL PROTECTION TO CLIENTS, THE PUBLIC, AND OURSELVES, ALL REPORTS ARE SUBMITTED AS THE CONFIDENTIAL PROPERTY OF CLIENTS, AND AUTHORIZATION FOR PUBLICATION OF STATEMENTS, CONCLUSIONS, OR EXTRACTS FROM OR REGARDING OUR REPORTS IS RESERVED PENDING OUR WRITTEN APPROVAL."

B-10922
7-19-65

WELL 34 ?

TEST BORING REPORT

CLIENT Diehl Pump & Supply Company — ORDER No. 5204.4

PROJECT Frigidaire Plant, Dayton, Ohio — HOLE No. 1

LOCATION As directed in the field by Mr. Smith, Diehl Pump & Supply Co.

DRILLER E. Fornash — DRILL No. 17 — DATE STARTED 7-12-65

ELEVATION REFERENCE Not Given — DATE COMPLETED 7-12-65

CASING: DIAMETER 4"O.D.Flight Augers — HAMMER WT. — FALL

SAMPLER: DIAMETER & TYPE 4"O.D. Flight Augers — HAMMER WT. 140# — FALL

DEPTH TO WATER; IMMEDIATE 40' — UPON COMPLETION Caved @ 25', dry

DEPTH TO WATER 1 Hr.; AFTER COMPLETION Caved @25', dry — WATER USED IN DRILLING No

ELEVATION	DEPTH		DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Hamm Blows Casin per Fo
	0'			1	5-8	Augers		
				2	10-12	Augers		
		65'	Brown fine to coarse sand and gravel, moist to wet - dense	3	15-17	Augers		
				4	20-22	Augers		
				5	25-27	Augers		
				6	30-32	Augers		
				7	35-38	Augers		
				8	40-43	Augers		
				9	45-46	Augers		
				10	50-52	Augers		
				11	55-56	Augers		
	65'							
		105'	Gray fine to coarse sand and gravel with gray clay seams, wet -					
	170'							
		1'	Gray silty clay, very stiff					
	171'							
			No sample recovery after depth of 56.0' was reached.					

REMARKS: Boring Completed

Respectfully submitted,
THE H. C. NUTTING CO.
By

As a mutual protection to the owners and ourselves, the engineer in the owner's behalf shall check this report with the samples submitted prior to the purchase of property, or designing of structures.

Production Well 35

WELL LOG AND DRILLING REPORT

ORIGINAL

PLEASE USE PENCIL OR TYPEWRITER
NOT USE INK.

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus, Ohio 43212

No 342974

County Montgomery Township [illegible] Section of Township

Owner Frigidaire Div, G.M.C. Address Dayton Ohio 45401

Location of property Plant 2 Dayton Ky - Well #35

CONSTRUCTION DETAILS

Casing diameter 20" Length of casing 189'
Type of screen Red Brass Length of screen 50'
Type of pump BJ - 12-CGH-5 stg.
Capacity of pump 1200
Depth of pump setting 120'
Date of completion 10/6/66

BAILING OR PUMPING TEST

Pumping Rate 3210 G.P.M. Duration of test 8 hrs.
Drawdown 14' 6" ft. Date 9/23/66
Static level-depth to water [illegible] 66 ft.
Quality (clear, cloudy, taste, odor) clear

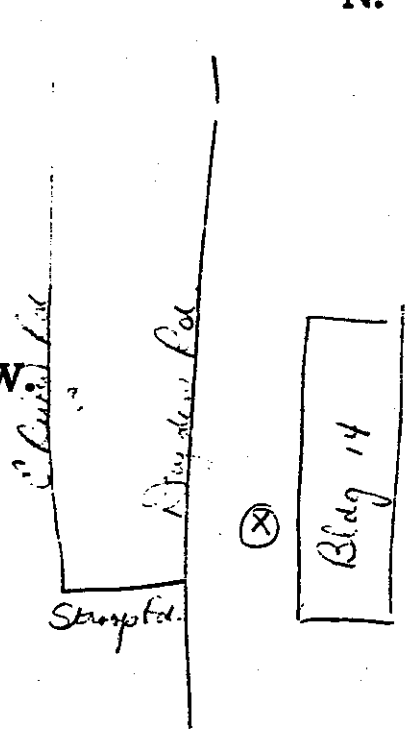
Pump installed by

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
clay & gravel	0 Feet	14 Ft.
[illegible]	14	20
dry [illegible] sand & gravel	20	36
Till	36	43
Coarse sand & gravel	43	51
Till	51	65
Dirty sand & gravel	65	91
Coarse sand & gravel	91	97
Hard sand & gravel	97	128
Sandy blue clay	128	129
Dirty sand & stone gravel	129	142
Hard gravel & some sand	142	145
Hard sand & gravel	145	175

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm MOODY'S OF DAYTON, INC.
150 North Dixie Drive
Vandalia, Ohio
Since 1891

Address

Date 9/29/66

Signed Ed Wagner - Pres.

5412

*If additional space is needed to complete well log, use next consecutive numbered form.

WELL LOG AND DRILLING REPORT

ORIGINAL

PLEASE USE PENCIL OR TYPEWRITER
DO NOT USE INK.

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus, Ohio 43212

No 342975
Page 2

County Montgomery Township [redacted] Section of Township

Owner Frigidaire Div, GMC Address Dayton, O 45401

Location of property Tipp City - Plant 2. Well #35

CONSTRUCTION DETAILS

Casing diameter ____ Length of casing ____

Type of screen ____ Length of screen ____

Type of pump ____

Capacity of pump ____

Depth of pump setting ____

Date of completion 10/6/66

BAILING OR PUMPING TEST

Pumping Rate ____ G.P.M. Duration of test ____ hrs.

Drawdown ____ ft. Date ____

Static level-depth to water ____ ft.

Quality (clear, cloudy, taste, odor) ____

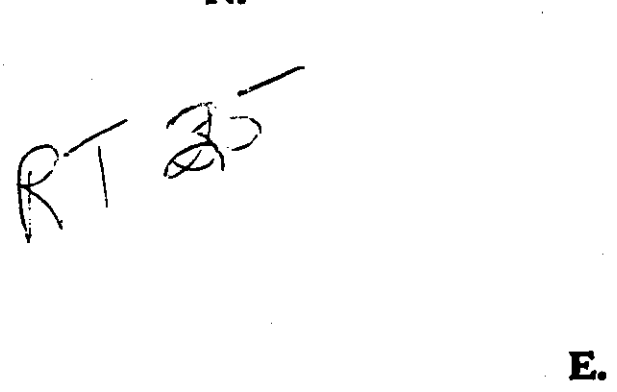
Pump installed by ____

WELL LOG* (Cont'd)

Formations Sandstone, shale, limestone, gravel and clay	From 0 Feet	To Ft.
Limestone and shale	175	186
Limestone and clay	186	193

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm MOODY'S OF DAYTON, INC. SINCE 1891
150 North Dixie Drive 898-4514
Address Vandalia, Ohio

Date 9/29/66

Signed E. L. Wagner - Pres.

5412

*If additional space is needed to complete well log, use next consecutive numbered form.

MOODY'S of Dayton, Inc.
SUCCESSOR TO THE DON ROE CO.
Since 1891
ADDRESS REPLY TO
150 NORTH DIXIE DRIVE
P.O. BOX 155
VANDALIA, OHIO 45377
PHONE 898-4514 — 898-49

June 29, 1966

Well #35

Frigidaire Division
General Motors Corporation
Dayton, Ohio 45401

Subject: 8-inch Test Well, Bldg. 14
P. O. # FKD-82618B

Attention: Mr. Charles Denning

Gentlemen

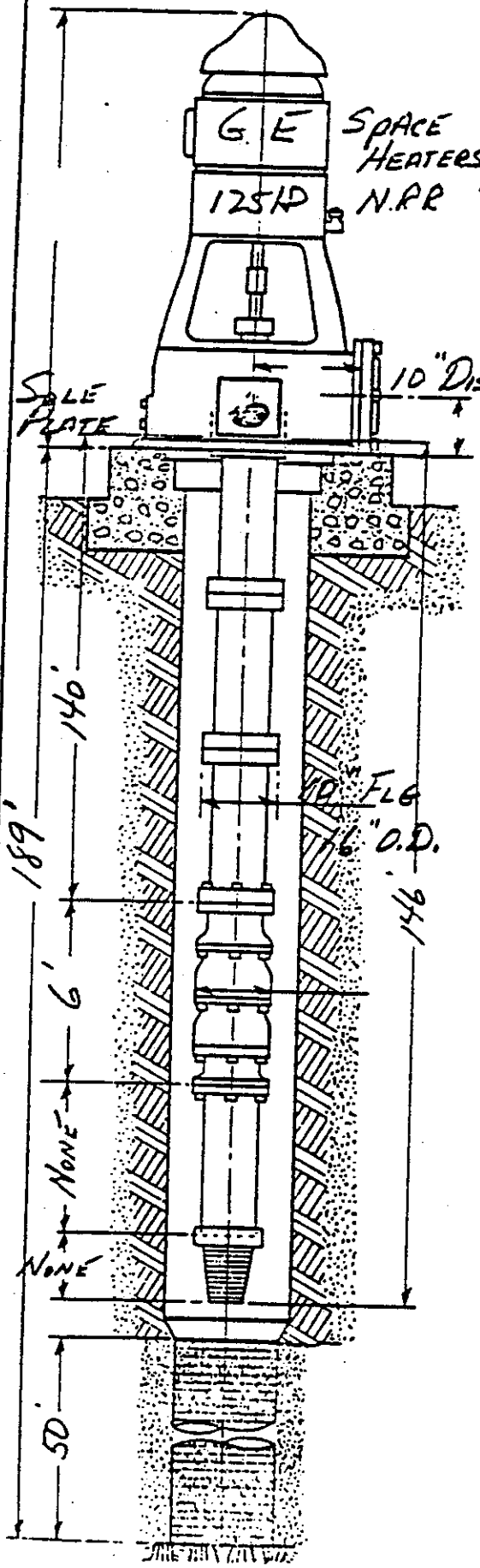
We are pleased to submit our report concerning the subject job. Drilling is completed, the casing has been removed from the ground, and the log is as follow

DRILLER'S LOG -- Drilled by Herman Rush
Static Level - approximately 60 ft.

	0 - 5 ft.	Fill
	5 - 20 ft.	Gravel
	20 - 40 ft.	Gravel
	40 - 65 ft.	Sand and gravel
	65 - 70 ft.	Clay
	70 - 85 ft.	Sand and gravel
	85 - 105 ft.	Sand and gravel
	105 - 115 ft.	Coarse gravel, fine sand
	115 - 125 ft.	Gravel and sand
	125 - 135 ft.	Gravel and sand
	135 - 140 ft.	Sand
Screen.	140 - 150 ft.	Gravel and sand
	150 - 160 ft.	Gravel and Sand
	160 - 190 ft.	Gravel and sand
	190 - 192 ft.	Clay
	192 - 200 ft.	Blue clay

Enclosed are three (3) copies of the Gamma Ray Log for your future reference. The samples and log indicate excellent water bearing sand and gravel from 140 to 190 ft. The material between 140 and 155 ft. is somewhat cleaner than the area between 155 and 190 ft. This bottom area will require more development and surging in order to properly develope and clean. There is a medium sand streak between 130 and 140 ft. The sand is clean and can be screened but the slot size will be smaller in this area.

MOODY'S OF DAYTON, INC.
VANDALIA, OHIO



TURBINE PUMP INSTALLATION FOR:

DATE - AUGUST 1ST, 1972

WELL DESIGNATION NO. 35

FRIGIDAIRE DIV. - GMC, PLANT #2

	SERIAL NUMBER
1200	GALLONS PER MINUTE
335	TOTAL HEAD IN FEET
13-MC H-5	STAGES
1760	MOTOR SPEED
140'	FEET OF SETTING
10"	SIZE COLUMN (FLANGED)
NONE	OIL TUBE
1 11/16"	LINE SHAFT
NONE	SUCTION PIPE
125	H.P. 440 VOLT. 3 CURRENT 60
WATER	LUBRICATION
144'	FEET OF AIRLINE
8/1/72	DATE INSTALLED

20" O.D.	OF WELL
189	FEET DEEP FROM FOUNDATION
185'	FEET DEEP FROM GRADE
50'	STRAINER LENGTH — SLOT SEE LETTER
80'	STATIC LEVEL — DATE 8/1/72 9/22/66
66'	" " " — " 8/69
60'	" " " — " 9/23/66
	" " " — "
9/26/66	DATE DRILLED

PUMP REPAIRED — DATE 9/1966

" " — " 7/1972

" " — "

WELL ACID TREATED — DATE 7/1972

" " " — "

COMMENTS — IMPELLERS CUT TO 8 7/16"

FORM TPI-762

LITHO IN U.S.A.

MOODY'S of Dayton, Inc.

ADDRESS REPLY TO:
P.O. BOX 155
VANDALIA, OHIO 45377
AC 513-898-3969

August 10, 1972

Frigidaire Division
General Motors Corporation
Dayton, Ohio 45401

Attention: Mr. Ed Oda

Subject: P.O. # 329904-D
Well # 35

Gentlemen:

Work has been completed with regard to the subject job. Our final report is submitted for your files and information.

This well was drilled and tested in September 1966. The pump was pulled and repaired in September 1969 but the well was not chemically treated or revitalized at that time.

We pulled the pump in July 1972 and found several holes in two columns and the bowl assembly had deteriorated to the extent that it had to be replaced. Other pump repairs were effected at the same time. The well was throughly air surged and treated with chemicals while repairing the pump. A final pumping test was conducted upon placing the installation back into operation.

Final Pumping Test after Treatment

August 1, 1972 By - Walter Fields
Readings taken 4' above grade - 144' Airline Installed.

Time	Capacity	Airline Reading	Pumping Level	Draw Down	Disc. Press.
12:00	0	60'	84' (static)	0	167 psi
12:03	692 GPM	55'	89'	5'	140 psi
12:05	692 GPM	55'	89'	5'	140 psi
12:08	938 GPM	53'	91'	7'	120 psi
12:10	938 GPM	53'	91'	7'	120 psi
12:15	1148 GPM	50'-6"	93'-6"	9'-6"	100 psi
12:20	1148 GPM	50'-6"	93'-6"	9'-6"	100 psi
12:25	1452 GPM	48'-6"	95'-6"	11'-6"	80 psi
12:27	1452 GPM	48'-6"	95'-6"	11'-6"	80 psi
12:30	1598 GPM	47'	97'	13'	60 psi

Time	Capacity	Airline Reading	Pumping Level	Draw Down	Disc. Press.
12:35	1598 GPM	47'	97'	13'	60 psi
12:40	1598 GPM	47'	97'	13'	60 psi
12:45	1921 GPM	44'	100'	16'	20 psi

Pump shut down and hooked into system.

Based upon the above the well responded perfectly to the chemical treatment. Enclosed are two (2) copies of our pump and well data charts giving details on this installation. If you have any questions, or need more information, please advise.

Very truly yours,

MOODY'S OF DAYTON, INC.

Ed. Wagner

EDWARD B. WAGNER
President

EBW/jd

MOODY'S of Dayton, Inc.

Since 1891

SUCCESSOR TO THE DON ROE CO.

ADDRESS REPLY TO
150 NORTH DIXIE DRIVE
P.O. BOX 155
VANDALIA, OHIO 45377
PHONE 898-4514 — 898-4971

September 26, 1966

Frigidaire Division
General Motors Corporation
Dayton, Ohio 45401

Subject: P.O. # FDK-83233 B
Well #35, Plant #2

Attention: Mr. Charles Denning

Gentlemen

We are pleased to report that work on the subject well has been completed. It is an excellent well as indicated by the pumping test results below and should provide you economical service over the years.

PUMPING TEST - 9/23/66
Static Level - 66 ft. Orifice 10" x 8"
Reading taken at pump discharge head located approximately 2 ft. above grade.

TIME	CAPACITY G.P.M.	ORIFICE READING INCHES	DRAW DOWN	PUMPING LEVEL	AIR LINE READING
9:50 a.m.				66'	28' 6"
10:00	2,845	92	12' 6"	78' 6"	16'
10:30	2,965	100	13' 6"	79' 6"	15'
11:00	2,995	102	14'	80'	14' 6"
12:00 noon	3,010	103	14' 6"	80' 6"	14'
1:00 p.m.	3,010	103	14' 6"	80' 6"	14'
2:00	3,010	103	14' 6"	80' 6"	14'
3:00	3,010	103	14' 6"	80' 6"	14'
4:00	3,010	103	14' 6"	80' 6"	14'
5:00	3,010	103	14' 6"	80' 6"	14'
6:00	3,010	103	14' 6"	80' 6"	14'

Also enclosed for your files and future reference are three (3) copies of our pump and well data sheets giving dimensions on the well, pump and motor. Included are two (2) copies of the sand sample analysis as conducted by the Cook Well Strainer Company. This information was used to determine the slot openings for the strainer.

The Cook strainer furnished was construcded of red brass material complete with lead packer and bail plug. The strainer is a 20-inch nominal screen, being 18-3/4-inch O.D. complete with red brass slip couplings. Slots on the screen were furnished as follows:

136 - 145 ft.	9 ft.	30 slot
145 - 150 ft.	5 ft.	60 slot
150 - 180 ft.	30 ft.	90 slot
180 - 186 ft.	6 ft.	25 slot

We should receive the pump from our supplier this week and will make arrangements to install the unit on your foundation during the week of October 3rd.

If you have any questions, or need additional information concerning any of the attached data, please contact us at your convenience. It has been a pleasure working with you on this project, and we sincerely thank you for your most valued business.

Very truly yours

MOODY'S of Dayton, Inc.

Ed Wagner

ED WAGNER
President

cc: Ed Oda

EW:djp

Enclosures

MOODY'S of Dayton, Inc.

ADDRESS REPLY TO:
P. O. BOX 123
MIAMISBURG, OHIO 45342
PHONE AC 513-859-4482

August 10, 1979

Delco Air Conditioning Division
General Motors Corporation
P. O. Box 824
Dayton, Ohio 45401

Attn: Mr. Paul Hines

Subject: PR#33041
Well #35

Gentlemen:

Confirming our meeting with Jim Mullins and Robert Massbaum on Monday, August 6th, we are pleased to offer the following recommendation to treat your Well #35 in order to correct the high bacteria problem.

History

Well #35 was drilled and put into service in October 1966. It is 20" Diameter, 186' deep and has fifty (50) feet of strainer installed.

The pump was repaired in September, 1969.

The well was revitalized and chemically treated and the pump repaired in August, 1972. It has been operating continually since 1972 without any major repairs.

Recommendations

Due to the increase in bacteria and the length of service without repairs, we suggest the following procedure to put this unit in first class condition:

Furnish necessary experienced men and equipment to remove the pump and motor for inspection and repair as required. The well will be Shock Chlorinated with 300-400 ppm and let set for 10-24 hours. This treatment will be followed by our standard combination surge and air development process utilizing two or three shots of acids. Final treatment will consist of Shock Chlorination. The repaired pump will be reinstalled, tested and checked out into your system.

Production Well 36

MOODY'S of Dayton, Inc.

SUCCESSOR TO THE DON ROE CO.

Since 1891

ADDRESS REPLY TO
150 NORTH DIXIE DRIVE
P.O. BOX 155
VANDALIA, OHIO 45377
PHONE 898-4514 — 898-4971

August 29, 1966

Frigidaire Division
General Motors Corporation
Dayton, Ohio 45401

Subject: PO # FKD-83234C

Attention: Charles Denning

Gentlemen

We are pleased to submit our report in connection with the subject job. The drilling is completed, the casing removed from the ground and the log is as follows:

DRILLER'S LOG - Herman Rush

Static Level - Approximately 61 Feet

0 - 8 ft.	Clay
8 - 18 ft.	Gravel
18 - 40 ft.	Clay, gravel & sand
40 - 60 ft.	Clay, gravel & sand
60 - 110 ft.	Sand & gravel
110 - 130 ft.	Fine sand
130 - 167 ft.	Clean sand & gravel
167 - 188 ft.	Clay & layer of shale
188 - 190 ft.	Clay
190 - 198 ft.	Sand & gravel
198 - 204 ft.	Blue shale

Enclosed are three (3) copies of the Gamma Ray Log for your future reference. The samples and log indicate excellent water bearing sand and gravel from 130 to 170 feet. However, the material from 130 to 155 ft. contains more silt and clay than the area below. This section of the formation will require more development and attention. The samples between 155 and 170 ft. were clean, loose and active formation and should produce large quantities of water efficiently.

We were disappointed that a clay layer was prevalent between 170 and 190 ft. This material is not water bearing and cannot be screened. The material from 190 to 200 ft. again is clean, active material and has good water bearing potential. It lies on top of bedrock shale and in our opinion should be screened. Our recommendations for well construction would be as follows:

The well should be approximately 200 ft. deep with 10 ft. of strainer installed from 190 to 200 ft. A twenty (20) foot section of 18-inch O.D. blank pipe installed from 170 to 190 ft. We would again screen from 135 to 170 ft.

PLEASE USE PENCIL OR TYPEWRITER
DO NOT USE INK.

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus, Ohio 43212

No 34296

County MONTGOMERY Township MORAINE Section of Township

Owner FRIGIDAIRE DIV. GMC Address DAYTON, OHIO 45401

Location of property Located approx 100 ft. east of Well #21 → to Well #36

CONSTRUCTION DETAILS

TEST WELL

Casing diameter 9" Length of casing 1 ft. cut

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion 8-24-66

BAILING OR PUMPING TEST

Pumping Rate G.P.M. Duration of test

Drawdown ft. Date

Static level-depth to water 61

Quality (clear, cloudy, taste, odor)

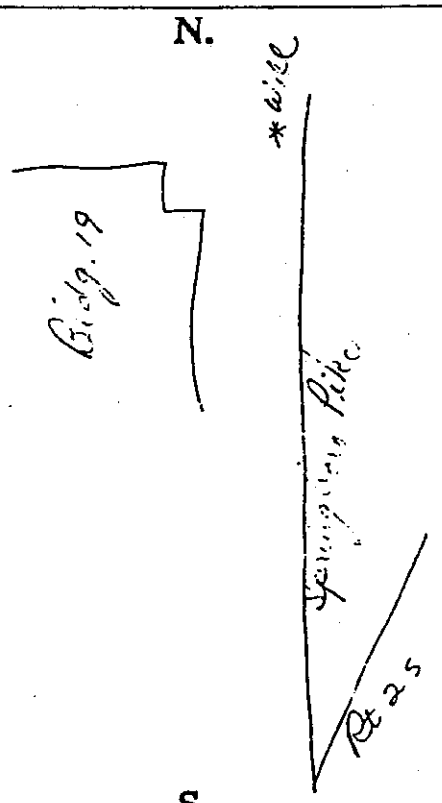
Pump installed by Herman Rush

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
Clay	0 Feet	8 Ft.
Gravel	8	18
Clay, gravel & sand	18	60
Sand & gravel	60	110
Fine sand	110	130
Clay, sand & gravel	130	167
Clay, layer of shale	167	188
Clay	188	190
Sand & gravel	190	198
Blue shale	198	204
5412		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc



See reverse side for instructions

Drilling Firm MOODY'S OF DAYTON, INC. SINCE 1891
150 North Dixie Drive
Kendalia, Ohio
278-4514

Address

Date 8-29-66

Signed Edward B Wagner

*If additional space is needed to complete well log, use next consecutive numbered for

C 6

with 35 feet of strainer openings.

By designing the well in this manner it will give you approximately 85 feet of available water to pump above the top of the screen. We feel the drawdown on this well will be greater than on Well #35 presently under construction, but fee the drawdown will be less than on many of your existing wells.

If you have any questions concerning our recommendations please contact us at your convenience. Thank you very much for your most valued business.

Very truly yours

MOODY'S of Dayton, Inc.

Ed Wagner

ED WAGNER
President

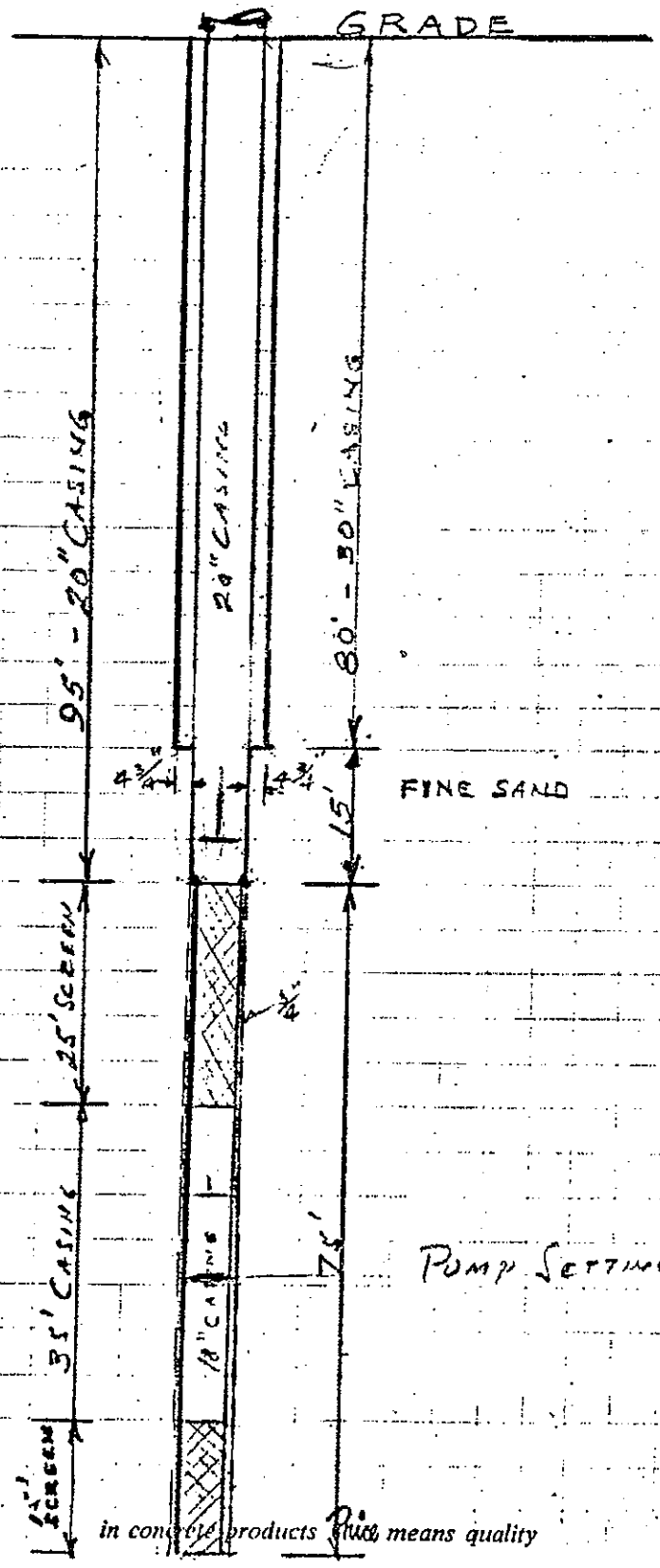
EW:djp

Enclosures

Price Brothers Company FLEXICORE DIVISION

Sales Offices:
cincinnati
cleveland
columbus
dayton
detroit
indianapolis
kent
lansing
toledo
Plant Locations:
dayton, ohio
kent, ohio
ivoonia, michigan

flexicore • flexicast • double tee • giant tee • wall panels

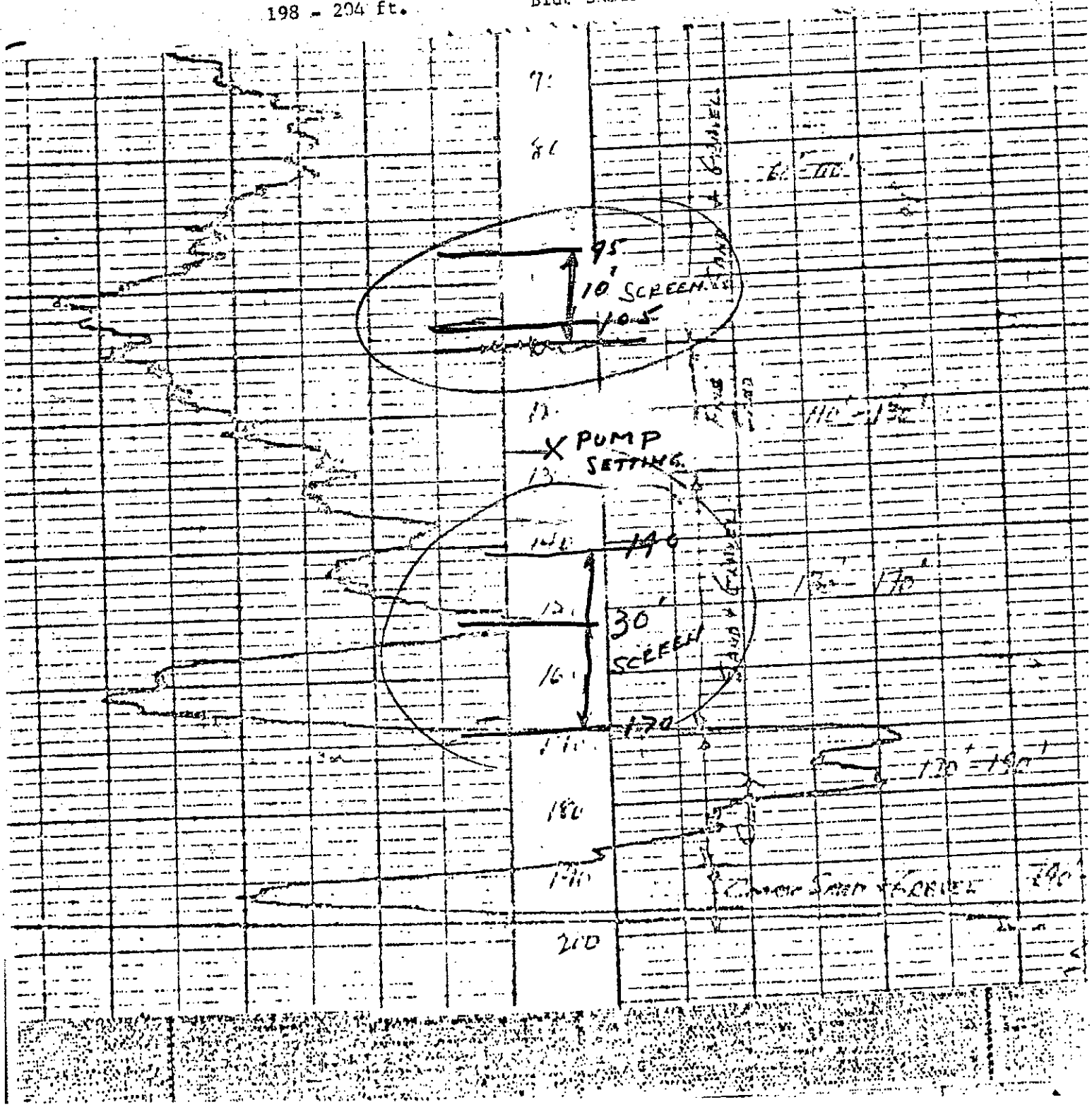


DRILLER'S LOG - Herman Rush

Static level - Approximately 61 feet

#31

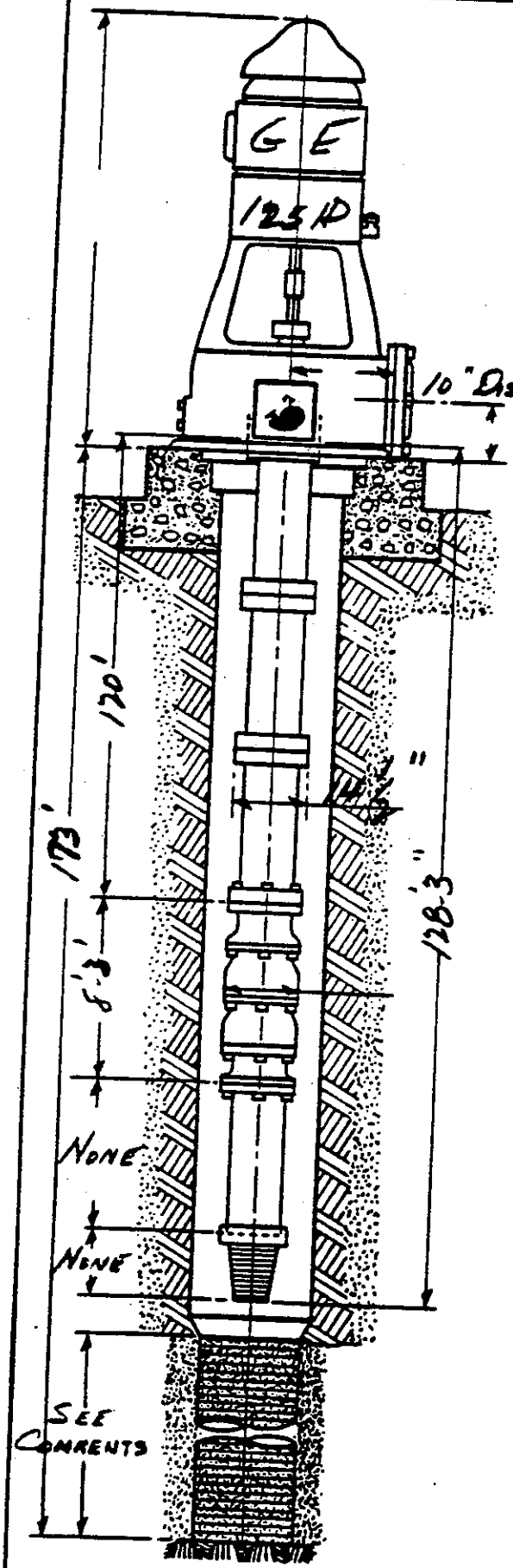
0 -	8 ft.	Clay
8 -	18 ft.	Gravel
18 -	40 ft.	Clay, gravel & sand
40 -	60 ft.	Clay, gravel & sand
60 -	110 ft.	Sand & gravel
110 -	130 ft.	Fine sand
130 -	167 ft.	Clean sand & gravel
167 -	188 ft.	Clay & layer of shale
188 -	190 ft.	Clay
190 -	198 ft.	Sand & gravel
198 -	204 ft.	Blue shale



VANDALIA, OHIO

MOODY'S, INC.

MEADVILLE, PA.



TURBINE PUMP INSTALLATION FOR:

FRIGIDAIRE DIV. - G.M.C.

WELL DESIGNATION NO. 36

55717 SERIAL NUMBER LAYNE
1200 GALLONS PER MINUTE
310 TOTAL HEAD IN FEET
12-WMC-B STAGES
1760 MOTOR SPEED
120 FEET OF SETTING
10" SIZE COLUMN
NONE OIL TUBE
1"/16 LINE SHAFT
NONE SUCTION PIPE
125 H.P. 460 VOLT. 3 CURRENT 60
WATER LUBRICATION
126 FEET OF AIRLINE
1/30/67 DATE INSTALLED

20 OD OF WELL
172 FEET DEEP FROM FOUNDATION
170 FEET DEEP FROM GRADE
40' STRAINER LENGTH — SLOT 25'- 95'-12
65' STATIC LEVEL — DATE 1/30/67 15'- 155'-17
73' " " — " 2/22/71
" " " — "
" " " — "
1/30/67 DATE DRILLED

PUMP REPAIRED — DATE 2/71
" " — "
" " — "

WELL ACID TREATED — DATE 2/22/71
" " " — "

COMMENTS — SPLIT SCREEN 25'-95'-120'
15'-155'-170'

MOODY'S, INC.

Phones

VANDALIA, OHIO: 898-4514

MEADVILLE, PA.: 6-1128

FORM TPI-762

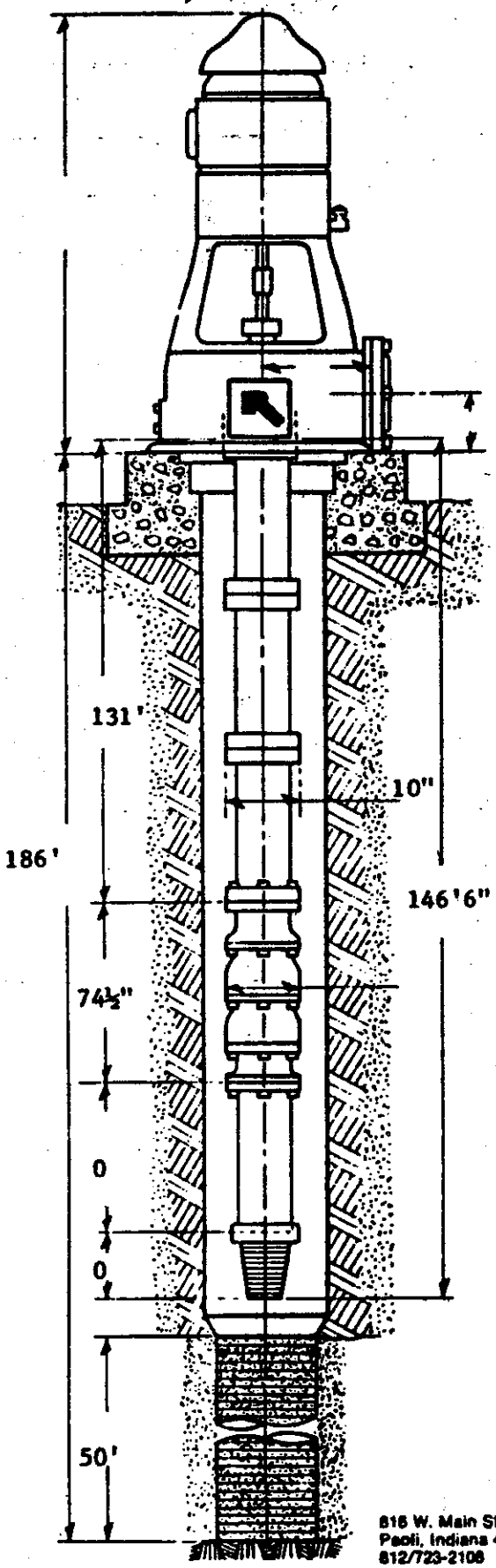
LITHO IN U.S.A.

Production Well 37

FRIGIDAIRE WELL NUMBER 37 DRILLER'S LOG

3" - 20'	Back fill - sand and course boulders
20' - 30'	Boulders up 16" has to drill out
30' - 40'	Sand and gravel up to 3" O. D.
40' - 60'	Yellow clay with sand and course boulders
60' - 68'	Gray material - sand and course boulders, gray mud clay has to drill out
68' - 75'	Course sand and gravel from 1/16" to 3/4"
75' - 80'	Medium brown sand - no gravel, with brown mud
80' - 90'	Medium fine brown sand
90' - 95'	Clean gray medium sand with gravel up to ½" O. D.
95' - 100'	Clean gray medium sand and fine gravel 1/8" - ½"
100' - 110'	Clean gray course sand and gravel up to 5" O. D.
110' - 129'	Fine gray sand, no gravel
129' - 136'	Blue clay and mud, black
136' - 138'	Course sand and gravel up 1" O. D.
138' - 140'	Boulders up to 8" and course sand, brown
140' - 156'	Boulders up to 12" and course sand, brown
156' - 160'	Course sand, very little gravel up to ½"
160' - 166'	Gravel up to 4" O. D. and course sand
166' - 168'	Medium sand, very little gravel 1/8" O. D.
168' - 176'	Course sand, gravel up to 2" O. D.
176' - 182'	Course sand, fine gravel ¼" O. D.
182' - 184'	Sand course gravel up to 3" O. D.
184'	Blue clay, drill to 188' have drill 2' out of bottom of pipe
184' - 195'	Blue clay

Reynolds Supply, Inc.



TURBINE PUMP INSTALLATION FOR:
Harrison Radiator

WELL DESIGNATION NO. 37

14-M135-4	SERIAL NUMBER
1600	GALLONS PER MINUTE
310	TOTAL HEAD IN FEET
4	STAGES
1760	MOTOR SPEED
131	FEET OF SETTING
10"	SIZE COLUMN Flanged
—	OIL TUBE
1 11/16"	LINE SHAFT
—	SUCTION PIPE
150	H.P. 440 VOLT. CURRENT 60 cycle
water	LUBRICATION
130	FEET OF AIRLINE
12/82	DATE INSTALLED

20"	I.D. OF WELL
186	FEET DEEP FROM FOUNDATION
185	FEET DEEP FROM GRADE
50	STRAINER LENGTH — SLOT
	STATIC LEVEL — DATE
	" " — "
	" " — "
	" " — "
5/67	DATE DRILLED

PUMP REPAIRED — DATE
" " — "
" " — "

WELL ACID TREATED — DATE
" " " — "

COMMENTS —

New pump 12/82

816 W. Main Street
Paoli, Indiana 47454
812/723-2108

Highway 60 East
Owensboro, Ky. 42301
502/685-5572

1421 Mellwood Ave.
Louisville, Ky. 40208
502/585-1241

6451 Germantown Rd
Middletown, Ohio 45
513/424-7287

Reynolds
Supply, Inc.

December 31, 1982

Harrison Radiator
P.O. Box 824
Dayton, Ohio 45401

Attention: Mr. Mike Hrosso

Reference: Rehabilitation Well 37

Dear Mr. Hrosso:

In accordance with Harrison Radiator's Purchase Order 34605-D, Reynolds Supply, Inc. (Reynolds) is pleased to report the successful rehabilitation of Well 37. The well was tested in 1981 and discovered that the pump was well below its performance curve, and the well was in need of cleaning. Therefore, the pump was removed and inspected. The pump bowls, shafting and bearing inserts were all found to be badly deteriorated. Following a meeting with Harrison personnel, it was decided to replace all but the column pipe which was in excellent condition.

The well was surged using a double disc surge block with high volume compressed air. Following initial surging, the well screen was chemically treated with 1500 gallons of inhibited muratic acid. After approximately 24 hours of contact time, the well was surged and blown to waste. The rehabilitation process continued until the well was returned to its maximum efficiency.

A new pump was installed (pump curve attached) and a test conducted on the well. The results of the test are summarily presented in Table 1.

Table 1 Step Drawdown Test Results Well 37

Step	Qgpm	Pumping Level (feet)	Drawdown (feet)	Specific Capacity gpm/ft	Discharge Pressure (pounds)
1	354	47.0	5.0	70.8	185
2	548	50.0	8.0	68.5	175
3	759	52.0	10.0	75.9	170
4	950	54.0	12.0	79.2	160
5	1205	56.0	14.0	86.1	145
6	1324	57.0	15.0	88.3	130
7	2200	67.0	25.0	88.0	40

- static water level 42.0 feet below pump base

P.O. Box 230
816 W. Main Street
Paoli, Indiana 47454
812/723-2108

P.O. Box 120
Highway 60 East
Owensboro, Ky. 42301
502/684-5075

1421 Mellwood Ave.
Louisville, Ky. 40206
502/585-1241

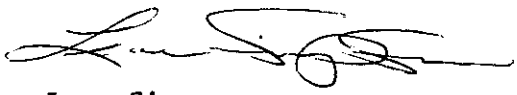
6451 Germantown Road
Middletown, Ohio 45042
513/424-7287

1730 South Harding St.
Indianapolis, Ind. 46221
317/636-1996

As shown by the test results, Well 37 responded very favorable to the rehabilitation efforts employed. At the rate of 2200 gpm approximately 60+ feet of reserve remained over top of the pump. Thus, the well is more than capable of producing the required volume of water.

We are very pleased with the results of Well 37 as we trust you are. If You have any questions or desire clarification please advise accordingly.

Respectfully submitted,

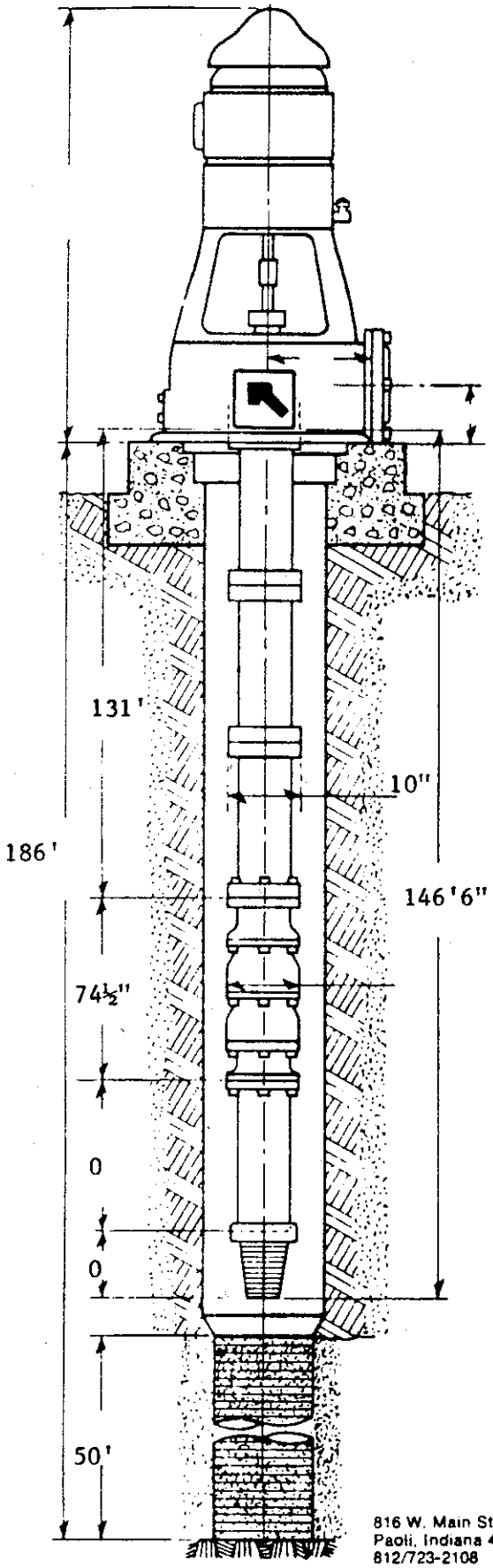


Leon Simpson
Ohio District Manager

Enc: Well log
Pump curve

LS/ct

Reynolds Supply, Inc.



TURBINE PUMP INSTALLATION FOR:
Harrison Radiator

WELL DESIGNATION NO. 37

14-M135-4	SERIAL NUMBER
1600	GALLONS PER MINUTE
310	TOTAL HEAD IN FEET
4	STAGES
1760	MOTOR SPEED
131	FEET OF SETTING
10"	SIZE COLUMN Flanged
—	OIL TUBE
1 11/16"	LINE SHAFT
—	SUCTION PIPE
150	H.P. 440 VOLT CURRENT 60 cycle
water	LUBRICATION
130	FEET OF AIRLINE
12/82	DATE INSTALLED

20"	I.D. OF WELL
186	FEET DEEP FROM FOUNDATION
185	FEET DEEP FROM GRADE
50	STRAINER LENGTH — SLOT
	STATIC LEVEL — DATE
	" " — "
	" " — "
	" " — "
5/67	DATE DRILLED

PUMP REPAIRED — DATE
" " — "
" " — "

WELL ACID TREATED — DATE
" " " — "

COMMENTS —

New pump 12/82

816 W. Main Street
Paoli, Indiana 47454
812/723-2108

Highway 60 East
Owensboro, Ky. 42301
502/685-5572

1421 Mellwood Ave.
Louisville, Ky. 40206
502/585-1241

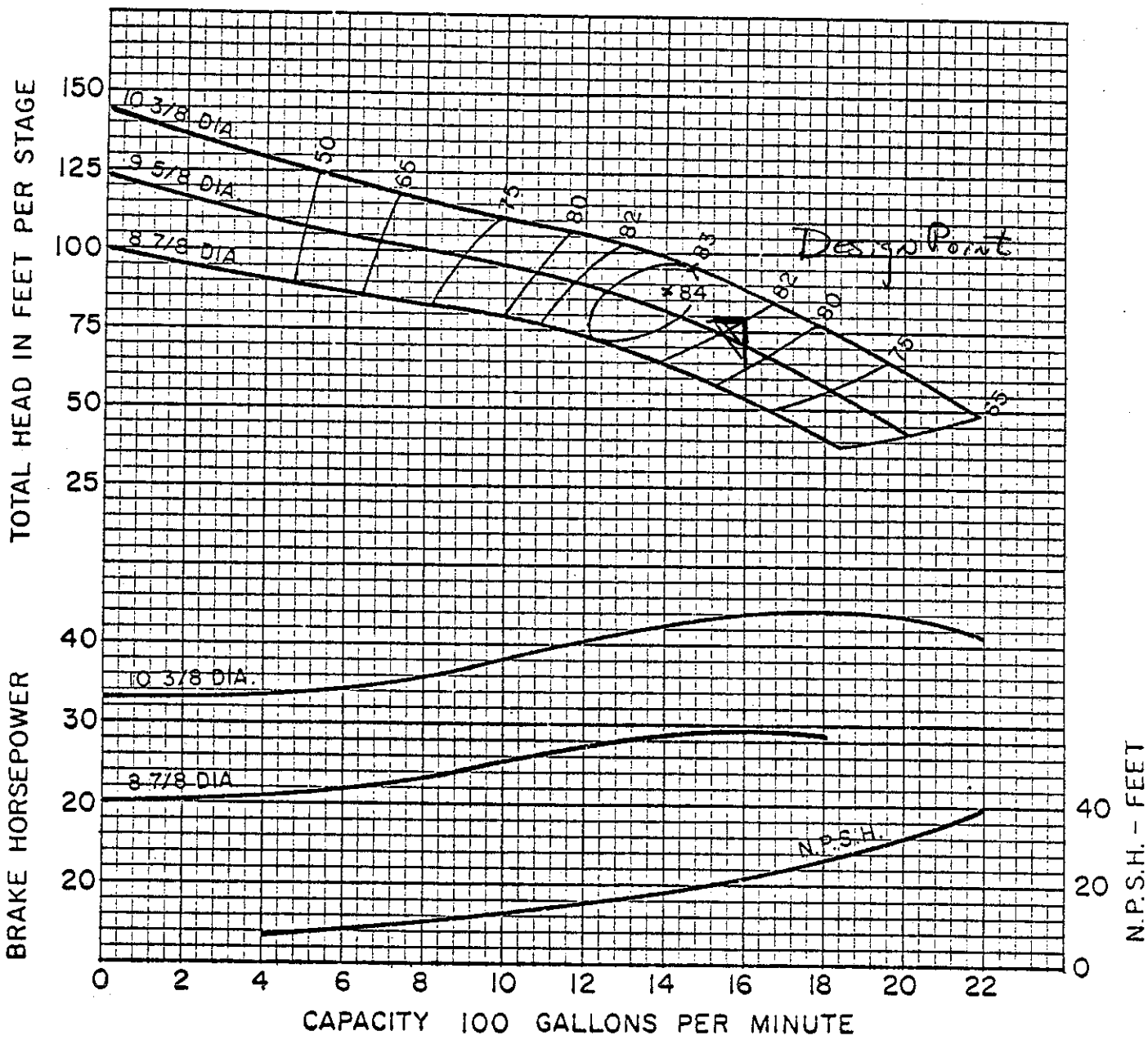
6451 Germantown Road
Middletown, Ohio 45042
513/424-7287

Harrison Radiator
Pump Performance Curve
Well 37

RATING CURVES

(60 CYCLES)

December 1, 1976
14M-135
1760 RPM

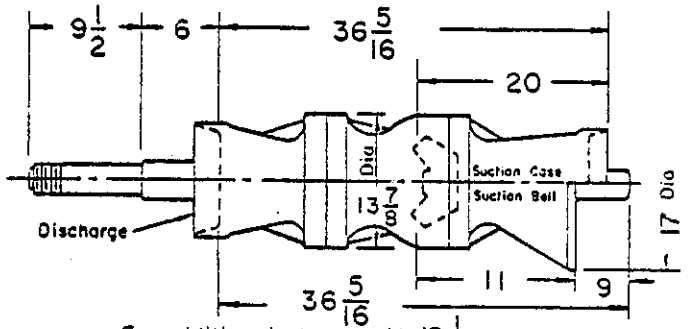


Efficiency shown is for 4 stages or more, with standard materials. For fewer stages or other materials change efficiency as shown.

No. of stages	Eff. change	MATERIAL	Eff. change
6	—	Impeller - bronze	—
5	—	Impeller - c.i.	-1
4	—	Impeller - c.i. enm.	+1
3	-.5	Bowl - c.i. enm.	—
2	+1	Bowl - cast iron	-2
1	-3	Bowl - bronze	-1.5

Standard materials			
Impeller - bronze			
Bowl - cast iron/enamelled			
Thrust factor	12		
Rotor wt. per stage (lbs.)	37		
Bowl wt. 1st stage (lbs.)	365		
Bowl wt. add'l. stage (lbs.)	135		
Max. bowl horsepower	570	Impeller shaft diameter	2 1/4
Impeller eye area (sq.in.)	24	Minimum impeller shaft end play	.75

Column pipe	10		
Suction pipe	10		



For additional stages add $12\frac{1}{8}$ per stage.

Worthington Pump Corporation - Shawnee, Oklahoma

WORTHINGTON

Production Well 38

PLEASE USE PENCIL OR TYPEWRITER

DO NOT USE INK

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus, Ohio 43212

No 374186

County Montgomery Township ~~Perry~~ Moraine Section of Township

Owner Frigidaire Div., G. M. C. Address Dayton, Ohio

Location of property West of Bldg #19 at Plant #2

Well #38 CONSTRUCTION DETAILS

Casing diameter 20" Length of casing

Type of screen Wire Wound Length of screen 10'

Type of pump Vertical turbine

Capacity of pump 1200

Depth of pump setting 97' 5"

Date of completion 8-17-68

BAILING OR PUMPING TEST

Pumping Rate 2500 G.P.M. Duration of test 8 hrs.

Drawdown 13' 6 ft. Date 8-18-68

Static level-depth to water 61 ft.

Quality (clear, cloudy, taste, odor) clear

no odor

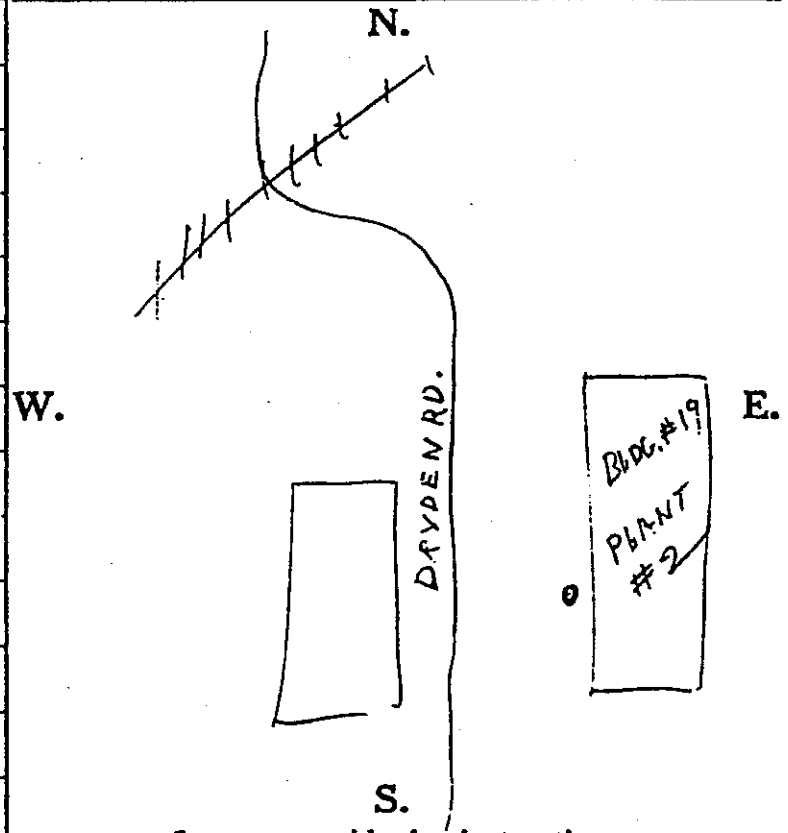
Pump installed by Walt Fields

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
top soil	0 Feet	5 Ft.
Coarse sand & gravel (dry)	5	31
Boulders and sand	31	33
cemented boulders (Till)	33	46
large gravel & boulders (dry)	46	56
till	56	67
Coarse sand & coarse gravel (wet)	67	79
medium sand & medium gravel	79	83
Clay	83	89
coarse sand & medium to coarse gravel	89	132
Hard pan clay	132	156
blue clay	156	157
blue shale (Bedrock)	157	160

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm Moody's of Dayton, Inc. Date Apr. 17, 1969

Address P.O. Box 135, Vandalia, O. Signed Betty Hurst

5412 45377

*If additional space is needed to complete well log, use next consecutive numbered form.

Production Well 39

MOODY'S of Dayton, Inc.

SUCCESSOR TO THE DON ROE CO.

ADDRESS REPLY TO:
150 NORTH DIXIE DRIVE
P.O. BOX 155
VANDALIA, OHIO 45377
PHONE 898-4514 — 898-4971

9 January 1970

Frigidaire Division
General Motors Corporation
Dayton, Ohio 45401
Attn: Ed Oda

Subject: Well #39

Gentlemen:

Work on the subject job has been completed and we are pleased to submit our report for your files and future reference. The driller's log is as follows:

Driller's Log - by George Barker

0 - 28'	-	Top Soil & Gravel
28' - 38'	-	Clay
38' - 55'	-	Coarse Sand & Gravel (Cobbles)
55' - 70'	-	Good Coarse Sand & Gravel
70' - 90'	-	Dirth Sand & Gravel
90' - 115'	-	Good Coarse Sand & Coarse Gravel
115' - 145'	-	Blue Shale (Bedrock)

We installed twenty-five (25) feet of Cook red brass screen with lead packer and bail plug. The screen was 18 3/4" O.D. with slots comprised as follows:

90' - 95'	- 5'	-	80 Slot
95' - 115'	- 20'	-	100 Slot

Also enclosed are three (3) copies of the Gamma Ray log conducted on the 20" Well. The log is complete with notations and our interpretation.

Three (3) copies of our pump and well data charts are enclosed showing dimensions and other pertinent data about the well and the pump installed.

The pumping test was conducted on October 22nd, 1969 with the results tabulated below. All readings were taken approximately 1' 6" above grade.

WELL LOG AND DRILLING REPORT

NO CARBON PAPER NECESSARY— SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
65 S. Front St., Rm. 815 Phone (614) 469-2646
Columbus, Ohio ~~43215~~

No. 407938

County Montgomery Township ~~Harris~~ Moraine Section of Township

Owner Frigidaire Division GMC Address Dayton, Ohio 45401

Location of property North End of Plant #2

~~Well #3~~ CONSTRUCTION DETAILS (Well #39)

Casing diameter 20" Length of casing 47'
Type of screen Red Brass Length of screen 25'
Type of pump Byron Jackson
Capacity of pump 800 GPM
Depth of pump setting 90'
Date of completion 31 July 1970

BAILING OR PUMPING TEST
(Specify one by circling)

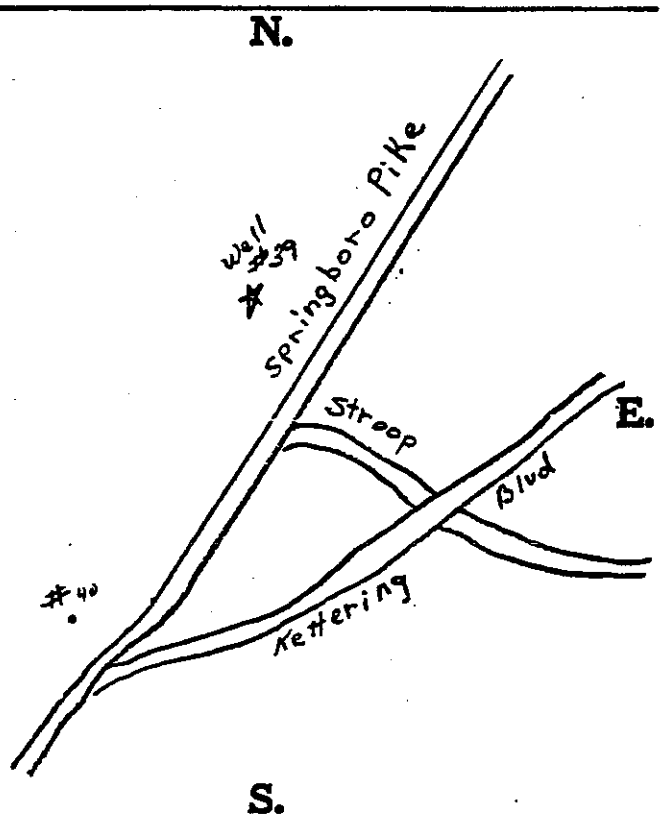
Test Rate 2,246 G.P.M. Duration of test 6 hrs.
Drawdown 188 GPM/ft. Date 10-22-69
Static level-depth to water 62 ft.
Quality (clear, cloudy, taste, odor) Clear
Pump installed by Moody's

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
Soil, Sandy & Some Gravel	0 Feet	28 Ft.
Clay	28	38
Large Gravel, Fair Lg. Rock	38	55
Clay & Gravel Mixed	55	90
" " Water at 100'	90	100
Good Gravel	100	115
Blue Shale	115	145
5412		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



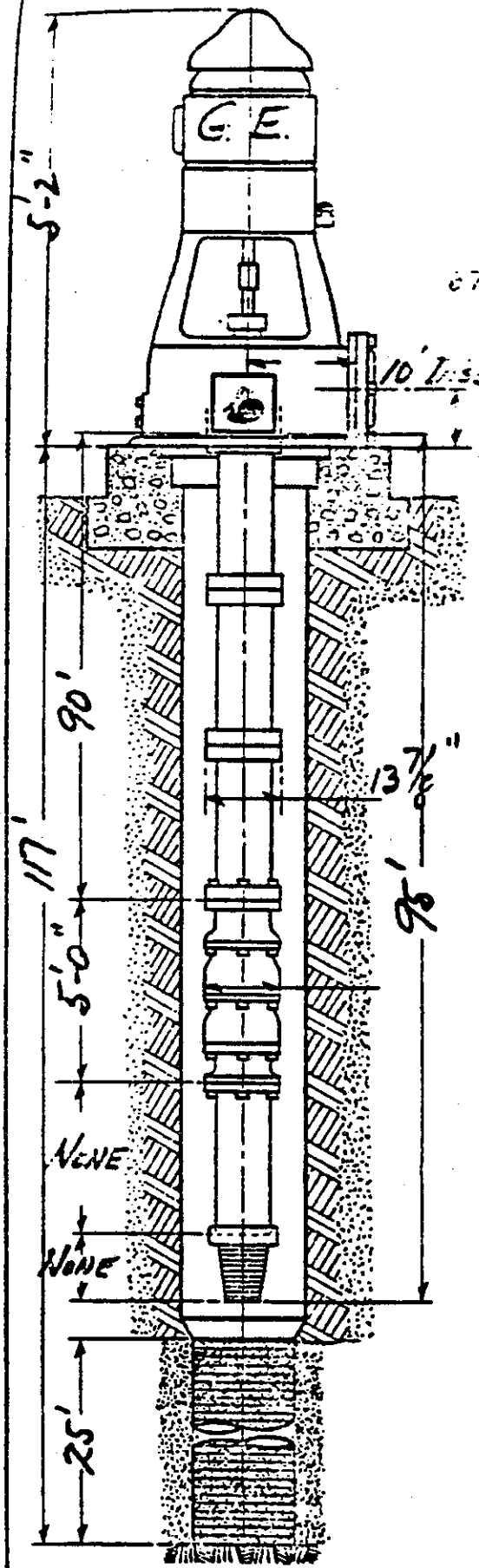
Drilling Firm MOODY'S OF DAYTON, INC.
Address P. O. Box 155, Vandalia, Ohio 45377 Area Code 513 898-3969

Date March 22, 1973
Signed V. C. Cooper/jd

*If additional space is needed to complete well log, use next consecutive numbered form.

MOODY'S, INC.

VANDALIA, OHIO — MEADVILLE, PA.



TURBINE PUMP INSTALLATION FOR:
FRIGIDAIRE DIV. - PLANT #2

WELL DESIGNATION NO. 39

- 11-C-1684 SERIAL NUMBER
- 800 GALLONS PER MINUTE
- 29 TOTAL HEAD IN FEET
- 10' Line 12-C-1684-5 — 5 STAGES BYRON JACKSON
- 1170 MOTOR SPEED
- 90' FEET OF SETTING
- 12" SIZE COLUMN FLANGED
- None OIL TUBE
- 1 1/16" LINE SHAFT S.S. COUPLINGS
- None SUCTION PIPE
- 125 H.P. 440 VOLT 3 CURRENT 66
- Water LUBRICATION
- 98' FEET OF AIRLINE
- _____ DATE INSTALLED

- 20" O.D. OF WELL
- 117' FEET DEEP FROM FOUNDATION
- 115' FEET DEEP FROM GRADE 5'-80 SLOT
- 25' STRAINER LENGTH — SLOT 20'-100 SLOT
- 62' STATIC LEVEL — DATE 10/22/69
- _____ " " — " _____
- _____ " " — " _____
- _____ " " — " _____
- 10/15/69 DATE DRILLED

PUMP REPAIRED — DATE _____
" " — " _____
" " — " _____

WELL ACID TREATED — DATE _____
" " " — " _____

COMMENTS — STATIC READING TAKEN TOP OF CASING 1'-6" ABOVE GRADE.

MOODY'S, INC.
Phones
VANDALIA, OHIO: 898-4514
MEADVILLE, PA.: 6-1128

Pumping Test Results

Time	Pumping Level	Draw Down	Capacity GPM	Orifice
9:25	62' (Static)	-	-	-
9:30	73' 7"	11' 7"	2,246	57½"
9:35	73' 8"	11' 8"	2,246	57½"
9:40	73' 8"	11' 8"	2,246	57½"
9:45	73' 8½"	11' 8½"	2,246	57½"
9:50	74' 0"	12'	2,253	58"
9:55	74' 1"	12' 1"	2,253	58"
10:00	74' 1"	12' 1"	2,253	58"
10:15	74' 1"	12' 1"	2,253	58"
10:30	74' 2"	12' 2"	2,253	58"
10:45	74' 2"	12' 2"	2,253	58"
11:00	74' 2"	12' 2"	2,253	58"
11:15	74' 3"	12' 3"	2,253	58"
11:30	74' 3"	12' 3"	2,253	58"
11:45	74' 3"	12' 3"	2,253	58"
12:00	74' 3"	12' 3"	2,253	58"
1:00	74' 3"	12' 3"	2,253	58"
2:00	74' 3"	12' 3"	2,253	58"
2:50	74' 3"	12' 3"	2,253	58"
2:55	67' 7"	7' 7"	1,027	12"
3:00	62' 6" (Shut Off)			
3:10	62' 0"			
3:15				

The specific yield on this well at the 2,246 GPM pumping rate is 188 GPM/ft. of draw down. This is an excellent well and if pumped at the rated 800 GPM, it should provide you with many years of trouble free service.

If you have any questions, or desire additional information, please contact us at your convenience.

Very truly yours,

MOODY'S OF DAYTON, INC.

Ed Wagner
President

EW:bac
Enclosure

Production Well 40

WELL LOG AND DRILLING REPORT

ORIGINAL

NO CARBON PAPER NECESSARY— SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
65 S. Front St., Rm. 815 Phone (614) 469-2646
Columbus, Ohio 43215

No. 407939

County Montgomery Township ~~Washington~~ Moraine Section of Township

Owner Frigidaire Div., GMC Address Dayton, Ohio 45401

Location of property North End of Plant #2

CONSTRUCTION DETAILS Well #40

Casing diameter 20" Length of casing 135'
Type of screen Cut Brass Length of screen 43'
Type of pump Byron Jackson
Capacity of pump 750 - 800 GPM
Depth of pump setting 90'
Date of completion 24 July 1970

BAILING OR (PUMPING) TEST
(Specify one by circling)

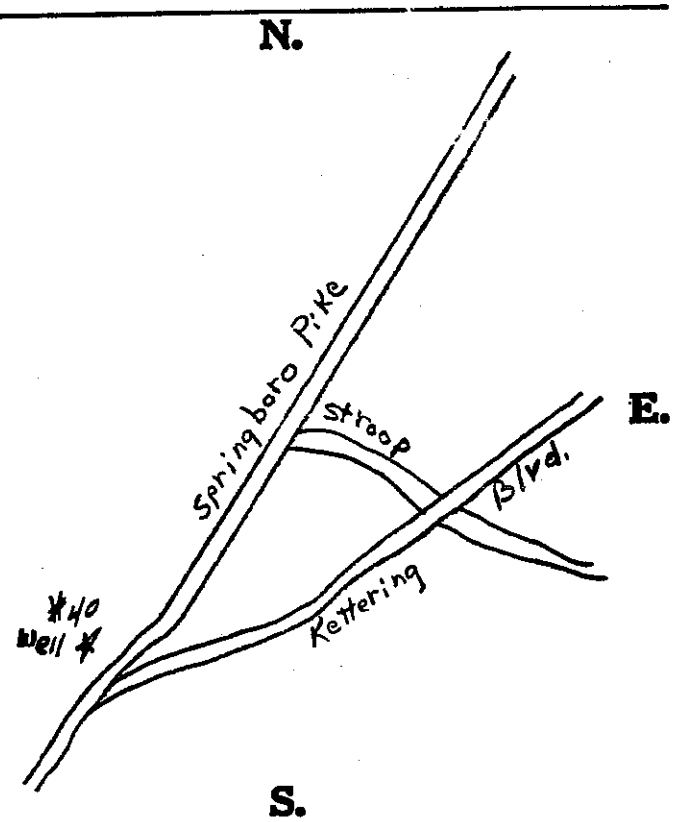
Test Rate 1568 G.P.M. Duration of test 6 hrs.
Drawdown 82 GPM/ft. Date 11-25-69
Static level-depth to water 66 ft.
Quality (clear, cloudy, taste, odor) Clear
Pump installed by Moody's

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
Soil, Sand & Gravel	0 Feet	30 Ft.
Sand & Gravel w/Clay	30	54
Fine Sand	54	66
Fine to Med. Sand (Some Gravel)	66	104
Med. to Coarse Sand	104	133
Yellow Clay	133	135
5412.		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



Drilling Firm MOODY'S OF DAYTON, INC.
Address P. O. Box 155 Vandalia, Ohio 45377 Area Code 513 898-3969

Date March 22, 1973
Signed V. C. Caspey /jal

*If additional space is needed to complete well log, use next consecutive numbered form.

MOODY'S of Dayton, Inc.

SUCCESSOR TO THE DON ROE CO.

ADDRESS REPLY TO:
150 NORTH DIXIE DRIVE
P.O. BOX 155
VANDALIA, OHIO 45377
PHONE 898-4514 — 898-4971

9 January 1970

Frigidaire Division
General Motors Corporation
Dayton, Ohio 45401
Attn: Ed Oda

#40

Subject: Well #40

Gentlemen:

Work on the subject well has been completed and we are pleased to submit our report for your files and future reference. The driller's log is as follows:

Driller's Log - by Everett Wheeler

Approx. Static Level - 66' (grade)

0 - 30'	-	Top Soil, Sand & Gravel
30' - 54'	-	Sand & Gravel with Clay
54' - 66'	-	Fine Sand
66' - 104'	-	Fine to medium Sand (few gravels)
104' - 133'	-	Medium to Coarse Sand
133' - 135'	-	Yellow Clay

We installed forty-three (43) feet of Cook red brass screen with lead packer and bail plug. The screen was 18 3/4" O.D. with slots comprised as follows:

90'	- 107'	- 17'	-	18 Slot
107'	- 112'	- 5'	-	40 Slot
112'	- 125'	- 13'	-	60 Slot
125'	- 133'	- 8'	-	40 Slot

Also enclosed are three (3) copies of the sieve analysis conducted on the sand samples. This information was used to select the screen slot sizes shown above.

Three (3) copies of our pump and well data charts are enclosed showing dimensions and other pertinent data about the well and pump installed.

Production Well 41

WEI' LOG AND DRILLING RE'ORT

ORIGINAL

NO CARBON PAPER NECESSARY— 'LF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
65 S. Front St., Rm. 815 Phone (614) 469-2646
Columbus, Ohio 43215

No. 420708

County [illegible] Township [illegible] Section of Township

Owner Frigidaire Division #41 Address Dayton, Ohio

Location of property [illegible]

CONSTRUCTION DETAILS

Casing diameter 8" Length of casing

Type of screen R.B. Length of screen 58

Type of pump [illegible]

Capacity of pump [illegible]

Depth of pump setting

Date of completion 1-28-71

BAILING OR PUMPING TEST
(Specify one by circling)

Test Rate 2461 G.P.M. Duration of test 10 hrs.

Drawdown 21 ft. Date 1-26-71

Static level-depth to water 62' ft.

Quality (clear, cloudy, taste, odor) clear

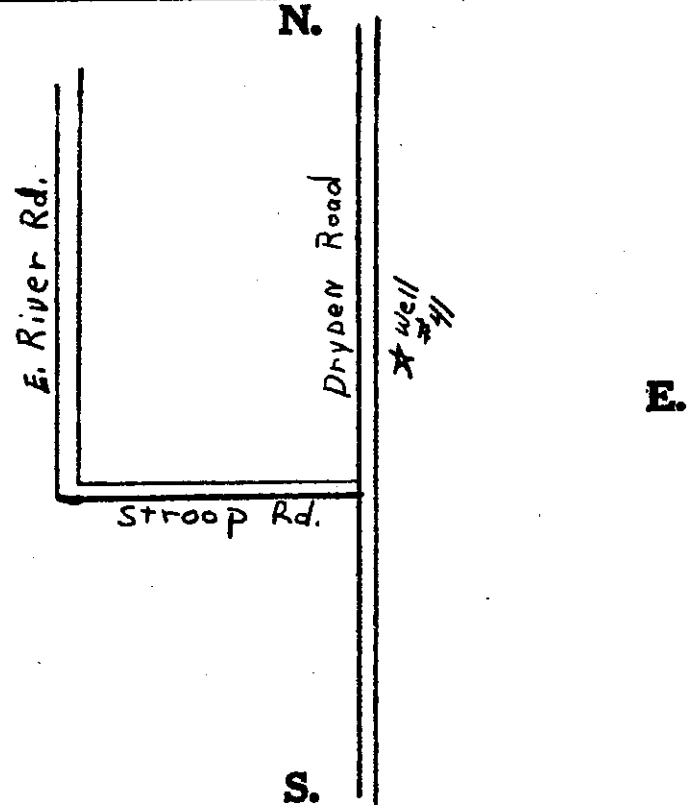
Pump installed by Russell Fields

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
Soil	0 Feet	1 Ft.
Clay with gravel	1	8
Dry sand + gravel	8	53
Blue clay	53	62
Coarse sand + mid gravel	62	77
clay streak	77	78
Coarse sand + gravel	78	129
Boulders mid sand + coarse gravel	129	138
Boulders + coarse sand + coarse gravel	138	149
Medium sand + gravel	149	168
Medium sand + fine gravel	168	181
" " "	181	193
Salt - bedrock	193	194

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



Drilling Firm MOODY'S OF DAYTON, INC.
P. O. Box 155 Area Code 513
Address Vandalia, Ohio 45377 898-3969

Date August 31, 1971

Signed T. C. Casper Jr.

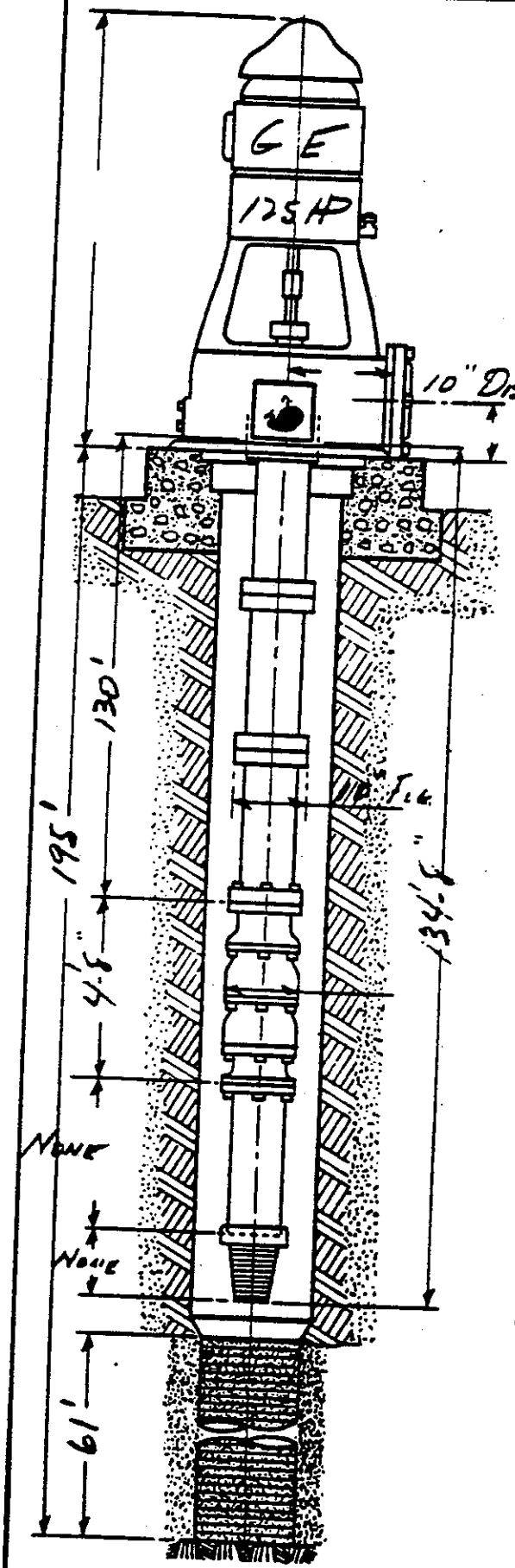
5412

*If additional space is needed to complete well log, use next consecutive numbered form.

VANDALIA, OHIO

MOODY'S, INC.

MEADVILLE, PA.



TURBINE PUMP INSTALLATION FOR:

FRIGIDAIRE DIV. - G M C.

WELL DESIGNATION NO. 41

701-C-1710 SERIAL NUMBER
1200 GALLONS PER MINUTE
310 TOTAL HEAD IN FEET
12GH, M, - 5 STAGES
1760 MOTOR SPEED
130' FEET OF SETTING
10" SIZE COLUMN FLANGED
NONE OIL TUBE
1" LINE SHAFT
NONE SUCTION PIPE
125 H.P. 460 VOLT. 3 CURRENT 60
WATER LUBRICATION
134.6" FEET OF AIRLINE
5/4/71 DATE INSTALLED

" O.D.
20' LB. OF WELL
195' FEET DEEP FROM FOUNDATION
193' FEET DEEP FROM GRADE
58' STRAINER LENGTH — SLOT See Letter 5/4
68' STATIC LEVEL — DATE 5/4/71
" " — "
" " — "
" " — "
2/4/71 DATE DRILLED

PUMP REPAIRED — DATE
" " — "
" " — "

WELL ACID TREATED — DATE
" " " — "

COMMENTS —

MOODY'S, INC.

Phones

VANDALIA, OHIO: 898-4514

MEADVILLE, PA.: 6-1128

FORM TPI-762

LITHO IN U.S.A.

MOODY'S of Dayton, Inc.

ADDRESS REPLY TO:
P.O. BOX 155
VANDALIA, OHIO 45377
AC 513-898-3969

January 25, 1972

Frigidaire Division
General Motors Corporation
Dayton, Ohio 45401
ATTN: Mr. Ed Oda

Subject: Well # 41
P.O. # FKD-05982-B

Gentlemen:

Following up our letter of February 4, 1971 and with the attached information, we are bringing this job file up to date.

Enclosed are two (2) copies of our pump and well data charts depicting pertinant information concerning the well and pump dimensions. This information is for your files and future reference.

After the pump was installed a short pumping test was conducted by Walter Fields. Results of this test were as follows.

Capacity	Disc Press.	Draw Down
1069 GPM	90 psi.	10'
1258 GPM	80 psi.	12'
1359 GPM	70 psi.	14'

Shut-off pressure was 160 psi at no flow.

After checking the attached information, if you have any questions, or need more information, please advise.

Very truly yours,

MOODY'S OF DAYTON, INC.

Ed Wagner

Edward B. Wagner
President

EBW/jld

Production Well 42

MOODY'S of Dayton, Inc.

ADDRESS REPLY TO:
P.O. BOX 155
VANDALIA, OHIO 45377
AC 513-898-3969

February 4, 1971

Frigidaire Division
General Motors Corporation
Dayton, Ohio 45401

Attention: Mr. Ed Oda

SUBJECT: Well #42
P.O. # FKD-05983-B

Gentlemen

Work is progressing satisfactorily on the subject job and we are pleased to submit our report on work completed to date.

DRILLER'S LOG - By Everett Wheeler
Approximate Static Level - 68 ft.

0 - 1 ft.	Top soil
1 - 4 ft.	Yellow clay
4 - 32 ft.	Dry sand & gravel
32 - 36 ft.	Yellow clay
36 - 49 ft.	Dry sand & gravel
49 - 60 ft.	Till
60 - 64 ft.	Blue clay
64 - 72 ft.	Medium sand & coarse gravel
72 - 85 ft.	Muddy blue clay
83 - 139 ft.	Coarse sand & coarse gravel
139 - 147 ft.	Boulders - coarse sand & coarse gravel
147 - 174 ft.	Coarse sand & coarse gravel
174 - 185 ft.	Coarse sand & medium gravel
185 - 193 ft.	Blue shale (bedrock)

We are enclosing three (3) copies of the sand sample analysis conducted on the formation samples. Also enclosed, are three (3) copies of the Gamma Ray Log conducted by Roger Rogers on November 27, 1970. This information was utilized to select the strainer installed in the well.

We furnished a Cook Well Strainer size 18-19/32" O.D. red brass material, with lead packer and bail plug, screwed strainer fittings and slots comprised as follows:

135 ft. - 137 ft. - 2 ft. - 90 Slot
137 ft. - 155 ft. - 18 ft. - 125 Slot
155 ft. - 160 ft. - 5 ft. - 100 Slot
160 ft. - 167 ft. - 7 ft. - 70 Slot
167 ft. - 175 ft. - 8 ft. - 90 Slot
175 ft. - 185 ft. - 10 ft. - 40 Slot

MOODY'S of Dayton, Inc.

ADDRESS REPLY TO:
P.O. BOX 155
VANDALIA, OHIO 45377
AC 513-898-3969

January 25, 1972

Frigidaire Division
General Motors Corporation
Dayton, Ohio 45401
ATTN: Mr. Ed Oda

Matches Well # 42 not well #41
TF
1/9/08

Subject: Well # 41
P.O. # FKD-05982-B

Gentlemen:

Following up our letter of February 4, 1971 and with the attached information, we are bringing this job file up to date.

Enclosed are two (2) copies of our pump and well data charts depicting pertinant information concerning the well and pump dimensions. This information is for your files and future reference.

After the pump was installed a short pumping test was conducted by Walter Fields. Results of this test were as follows.

Capacity	Disc Press.	Draw Down
1069 GPM	90 psi.	10'
1258 GPM	80 psi.	12'
1359 GPM	70 psi.	14'

Shut-off pressure was 160 psi at no flow.

After checking the attached information, if you have any questions, or need more information, please advise.

Very truly yours,

MOODY'S OF DAYTON, INC.

Ed Wagner

Edward B. Wagner
President

EBW/jld

WELL LOG AND DRILLING REPORT

ORIGINAL

NO CARBON PAPER NECESSARY— SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
65 S. Front St., Rm. 815 Phone (614) 469-2646
Columbus, Ohio 43215

No. 420709

County Montgomery Township Harrison Section of Township

Owner Frigidaire Division #42 Address Dayton, Ohio

Location of property Off Dryden Rd.

CONSTRUCTION DETAILS

Casing diameter 20" Length of casing 150
Type of screen R.B. Length of screen 50
Type of pump Turbine
Capacity of pump 1750 G.P.M.
Depth of pump setting 130 ft.
Date of completion 5-4-71

BAILING OR PUMPING TEST
(Specify one by circling)

Test Rate 2219.0 G.P.M. Duration of test 5½ hrs.
Drawdown 14-0 ft. Date
Static level-depth to water 69' ft.
Quality (clear, cloudy, taste, odor) clear

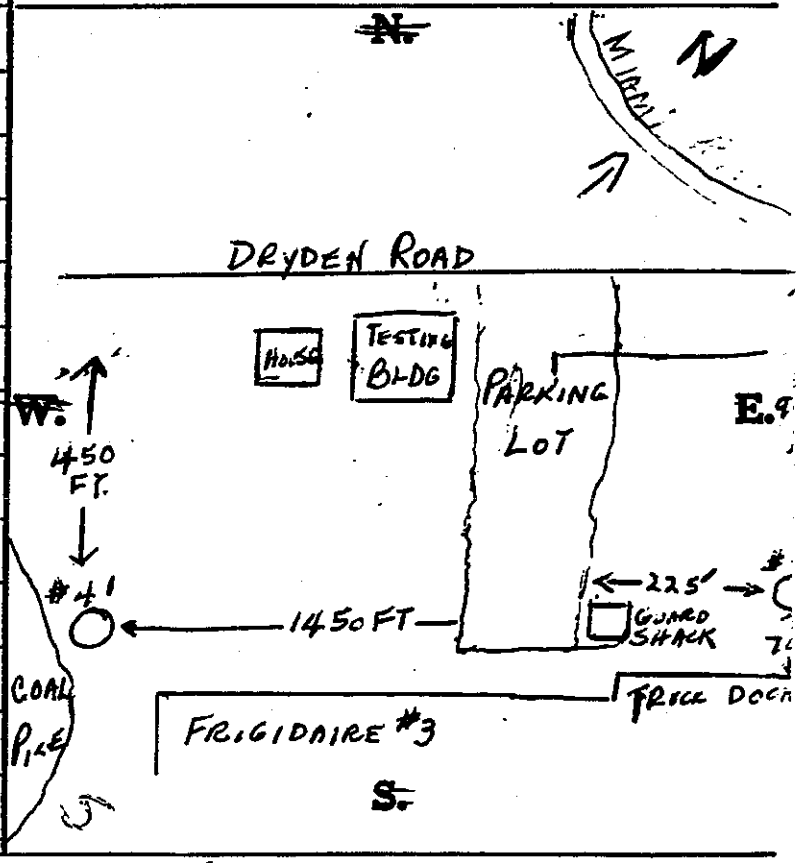
Pump installed by Everett Wheeler

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
Top Soil	0 Feet	1 Ft.
Yellow-clay	1	4
Dry sand+gravel	4	32
Yellow clay	32	36
Dry sand+gravel	36	49
Till	49	60
Blue Clay	60	64
Med. sand+coarse gravel	64	72
Muddy Blue Clay	72	85
Coarse sand+gravel	85	139
Boulder-coarse sand+gravel	139	147
Coarse sand+gravel	147	174
Coarse sand+med gravel	174	185

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



Drilling Firm 5412 MOODY'S OF DAYTON, INC.
Address P. O. Box 155 Area Code 513 Vandalia, Ohio 45377 898-3969

Date September 1, 1971
Signed [signature]

*If additional space is needed to complete well log, use next consecutive numbered form.

WEI' LOG AND DRILLING REP'RT

ORIGINAL

NO CARBON PAPER NECESSARY— SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
65 S. Front St., Rm. 815 Phone (614) 469-2646
Columbus, Ohio 43215

No. 420710
P-2

County Morton Township Marion Section of Township

Owner Wright Farm Res. # 42 Address

Location of property

CONSTRUCTION DETAILS

Casing diameter Length of casing

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion

BAILING OR PUMPING TEST
(Specify one by circling)

Test Rate G.P.M. Duration of test hrs.

Drawdown ft. Date

Static level-depth to water ft.

Quality (clear, cloudy, taste, odor)

Pump installed by

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
Shale (Bedrock)	0 Feet	Ft.
	185	193
541.2		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.

N.

W. E.

S.

Drilling Firm Moodys + Wayton Date 9-1-71

Address Vinculia O. Signed

*If additional space is needed to complete well log, use next consecutive numbered form.

We installed fifty (50) feet of screen. Some of the samples were slightly dirty, but generally speaking the material was coarse grained and of good quality.

The well was surged with our 28L rig by the straight surge method and combination air and surge method for a total of seventy-three (73) hours.

A short pumping test was conducted after the straight surging was completed. Another pumping test will be conducted after surging with the combination air and surge method. This information will be furnished prior to completion of this project and after the permanent pump is installed.

If you have any questions, or need more information, please contact us at your convenience.

Very truly yours

MOODY'S of Dayton, Inc.

Ed Wagner

EDWARD B. WAGNER
President

EBW/dw
Encls

Size	WT.	%	WT.	%
.187	206	30.5		
.132	68	40.6		
.094	65	50.2		
.079	29	54.5		
.066	30	59.0		
.047	48	66.1		
.033	44	72.6		
.023	51	80.1		
.017	57	88.6		
.012	34	93.6		
.008	20	96.6		
.006	12	98.4		
Pan	11	100.0		
Total	675			

Name: E. WHEELER

Job: FRIGIDAIRE # 42

Notes:

Size	WT.	%	WT.	%
.187				
.132				
.094				
.079				
.066				
.047				
.033				
.023				
.017				
.012				
.008				
.006				
Pan				
Total				

Name:

Job:

Notes:

Size	WT.	%	WT.	%
.187	177	25.0	173	23.6
.132	68	34.5	113	39.0
.094	67	44.0	117	55.0
.079	33	48.7	49	61.7
.066	34	53.4	48	68.2
.047	56	61.3	73	78.2
.033	41	67.1	53	85.4
.023	41	72.9	40	90.8
.017	60	81.4	23	94.0
.012	64	90.4	18	96.4
.008	38	95.8	10	97.8
.006	13	97.6	6	98.6
Pan	17	100.0	10	100.0
Total	709		733	

Name: E. Wheeler Driller

Job: FRIGIDAIRE # 4v

Notes:

Size	WT.	%	WT.	%
.187	276	37.4	325	46.4
.132	108	52.1	97	59.6
.094	95	65.0	79	70.8
.079	40	70.4	36	76.0
.066	38	75.6	33	80.7
.047	61	83.8	47	87.4
.033	43	89.7	30	91.7
.023	29	93.6	20	94.6
.017	19	96.2	13	96.4
.012	10	97.5	8	97.6
.008	6	98.4	5	98.3
.006	4	98.9	3	98.7
Pan	8	100.0	9	100.0
Total	737		700	

Name: E. Wheeler (DRILLER)

Job: FRIGIDAIRE # 4v

Notes:

MOODY'S of Dayton, Inc.

ADDRESS REPLY TO:
P.O. BOX 155
VANDALIA, OHIO 45377
AC 513-898-3969

January 27, 1972

Frigidaire Division
General Motors Corporation
Dayton, Ohio 45401
ATTN: Ed Ode

Subject: Well # 42
P.O.# FED-05983-S

COPY

Gentlemen:

Following up our letter of February 4, 1971 and with the attached information we are bringing this job file up to date.

Enclosed are two (2) copies of our pump and well data charts depicting pertinant information concerning the well and pump dimensions.

A short pumping test was conducted on the well in January of 1971. Results of this test were as follows:

Time	10"Pipe x8" Orifice	Capacity GPM	Pumping Level	Draw Down
10:00 AM	0	0	69' (static)	0
10:20	2"	419 GPM	75'	6'
10:55	5"	692 GPM	76'	7'
11:00	12"	1027 GPM	77'	8'
11:20	13"	1069 GPM	77'	8'
11:22	23"	1421 GPM	84'	15'
11:30	23"	1421 GPM	84'	15'
12:00	23"	1421 GPM	84'	15'
12:05	40½"	1875 GPM	90'	21'
12:35	50"	2095 GPM	93'-6"	24'-6"
12:45	50"	2095 GPM	93'-6"	24'-6"
1:00	54"	2168 GPM	95'	26'
1:30	56"	2219 GPM	96'	27'
2:00	56"	2219 GPM	96'	27'
		Pump Shut-Off		

After the pump was installed another pumping test was conducted by Jesse Helm on 6/28/71. Results of this test were as follows:

MOODY'S INC

Specialists in Geophysical Surveys
GAMMA RAY AND ELECTRIC LOGS
RESISTIVITY SURVEYS
AERIAL PHOTOGRAPHY STUDIES

PUMP SALES AND REPAIRS
WELL DRILLING
WELL CLEANING

Capacity	Disc Press	Draw Down	Amps
1421 GPM	50 psi	13'	125
1258 GPM	75 psi	12'	125
1186 GPM	90 psi	10'	125

Shut-Off pressure was 150 psi and the motor drew 70 amps.

After checking the attached information, if you have any questions, or need more information, please advise.

Very truly yours,

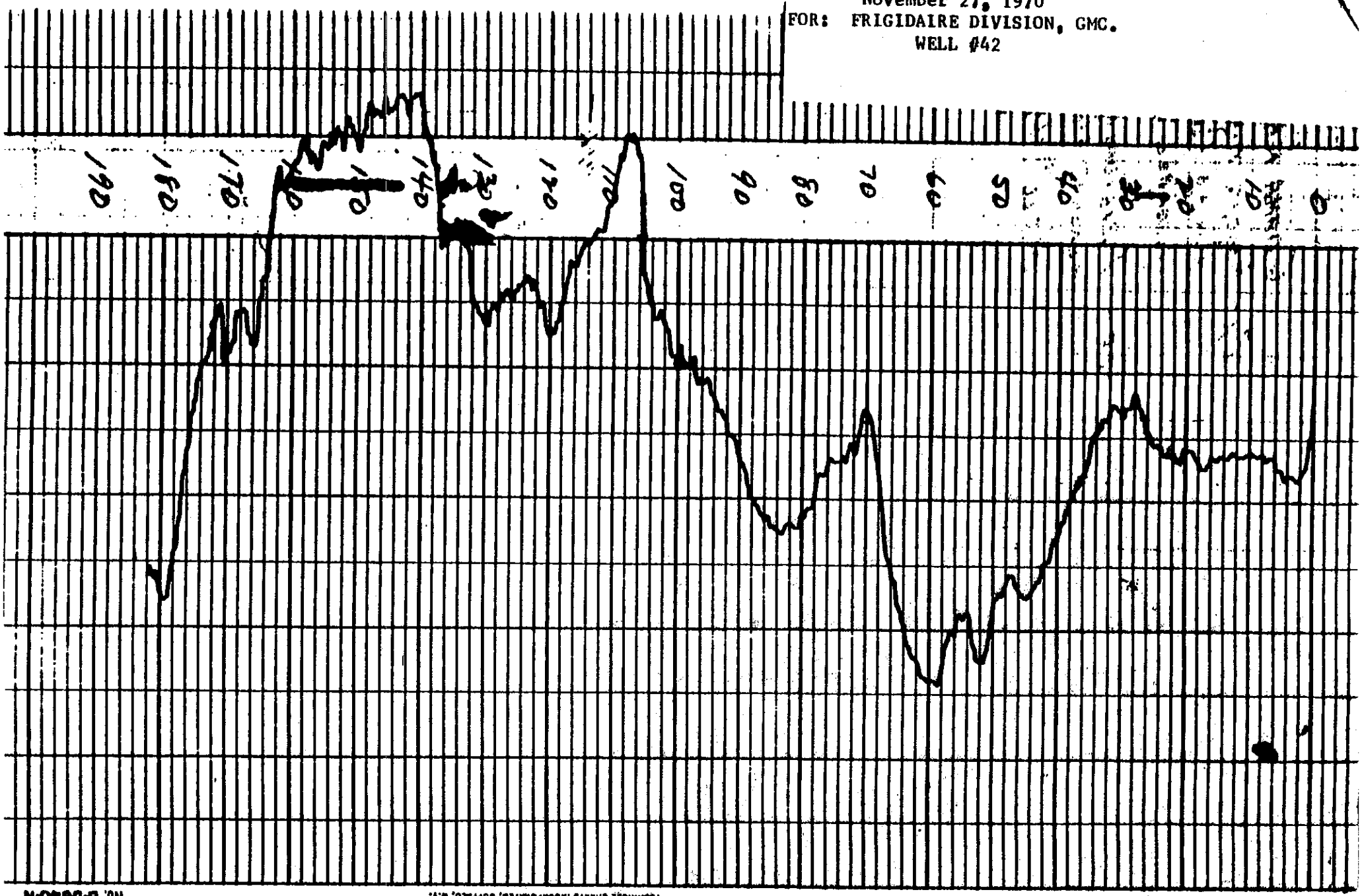
MOODY'S OF DAYTON, INC.

Ed Wagner

Edward B. Wagner
President

EBW/jld

GAMMA RAY LOG
BY: MOODY'S OF DAYTON, - Roger Rogers
November 27, 1970
FOR: FRIGIDAIRE DIVISION, GMC.
WELL #42

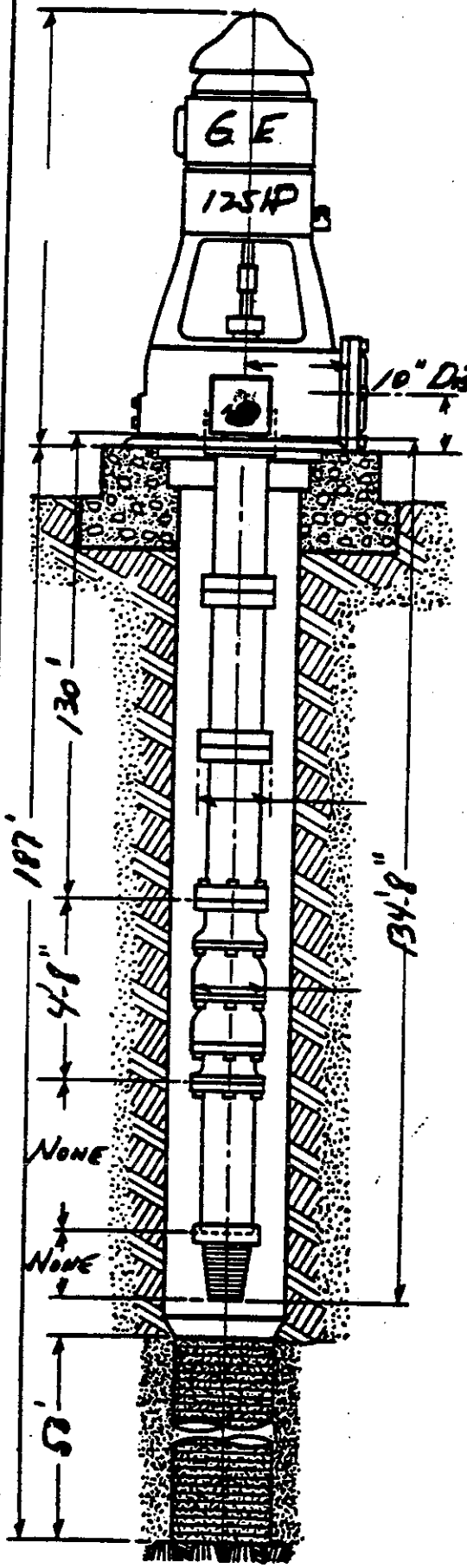


NO. B-2640-N
TECHNICAL CHARTS INCORPORATED, BUFFALO, N.Y.
PRINTED IN U.S.A.

VANDALIA, OHIO

MOODY'S, INC.

MEADVILLE, PA.



TURBINE PUMP INSTALLATION FOR:

FRIGIDAIRE DIV. - G.M.C.

WELL DESIGNATION NO. 42

701-C-1711 SERIAL NUMBER
1200 GALLONS PER MINUTE
210 TOTAL HEAD IN FEET
12-6H2M2 - 5 STAGES
1760 MOTOR SPEED
130 FEET OF SETTING
10" SIZE COLUMN FLANGED
NONE OIL TUBE
1 11/16" LINE SHAFT
NONE SUCTION PIPE
125 H.P. 460 VOLT 3 CURRENT 60
WATER LUBRICATION
136 FEET OF AIRLINE 1/4" GALVANIZED
6/28/71 DATE INSTALLED

20" O.D.
187' TD. OF WELL
187' FEET DEEP FROM FOUNDATION
185' FEET DEEP FROM GRADE
50' STRAINER LENGTH — SLOT See Letter 2/4/71
69' STATIC LEVEL — DATE 6/28/71
" " — "
" " — "
" " — "
2/4/71 DATE DRILLED

PUMP REPAIRED — DATE
" " — "
" " — "

WELL ACID TREATED — DATE
" " " — "

COMMENTS —

MOODY'S, INC.

Phones

VANDALIA, OHIO: 898-4514

MEADVILLE, PA.: 6-1128

FORM TPI-762

LITHO IN U.S.A.

Production Well 43

WELL LOG AND DRILLING REPORT

ORIGINAL

NO CARBON PAPER NECESSARY— SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
65 S. Front St., Rm. 815 Phone (614) 469-2646
Columbus, Ohio 43215

No. 420737

County Montgomery Township ~~City~~ Moraine Section of Township 16 - 7

Owner Frigidaire Div General Motors Address Dayton, Ohio 45401

Location of property North of Bldg. #14 (A)

CONSTRUCTION DETAILS

Casing diameter 20" Length of casing 205'
Type of screen P.B. Length of screen 50'
Type of pump B.J. 126 Bronze 5 stg.
Capacity of pump 1200
Depth of pump setting 129' 9"
Date of completion May 8 1973

BAILING OR PUMPING TEST
(Specify one by circling)

Test Rate 1200 G.P.M. Duration of test 3 hrs.
Drawdown 8 ft. Date [redacted] 5-8-73
Static level-depth to water 84' ft.
Quality (clear, cloudy, taste, odor) clear
Pump installed by

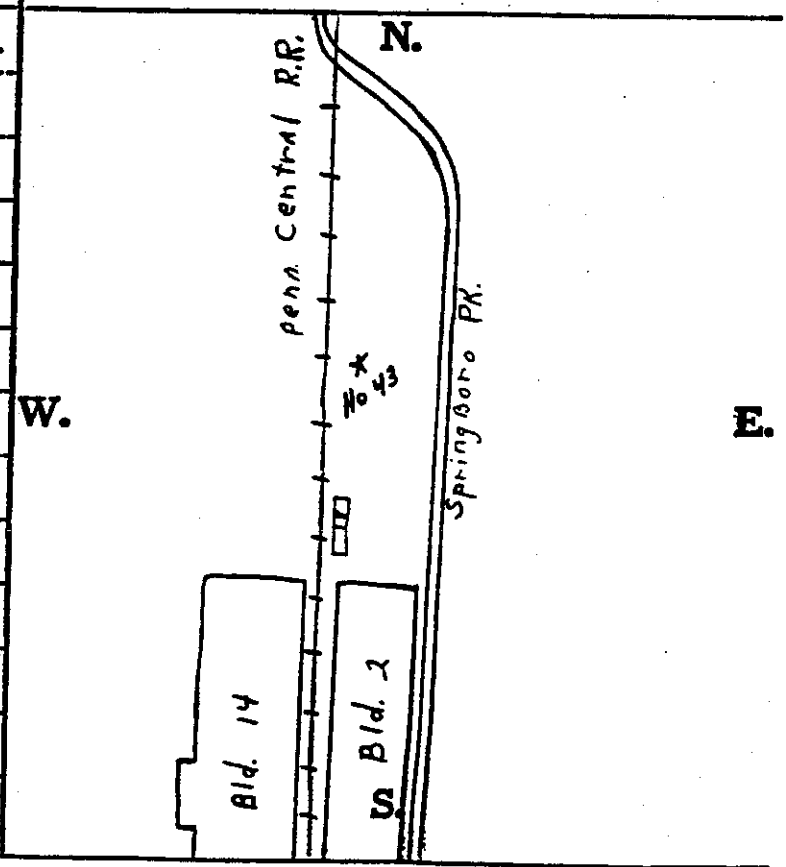
Well #43

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
Soil	0 Feet	2 Ft.
Gravel + Boulders	2'	32'
Clay + Gravel	32'	57'
Boulders - large gravel	57'	67'
Blue clay + gravel	67'	75'
Large gravel + coarse sand	75'	125'
P. Gravel, fine coarse sand	125'	135'
P. Gravel + coarse sand	135'	158'
Fine Sand	158'	165'
Grey clay (Sandy)	165'	175'
Hardpan - Tough blue clay with gravel	175'	197'
Sand + Fine gravel - Flat	197'	205'
Rock + boulders at 205'		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



5412
ing Firm MOODY'S OF DAYTON, INC.
Address P. O. BOX 155
VANDALIA, OHIO 45377

Date June 18, 1973
Signed W.C. Cooper/jd

*If additional space is needed to complete well log, use next consecutive numbered form.

43

P.1.1

MOODY'S of Dayton, Inc.

ADDRESS REPLY TO:
P.O. BOX 155
VANDALIA, OHIO 45377
AC 513-898-3969

February 8, 1972

#43

Frigidaire Division G.M.C.
Dayton, Ohio 45401

ATTN: Mr. Ed Oda

Subject: Well # 43, P.O. # FKD-11872-D
Emergency Field Order # 1
Request # 407008

COPY

Gentlemen:

Regarding your Emergency Field Order # 1, we are quoting as follows for the described emergency work.

Furnish necessary men and equipment to set up 28 L drilling rig, drill 119' deep, pull 20" casing from the hole and abandon well in accordance with State Board of Health requirements and tear down drilling equipment.

119 ft. at $30.00 per ft. $ 3,570.00

The log on this well was as follows:

0 - 3'	Top soil
3 - 41'	Coarse sand & medium gravel (dry)
41 - 42'	Clay
42 - 58'	Medium to large sand & gravel (dry)
58 - 95'	Till
95 - 110'	Coarse sand & coarse gravel
110 - 112'	Blue Clay
112 - 119'	Blue Shale

If you have any questions or need more information please advise.

Very truly yours,

MOODY'S OF DAYTON, INC.

Ed Wagner

Edward B. Wagner
President

EBW/jd

Production Well 45

WELL LOG AND DRILLING REPORT

ORIGINAL

NO CARBON PAPER NECESSARY– ELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Geological Survey
Fountain Square
Columbus, Ohio 43224 Phone (614) 466-5344

472232

COUNTY MONTGOMERY TOWNSHIP ~~HARRISON~~ (Moraine) SECTION OF TOWNSHIP OR LOT NUMBER

OWNER DELCO AIR CONDITIONING DIV. GMC ADDRESS MORAINE CITY, OHIO

LOCATION OF PROPERTY (45)

CONSTRUCTION DETAILS

Casing diameter 20" Length of casing 139 ft.
Type of screen Stainless Steel Length of screen 50 ft.
Type of pump BJ 12MQL submersible turbine
Capacity of pump 1200 GPM
Depth of pump setting 124 ft.
Date of completion ~~XXXXXXX~~ 7-19-76

BAILING OR PUMPING TEST
(specify one by circling)

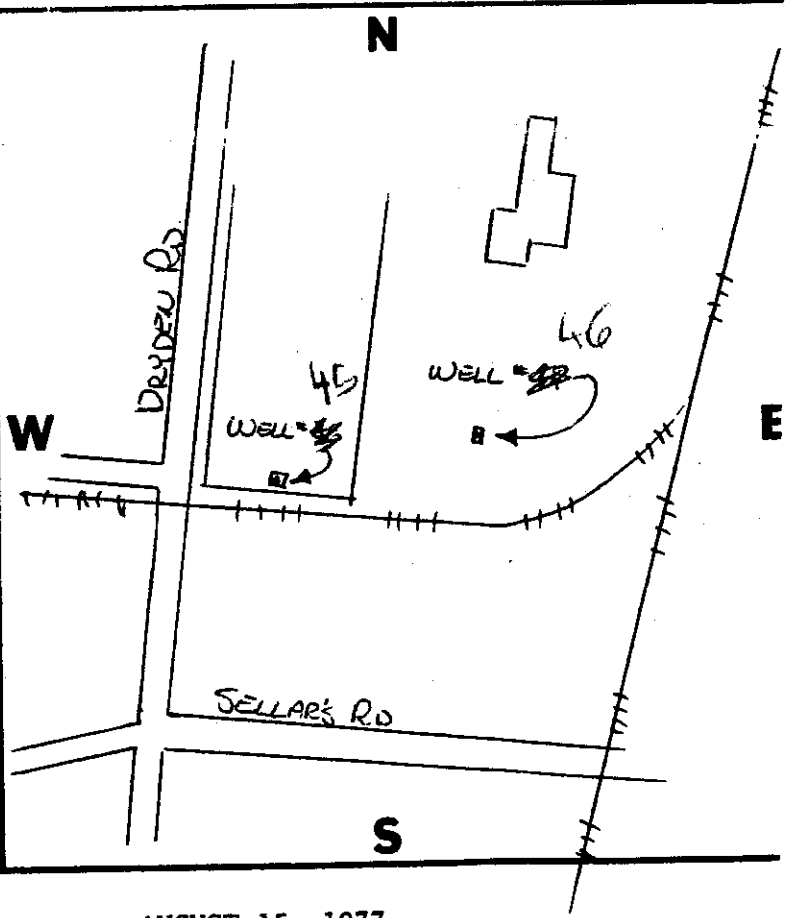
Test rate 1700 gpm Duration of test 8 hrs
Drawdown 13.5 ft Date 9-29-76
Static level (depth to water) 72 ft. ft
Quality (clear, cloudy, taste, odor) Clear
Pump installed by Moody's of Dayton, Inc.

WELL LOG* WELL # ~~46~~ 45

Formations: sandstone, shale, limestone, gravel, clay	From	To
Bl top & fill	0 ft	3 ft
Dump fill	3	12
Clay	12	21
Dry gravel	21	58
Hard pan	58	74
Brown Gravel	74	90
Grey Gravel, big	90	189
5412		

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



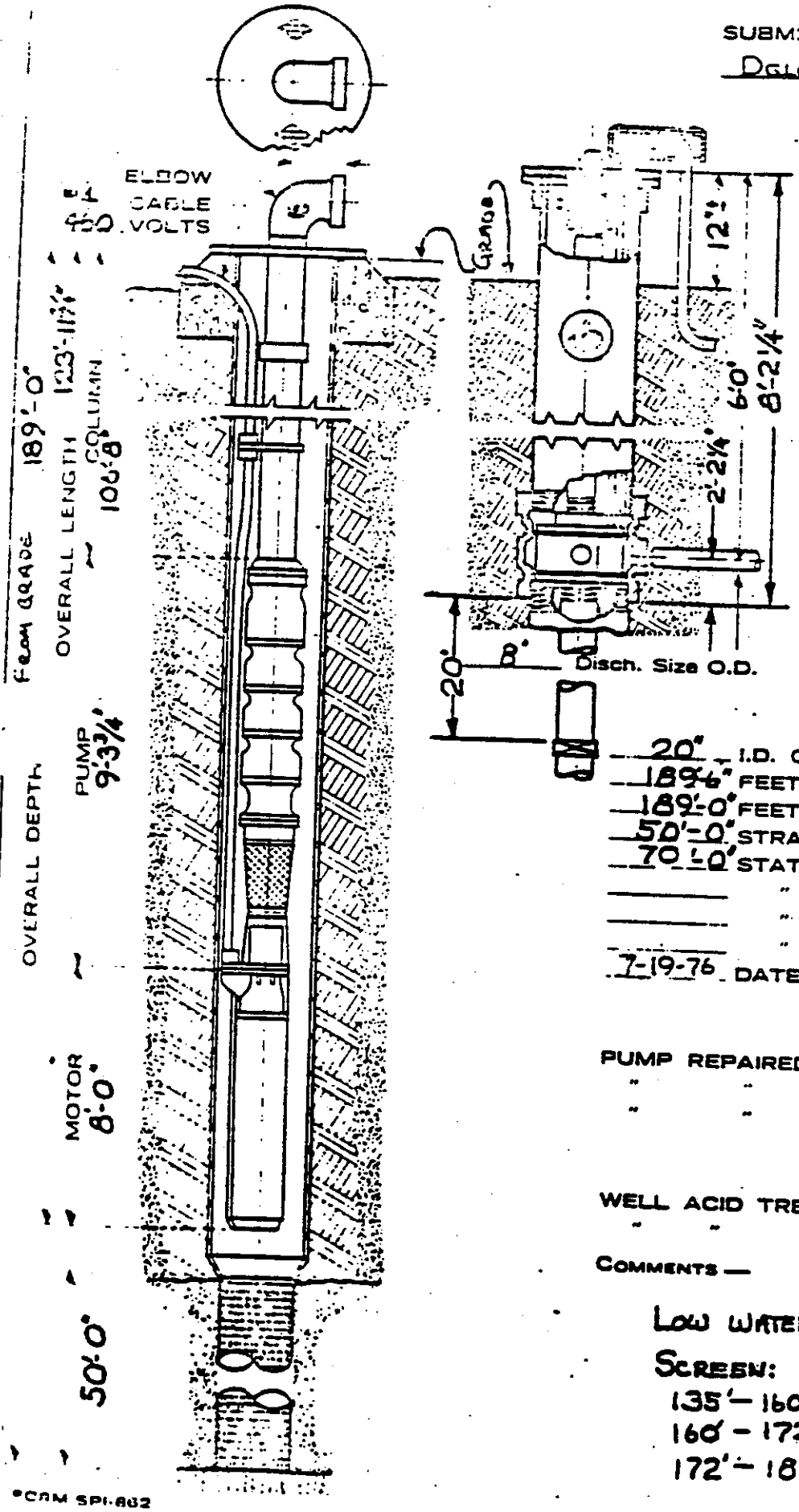
DRILLING FIRM MOODY'S OF DAYTON, INC. DATE AUGUST 15, 1977
ADDRESS 4359 INFIRMARY RD., MIAMISBURG, OHIO 45342 SIGNED Charlie Buck
P.O. BOX 123

*If additional space is needed to complete well log, use next consecutive numbered form.

VANDALIA, OHIO

SUBMERSIBLE PUMP INSTALLATION FOR

Delco Air Conditioning Div.



WELL DESIGNATION NO. 26 45 (45)

Byron Jackson

76-C-1610 SERIAL NUMBER

1200 GALLONS PER MINUTE

310 TOTAL HEAD IN FEET

12MQL 6 STAGES

1770 MOTOR SPEED

123'-11¾" FEET OF SETTING

8" SIZE COLUMN

WELL SEAL

8" COLUMN CHECK VALVE

SURFACE PLATE

20" PITLESS ADAPTOR

125 H.P. 460 VOLTAGE

135 Amps CURRENT

OIL MOTOR LUBRICATION

FEET OF AIRLINE

5-18-77 DATE INSTALLED

20" I.D. OF WELL

189'-6" FEET DEEP FROM FOUNDATION

189'-0" FEET DEEP FROM GRADE

50'-0" STRAINER LENGTH — SLOT SEE BELOW

70'-0" STATIC LEVEL — DATE 7-29-76

" " — "

" " — "

" " — "

7-19-76 DATE DRILLED

PUMP REPAIRED — DATE

" " — "

" " — "

WELL ACID TREATED — DATE

" " — "

COMMENTS —

Low water probe at 119'-7"

Screen:

135'–160': 25' of 125 slot

160'–172': 12' " 60 "

172'–189': 17' " 100 "

*CRM SPI-862

LITHO IN U.S.A.

Date September 11, 19 7

PRODUCTION TEST OF WELL

Job No.

Owner DELCO AIR CONDITIONING DIV. City MORAINE State OHIO

Well No. 3545 Location SOUTH END OF PARKING LOT, DRYDEN ROAD

Measured from ground level: Total depth ____ Inside Dia. 20" Standing water level 70'0"

Type well: Gravel Wall __ Tubular X Rock __ New X Old __ Cleaned __ Gravel Wall Dia. ____

Screen: Length 50' Dia. 20" Slot size Var. Type S.S. Depth to top ____

Orifice size 8" by 10" Water discharged ____ feet from well into ____

DATE	TIME	INCHES ON ORIFICE	GALLONS PER MINUTE	AIR LINE READING	GROUND TO WATER LEVEL	DISCHARGE PRESSURE	REMARKS
9-10-76	10:00	5	739		74'4"		Measurement of
	10:30	5	739		74'4"		depth made wit
	10:45	7	876		76'5"		electric tape.
	11:00	7	876		76'5"		
	11:15	9	1016		77'3"		
	11:30	9	1016		77'3"		
	12:00	9	1016		77'5"		
	12:30	22	1471		79'5"		
	1:00	22	1471		79'5"		
	1:30	22	1471		79'6"		
	1:45	31.5	1739		85'2"		
	2:00	31.5	1739		85'6"		
	3:00	31.5	1739		85'6"		
	4:00	31.5	1739		85'6"		
	5:00	31.5	1739		85'6"		
	6:00	31.5	1739		85'6"		
	---- RECOVERY ----						
	6:00				70'6"		
	6:05				70'4"		
	6:10				70'3"		
	6:15				70'3"		

Production Well 46

WELL LOG AND DRILLING REPORT

ORIGINAL

NO CARBON PAPER NECESSARY– SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Geological Survey
Fountain Square
Columbus, Ohio 43224 Phone (614) 466-5344

472233

COUNTY MONTGOMERY TOWNSHIP ~~HARRISON~~ SECTION OF TOWNSHIP OR LOT NUMBER

OWNER DELCO AIR CONDITIONING DIV. GMC ADDRESS MORAINE CITY, OHIO

LOCATION OF PROPERTY (46)

CONSTRUCTION DETAILS

Casing diameter 20" Length of casing 145'8"
Type of screen Stainless Steel Length of screen 48 ft.
Type of pump BJ 12 MQL submersible turbine
Capacity of pump 1200 GPM
Depth of pump setting 105 ft.
Date of completion 5-18-77

BAILING OR PUMPING TEST
(specify one by circling)

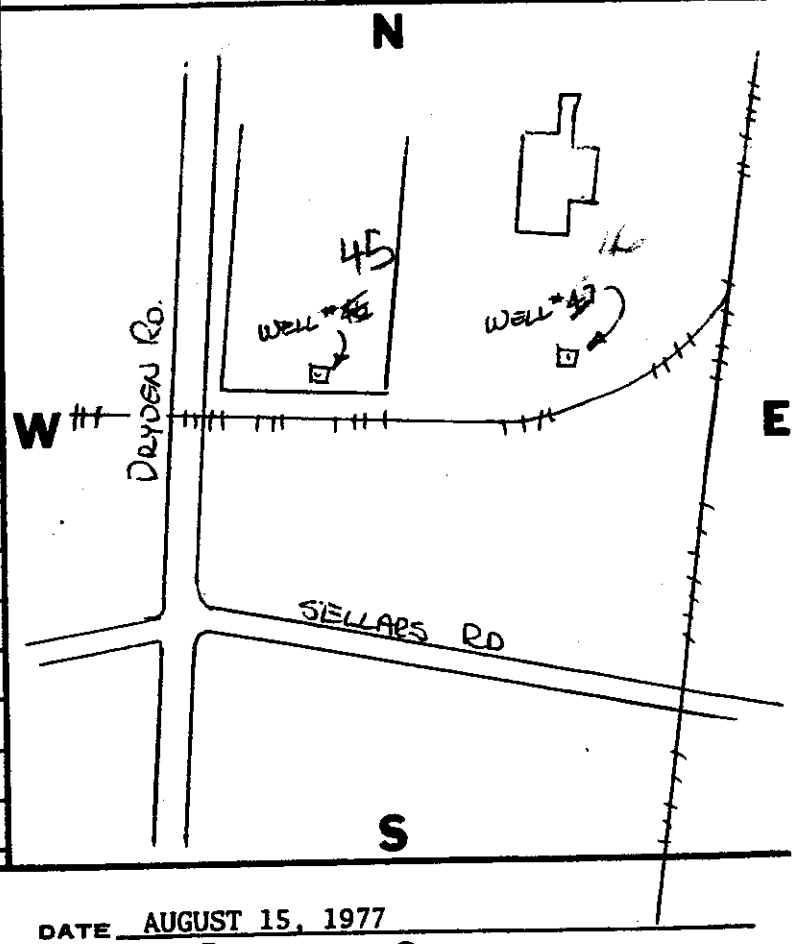
Test rate 1400 gpm Duration of test 8 hrs
Drawdown 19'11" ft Date 12-15-76
Static level (depth to water) 75 ft. ft
Quality (clear, cloudy, taste, odor) Clear
Pump installed by Moody's of Dayton, Inc.

WELL LOG* WELL # 47 46

Formations: sandstone, shale, limestone, gravel, clay	From	To
Fill wood ash, etc.	0 ft	17 ft
Clay and gravel	17	32
Dry Gravel	32	55
Hard Pan	55	75
Brown Gravel	75	115
Boulders	115	130
Grey Gravel	130	135
Clay and Gravel	135	142
Gravel, water bearing	142	195
5412		

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



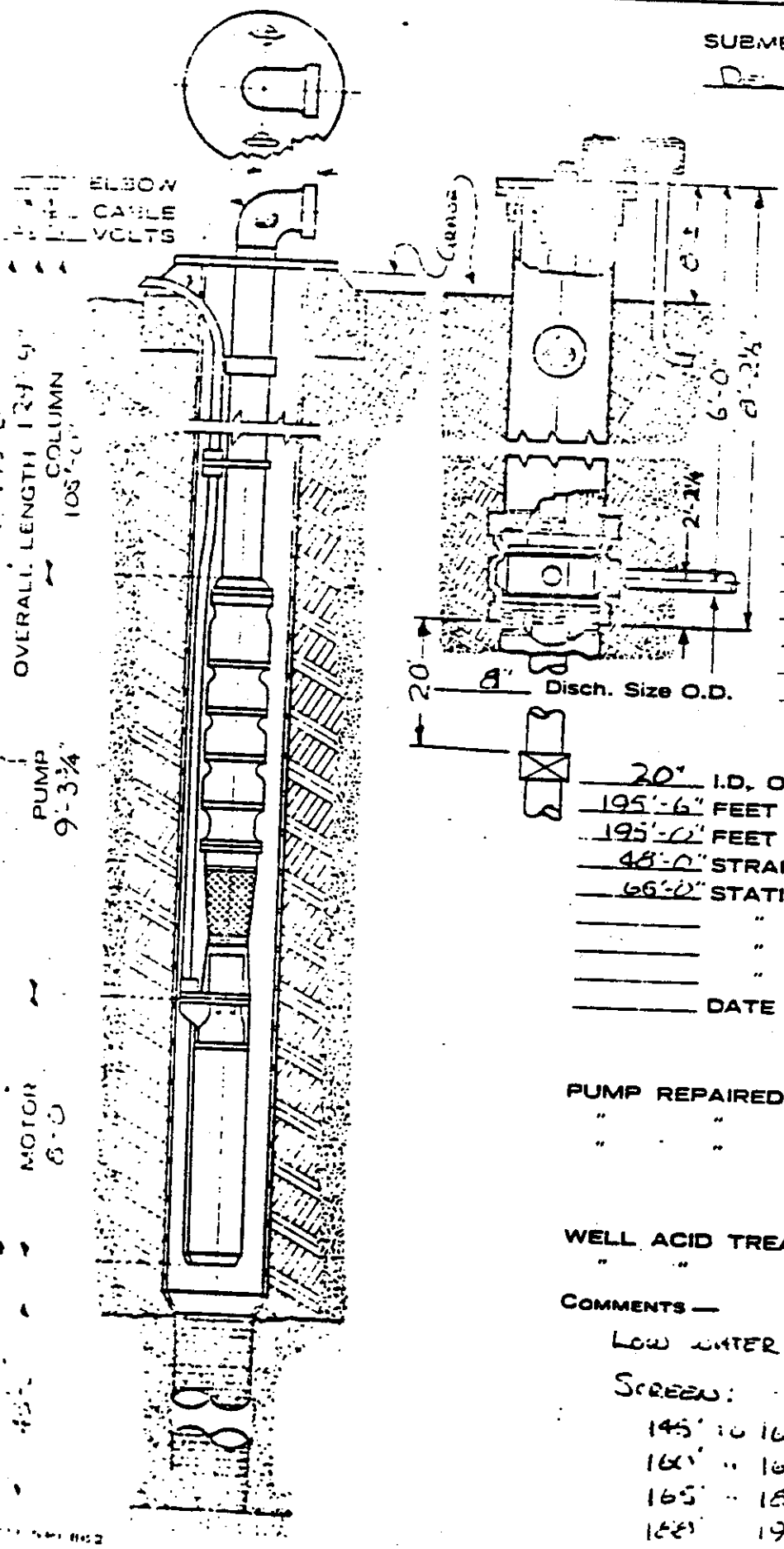
DRILLING FIRM MOODY'S OF DAYTON, INC. DATE AUGUST 15, 1977

ADDRESS 4359 INFIRMARY RD., MIAMISBURG, OH. P.O. BOX 123 - 45342 SIGNED Charlie Buck

*If additional space is needed to complete well log, use next consecutive numbered form.

VANDALIA, OHIO

SUBMERSIBLE PUMP INSTALLATION FOR:



WELL DESIGNATION
NO. 46

Byron Jackson
[illegible] SERIAL NUMBER
1200 GALLONS PER MINUTE
310 TOTAL HEAD IN FEET
12KSTL 6 STAGES
1770 MOTOR SPEED
129'-6" FEET OF SETTING
8" SIZE COLUMN
WELL SEAL
8" COLUMN CHECK VALVE
SURFACE PLATE
20" PITLESS ADAPTOR
125 H.P. 460 VOLTAGE
135 A CURRENT
OIL MOTOR LUBRICATION
FEET OF AIRLINE
6-15-77 DATE INSTALLED

20" I.D. OF WELL
195'-6" FEET DEEP FROM FOUNDATION
195'-0" FEET DEEP FROM GRADE
48'-0" STRAINER LENGTH — SLOT SEE BELOW
66'-0" STATIC LEVEL — DATE 6-15-77.
" " — "
" " — "
" " — "
DATE DRILLED

PUMP REPAIRED — DATE
" " — "
" " — "

WELL ACID TREATED — DATE
" " — "

COMMENTS —

Low water probe at 106'-8"

Screen:

145' to 160': 15 of 125 slot
160' " 165': 5' " 80 "
165' " 188': 23' " 30 "
188' 193': 5' " 80 "

LITHO IN U.S.A.

Date December 15, 1976

PRODUCTION TEST OF WELL

Job No. _____

Owner DELCO AIR CONDITIONING DIV. City MORAINE State OHIO

Well No. 47-46 Location SOUTH OF POWERHOUSE

Measured from ground level: Total depth ___ Inside Dia. 20" Standing water level 75 ft.

Type well: Gravel Wall __ Tubulary X Rock __ New X Old __ Cleaned __ Gravel Wall Dia. _____

Screen: Length 48" Dia. 20" Slot size Var. Type S.S. Depth to top _____

Orifice size 8" by 10" Water discharged _____ feet from well into _____

DATE	TIME	INCHES ON ORIFICE	GALLONS PER MINUTE	AIR LINE READING	GROUND TO WATER LEVEL	DISCHARGE PRESSURE	REMARKS
12-15-76	10:00 AM	5	739		75'		Water level
	10:05	5	739		85'		measured with
	10:10	5	739		85'		electric tape
	10:15	5	739		85'		
	10:20	5	739		85'		
	10:25	5	739		85'		
	10:30	5	739		85'		
	10:35	5	739		85'		
	10:40	5	739		85'		
	10:45	5	739		85'		
	10:50	5	739		85'		
	10:55	5	739		85'		
	11:00	7	876		89'		
	11:05	7	876		89'		
	11:10	7	876		89'		
	11:15	7	876		89'		
	11:20	7	876		89'		
	11:25	7	876		89'		
	11:30	7	876		89'		
	11:35	7	876		89'		
	11:40	7	876		89'		
	11:45	7	876		89'		
	11:50	7	876		89'		
	11:55	7	876		89'		
	12:00	20	1404		94'6"		
	12:05	20	1404		94'6"		
	12:10	20	1404		94'6"		

Date: December 17, 19 7

PRODUCTION TEST OF WELL

Job No. _____

Owner TELCO AIR CONDITIONING DIV. City MORAINE State OHIO

Well No. 4746 Location _____

Measured from ground level: Total depth ____ Inside Dia. ____ Standing water level _____

Type well: Gravel Wall __ Tubular __ Rock __ New __ Old __ Cleaned __ Gravel Wall Dia. _____

Screen: Length ____ Dia. ____ Slot size ____ Type _____ Depth to top _____

Orifice size ____ by ____ Water discharged _____ feet from well into _____

DATE	TIME	INCHES ON ORIFICE	GALLONS PER MINUTE	AIR LINE READING	GROUND TO WATER LEVEL	DISCHARGE PRESSURE	REMARKS
12-15-76	12:15	20"	1404		94'9"		
	12:20	20"	1404		94'9"		
	12:30	20"	1404		94'9"		
	12:35	20"	1404		94'9"		
	12:40	20"	1404		94'9"		
	12:45	20"	1404		94'9"		
	12:50	20"	1404		94'9"		
	12:55	20"	1404		94'9"		
	1:00	20"	1404		94'9"		
	1:15	20"	1404		94'9"		
	1:30	20"	1404		94'9"		
	2:00	20"	1404		94'9"		
	2:30	20"	1404		94'9"		
	3:00	20"	1404		94'9"		
	3:30	20"	1404		94'9"		
	4:00	20"	1404		94'9"		
	4:30	20"	1404		94'9"		
	5:00	20"	1404		94'9"		
	5:30	20"	1404		94'9"		
	6:00	20"	1404		94'9"		

Observation Well MT-51

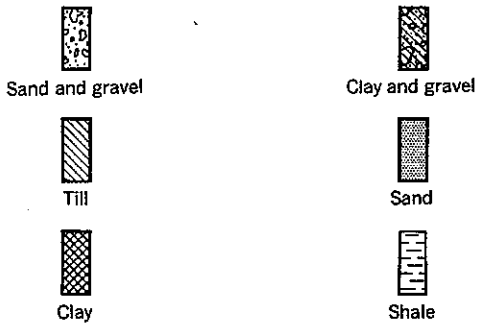
PRODUCTION WELL	-----
USGS LOG NUMBER	563
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	724.86
DATE DRILLED	-----
DEPTH (ft)	115
WATER LEVEL DEPTH	-----
DATE	-----
YIELD RATE (gpm)	-----
DRAWDOWN (ft)	-----
TYPE OF PUMP	None
DIAMETER OF WELL (in)	8
USE	Observation
COMMENT	Observation well

INFO FROM FRIGIDAIRE STRIP LOGS:

SCREEN INTERVAL (ft BGS)	-----
DATE OF COMPLETION	-----

NOTE : NO LOG AVAILABLE

EXPLANATION



SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

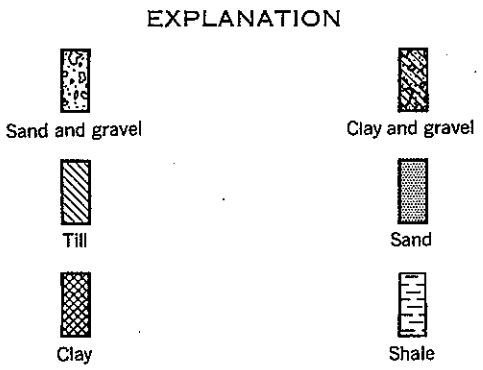
OBSERVATION WELL MT 51
GENERAL MOTORS CORPORATION
Moraine, Ohio

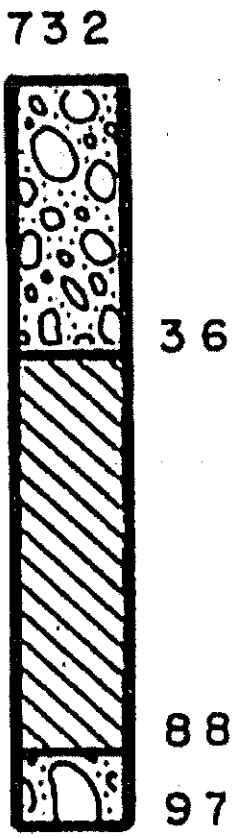
CRA

Return Well 562

PRODUCTION WELL	-----
USGS LOG NUMBER	562
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	732.21
DATE DRILLED	12/55
DEPTH (ft)	97
WATER LEVEL DEPTH	45.75
DATE	12/54
YIELD RATE (gpm)	200
DRAWDOWN (ft)	-----
TYPE OF PUMP	None
DIAMETER OF WELL (in)	20
USE	Return
COMMENT	-----

INFO FROM FRIGIDAIRE STRIP LOGS:
SCREEN INTERVAL (ft BGS) -----
DATE OF COMPLETION -----





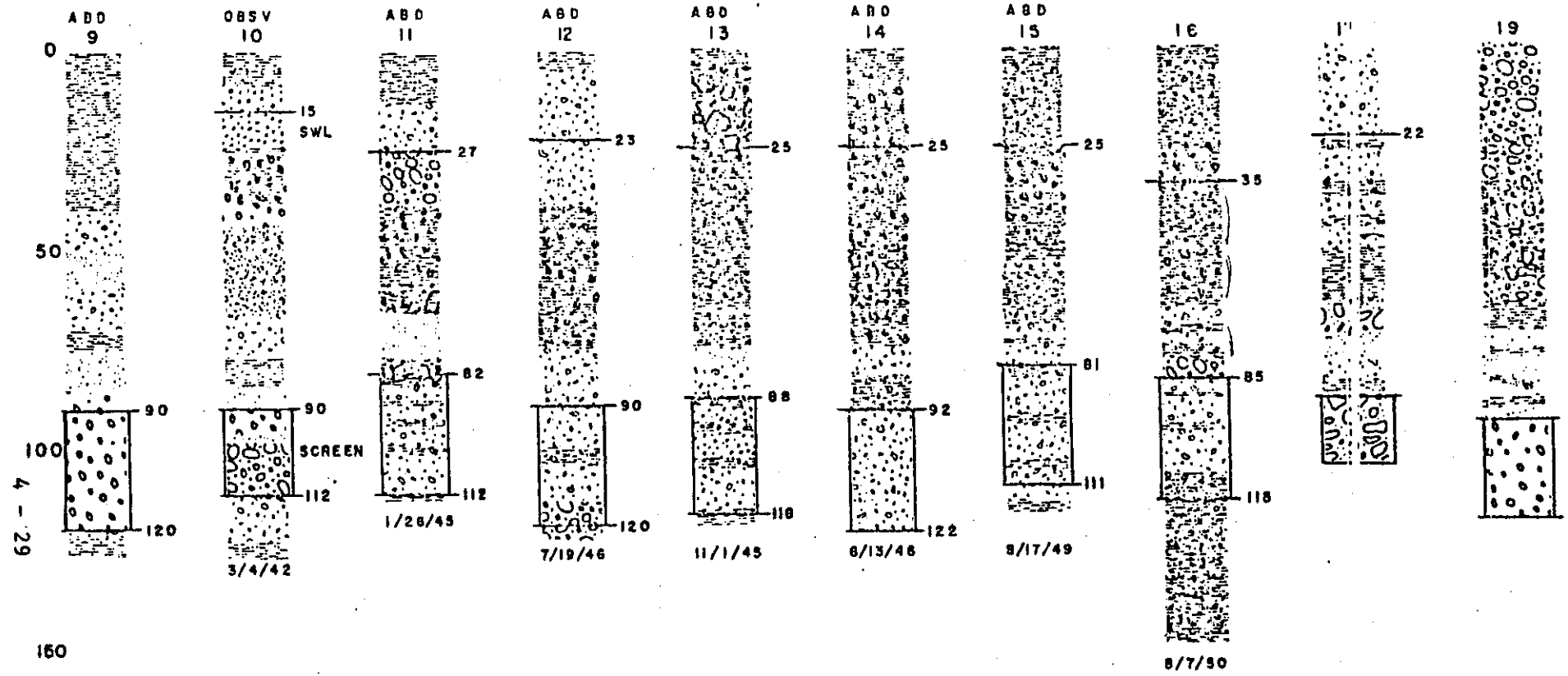
SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

RETURN WELL 562
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

Frigidaire Strip Logs: Production Wells 9-17, 19-30, 33-41

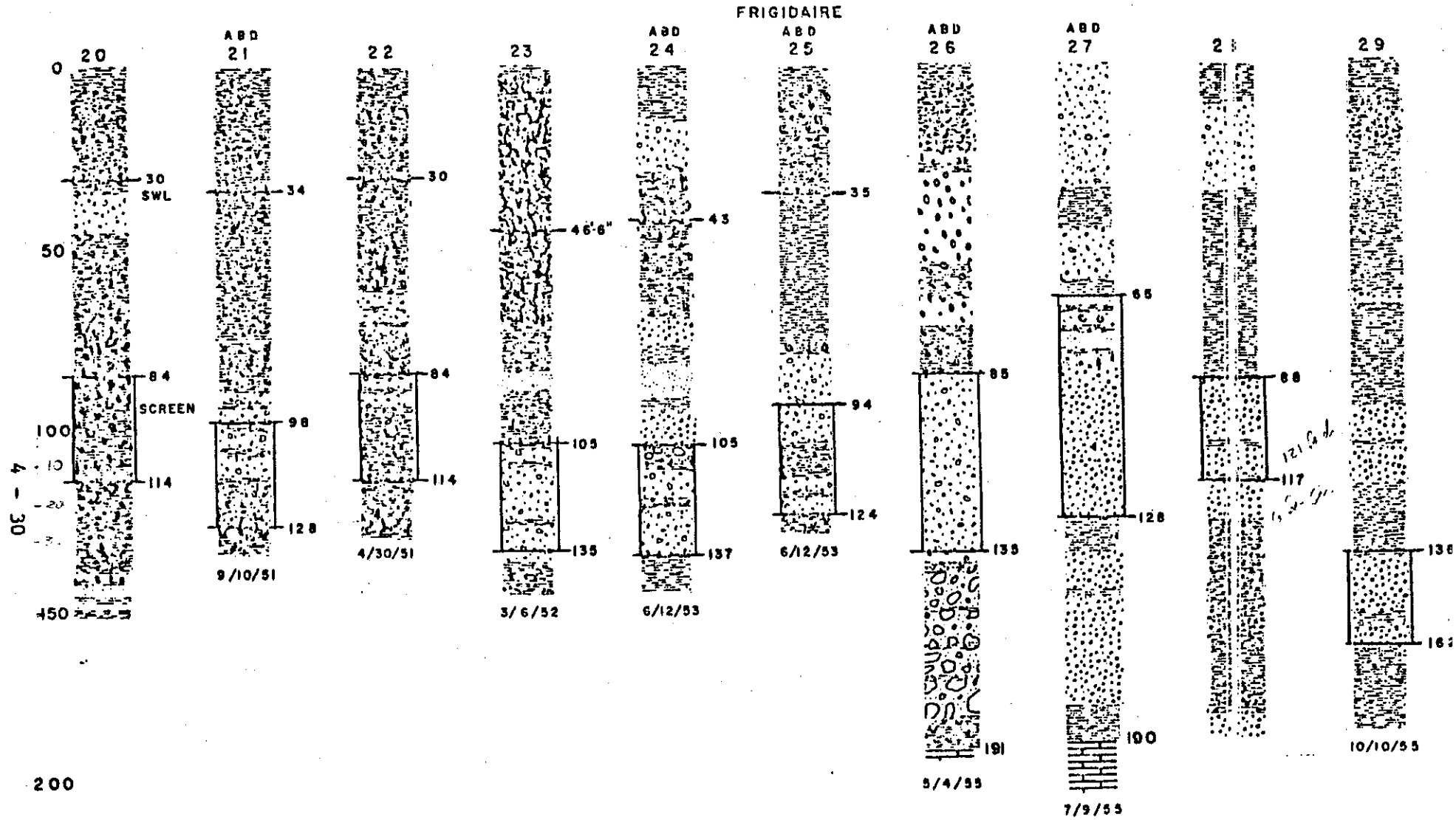
FRIGIDAIRE



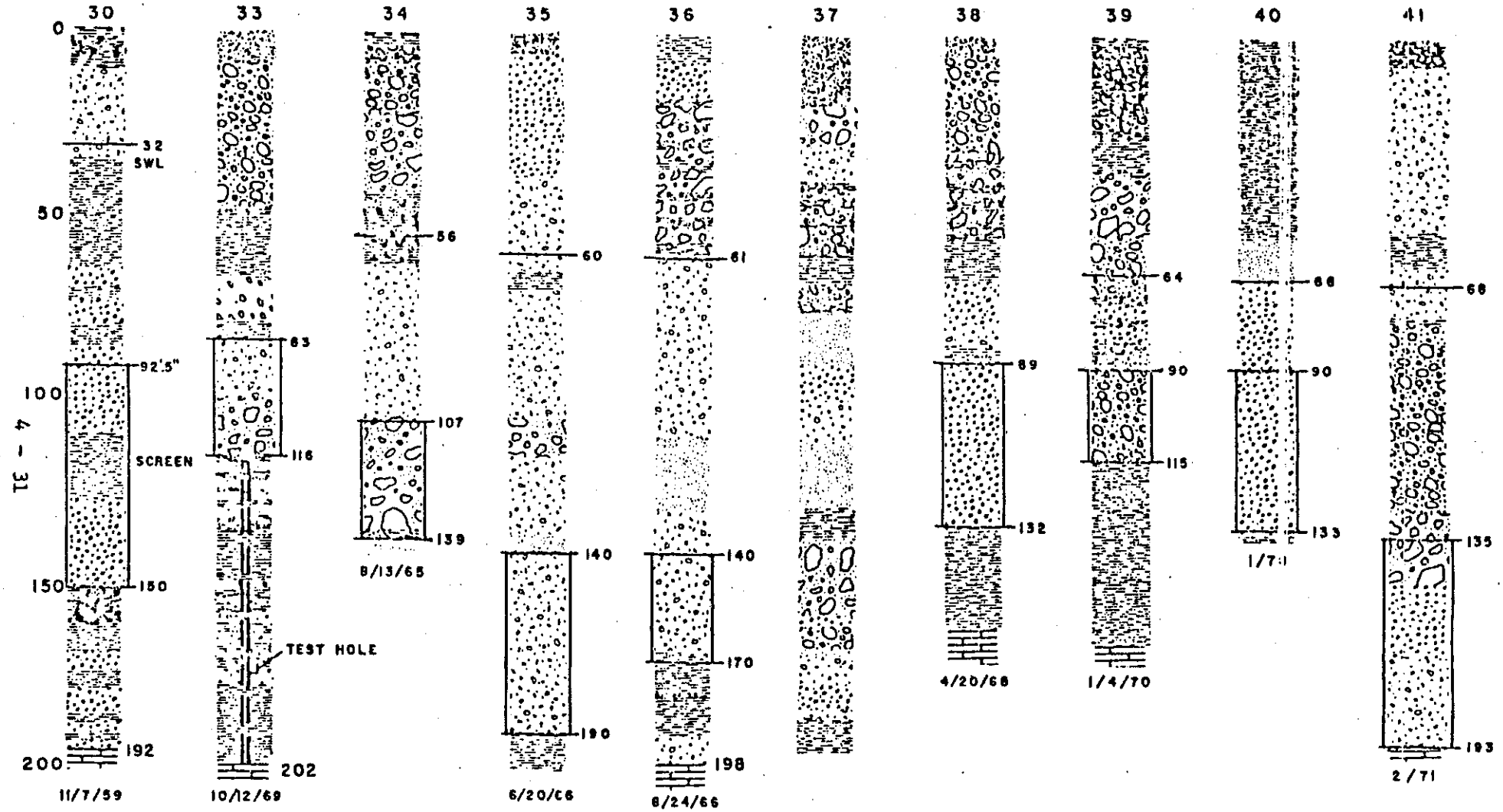
4 - 29

NOTE:

1. TEST WELL 119' TO ROCK-WEST OF BLDG No. 9
2. OBSV WELL BLDG 13- N.G.


FRIGIDAIRE
ABD
20
21
22
23
24
25
26
27
28
29
0
50
100
150
200
250
30
SWL
84
SCREEN
114
34
98
128
9/10/51
30
84
114
4/30/51
46'6"
105
135
3/6/52
43
105
137
6/12/53
35
94
124
6/12/53
85
135
191
5/4/55
65
128
100
7/9/55
68
117
121 G.L.
10/10/55
4 - 30

FRIGIDAIRE



4 - 31

250

NO BORING LOGS AVAILABLE
ON No. 31 & 32 (OPERABLE)

BY ED WAGNER - MOODY'S OF DAYTON, INC.

MAY 2, 1983

	WELL #32	WELL #37	WELL #31	WELL #35	WELL
DRILLED BY	Don Roe	Diehl Pump	Don Roe	Moody's	Moody's
DATE DRILLED	10/60	10/67	10/60	6/66	11/69
ORIGINAL STATIC	44'	56' (65'- 1970)	36' (61' - 1968)	66' (80' - 1972)	62'
DEPTH	150'	186'	123'	186'	117'
SCREEN LENGTH	25'	50' - 60 slot	30'	50'	25'
SCREEN DIAMETER	20" Nominal	20" Nominal	20" Nominal	20" Nominal	20" Nominal
TYPE SCREEN	Cook	Cook	Cook	Cook	Cook
SPECIAL NOTES	Split Screen 29'-18" O.D. casing between screen sections	Worthington Pump & 150 HP motor	Deming Pump & 100 HP Motor	B.J. Pump & 125 HP Motor	Designed for 800 GPM only. B.J. pump & 125 HP motor.
HISTORY	9/66 : Pump Repairs & Well Revitalization. 7/71: Pump Repairs & well revitalization. Deming col. & BJ bowl assembly. 11/75 : Deepened & Re-drilled . 47' screen 187' deep. pump repaired. 14" O.D. pipe. 1/78 : Install 10" check valve.	9/70 : Pump Repairs - Worth. Base. B.J. Col. & shaft. Use Bowl Assy. from Well #28. 5/77 : Pump Repairs & well revitalization. 4/79 : Furnish & install U.S. Infi-drive. 7/82 : Revitalize well & new pump.	2/68 : Pump Repair & Well Revitalization. 10/70 :Pump repair & well Revitalization. Install Worth. pump from Well #37. 5/72 : Pump repairs only. 2/75 : Pump repairs & motor. 1982 : Reduce capacity of pump.	9/69 : Pump Repairs only. New BJ Bowl Assy. 8/72 : Pump Repairs & well revitalization. 2/80 : Pump repairs & well revitalization.	4/76 : Motor repair. Well cannot be deepened

PLANT #1

	WELL #46	WELL #47	FIRE WELL	WELL #2
	Moody's 6/77 65' 179' 50' 20" nominal Cook	Moody's 6/77 65' 193' 48' 20" nominal Cook	Moody's 8/74 76' 166' 50' 24" nominal Cook	Don Roe 2/51
HP	B.J. 125 HP Type H submersible. Well King Adapters.	B.J. 125 HP Type H submersible. Well King Adapters.	Peerless 2,000 GPM fire pump & engine.	WELL ABANDONED 8/1978
pairs.	No Work	No Work	No Work	
pairs.				
pairs &				
pairs.				
ve in- epaired zed. ynolds)				

Section 2

Fire Well Logs

Fire Well	1
Fire Well	1A
Fire Well	2
Fire Well	3
Fire Well	4

Fire Well 1

Reynolds Supply, Inc.

COMPLETE MUNICIPAL & INDUSTRIAL WATER SYSTEMS

FORMATION LOG OF WELL

Starting Date Nov. 7, 1980 Finished Nov. 7, 1980 Well Number Test Well #1. (Fire Well #1)

Owner General Motors Location

TOTAL DEPTH	THICKNESS EACH STRATUM	FORMATION
175ft		0-7 Clay, sand and gravel (N.C.)
7-20ft		Little clay and sand (C.)
20-40ft		Sand and gravel (C.)
40-60ft		Sand (N.C.)
60-80ft		Sand and gravel (N.C.)
80-100ft		Sand, gravel and some clay (C.)
100-120ft		Sand, gravel and some clay (C.)
120-140ft		Sand and gravel (N.C.)
140-155ft		Fine sand and gravel (N.C.)
155-168ft		Sand (N.C.)
168-175ft		Clay, sand and gravel

Static Water Level Draw Down

WELL SEALING REPORT
(For Abandoned or Unused Wells)
OHIO DEPARTMENT OF NATURAL RESOURCES
Division of Water, Ground Water Resources Section
1939 Fountain Square Drive
Columbus, Ohio 43224-1360

LOCATION

County Montgomery Township _____ Section _____
Property Owner General Motors Truck & Bus
Address of Property Stroop Road
Location: 1 miles west (n, e, s, w) of Stroop and Dorothy Lane (nearest intersection)
on the South (n, e, s, w) side of Stroop Road (road name)

ORIGINAL WELL

ODNR Well Log Number not available Copy attached? Yes or (No) (circle one)

MEASURED CONSTRUCTION DETAILS

Date of measurements June 1997
Depth of Well 146 feet
Size of Casing 16 inch with 12 inch liner Static Water Level 30.92 feet
Well Condition fair Length of casing 100 feet

SEALING PROCEDURE

Method of Placement Tremie

Placement:			Sealing Material	Volume
From	0	To 146 feet	Cement/Bentonite	216 Ft 3
From		To		
From		To		

Was Casing Removed? (Yes) or No liner (circle one)
Condition of Casing Fair but bad holes
Perforations: From _____ To _____
From _____ To _____
Date Sealing Performed June 1997
Reason(s) for Sealing Well was in the building line for expansion

CONTRACTOR

Name Reynolds, Inc.
Address 6451 Germantown Rd. ODH Registration # 2286
City/State/Zip Middletown, OH 45042 Signature

SUBMIT COMPLETED FORM TO ODNR-DIVISION OF WATER

Fire Well 1A

TYPE OR USE PEN
SELF TRANSCRIBING
PRESS HARD

Ohio Department of Natural Resources
Divison of Water, 1939 Fountain Square Drive
Columbus, Ohio 43224 Phone (614) 265-6739

Permit Number 198191

COUNTY Montgomery TOWNSHIP SECTION/LOT No. (Circle One)

OWNER/BUILDER (Circle One or Both) Truck & Bus (First / Last) PROPERTY ADDRESS (Address of well location) Number Moraine Street City Zip Code + 4

LOCATION OF PROPERTY North end of plant

CONSTRUCTION DETAILS

CASING (Length below grade) Borehole Diameter ____ in.
1 Diameter 30 in. Length 25 ft. Wall Thickness .375 in.
2 Diameter 24 in. Length 106 ft. Wall Thickness .375 in.
Type: 1 (2) Steel 1 Galv. 2 PVC 1 2 Other
Joints: 1 Threaded 1 (2) Welded 2 Solvent 1 2 Other
Liner: Length ____ Type ____ Wall Thickness ____ in.
SCREEN
Type (wire wrapped, louvered, etc.) ____ Material ____
Length 60 ft. Diameter 24 Xtele. in.
Set between 106 ft. and 166 ft. Slot varied

GROUT
Material Cement Volume used ____
Method of installation Tremie
Depth: placed from 0 ft. to 25 ft.
GRAVEL PACK (Filter Pack)
Material NA Volume used ____
Method of installation ____
Depth: placed from ____ ft. to ____ ft.
Pitless Device ☐ Adapter ☐ Preassembled unit
Use of Well Fire well
☐ Rotary ☒ Cable ☐ Augered ☐ Driven ☐ Dug ☐ Other
Date of Completion 3-98

WELL LOG*

INDICATE DEPTH(S) AT WHICH WATER IS ENCOUNTERED.
Show color, texture, hardness, and formation: sandstone, shale, limestone, gravel, clay, sand, etc.

From	To	
0	3 ft	Blacktop, fill
3	12	Fill
12	32	Gravel and sand
32	52	Gray clay, some gravel
52		Hard pan
52	62	Gravel, sand, rocks
62	92	Gravel and sand
92	140	Gravel and sand
140	166	Gravel and sand
166	169	Blue Slate

(Additional space is needed to complete well log, use next consecutively numbered form.)

WELL TEST

☐ Bailing ☐ Pumping* ☐ Other
Test rate 2400 gpm Duration of test 8 hrs.
Drawdown 12.85 ft.
Measured from: ☒ top of casing ☐ ground level ☐ Other
Static Level (depth to water) 33.75 ft. Date: 3-18-98
Quality (clear, cloudy, taste, odor) ____
*(Attach a copy of the pumping test record, per section 1521.05, ORC)

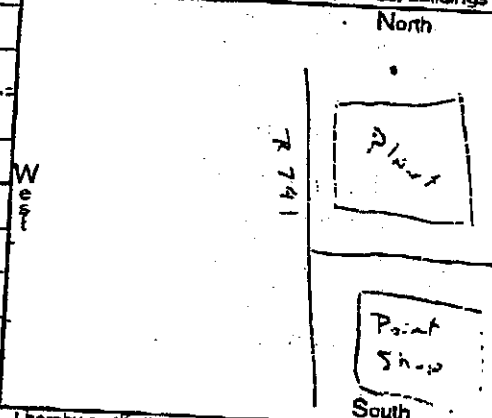
PUMP

Type of pump Turbine Capacity 2500 gpm
Pump set at 106 ft.
Pump installed by Reynolds Inc.

WELL LOCATION

Location of well in State Plane coordinates, if available:
Zone ____ x ____ y ____
Elevation of well ____ ft/m. Datum plain: ☐ NAD27 ☐ NAD83
Source of coordinates: ☐ GPS ☐ Survey ☐ Other ____

Sketch a map showing distance well lies from numbered state highways, street intersections, county roads, buildings or other notable landmarks.



Drilling Firm Reynolds Inc.
Address 6451 Germantown Rd.
State, Zip Middletown, OH 45042

I hereby certify the information given is accurate and correct to the best of my knowledge.
Signed ____
Date 5-1-98

ODH Registration Number 2289

Completion of this form is required by section 1521.05, Ohio Revised Code - file within 30 days after completion of drilling.
ORIGINAL COPY TO - ODNR, DIVISION OF WATER, 1939 FOUNTAIN SQ. DRIVE, COLS., OHIO 43224
Blue - Customer's copy Pink - Driller's copy Green - Local Health Dept. copy

Fire Well 2

Job # 474D

Reynolds Supply, Inc.

COMPLETE MUNICIPAL & INDUSTRIAL WATER SYSTEMS

FORMATION LOG OF WELL

Starting Date Nov. 5, 1980 Finished Nov. 5, 1980 Well Number Test Well #2 (Fire Well #2)

Owner General Motors Location

TOTAL DEPTH	THICKNESS EACH STRATUM	FORMATION
160ft		0-25 Clay, sand and gravel
23-33 ft		Sand and gravel
33-35 ft		Sand, gravel and clay
35-60 ft		Sand, gravel and clay
60-80 ft		Sand, gravel and clay
80-95 ft		Sand, gravel and clay
95-100ft		Sand and gravel
100-105ft		Small gravel and sand
105-120ft		Small gravel, sand and little clay
120-140ft		Small Gravel, sand and little clay
140-160		Clay and gravel

Static Water Level 45ft Draw Down

Driller

Fire Well 3

Reynolds Supply, Inc.

COMPLETE MUNICIPAL & INDUSTRIAL WATER SYSTEMS

FORMATION LOG OF WELL

Starting Date _____ Finished _____ Well Number Test Well #3-80 (Fire Well #3)

Owner General Motors Location _____

TOTAL DEPTH	THICKNESS EACH STRATUM	FORMATION
0-3'	3'	Clay, Topsoil.
3-31'	28'	Sand and gravel with some large rock. (NC)
31-79'	48'	Sand and gravel with some large rock and some clay. (NC) with (C) at 54' and 74'.
79-102'	23'	Sandy clay and some gravel. (C) at 88'
102-125'	23'	Sand and gravel with some large rock. (NC)
125-127'	2'	Sand and gravel with some large rock and some clay. (C)
127-138'	11'	Sand and gravel. (NC)
138-140'	2'	Sand and gravel with some clay. (C)
[illegible]-154'	14'	Sand and gravel with some large rocks and some clay. (NC)
[illegible]-200'	46'	Gray soft shale. (Hardpan clay)

Static Water Level _____ Draw Down _____

Driller Buddy Rogers

Fire Well 4

Reynolds Supply, Inc.

COMPLETE MUNICIPAL & INDUSTRIAL WATER

FORMATION LOG OF WELL

Starting Date November 7, 1980 Finished November 7, 1980 Well Name Test Well #4

(Fire Well #4)

Owner General Motors Location Moraine

TOTAL DEPTH	THICKNESS EACH STRATUM	FORMATION
0-20'		Sand and gravel with clay. (C.)
20'-42'		Sand and gravel. (N.C.)
42'-50'		Clay with large rock. (C.)
50'-75'		Sand and gravel with clay. (C.)
75'-80'		Fine sand and gravel. (N.C.)
80'-90'		Sand and gravel with clay. (C.)
90'-100'		Clay and large rock. (C.)
100'-112'		Clay, sand and gravel. (C.)
112'-135'		Good sand and grabel. (N.C.) Dropping.
135'-140'		Sand and gravel with some clay. (C.)
140'-160'		Clay and gravel.

Static Water Level _____ Draw Down _____

Driller _____

Section 3

Frigidaire Division Test Well Logs

Test Well 1
Test Well 2
Test Well 3
Test Well 4
Test Well 5
Test Well 6

Test Well 1

WEI LOG AND DRILLING REF RT

ORIGINAL

NO CARBON PAPER NECESSARY— SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
65 S. Front St., Rm. 815 Phone (614) 469-2646
Columbus, Ohio 43215

No. 420729

County Montgomery Township ~~City of~~ Miami Section of Township

Owner Frigidaire Div of General Motors Address Dayton, Ohio 45401

Location of property

Test Well #1.

CONSTRUCTION DETAILS

Casing diameter 8" Length of casing

Type of screen none Length of screen

Type of pump none

Capacity of pump

Depth of pump setting

Date of completion 5-17-73

BAILING OR PUMPING TEST
(Specify one by circling)

Test Rate none G.P.M. Duration of test hrs.

Drawdown none ft. Date

Static level-depth to water 74' ft.

Quality (clear, cloudy, taste, odor)

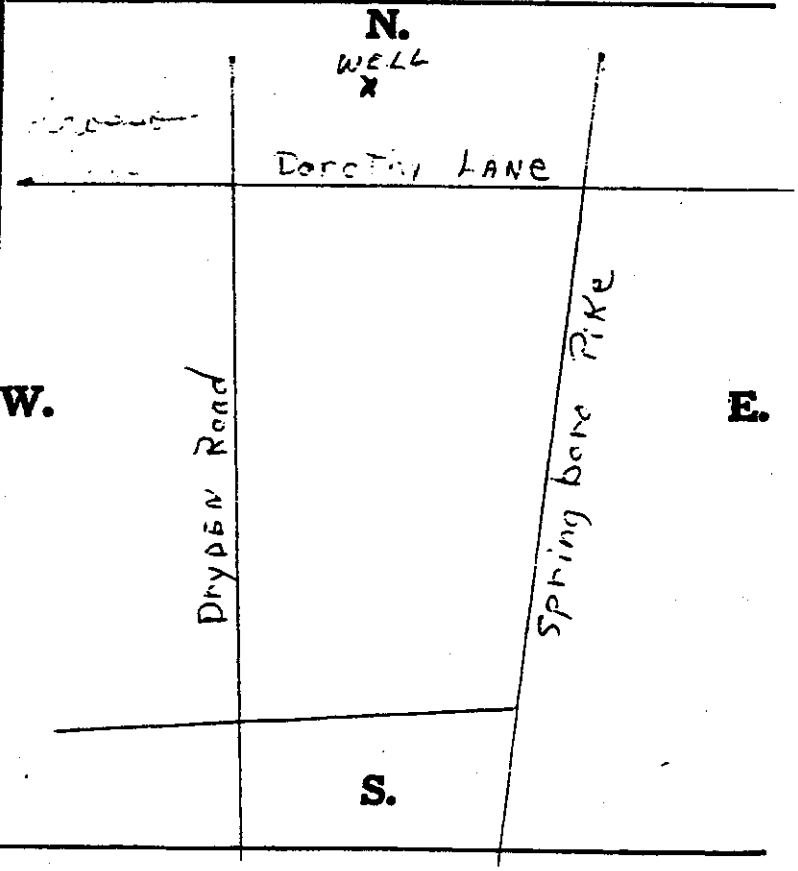
Pump installed by

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
Soil	0 Feet	4 Ft.
Clay Gravel + Sand	4'	68'
Gray Clay	68'	77'
Coarse Sand + Gravel	77'	168'
Hard Brown Clay	168'	182'
Sandy Clay	182'	188'
Hard Blue Clay	188'	196'
Blue Shale (Bedrock)	196'	200'
5412		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



Drilling Firm MOODY'S OF DAYTON, INC.
P. O. BOX 155
Address VANDALIA, OHIO 45377

Date 5-4-73

Signed Elmer Beck

*If additional space is needed to complete well log, use next consecutive numbered form.

Test well 1

Test Well 2

WELL LOG AND DRILLING REPORT

ORIGINAL

NO CARBON PAPER NECESSARY— SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
65 S. Front St., Rm. 815 Phone (614) 469-2646
Columbus, Ohio 43215

No. 420730

County Montgomery Township ~~City of~~ Vandalia Section of Township

Owner Frigidaire Div. General Motors Address Dayton, Ohio 45401

Location of property

Test well # 2.

CONSTRUCTION DETAILS

Casing diameter None Length of casing

Type of screen None Length of screen

Type of pump None

Capacity of pump

Depth of pump setting

Date of completion 5-17-72

BAILING OR PUMPING TEST
(Specify one by circling)

Test Rate None G.P.M. Duration of test hrs.

Drawdown None ft. Date

Static level-depth to water 80' ft.

Quality (clear, cloudy, taste, odor)

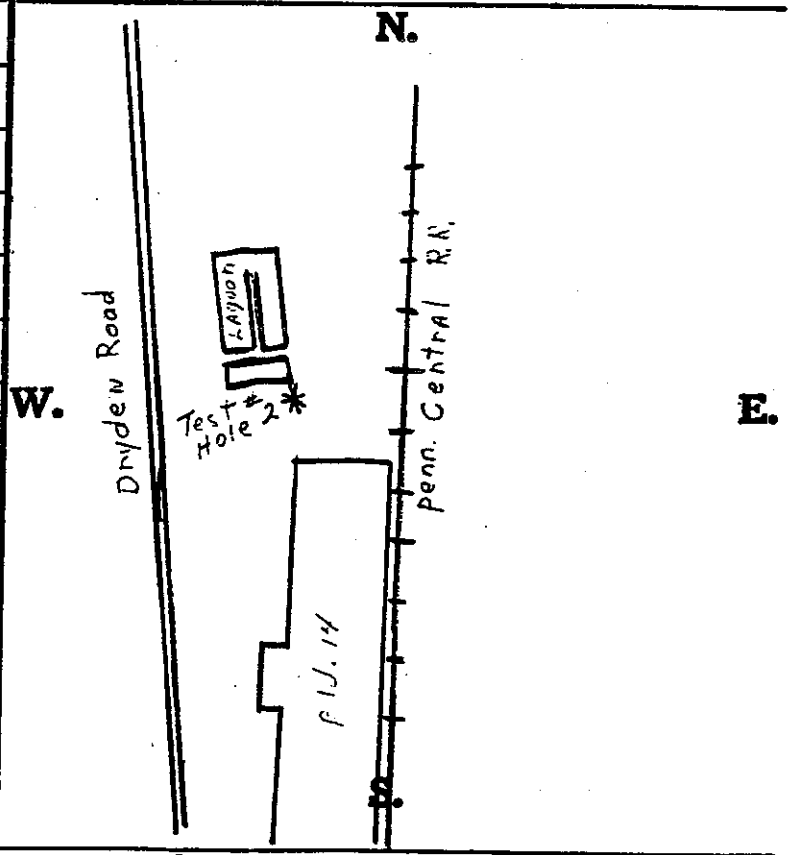
Pump installed by

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
Soil & Gravel	0 Feet	5 Ft.
Dry Gravel & Sand	5'	55'
Gray Clay	55'	60'
Dry Gravel Sand	60'	77'
Streak Gray Clay	77'	79'
Large Rock & Sand & Gravel	79'	90'
Coarse Sand & Gravel	90'	127'
Gray Blue Clay with gravel	127'	200'
Blue Shale (Hydrid)	200'	201'
5412.		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



Drilling Firm [illegible]

Address [illegible]

Date June 18, 1973

Signed V.C. Caspy/jd

Test Well #2

*If additional space is needed to complete well log, use next consecutive numbered form.

Test Well 3

WELL LOG AND DRILLING REPORT

Page #1

ORIGINAL

NO CARBON PAPER NECESSARY— SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
65 S. Front St., Rm. 815 Phone (614) 469-2646
Columbus, Ohio 43215

No. 420731

County Montgomery Township ~~City of~~ Moraine Section of Township

Owner Frigidaire Div. General Motors Address Dayton, Ohio 45401

Location of property

Test Well # 3

CONSTRUCTION DETAILS

Casing diameter 8" Length of casing

Type of screen None Length of screen

Type of pump None

Capacity of pump

Depth of pump setting

Date of completion

BAILING OR PUMPING TEST
(Specify one by circling)

Test Rate None G.P.M. Duration of test hrs.

Drawdown None ft. Date

Static level-depth to water 75' ft.

Quality (clear, cloudy, taste, odor)

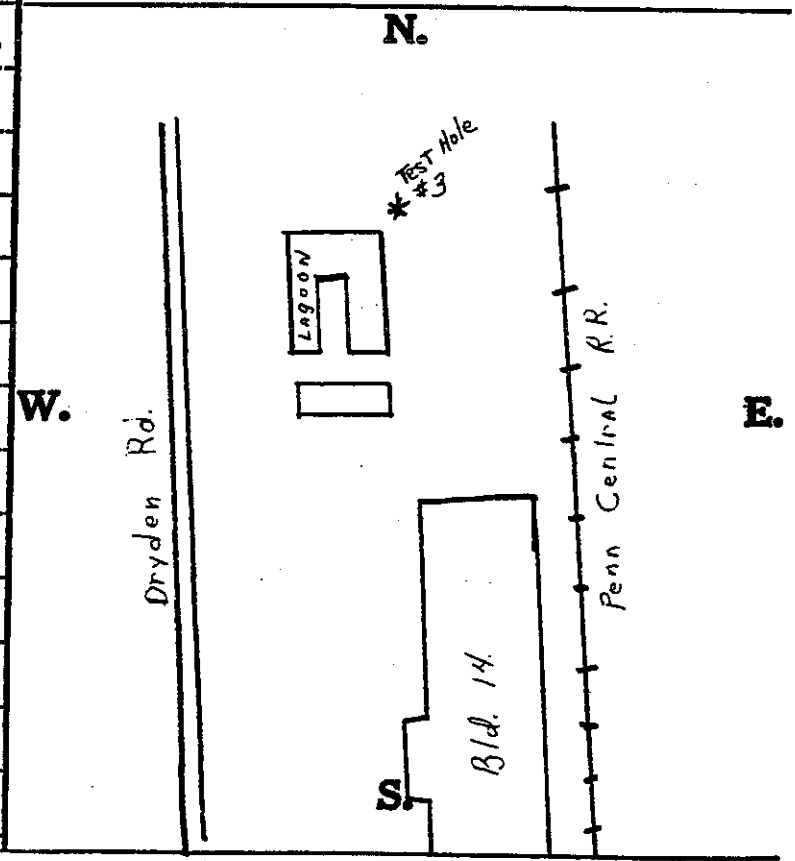
Pump installed by

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
Soil, Gravel & Clay	0 Feet	5 Ft.
Silty Gravel	5'	16'
Dry Sandy Gravel	16'	62'
Till	62'	70'
Sand & Gravel	70'	84'
Clay Streak	84'	88'
Coarse Sand & Gravel	88'	115'
Medium Sand	115'	120'
Medium Sand & Gravel	120'	125'
Coarse Sand	125'	140'
Coarse Sand & Gravel	140'	175'
Till	175'	182'
Gravel Streak	182'	190'

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



Drilling Firm MOODY'S OF DAYTON, INC.

Address P. O. BOX 155 VANDALIA, OHIO 45377

Date June 18, 1973

Signed V. C. Caspersohn

Test Well #3 5412

*If additional space is needed to complete well log, use next consecutive numbered form.

WELL LOG AND DRILLING REPORT

Page #1. ORIGINAL

NO CARBON PAPER NECESSARY— SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
65 S. Front St., Rm. 815 Phone (614) 469-2646
Columbus, Ohio 43215

No. 420732

County Montg. Township Moraine Section of Township

Owner Frigidaire Div. General Motors Address Dayton, Ohio 45401

Location of property

CONSTRUCTION DETAILS

Casing diameter Length of casing

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion

BAILING OR PUMPING TEST
(Specify one by circling)

Test Rate G.P.M. Duration of test hrs.

Drawdown ft. Date

Static level-depth to water ft.

Quality (clear, cloudy, taste, odor)

Pump installed by

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
	0 Feet	Ft.
Blue Clay	190'	200'
Blue Shale (Bedrock)	200'	201'
5412		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.

N.

W. E.

S.

Drilling Firm Moodys of Dayton Date 6-18-73

Address Test Well #3 Signed

*If additional space is needed to complete well log, use next consecutive numbered form.

Test Well 4

WELL LOG AND DRILLING REPORT

page #1 ORIGINAL

NO CARBON PAPER NECESSARY— SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
65 S. Front St., Rm. 815 Phone (614) 469-2646
Columbus, Ohio 43215

No. 420733

County Montgomery Township ~~City of Mia~~ Section of Township

Owner Frigidaire Div. General Motors Address Dayton, Ohio 45401

Location of property

Test Well #4

CONSTRUCTION DETAILS

Casing diameter 8" Length of casing

Type of screen None Length of screen

Type of pump None

Capacity of pump

Depth of pump setting

Date of completion

BAILING OR PUMPING TEST
(Specify one by circling)

Test Rate None G.P.M. Duration of test hrs.

Drawdown None ft. Date

Static level-depth to water 81' ft.

Quality (clear, cloudy, taste, odor)

Pump installed by

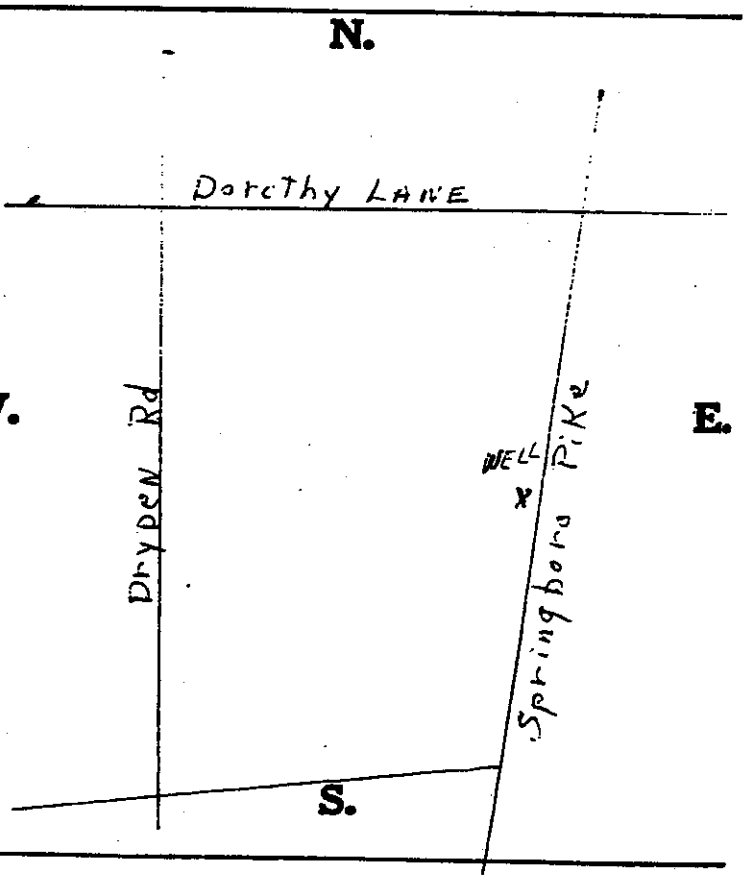
WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
Soil	0 Feet	4 Ft.
Brown Clay	4'	16'
Dry Gravel	16'	37'
Hard Dry Clay	37'	64'
Soft Dry Clay with Gravel	64'	85'
Coarse Sand & Gravel	85'	113'
Hard Dry Clay	113'	117'
Sand & Gravel	117'	122'
Hard Dry Clay	122'	130'
Sand & Gravel	130'	135'
Dirty Sand & Med. Gravel	135'	141'
Brown Sand & Fine Gravel	141'	156'
Brown Clay	156'	170'

5-12

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



Drilling Firm ~~MOODY'S OF DAYTON, INC.~~

Address P. O. BOX 155 VANDALIA, OHIO 45377

Date 5-4-73

Signed Elmer Backfield

Test Well #4

*If additional space is needed to complete well log, use next consecutive numbered form.

WELL LOG AND DRILLING REPORT

Page #2.

ORIGINAL

NO CARBON PAPER NECESSARY— SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
65 S. Front St., Rm. 815 Phone (614) 469-2646
Columbus, Ohio 43215

No. 420734

County Montg Township Moraine Section of Township

Owner Frigidaire Div. General Motors Address Dayton, Ohio 45401

Location of property

Test Well #4

CONSTRUCTION DETAILS

Casing diameter Length of casing

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion

BAILING OR PUMPING TEST
(Specify one by circling)

Test Rate G.P.M. Duration of test hrs.

Drawdown ft. Date

Static level-depth to water ft.

Quality (clear, cloudy, taste, odor)

Pump installed by

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
	0 Feet	Ft.
Fine to Med. Sand & Gravel	170'	175'
Coarse Sand & Med. gravel	175'	185'
Coarse Sand & gravel	185'	216'
Blue Shale & Clay (Bedrock)	216'	220'
5412		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.

N.

W. E.

S.

Drilling Firm ~~MOODY'S OF DAYTON, INC.~~

Address ~~P. O. BOX 155~~ ~~VANDALIA, OHIO 45377~~

Date

Signed

Test Well #4

*If additional space is needed to complete well log, use next consecutive numbered form.

Test Well 5

WEL LOG AND DRILLING REF RT

ORIGINAL

NO CARBON PAPER NECESSARY— SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
65 S. Front St., Rm. 815 Phone (614) 469-2646
Columbus, Ohio 43215

No. 420735

County Montgomery Township Miamisburg City Section of Township

Owner Frigidaire Div. General Motors Address Dayton, Ohio 45401

Location of property

Test Well #5

CONSTRUCTION DETAILS

Casing diameter 8" Length of casing

Type of screen None Length of screen

Type of pump None

Capacity of pump

Depth of pump setting

Date of completion 8-29-72

BAILING OR PUMPING TEST
(Specify one by circling)

Test Rate None G.P.M. Duration of test hrs.

Drawdown None ft. Date 82'

Static level-depth to water ft.

Quality (clear, cloudy, taste, odor)

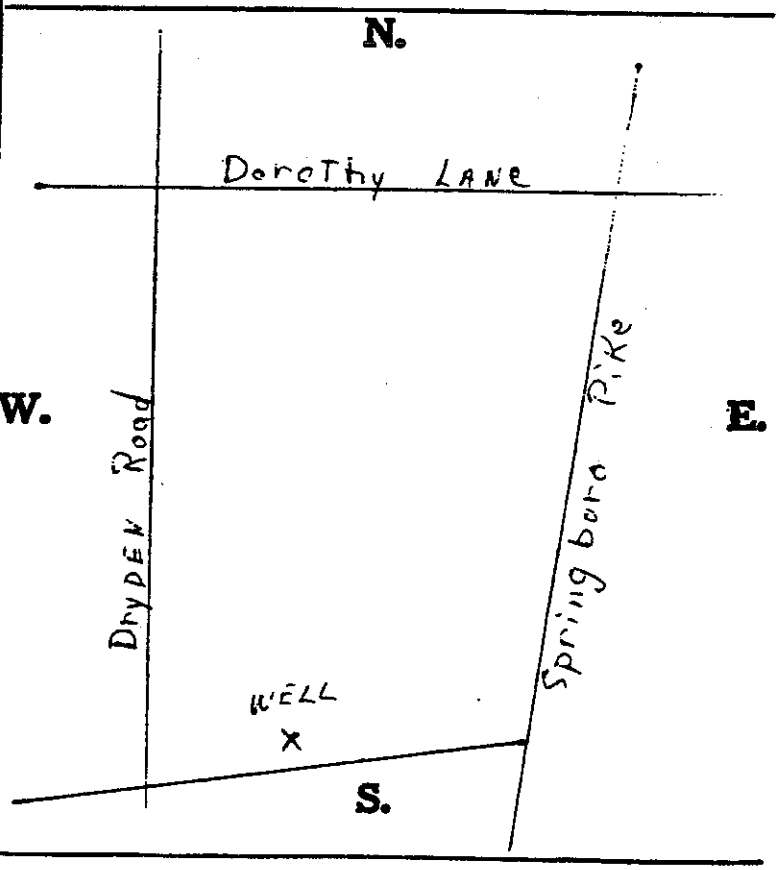
Pump installed by

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
Fill	0 Feet	3' Ft.
Brown Clay	3'	11'
Dry Gravel	11'	49'
Gray Clay	49'	82'
Coarse Sand + Gravel	82'	125'
Clay Streak	125'	132'
Coarse Sand + Gravel	132'	170'
Stratified Gravel Clay	170'	188'
Brown Clay	188'	192'
Blue Shale	192'	193'
5412		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



Drilling Firm ~~MOODY'S OF DAYTON, INC.~~

Address P. O. BOX 155 VANDALIA, OHIO 45377

Date 5-4-73

Signed Elmer Backgd

Test Well #5

*If additional space is needed to complete well log, use next consecutive numbered form.

Test Well 6

WELL LOG AND DRILLING REPORT

ORIGINAL

NO CARBON PAPER NECESSARY— SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
65 S. Front St., Rm. 815 Phone (614) 469-2646
Columbus, Ohio 43215

No. 420736

County Montgomery Township ~~Perry~~ Mariae Section of Township

Owner Frigidaire Div. General Motors Address Dayton, Ohio 45401

Location of property

Test well #6

CONSTRUCTION DETAILS

Casing diameter 8" Length of casing

Type of screen None Length of screen

Type of pump None

Capacity of pump

Depth of pump setting

Date of completion 8-29-72

BAILING OR PUMPING TEST
(Specify one by circling)

Test Rate None G.P.M. Duration of test hrs.

Drawdown None ft. Date

Static level-depth to water 83' ft.

Quality (clear, cloudy, taste, odor)

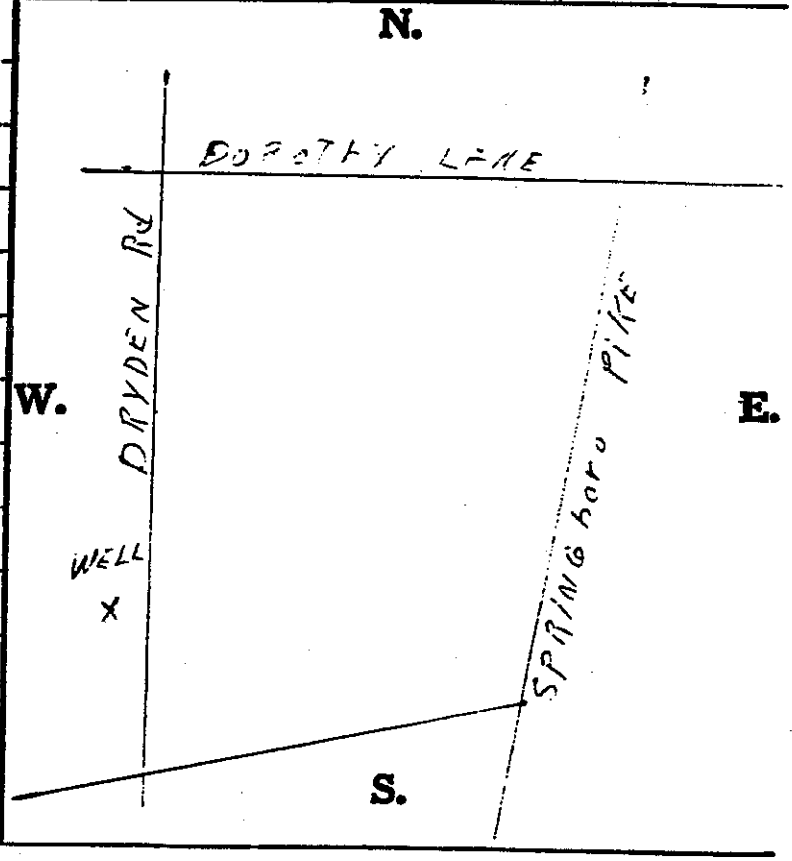
Pump installed by

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
Soil	0 Feet	10 Ft.
Clay + Gravel	10'	22'
Dry Gravel	22'	55'
Clay + Gravel	55'	60'
Gravel Streak	60'	65'
Clay + Dirty Gravel	65'	85'
Coarse Sand + gravel	85'	120'
Dirty Gravel	120'	130'
Clay Streak	130'	135'
Cavity + Coarse Gravel + Some with Boulders	135'	155'
Coarse Sand + Gravel	155'	200'
Dry Clay	200'	205'
Blue Shale	205'	210'

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



5412

Drilling Firm ~~MOODY'S OF DAYTON, INC.~~

Address P. O. BOX 155 VANDALIA, OHIO 45377

Date 5-4-73

Signed Elmer Backfield

Test well #6

*If additional space is needed to complete well log, use next consecutive numbered form.

Section 4

USGS Graphic Logs

532
533
534
544
565
570
574
577
584
585
586
588
591

USGS Graphic Log 532

USGS LOG NUMBER	532
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	720
DATE DRILLED	10/55
DEPTH (ft)	74
WATER LEVEL DEPTH	36
DATE	10/14/55
YIELD RATE (gpm)	15
DRAWDOWN (ft)	0
TYPE OF PUMP	Jet
DIAMETER OF WELL (in)	6
USE	Domestic
COMMENT	-----

532

EXPLANATION

Sand and gravel

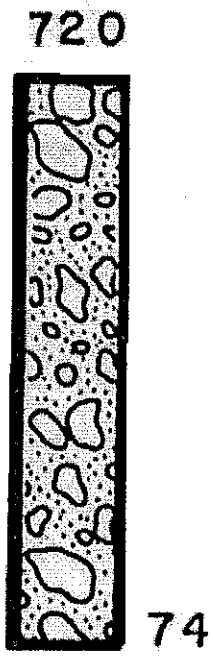
Clay and gravel

Till

Sand

Clay

Shale



SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

USGS WELL 532
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

X = 1,5[illegible]
(3[illegible]
Y = -621,400-S

WELL LOG AND DRILLING REPORT

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Columbus, Ohio

No 114304

County Montgomery Township [redacted] (Moraine) Section of Township or Lot Number

Owner Red Horse Tourist Court Address 4600 S Dixie Dr Dayton

Location of property RR 25 south of Dayton at Springboro Pike.

CONSTRUCTION DETAILS

Casing diameter 5 5/8" Length of casing 91

Type of screen Cook Length of screen 10

Type of pump

Capacity of pump

Depth of pump setting

PUMPING TEST

Pumping rate G.P.M. Duration of test hrs.

Drawdown ft. Date

Developed capacity

Static level—depth to water ft.

Pump installed by

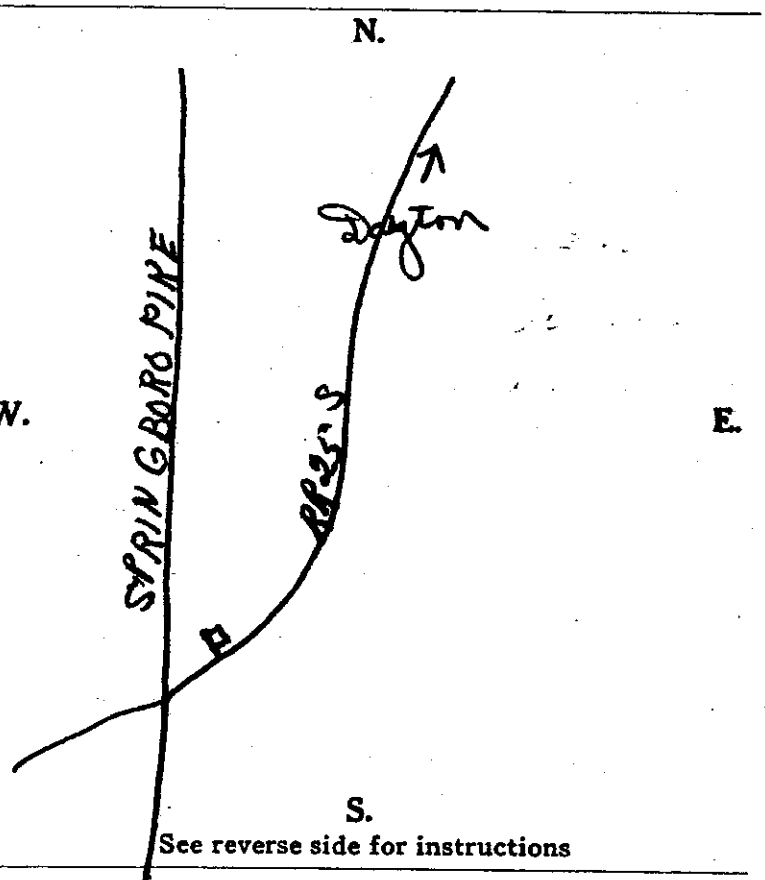
WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
Clay	0 Feet	10 Ft.
gravel	10	20
Clay	20	40
gravel & sand	40	65
Clay	65	90
gravel	90	100

1251

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm Clay P. Harmon

Address 3901 S Dixie Dr. Dayton, Ohio.

Date Aug 21, 1953

Signed

586

USGS Graphic Log 533

USGS LOG NUMBER	533
ODNR NUMBER	131429
ALTITUDE (ft AMSL)	720
DATE DRILLED	8/54
DEPTH (ft)	49
WATER LEVEL DEPTH	17
DATE	8/7/54
YIELD RATE (gpm)	20
DRAWDOWN (ft)	0
TYPE OF PUMP	Jet
DIAMETER OF WELL (in)	6
USE	Domestic
COMMENT	Stock

533

EXPLANATION

Sand and gravel

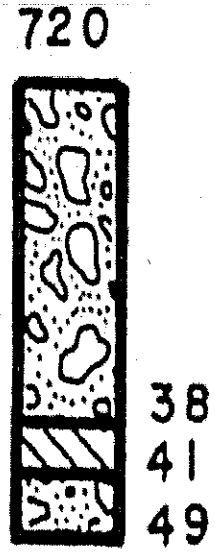
Clay and gravel

Till

Sand

Clay

Shale



SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

USGS WELL 533
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

WELL LOG AND DRILLING REPORT

ORIGINAL

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Columbus, Ohio

No. 131429

County Montgomery Township Maxine Section of Township or Lot Number

Owner O. A. Everett Address 2800 Gladstone

Location of property West Maxine Plat
2732 Gladstone

CONSTRUCTION DETAILS

Casing diameter 6" OD Length of casing 49

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

PUMPING TEST

Pumping rate 20 G.P.M. Duration of test 4 hr.

Drawdown 0 ft. Date 8-7-54

Developed capacity 1500 GAL. P. H

Static level—depth to water 17 ft.

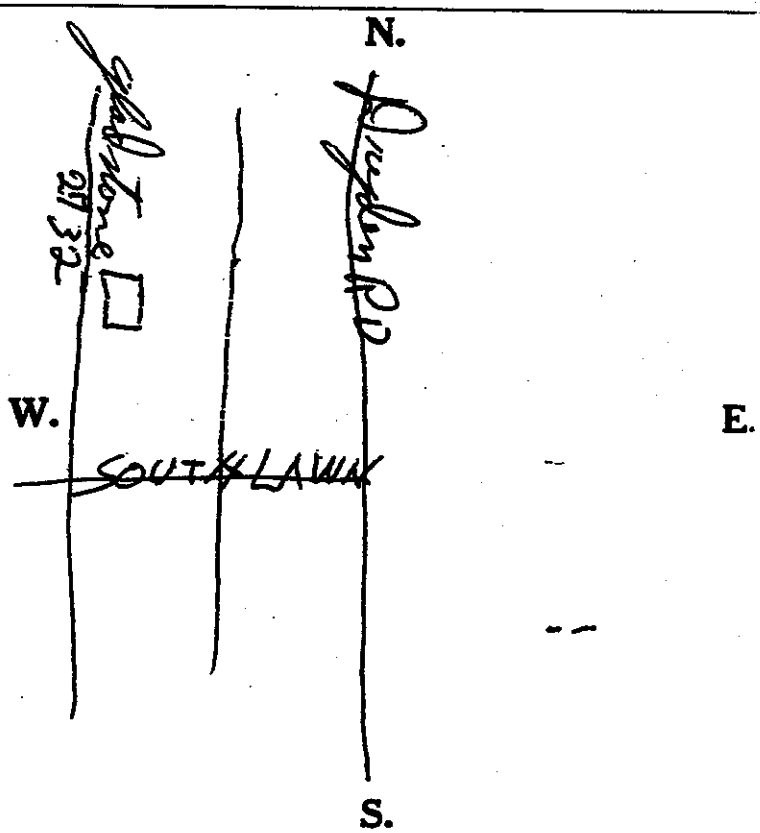
Pump installed by

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
	0 Feet	Ft.
Sand + gravel		38
Clay	38	41
Sand + gravel	41	49
Water at 41		
1389		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm Louis S. Kennedy Date 8-7-54

Address 442 Cincinnati ST Signed Louis S. Kennedy

Dayton 8, Ohio

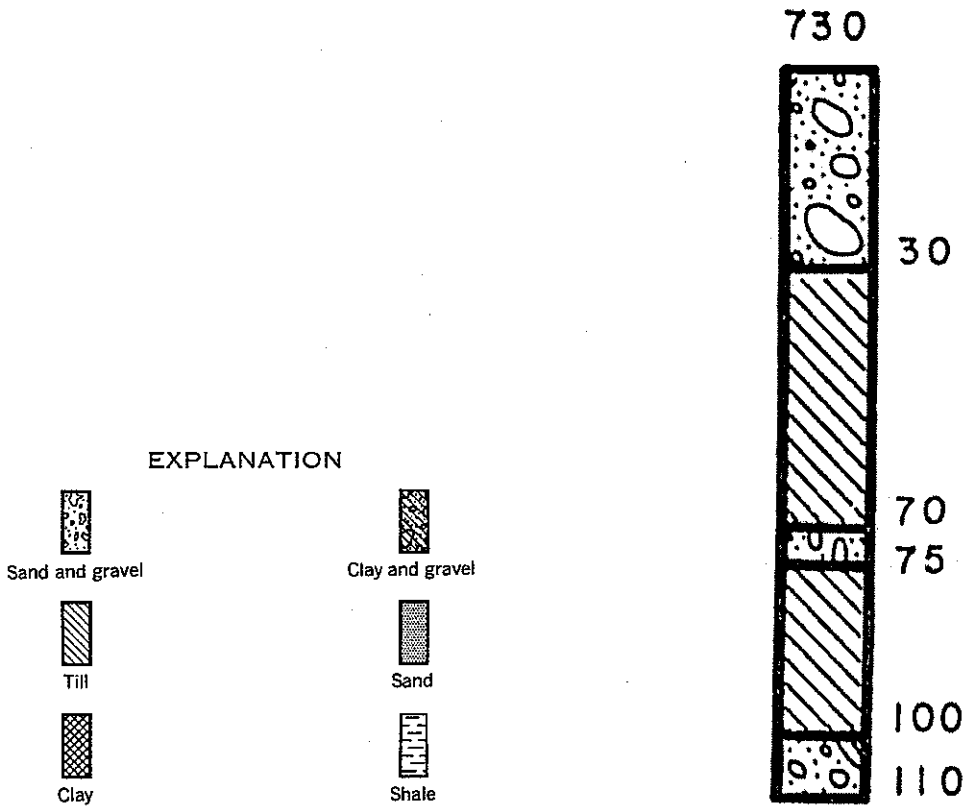
533

A(

USGS Graphic Log 534

USGS LOG NUMBER	534
ODNR NUMBER	177675
ALTITUDE (ft AMSL)	730
DATE DRILLED	7/56
DEPTH (ft)	110
WATER LEVEL DEPTH	35
DATE	7/16/56
YIELD RATE (gpm)	50
DRAWDOWN (ft)	2
TYPE OF PUMP	Submersible
DIAMETER OF WELL (in)	6
USE	Sanitary
COMMENT	-----

534



SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

USGS WELL 534
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

WELL LOG AND DRILLING REPORT

ORIGINAL

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1500 Dublin Road
Columbus, Ohio

No. 177675

County Montgomery Township ~~Mad River~~ Moraine Section of Township 10

Owner Filan Associates Address 4600 S Dixie Dr., Dayton O.

Location of property 4600 S Dixie Dr. Dayton O.

CONSTRUCTION DETAILS

Casing diameter 5 5/8 Length of casing 100

Type of screen Cook Length of screen 10

Type of pump Submersible

Capacity of pump 3000 PH

Depth of pump setting 84'

Date of completion July 19 1956

BAILING OR PUMPING TEST

Pumping rate 50 G.P.M. Duration of test 2 hrs.

Drawdown 2 ft. Date July 16

Developed capacity unknown

Static level—depth to water 35 ft.

Pump installed by Clay P. Harrison

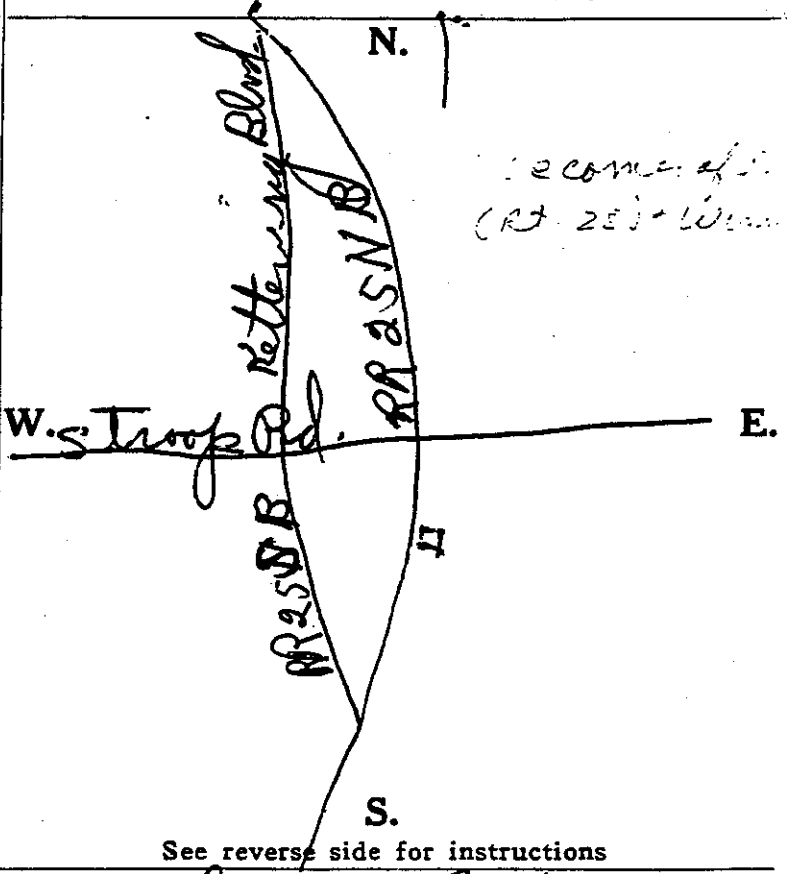
WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
Clay	0 Feet	5 Ft.
gravel	5	30
Clay	30	70
gravel	70	75
Clay	75	100
gravel	100	110

1251

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm CLAY P. HARRISON WELL CONTRACTOR 3901 S. DIXIE DR. DAYTON 9, OHIO

Address

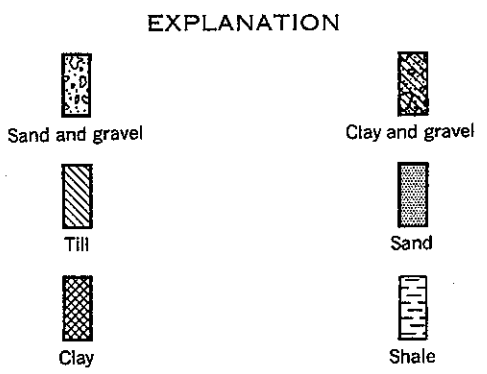
Date July 20 1956

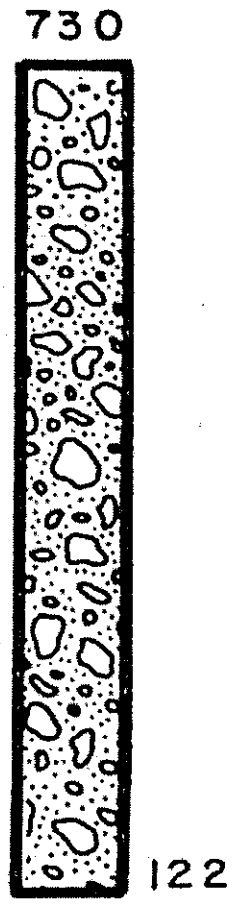
Signed

C74
534

USGS Graphic Log 544

USGS LOG NUMBER	544
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	729.67
DATE DRILLED	4/54
DEPTH (ft)	115
WATER LEVEL DEPTH	47
DATE	9/9/54
YIELD RATE (gpm)	960
DRAWDOWN (ft)	-----
TYPE OF PUMP	Turbine
DIAMETER OF WELL (in)	14
USE	Industrial
COMMENT	Abandoned





SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

USGS WELL 544
GENERAL MOTORS CORPORATION
Moraine, Ohio

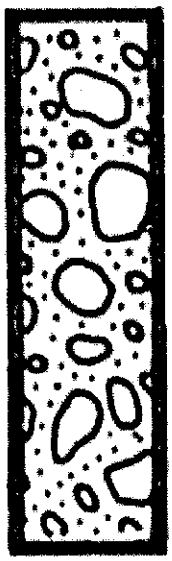
CRA

USGS Graphic Log 565

USGS LOG NUMBER	565
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	735
DATE DRILLED	1/52
DEPTH (ft)	52
WATER LEVEL DEPTH	25
DATE	1/1/52
YIELD RATE (gpm)	8.3
DRAWDOWN (ft)	0
TYPE OF PUMP	Jet
DIAMETER OF WELL (in)	6
USE	Industrial
COMMENT	-----

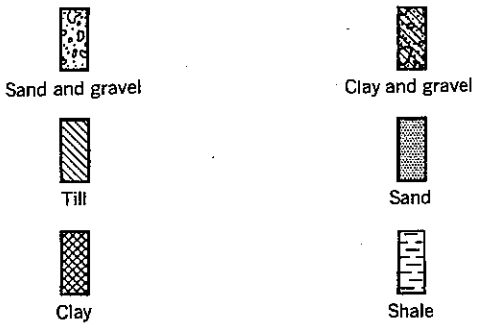
565

735



52

EXPLANATION



SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

USGS WELL 565
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

USGS Graphic Log 570

USGS LOG NUMBER	570
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	725
DATE DRILLED	9/54
DEPTH (ft)	76
WATER LEVEL DEPTH	35
DATE	9/10/54
YIELD RATE (gpm)	15
DRAWDOWN (ft)	2
TYPE OF PUMP	Jet
DIAMETER OF WELL (in)	6
USE	Domestic
COMMENT	-----

570

725



76

EXPLANATION



Sand and gravel



Clay and gravel



Till



Sand



Clay



Shale

SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

USGS WELL 570
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

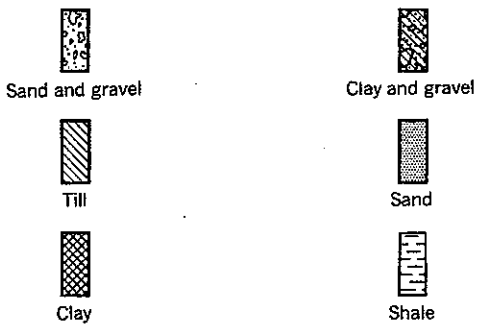
USGS Graphic Log 574

USGS LOG NUMBER	574
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	720
DATE DRILLED	8/54
DEPTH (ft)	46
WATER LEVEL DEPTH	28
DATE	8/16/54
YIELD RATE (gpm)	-----
DRAWDOWN (ft)	-----
TYPE OF PUMP	Jet
DIAMETER OF WELL (in)	6
USE	Domestic
COMMENT	-----

574



EXPLANATION



SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

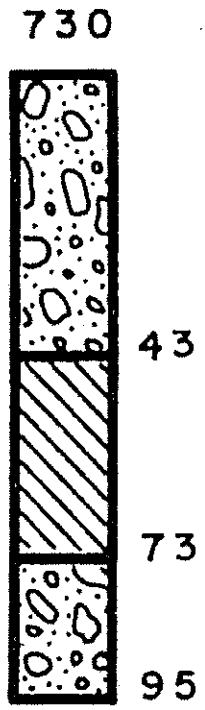
USGS WELL 574
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

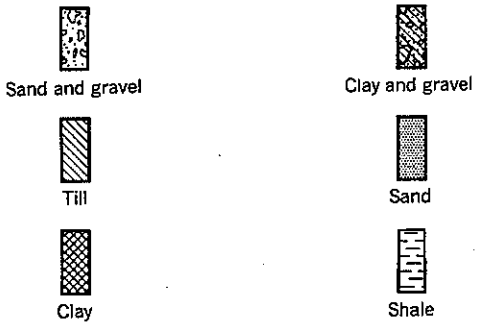
USGS Graphic Log 577

USGS LOG NUMBER	577
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	730
DATE DRILLED	11/54
DEPTH (ft)	95
WATER LEVEL DEPTH	42
DATE	-----
YIELD RATE (gpm)	-----
DRAWDOWN (ft)	-----
TYPE OF PUMP	Jet
DIAMETER OF WELL (in)	6
USE	Submersible
COMMENT	-----

577



EXPLANATION



SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

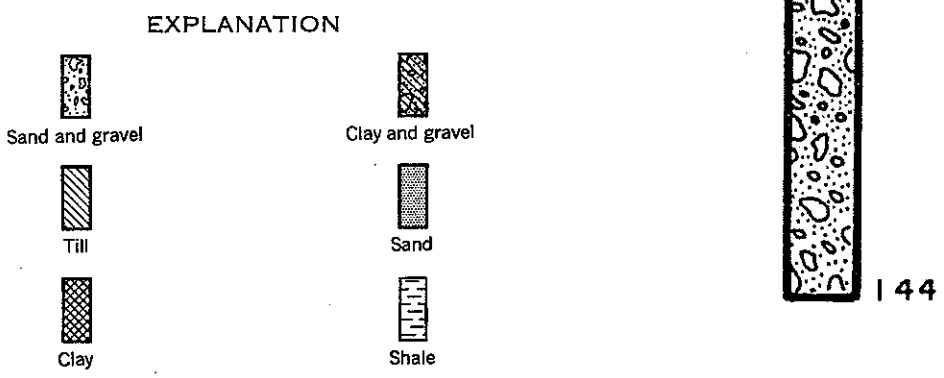
USGS WELL 577
GENERAL MOTORS CORPORATION
Moraine, Ohio

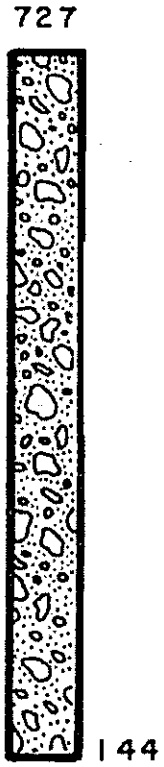
CRA

USGS Graphic Log 584

USGS LOG NUMBER	584
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	726.75
DATE DRILLED	8/54
DEPTH (ft)	111
WATER LEVEL DEPTH	28
DATE	8/25/54
YIELD RATE (gpm)	340
DRAWDOWN (ft)	-----
TYPE OF PUMP	Turbine
DIAMETER OF WELL (in)	10
USE	Irrigation
COMMENT	-----

584





SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

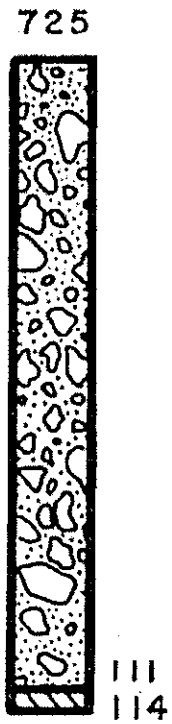
USGS WELL 584
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

USGS Graphic Log 585

USGS LOG NUMBER	585
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	726.82
DATE DRILLED	9/54
DEPTH (ft)	110
WATER LEVEL DEPTH	30
DATE	9/20/54
YIELD RATE (gpm)	340
DRAWDOWN (ft)	-----
TYPE OF PUMP	Turbine
DIAMETER OF WELL (in)	10
USE	Irrigation
COMMENT	-----

585



EXPLANATION

Sand and gravel

Clay and gravel

Till

Sand

Clay

Shale

SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

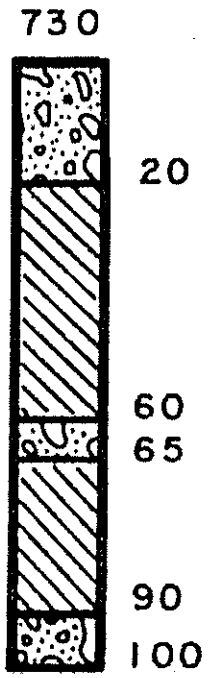
USGS WELL 585
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

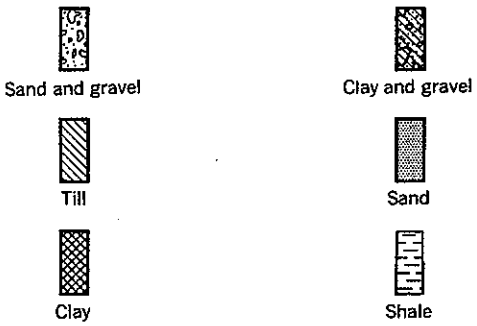
USGS Graphic Log 586

USGS LOG NUMBER	586
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	730
DATE DRILLED	8/53
DEPTH (ft)	100
WATER LEVEL DEPTH	35-40
DATE	8/21/53
YIELD RATE (gpm)	-----
DRAWDOWN (ft)	-----
TYPE OF PUMP	Jet
DIAMETER OF WELL (in)	6
USE	Sanitary
COMMENT	-----

586



EXPLANATION



SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

USGS WELL 586
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

USGS Graphic Log 588

USGS LOG NUMBER	588
ODNR NUMBER	131373
ALTITUDE (ft AMSL)	720
DATE DRILLED	1/54
DEPTH (ft)	44
WATER LEVEL DEPTH	18
DATE	1/18/54
YIELD RATE (gpm)	-----
DRAWDOWN (ft)	-----
TYPE OF PUMP	Jet
DIAMETER OF WELL (in)	6
USE	Domestic
COMMENT	-----

588

720



10

28

44

EXPLANATION



Sand and gravel



Clay and gravel



Till



Sand



Clay



Shale

SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

USGS WELL 588
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

Y-- 1,515,700
(5000,5000)

-617,300-S

WELL LOG AND DRILLING REPORT

ORIGINA

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Columbus, Ohio

Moraine

No 131373

County Montgomery Township ~~Jefferson~~ Section of Township or Lot Number

Owner Delbert Roberts Address 2867 Cadilac ave

Location of property 2867 Cadilac ave.

CONSTRUCTION DETAILS

Casing diameter 5 5/8 Length of casing 44'

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

PUMPING TEST

Pumping rate G.P.M. Duration of test hr

Drawdown ft. Date

Developed capacity

Static level—depth to water 18 f

Pump installed by

WELL LOG

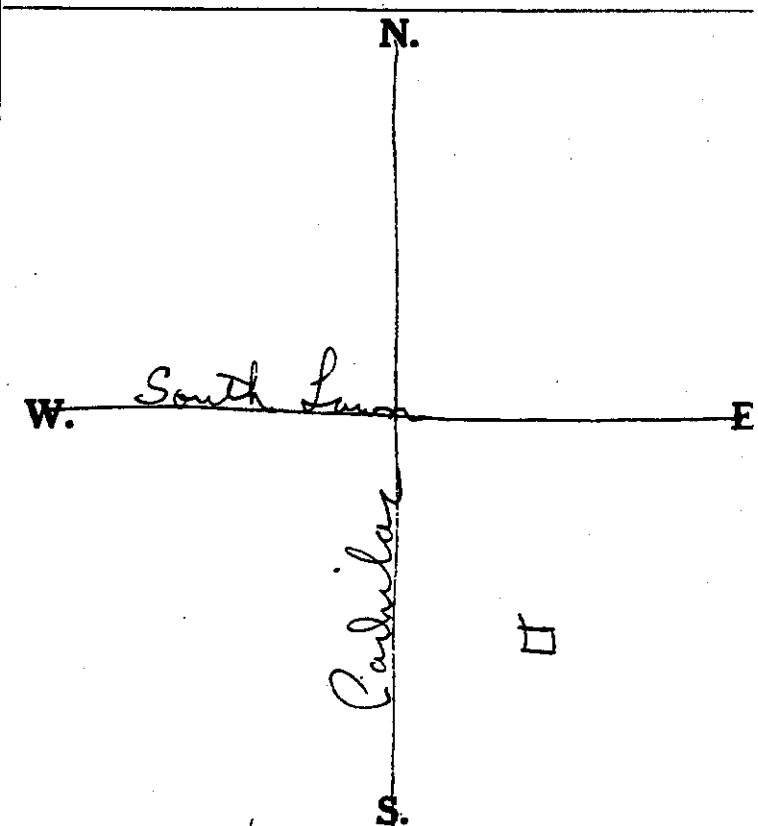
Formations Sandstone, shale, limestone, gravel and clay	From	To
Clay	0 Feet	10 Ft.
Clay & Gravel	10	28
Sand	28	38
Gravel	38	44

Water @ 38

11073.

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm Elbert Hays Date 1/18/54

Address 2203 Gladstone Signed Elbert Hays

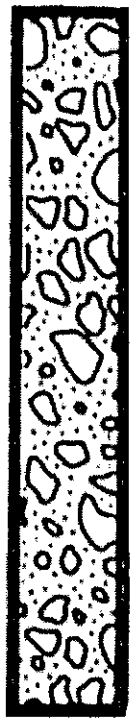
588

USGS Graphic Log 591

USGS LOG NUMBER	591
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	725
DATE DRILLED	3/55
DEPTH (ft)	94
WATER LEVEL DEPTH	31
DATE	3/26/55
YIELD RATE (gpm)	800
DRAWDOWN (ft)	4
TYPE OF PUMP	Turbine
DIAMETER OF WELL (in)	10
USE	Irrigation
COMMENT	-----

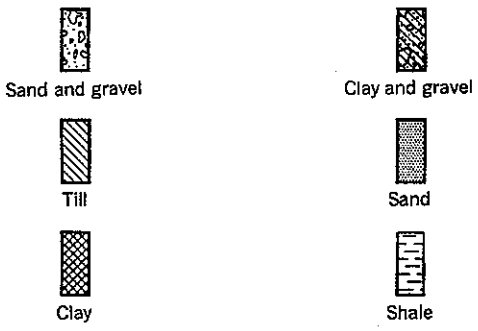
591

725



94

EXPLANATION



SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

USGS WELL 591
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

Section 5

ODNR Log Areas
(A, B and C)

WELL LOG AND DRILLING REPORT

ORIGINAL

A, ✓

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1500 Dublin Road
Columbus, Ohio

No. 190088

County Montgomery Township Moraine Section of Township 17
1242 W, 357.
Owner Tidy Bowl Co. Address Dryden Rd.
Location of property 500 ft South of Kreitzer Rd on Dryden Rd.

CONSTRUCTION DETAILS

Casing diameter 5 5/8 Length of casing 73
Type of screen Length of screen
Type of pump
Capacity of pump
Depth of pump setting
Date of completion

BAILING OR PUMPING TEST

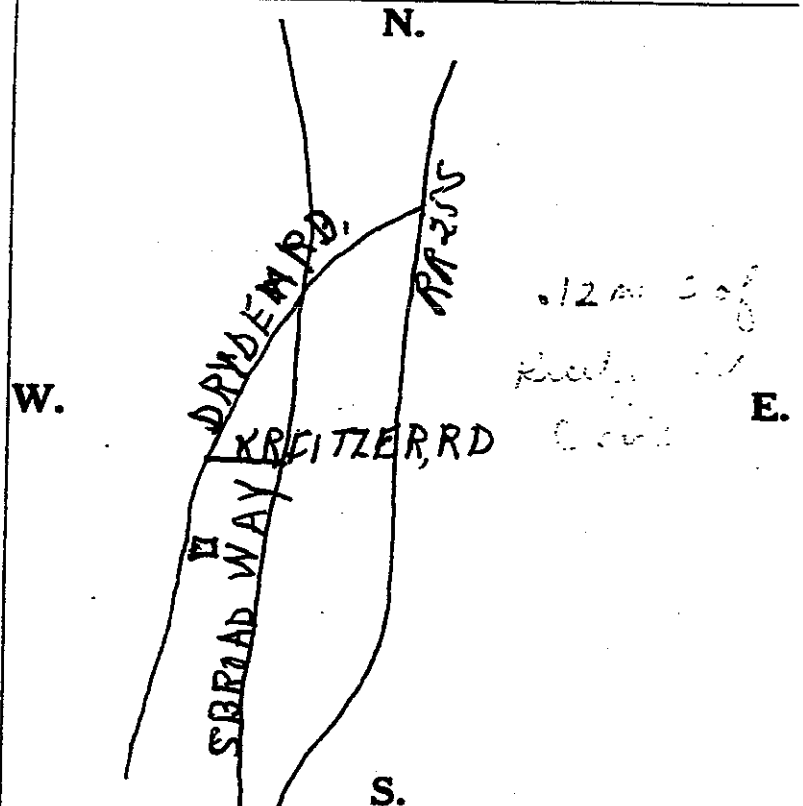
Pumping rate 10 G.P.M. Duration of test 2 hrs.
Drawdown 3 ft. Date June 1
Developed capacity 600 GPH
Static level—depth to water 50 ft.
Pump installed by

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
gravel & Clay.	0 Feet	40 Ft.
Clay.	40	70
	70	73

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm CLAY P. GARRISON
WELL CONTRACTOR
3901 S. DIXIE DR.
DAYTON 9, OHIO

Date June 1 1957

Address

Signed

413

Y-1.5 (5)

1-618 5-5

)-yem machine co-

WELL LOG AND DRILLING REPORT

ORIGINA

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Columbus, Ohio

No 128429

County Montgomery Township Moraine Section of Township or Lot Number

Owner Nellie L Wordrow Address 109 Otterbein Ave

Location of property 2853 North Lawn Rd. Dayton 9. (North Lawn)

CONSTRUCTION DETAILS

Casing diameter ____ Length of casing ____

Type of screen ____ Length of screen ____

Type of pump ____

Capacity of pump ____

Depth of pump setting ____

PUMPING TEST

Pumping rate ____ G.P.M. Duration of test ____ hrs

Drawdown ____ ft. Date ____

Developed capacity ____

Static level—depth to water ____ ft

Pump installed by ____

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
Clay.	0 Feet	6 Ft.
gravel & sand	6	99

14-48"

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.

N.

W. E.

S.

See reverse side for instructions

Drilling Firm A E Lotts & son Date Sept 54

Address 2413 Valley st Signed A E Lotts

-14

WELL LOG AND DRILLING REPORT

ORIGINA

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Columbus, Ohio

No. 136460

County Mont Township Jefferson Section of Township or Lot Number

Owner Lyndal Sutton Address Dayton, Ohio

Location of property 2600 Cadillac Ave.

CONSTRUCTION DETAILS

Casing diameter 5 5/8 Length of casing 50'

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

PUMPING TEST

Pumping rate G.P.M. Duration of test hrs

Drawdown ft. Date

Developed capacity

Static level—depth to water 20' ft

Pump installed by

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
Clay	0 Feet	5 Ft.
Gravel	5	25
Sand	25	48
Gravel	48	50
Water @ 30'		

4073

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.

N.

W. E.

S.

See reverse side for instructions

Drilling Firm Clapp-Hays Date 2/2/54

Address 2900 Hamilton Signed Elbert Clapp

A16

X -1,513,-
(2nd - 3rd)
(-621,303 -S
6)

WELL LOG AND DRILLING REPORT

ORIGINAL

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Columbus, Ohio

No. 136482

County Mont Township Harrison Section of Township or Lot Number

Owner Lloyd Coffman Address 2624 Baldwin Ave

Location of property 2624 Baldwin Ave Dayton 11 Ohio

CONSTRUCTION DETAILS

Casing diameter 5 5/8 Length of casing 46'
Type of screen 5 Length of screen
Type of pump
Capacity of pump
Depth of pump setting

PUMPING TEST

Pumping rate G.P.M. Duration of test hrs
Drawdown ft. Date
Developed capacity
Static level—depth to water 20 ft
Pump installed by

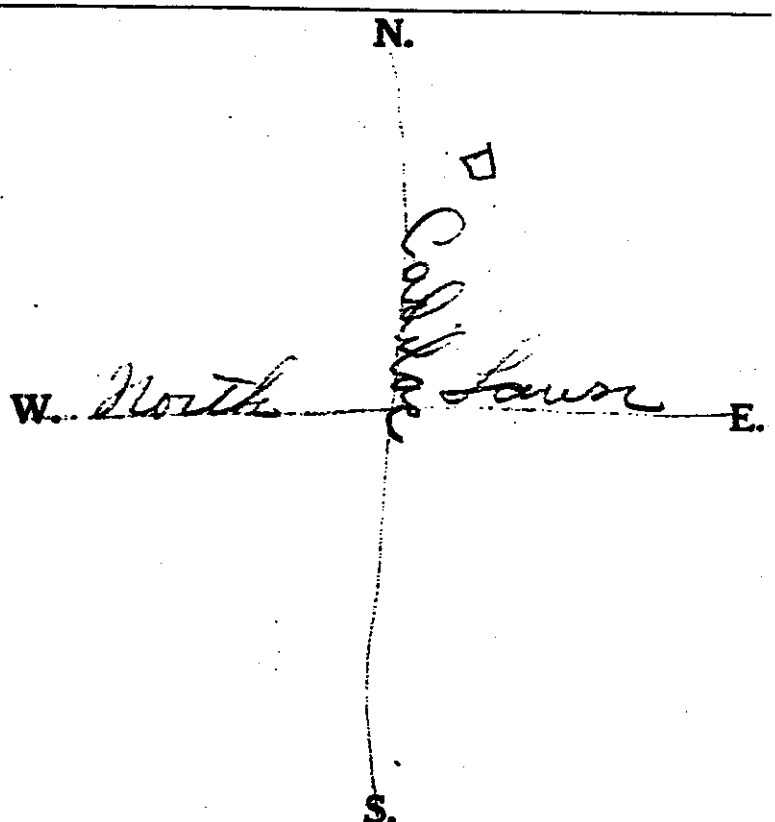
WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
Clay & Gravel	0 Feet	15 Ft.
Gravel	15	30
Clay	30	38
Sand	38	43
Gravel	43	46
Water @ 38		

4073

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm Albert Hoyt Date 8/16/54

Address 2900 Gladstone Ave Signed Albert Hoyt

417

X = 1,513,000
(500,000)
Y = 621,300 ± 2

WELL LOG AND DRILLING REPORT

ORIGIN

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Columbus, Ohio

No 136463

County Monr Township Monroe Section of Township or Lot Number

Owner Adam Carroll Address Dayton 2 Ohio

Location of property 2709 Cadillac

CONSTRUCTION DETAILS

Casing diameter 5 5/8 Length of casing 55'

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

PUMPING TEST

Pumping rate G.P.M. Duration of test hr

Drawdown ft. Date

Developed capacity

Static level—depth to water 20' f

Pump installed by

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
Clay	0 Feet	5 Ft.
Gravel	5	27
Sand	27	50
Gravel	50	55
Water @ 20'		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.

N.

3 houses to the ... Rapids

W. E.

S.

See reverse side for instructions

4073

Drilling Firm Albert Layne

Address 2900 Manchester

Date 2/8/54

Signed Albert Layne

118

WELL LOG AND DRILLING REPORT

ORIGINAL

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Columbus, Ohio

No. 131416

County Montgomery Township Moraine Section of Township or Lot Number 120

Owner William Griffey Address 2855 Cadillac Ave

Location of property 150 Yards West of Dryden RD West Moraine plat

CONSTRUCTION DETAILS

Casing diameter 6" OD Length of casing 46'

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

PUMPING TEST

Pumping rate 20 G.P.M. Duration of test 6 hr

Drawdown • ft. Date June 16, 195

Developed capacity 1000

Static level—depth to water 21 f

Pump installed by

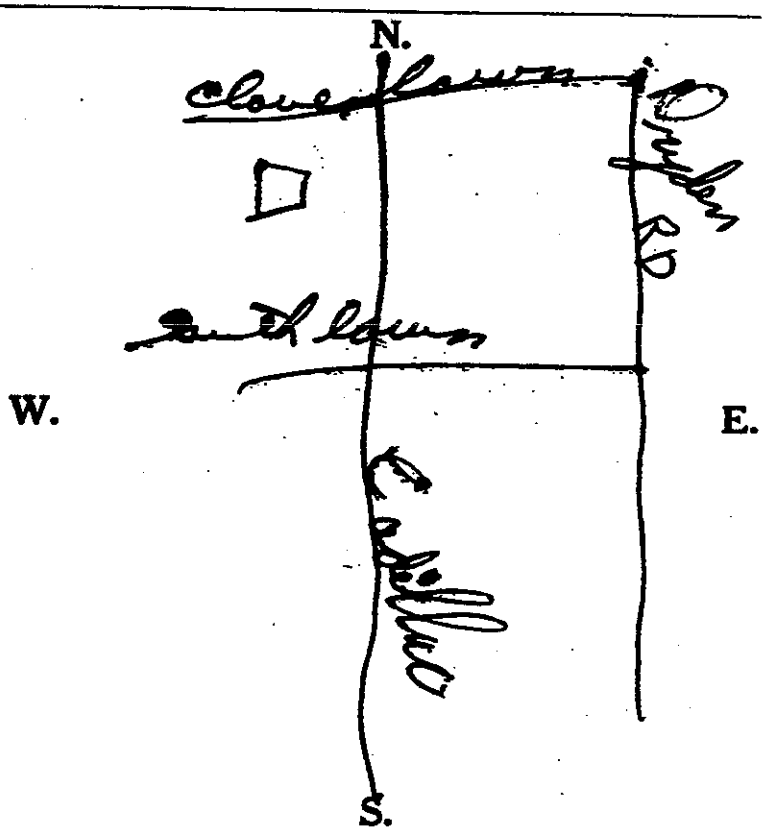
WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
	0 Feet	Ft.
Sand + gravel		40
Clay	40	44
Sand + gravel	44	48
Water at 44 ft		

1389

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm Louis S. Kennedy Co

Address 1462 Cincinnati St Dayton 4, O Rich

Date June 16, 1954

Signed Louis S. Kennedy

4 1,512,000 (6000 ft)

4 - 612,500-5

WELL LOG AND DRILLING REPORT

ORIGINA

4 C

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Columbus, Ohio

No 131330

County Montgomery Township ~~Moraine~~ Moraine Section of Township or Lot Number

Owner Leonard Jarrett Address 2905 Gladstone Ave

Location of property 2905 Gladstone ave (STATE Rt 25) 1 Mile West

CONSTRUCTION DETAILS

Casing diameter 5 5/8 Length of casing 41'

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

PUMPING TEST

Pumping rate G.P.M. Duration of test hr.

Drawdown ft. Date

Developed capacity

Static level—depth to water 20' ft.

Pump installed by

WELL LOG

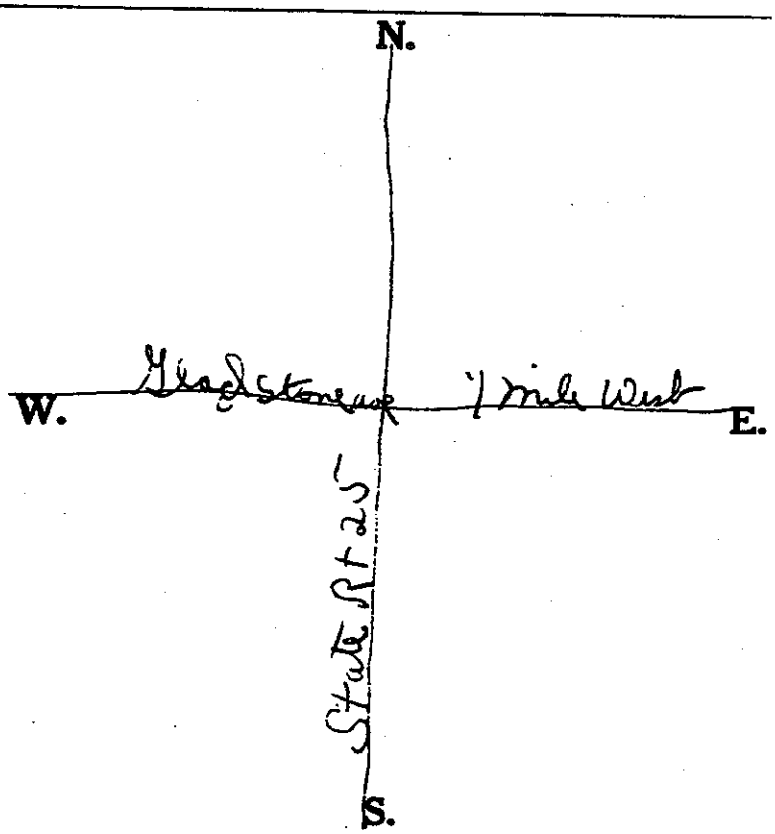
Formations Sandstone, shale, limestone, gravel and clay	From	To
Clay.	0 Feet	5 Ft.
Clay + Gravel.	5	35
Gravel + Sand	35	41

Water at 38'

41073

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm Elbert Hays Date 12/11/53

Address 2900 Gladstone ave Signed Elbert Hays

420

WELL LOG AND DRILLING REPORT

ORIGINA

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Columbus, Ohio

No 146805

County Mont Township Mound Section of Township or Lot Number

Owner James W. Hendricks Address 2837 Gladstone ave Dayton

Location of property 2837 Gladstone ave (

CONSTRUCTION DETAILS

Casing diameter 5 5/8" Length of casing 43'

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

PUMPING TEST

Pumping rate G.P.M. Duration of test hrs

Drawdown ft. Date

Developed capacity

Static level—depth to water 20 ft

Pump installed by

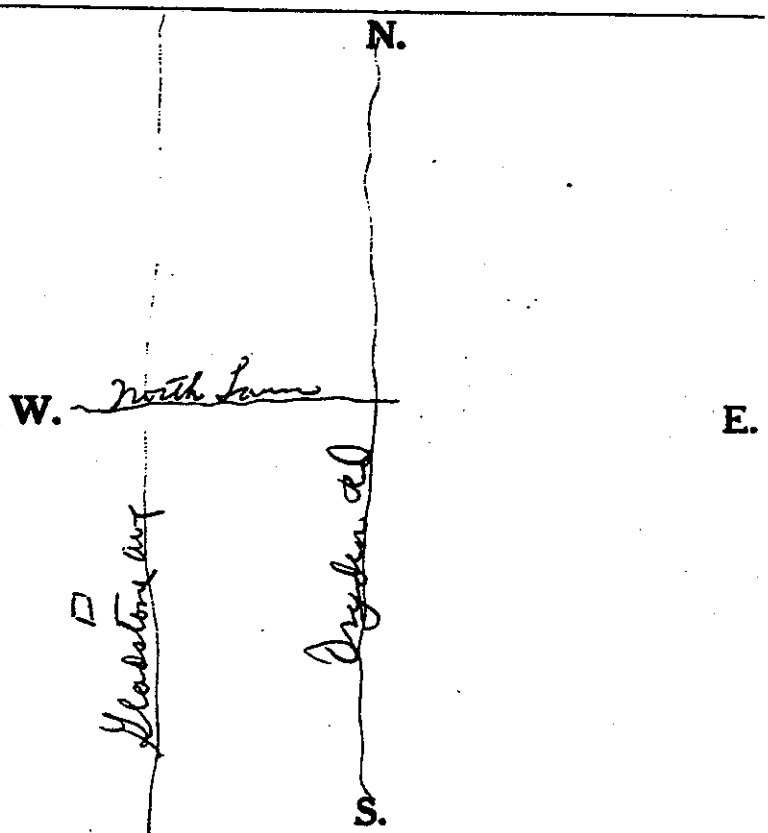
WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
Clay	0 Feet	10 Ft.
Sand & Gravel	10	30
Sand.	30	41
Gravel.	41	43
Water @ 30'		

11073

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm Albert Hays Date 12/55

Address 2900 Gladstone Ave Signed Albert Hays

21

WELL LOG AND DRILLING REPORT

ORIGINAL

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Columbus, Ohio

No 131432

County Montgomery Township Mad River Section of Township or Lot Number West Mad River Plat

Owner Louis E Pennell Address 2713 Gladstone

Location of property 100 yards west of Dryden RD

CONSTRUCTION DETAILS

Casing diameter 6" Length of casing 41'

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

PUMPING TEST

Pumping rate 20 G.P.M. Duration of test 4 hrs.

Drawdown 0 ft. Date 9-11-54

Developed capacity 1000 G.P.H.

Static level—depth to water 22 ft.

Pump installed by

WELL LOG

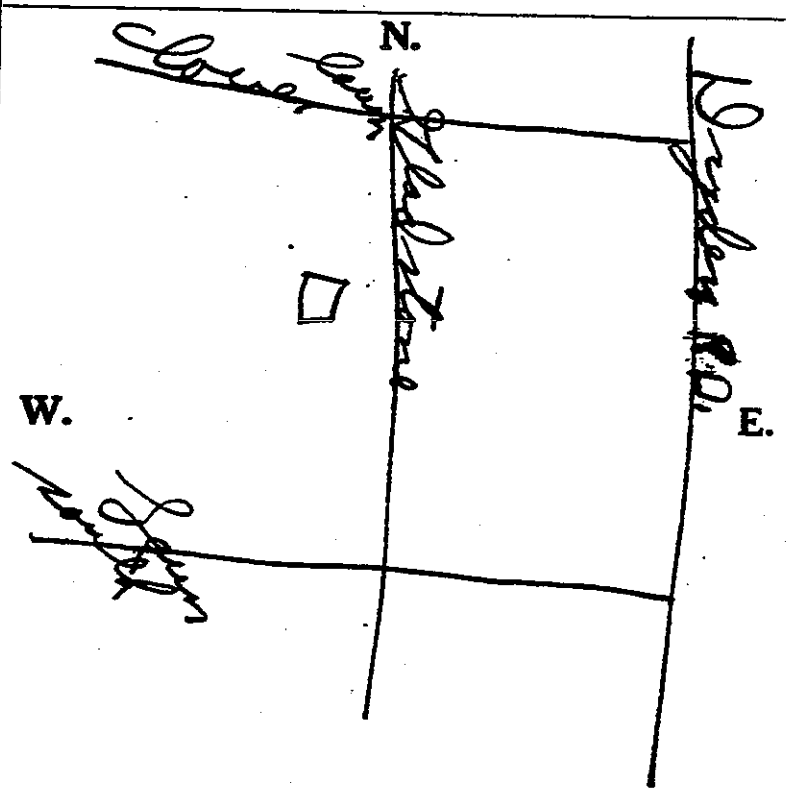
Formations Sandstone, shale, limestone, gravel and clay	From	To
	0 Feet	Ft.
Clay	0	8
Sand & gravel	8	41

Water at 32

1389

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm Louis E Pennell Date 9-11-54

(22) Address 442 Cincinnati St Signed Louis E Pennell

Dayton 8, Ohio

WELL LOG AND DRILLING REPORT

ORIGINAL

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Columbus, Ohio

No. 136478

County Mont Township Mouere Section of Township or Lot Number

Owner George Custer Address 2600 Helena St Dayton

Location of property 2600 Helena Ave Dayton

CONSTRUCTION DETAILS

Casing diameter 5 5/8 Length of casing 45'

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

PUMPING TEST

Pumping rate G.P.M. Duration of test hrs

Drawdown ft. Date

Developed capacity

Static level—depth to water 22' ft

Pump installed by

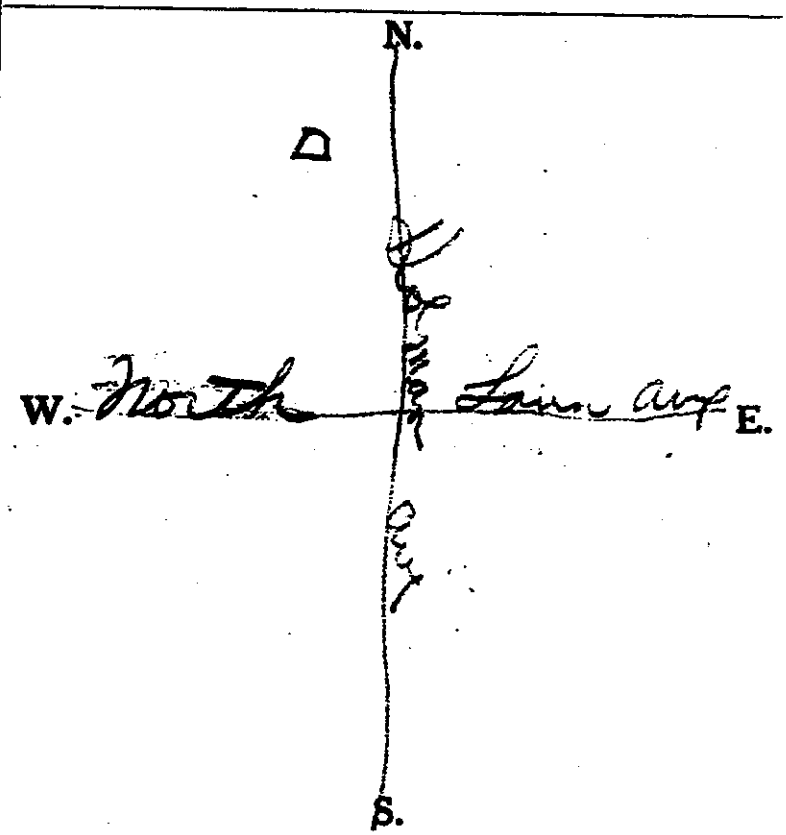
WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
Clay	0 Feet	10 Ft.
Gravel	10	20
Sand	20	30
Clay	30	40
Gravel	40	45
Water @ 40'		

4073

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm Albert Hayes Date 8/18/54

Address 2900 Gladstone Signed Albert Hayes

24

WELL LOG AND DRILLING REPORT

ORIGINAL

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Columbus, Ohio

No. 136480

County Montgomery Township Mound Section of Township or Lot Number

Owner Geo. Cook Address 2624 Holman Ave

Location of property 2624 Holman Ave Dayton Ohio

CONSTRUCTION DETAILS

Casing diameter 5 5/8 Length of casing 53'

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

PUMPING TEST

Pumping rate G.P.M. Duration of test hrs

Drawdown ft. Date

Developed capacity

Static level—depth to water 30' ft

Pump installed by

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
Clay & Gravel	0 Feet	15 Ft.
Gravel	15'	25'
Clay	25'	32
Sand	32	50
Gravel	50	53
Water @ 38		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.

N.

W. North Lawn E.

S.

See reverse side for instructions

U073

Drilling Firm Albert Hayes

Address 2900 Hoobstown

Date 8/2/07

Signed Albert Hayes

25

X-1 513 00
(2000/3000)
621,300-S

WELL LOG AND DRILLING REPORT

ORIGINAL

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Columbus, Ohio

No 146804

County Mont. Township Monroe Section of Township or Lot Number 17

Owner Kenneth Gillispee Address

Location of property 2248 Holman (State Rt 25) 1/2 mile West

CONSTRUCTION DETAILS

Casing diameter 5 5/8 Length of casing 241

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

PUMPING TEST

Pumping rate G.P.M. Duration of test hrs.

Drawdown ft. Date

Developed capacity

Static level—depth to water 23 ft.

Pump installed by

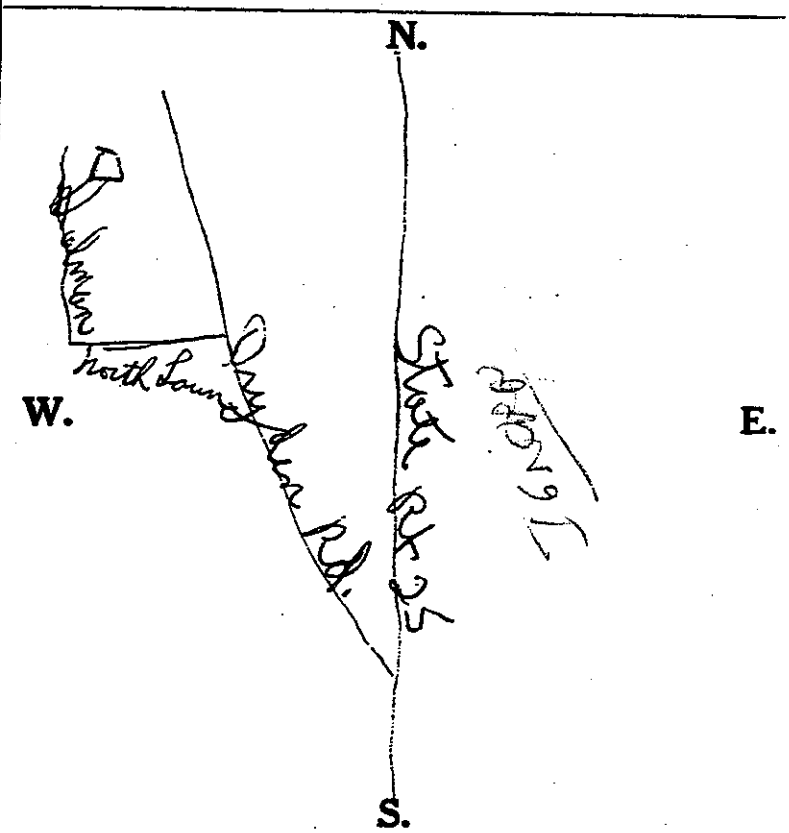
WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
Clay.	0 Feet	10 Ft.
Clay & Gravel	10	35
Sand	35	40
Clay	40	50
Gravel & Clay	50	60
Gravel	60	74
Water @ 50'		

4073

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm Albert Hayes

Address 2902 Gladstone Ave

Date 10/28/54

Signed Albert Hayes A26

726

Y--1,509,600
(2000 x 2000)
Y - 619,600 - S

WELL LOG AND DRILLING REPORT

ORIGINAL

R.C.

State of Ohio
OHIO WATER RESOURCES BOARD
Department of Public Works
553 E. Broad St., Columbus 15, Ohio

No 49172

County Montgomery Township ~~Washington~~ Moraine Section of Township or Lot Number 17

Owner Harley Crutchfield Address 2421 Dayton Rd

Location of property ½ mile east of Dayton Road on Dayton Rd

CONSTRUCTION DETAILS

Casing diameter 6" Length of casing 43
Type of screen Length of screen
Type of pump
Capacity of pump
Depth of pump setting

PUMPING TEST

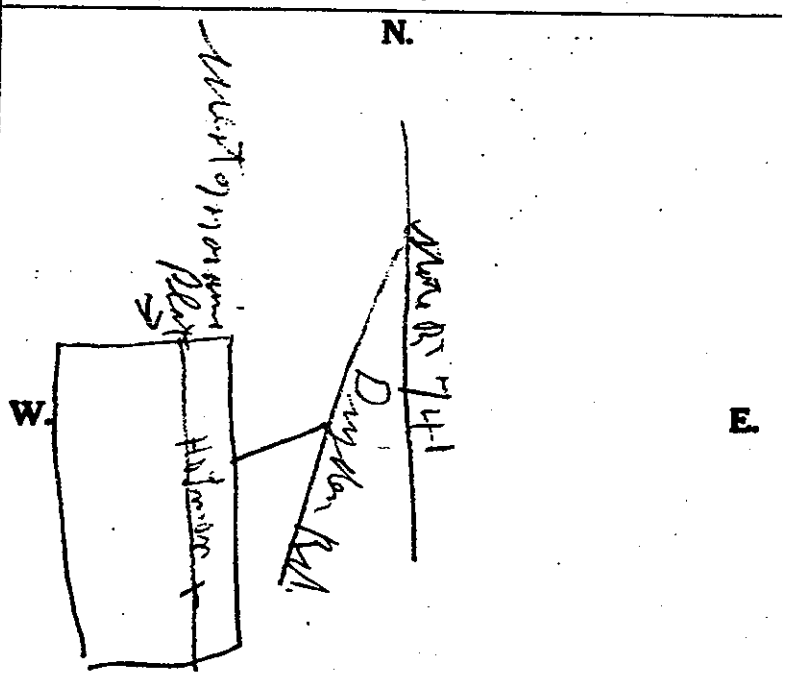
Pumping rate G.P.M. Duration of test hrs.
Drawdown 5 ft. Date
Developed capacity
Static level of completed well 22 ft.
Pump installed by Owner

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
Topsoil	0 Feet	3 Ft.
Gravel	3	37
Water bearing Gravel	37	43

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

1644

Drilling Firm W. V. Scott Date 7-8-54
Address RR #3 Box 219-B Signed W. V. Scott
Dayton Ohio

127

X = 1,507,600
(3000 x 3000)

= 619,600 - S

WELL LOG AND DRILLING REPORT

ORIGINA

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Columbus, Ohio

Group T

No 109421

County Monty Township ~~Harrison~~ Jefferson Section of Township or Lot Number

Owner Arnold Blair Address 2901 Holman

Location of property Same

CONSTRUCTION DETAILS

Casing diameter 4 1/4 Length of casing 56

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

PUMPING TEST

Pumping rate G.P.M. Duration of test hrs

Drawdown ft. Date

Developed capacity

Static level—depth to water ft.

Pump installed by

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
clay	0 Feet	4 Ft.
Sand & Gravel	4	56

1448

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.

N.

W. E.

S.

See reverse side for instructions

Drilling Firm A E Lotts & son Date July 21 / 53

Address 2413 Valley st Dayton 8 Signed A E Lotts

A29

X = 1,517 ft.
(E of W)

-633,700 -S

WELL LOG AND DRILLING REPORT

ORIGINAL

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Columbus, Ohio

No 142763

County Montgomery Township ~~Moraine~~ Section of Township or Lot Number Moraine

Owner South Hills Pit, Inc. Address 2415 S. Dixie, Dayton, Ohio

Location of property Mofaine Twshp. - 1 mile west of Doroty Lane, 1/2 mile north of Betwynn Drive.

CONSTRUCTION DETAILS

Casing diameter 16" Length of casing 76'1"

Type of screen Cook Length of screen 25'

Type of pump Turbine.

Capacity of pump 1500 GPM

Depth of pump setting 65'

PUMPING TEST

Pumping rate 1500 G.P.M. Duration of test ____ hr.

Drawdown ____ ft. Date ____

Developed capacity 1500

Static level—depth to water 22'6" f

Pump installed by Jos. Koehne Sons.

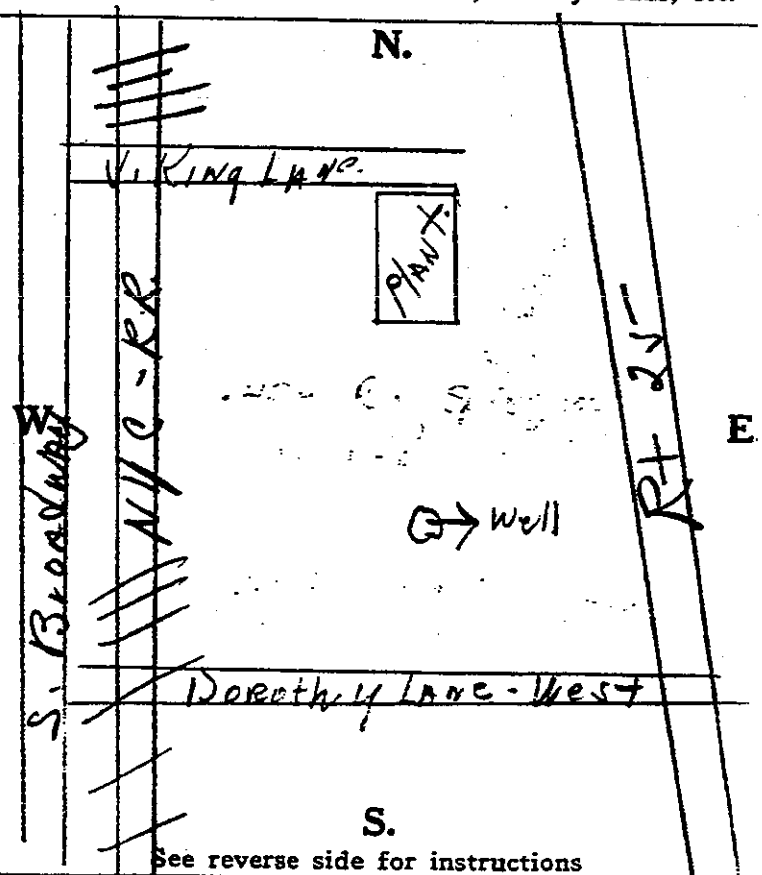
WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
y Gravel	0 Feet	~~28~~ Ft.
S and & Gravel	22	25
Blue Clay & Gravel	25	34
Sand & Gravel	34	66
Hard Pan	66	71
Boulders	71	72
Dead Gravel	72	75
Sand & Gravel	75	91'

1411

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm Jos. Koehne Sons. Date Nov. 3, 1954

Address 1826 Sherman Ave. Norwood, Ohio Signed C R Koehne

A72

A 72

WELL LOG AND DRILLING REPORT

NO CARBON PAPER NECESSARY– SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Fountain Square
Columbus, Ohio 43224

596054

Moraine
~~City of Dayton~~

COUNTY Montgomery TOWNSHIP _____ SECTION OF TOWNSHIP _____

OWNER Mallett Labs Inc ADDRESS 3035 Dryden Rd

LOCATION OF PROPERTY 3035 Dryden Rd Dayton

CONSTRUCTION DETAILS

Casing diameter 6" Length of casing 53'

Type of screen Cook Stainless #80 Length of screen 10

Type of pump Heat pump disposal well

Capacity of pump _____

Depth of pump setting _____

Date of completion _____

BAILING OR PUMPING TEST
(specify one by circling)

Test rate 350 gpm est gpm Duration of test 4 hrs

Drawdown Air compressor ft Date 7/2/81

Static level (depth to water) 31' 3" ft

Quality (clear, cloudy, taste, odor) _____

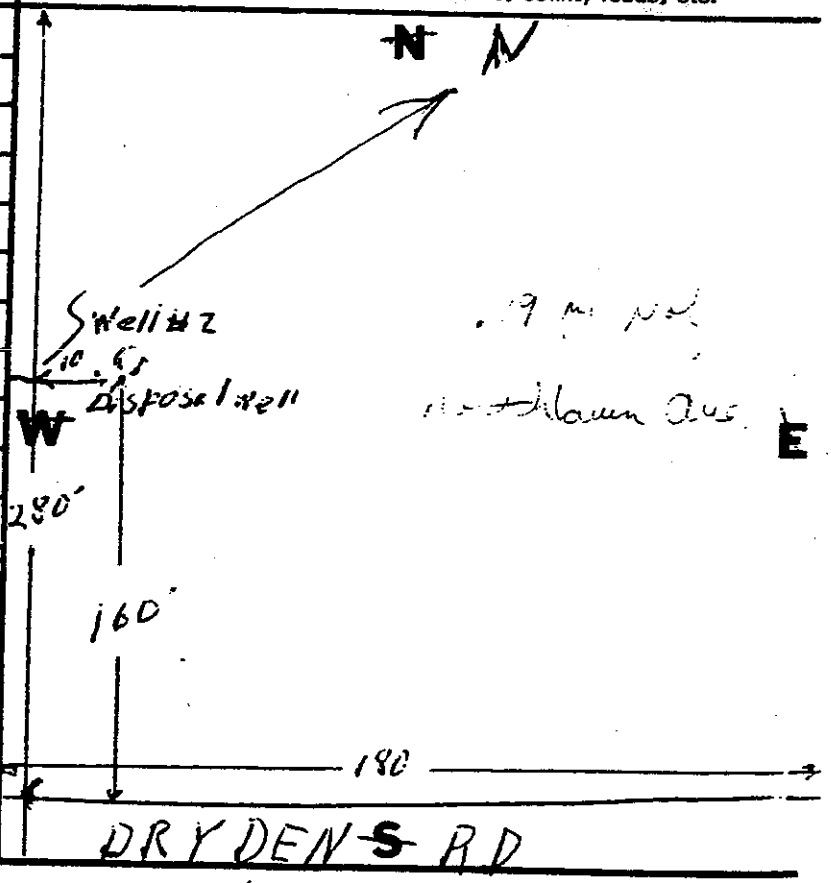
Pump installed by W CRANE

WELL LOG*

Formations: sandstone, shale, limestone, gravel, clay	From	To
Gravel drive	0 ft	1 ft
Yg gravel	1'	10'
Coarse sand & gravel	10'	36'
Gray till	36'	43'
Med to coarse sand & gravel #80	43'	63'
Hard gray clay & gravel	63'	74'
Coarse sand & gravel	74'	80'
17 ft 5" tail pipe from 63' to 80 ft		
5129		

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM Wm Crane DATE 7/20/81

ADDRESS Box 33 Shandon, O SIGNED _____

81 *If additional space is needed to complete well log, use next consecutive numbered form.

ORIGINAL COPY - ODNR, DIVISION OF WATER, FOUNTAIN SQ., COLS., OHIO 43224

WELL LOG AND DRILLING REPORT

ORIGINAL

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Columbus, Ohio

No 101813

County Montgomery Township Madison Section of Township or Lot Number Moraine

Owner Montgomery County Sanitary Dept Address 127 South Perry Street Dayton

Location of property Dryden Road Well Field - Greater Moraine Water System

CONSTRUCTION DETAILS

Casing diameter 18 Length of casing 105
Type of screen Cook WW Length of screen 40
Type of pump Turbine
Capacity of pump 1700 GPM
Depth of pump setting 110 ft

PUMPING TEST

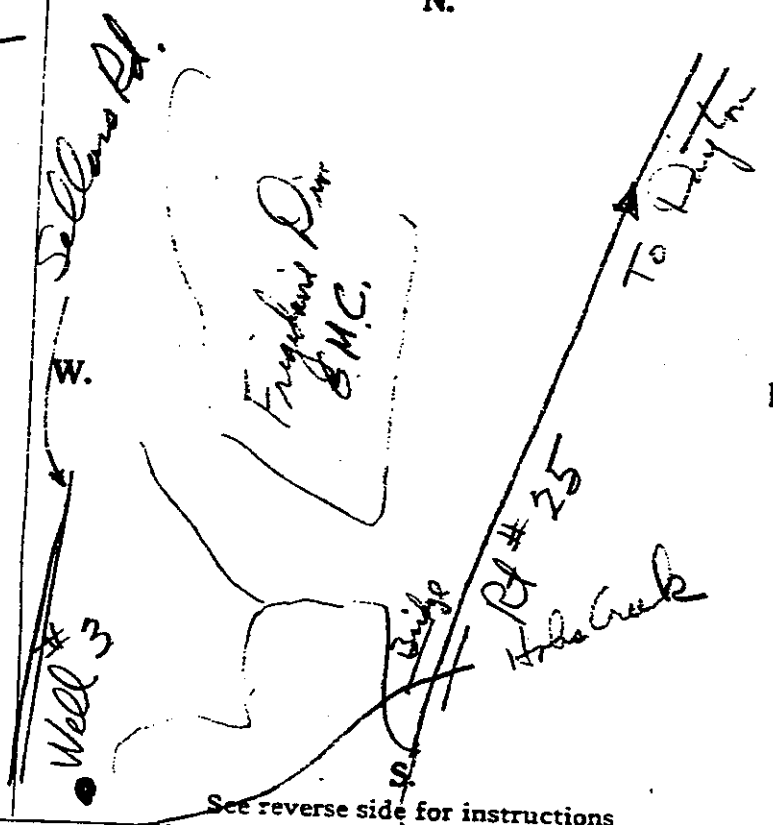
Pumping rate 1900 G.P.M. Duration of test 1 hrs.
Drawdown 23 ft. Date 10/15/57
Developed capacity 1700 GPM
Static level—depth to water 28 ft ft.
Pump installed by ———

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
Top Soil + Clay	0 Feet	6 Ft.
fine + medium gravel with clay lenses	6	95
Medium + Coarse Gravel	95	100
" " "	100	105
" " "	105	110
" " "	110	115
" " "	115	120
" " "	120	130
" " "	130	140
" " "	140	145
Mud	145	150

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm Diehl Pumps & Supply Co. Inc Date March 24, 1958

Address Roselawn Center Bldg. Rm A-6 Signed Edw. B. Wagner

73

1190

WELL LOG AND DRILLING REPORT

ORIGINAL

NO CARBON PAPER NECESSARY— SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
65 S. Front St., Rm. 815 Phone (614) 469-2646
Columbus, Ohio 43215

No. 420704

County Montgomery Township City of Miami Section of Township

Owner Montgomery Co. Sanitary Dept. Address 4221 Siebenthaler Road - Dayton

Location of property

CONSTRUCTION DETAILS

Casing diameter 18" Length of casing 166'
Type of screen R B Length of screen 53
Type of pump G.E. 10 HP 1800 RPM - Turbine
Capacity of pump 850 GPM
Depth of pump setting 159' from Foundation
Date of completion 7-29-71

BAILING OR PUMPING TEST
(Specify one by circling)

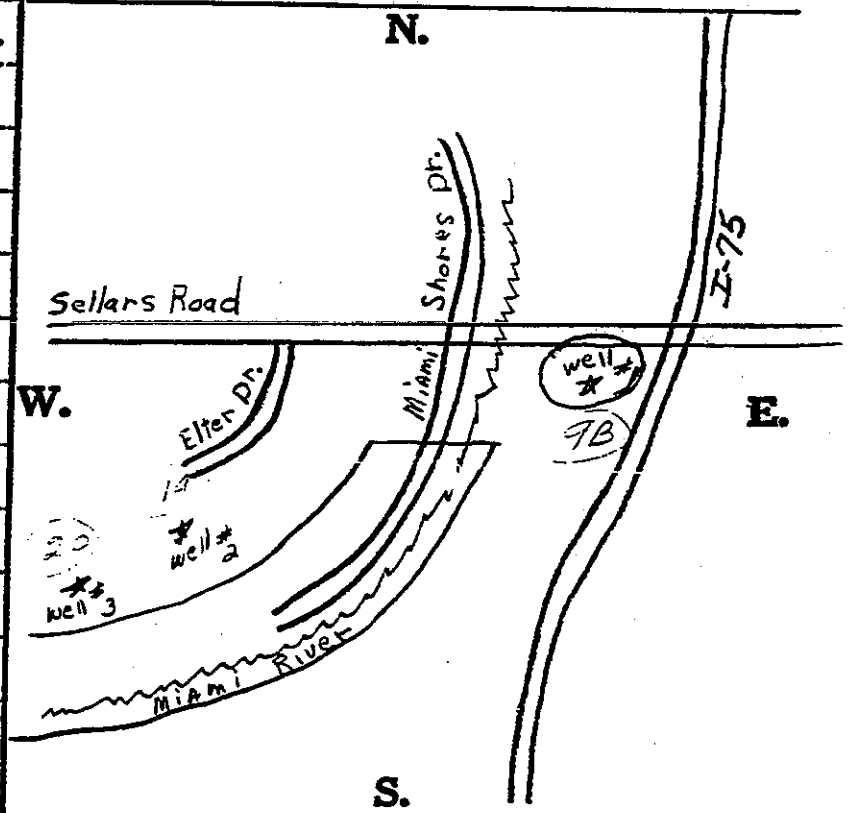
Test Rate 1000 G.P.M. Duration of test 4 hrs.
Drawdown 14'-4½" ft. Date Aug 12-1971
Static level-depth to water approx 60' ft.
Quality (clear, cloudy, taste, odor) clear
Pump installed by Wells Pump & Well Service & Gill Burgess

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
Top Soil	0 Feet	1 Ft.
Clay with sand + gravel	1	14
Sand + gravel, med. Boulders	14	55
Small gravel + coarse sand	55	60
Sm. pea gravel + fine sand	60	112
Coarse + fine sand	112	120
Sm. to med gravel + coarse sand	120	148
Yellow clay	148	159
Boulders + coarse gravel	159	163
Clay - yellow - Lt. + Blue	163	176
Dirty sand + gravel	176	188
Blue shale	188	191
5412		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



Drilling Firm MOODY'S OF DAYTON, INC. Date March 28, 1973
Address P. O. Box 155 Vandalia, Ohio 45377 Area Code 513 898-3969 Signed V.C. Caspers Jr.

B80

*If additional space is needed to complete well log, use next consecutive numbered form

WEL LOG AND DRILLING RE RT

ORIGINAL

NO CARBON PAPER NECESSARY- SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Fountain Square
Columbus, Ohio 43224

525223

COUNTY Montgomery TOWNSHIP Miami (City Moraine) SECTION OF TOWNSHIP

OWNER Mid-States Development Co ADDRESS 3265 Dryden Road

LOCATION OF PROPERTY North And Northeast Corner Of Existing Bldg 3265 Dryden Rd Off I - 75 Moraine Industrial Center

CONSTRUCTION DETAILS

Casing diameter 6" Length of casing 62

Type of screen PVC Length of screen 10

Type of pump

Capacity of pump

Depth of pump setting

Date of completion 5 - 24 - 79

(BAILING OR PUMPING TEST)
(specify one by circling)

Test rate 20 gpm Duration of test 4 hrs

Drawdown 10 ft Date 5 - 24 - 79

Static level (depth to water) 46 ft

Quality (clear, cloudy, taste, odor) Clear

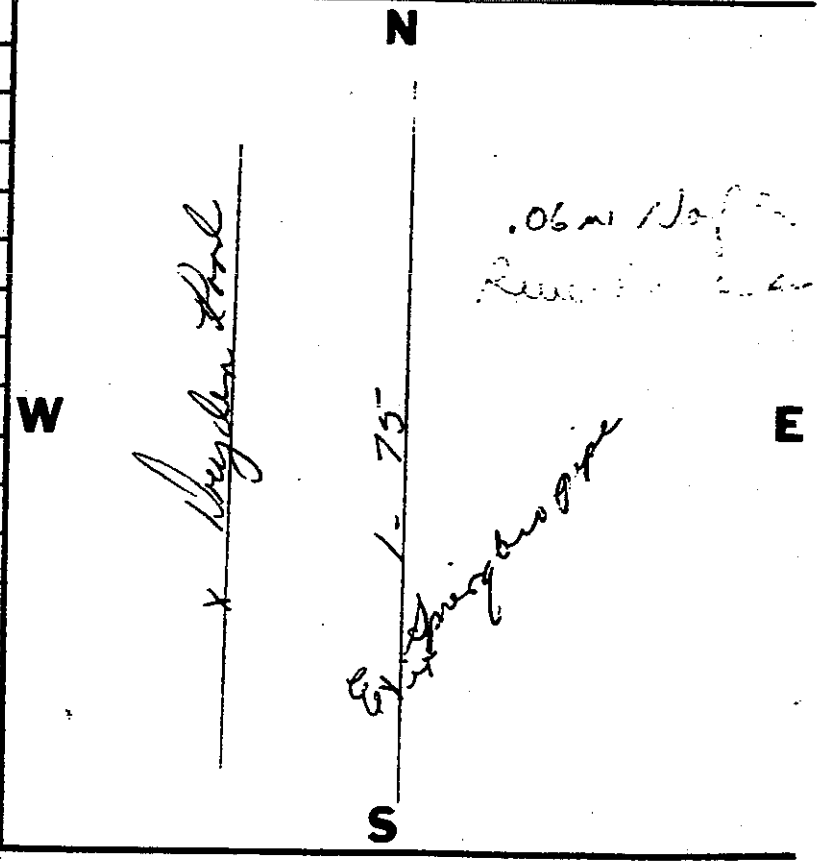
Pump installed by Test Pumps Used By EPA For Sample Testing

WELL LOG*

Formations: sandstone, shale, limestone, gravel, clay	From	To
Soil	0 ft	1-6" ft
Dry Gravel	1-6"	48
Water Gravel	48	54
Hard Pan	54	62
Water Gravel	62	84-5"
74 Ft 4" Non Toxic PVC - Sch. 40 Pipe		
Well Screen 10 Ft PVC		
Well Casing Pulled Back 22 Ft - Above		
Hard Pan Formation - Cemented At This		
Depth And Filled To Ground Level		
5513 *		

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM Scott Well Drilling Company DATE 5 - 24, 1979

ADDRESS 5859 Brantford Road, Dayton 45414 SIGNED Wm. O. Lee Scott

C12

*If additional

Y-1,515,300
(5000 ...
X 6[illegible]

WELL LOG AND DRILLING REPORT

ORIGINAL

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Columbus, Ohio

No 109470

County Montgomery Township ~~Madison~~ Moraine Section of Township or Lot Number 16 West Moraine Plat

Owner George Murphy Address 3012 Roylake Drive Dayton 9, Ohio

Location of property West Moraine Plat Dayton 9, Ohio

CONSTRUCTION DETAILS

Casing diameter 4" Length of casing 47

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

PUMPING TEST

Pumping rate G.P.M. Duration of test hrs

Drawdown ft. Date

Developed capacity

Static level—depth to water 30 ft.

Pump installed by

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
Clay and Gravel	0 Feet	30 Ft.
Gravel, Water	30	47

Dip test at approx. 10 G.P.M.

UC64

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.

N.

W. E.

S.

See reverse side for instructions

Drilling Firm EARL HOLLANDSWORTH Well Drilling

Address 2538 Ome Avenue - North Ridge DAYTON, OHIO

Date October 31 1953

Signed Earl Hollandsworth

253

Y = 1,515,300
(5000 - 5000)

1 - 618,000 - S

WELL LOG AND DRILLING REPORT

ORIGIN.

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Columbus, Ohio

Nº 109480

County Montgomery Township ~~Mad~~ Van Buren Section of Township or Lot Number West Moraine Plat

Owner OMER MYNHIER Address 2928 Hoylake Ct. Dayton 9, Ohio

Location of property Hoylake Ct. West Moraine Plat Dayton 9, Ohio

CONSTRUCTION DETAILS

Casing diameter 4¼" Length of casing 50'

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

PUMPING TEST

Pumping rate G.P.M. Duration of test hrs

Drawdown ft. Date

Developed capacity

Static level—depth to water 29' ft

Pump installed by

WELL LOG

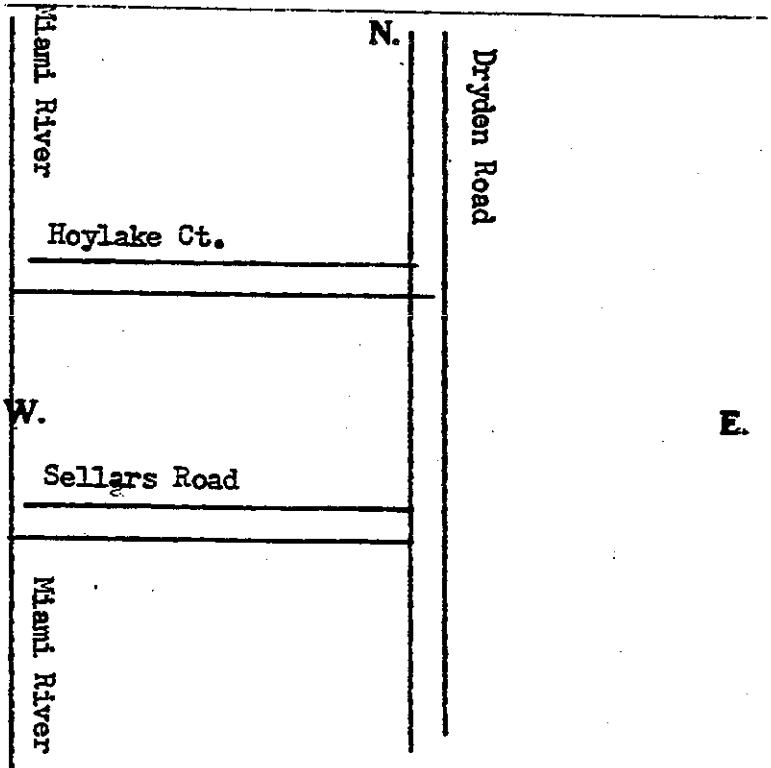
Formations Sandstone, shale, limestone, gravel and clay	From	To
Clay and Gravel	0 Feet	18 Ft
Gravel, Dry	18	29
Water Gravel and Sand	29	50

Dip test at approx.
8 G.P.M.

4064.

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways. St. Intersections, County roads, etc.



See reverse side for instructions

EARL HOLLANDSWORTH
Drilling Firm ~~Well Drilling~~

Address 2538 Ome Avenue - North Ridge
DAYTON, OHIO

Date January 3 1954

Signed Earl Hollandsworth

254

WELL LOG AND DRILLING REPORT

ORIGINAL

PLEASE USE PENCIL OR TYPEWRITER
DO NOT USE INK.

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus, Ohio 43212

No. 374378

County Montgomery Township Moraine Section of Township

Owner Six Industries Address 626 Railroad St.

Location of property Frigidaire Warehouse

CONSTRUCTION DETAILS

Casing diameter 5 5/8 Length of casing 80
Type of screen Length of screen
Type of pump submersible
Capacity of pump 10 G.P.M.
Depth of pump setting 70
Date of completion 7/11/69

BAILING OR PUMPING TEST

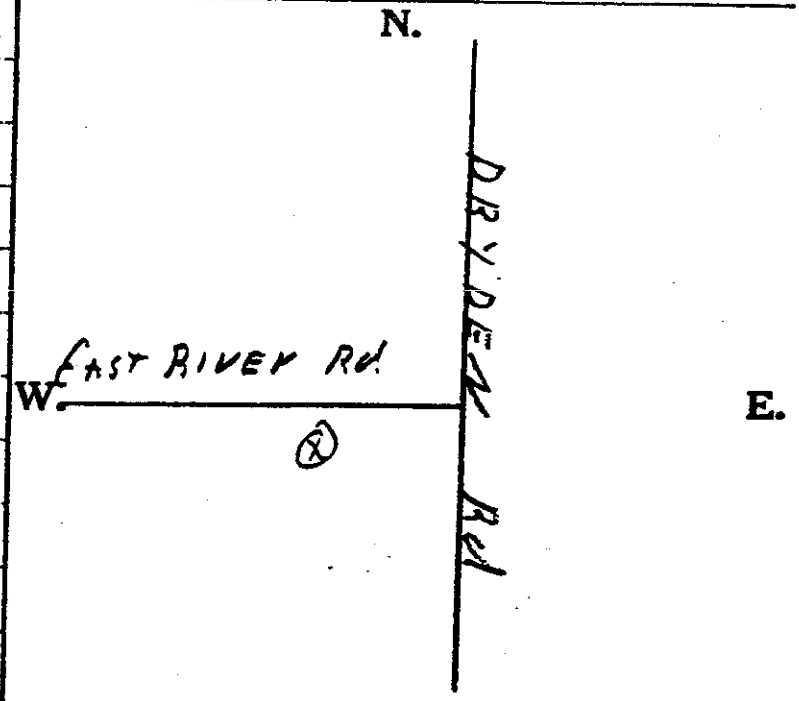
Pumping Rate 20 G.P.M. Duration of test hrs.
Drawdown 9 ft. Date 7/11/69
Static level-depth to water 34 ft.
Quality (clear, cloudy, taste, odor) clear
Pump installed by Scott Well & Pump Co.

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
top soil	0 Feet	3 Ft.
dry gravel	3	32
water sand & gravel	32	57
hardpan	57	61
water sand & gravel	61	80
1644		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm Scott Well & Pump Co. Date 7/11/69

Address 5859 Brantford Rd. Signed

C59

*If additional space is needed to complete well log, use next consecutive numbered form.

WELL LOG AND DRILLING REPORT

ORIGINAL

PLEASE USE PENCIL OR TYPEWRITER
DO NOT USE INK.

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus, Ohio 43212

No. 351614

County Montgomery Township Van Buren Section of Township

Owner Taft Broadcasting WLW-D Address Dayton, Ohio

Location of property 4595 So. Dixie highway.

CONSTRUCTION DETAILS

Casing diameter 10" Length of casing

Type of screen Johnson Length of screen 10'

Type of pump D.W. Turbine

Capacity of pump 200 G.P.M.

Depth of pump setting 100'

Date of completion

BAILING OR PUMPING TEST

Pumping Rate 230 G.P.M. Duration of test 8 hrs.

Drawdown 11'6" ft. Date May 1967

Static level-depth to water 60' ft.

Quality (clear, cloudy, taste, odor) Clear

Pump installed by

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
Clay & gravel-Dr.	0 Feet	24 Ft.
" " Clay	24	53
Sand & gravel	53	64
Clay & gravel	64	86
Sand & gravel	86	95
Clay & gravel	95	101
Sand & gravel	101	153
5026		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.

N.

W. E.

S.

See reverse side for instructions

Drilling Firm G. M. Baker & Son Date 10/16/67

Address Columbus Ohio Signed W. H. Boger

C-75

*If additional space is needed to complete well log, use next consecutive numbered form

ARCADIS

Section 6

Montgomery County Logs

MT 68
MT 69
MT 576
MT 596
M 1
M 2
M 3
M 4
M 5
M 6
M 7
M 8
M 10
M 11
M 12

Miami Shores Well Field

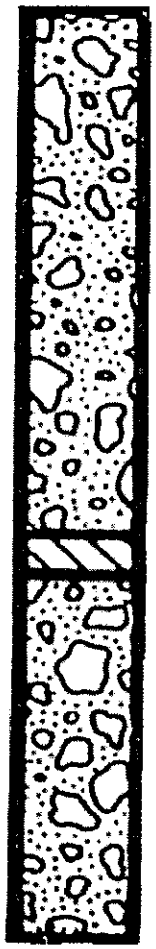
14
15
16
17
18
19
20
21-Well Construction Details Only
22-Well Construction Details Only

Montgomery County Log MT 68

USGS WELL	M-9
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	743.55
DATE DRILLED	3/54
DEPTH (ft)	135
WATER LEVEL DEPTH	51
DATE	-----
YIELD RATE (gpm)	40
DRAWDOWN (ft)	0.5
TYPE OF PUMP	-----
DIAMETER OF WELL (in)	6
USE	Observation
COMMENT	Lamme Rd

ESTIMATED GROUND
SURFACE ELEVATION (ft AMSL) 747.5

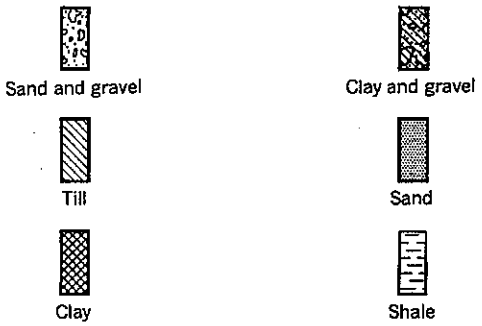
M-9



77
81

135

EXPLANATION



SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

MUNICIPAL WELL MT68
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

The Miami Conservancy District
Water Conservation Subdistrict

STATION DESCRIPTION
GROUND WATER OBSERVATION WELL

MT-68

Location: Lat. 39°41'26"~~3~~, Long. 84°12'~~52~~49", in Sec. 10, City of Moraine, Montgomery County, Ohio. 160 feet northwest and 20 feet north of fence at west side of Montgomery County Sanitary Department Maintenance Building on Lamme Road, Dayton South Quad. State Plane Coordinates: X: 1,517,600 Y: 620,200 Zone: S

History: Drilled by Don Roe Add. Vandalia 54-03-27 for observation of ground water levels at Lamme Road well field. Equipped with Stevens Type E recorder log on reverse. Serviced by Montgomery County personnel. The Miami Conservancy District made on-site tape downs to water surface from 11-28-61 to [illegible] at which time the Type E recorder was removed. (Montgomery County Owner)

Description: Drilled observation well, 5 and 5/8-inch diameter casing, length 135 feet. Aquifer 0-2 feet, top soil 2-8 feet, dirty gravel 8-13 feet, brown till 13-20 feet, dirty gravel 20-30 feet, gravel 30-39 feet, dirty gravel 39-50 feet, gravel 50-65 feet, sand and gravel 65-77 feet, gravel 77-81 feet, yellow till 81-95 feet, gravel 95-105 feet, sand and gravel 105-115 feet, gravel.

Measuring point is floor of instrument shelter. The following are referred to elevation above sea level:

Bottom of Well	611.48
Land Surface	743.68
Top of Casing	~~746.48~~ 746.44
Measuring Point	746.54
Land Surface Correction	~~2.91~~ -2.86

Gage: Stevens Type F water level recorder, Serial No. 9653, gage height scale 1:5, time scale 0.3 inches per day, 32 day battery driven clock, and beaded cable. Installed and serviced by The Miami Conservancy District at time of removal of Stevens Type E recorder.

Remarks:

Prepared By: M. S. Brown 1-5-76
Checked By: _____

Revised By: _____

MT68

9-185
(October 1950)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

M-9

OBSERVATION WELL

WELL SCHEDULE

Date 1-31, 19 57 Field No. M-11

Record by ____ Office No. ____

Source of data ____

1: *Location:* State Ohio County Mont

Map ____

____ ¼ ____ ¼ sec. ____ T ____ N S R ____ E W

2. *Owner:* Montgomery County Address Mason City Well Field

Tenant ____ Address ____

Driller Don Rob Address ____

3. *Topography* 743.55 (M.P. 746.55)

4. *Elevation* 745 ft. above / below

5. *Type:* Dug, drilled, driven, bored, jetted 3-27 19 54

6. *Depth:* Rept. 135 ft. Meas. ____ ft.

7. *Casing:* Diam. 6 in., to ____ in., Type ____

Depth 135 ft., Finish ____

8. *Chief Aquifer* Sand & Gravel From ____ ft. to 135 ft.

Others ____

9. *Water level* 51 ft. rept. meas. ____ 19 ____ above / below ____

____ which is ____ ft. above / below surface

10. *Pump:* Type ____ Capacity ____ G. M. ____

Power: Kind ____ Horsepower ____

11. *Yield:* Flow ____ G. M., Pump 40 G. M., Meas., Rept. Est. ____

Drawdown 11½ ft. after ½ hours pumping 40 G. M.

12. *Use:* Dom., Stock, PS., RR., Ind., Irr., (Obs.)

Adequacy, permanence ____

13. *Quality* ____ Temp ____ °F.

Taste, odor, color ____ Sample Yes / No ____

Unfit for ____

14. *Remarks:* (Log, Analyses, etc.) H-2 Formerly RR

____

____

U. S. GOVERNMENT PRINTING OFFICE 16—62501-1

GROUNDWATER 2000
Groundwater Well Station Description Form

Well Location Information:

Owner	MT CO
Well Address	
County	Montgomery
Township	Moraine
City	Moraine
USGS Quadrant	Dayton South
Coordinates:	
Northing	620200
Easting	1517600
Based On	

Well ID/Construction Information:

ODNR #	
Name	MT68
Owner Well ID	
Installation Date	3/27/54
Aquifer Type	
Well Depth (ft.)	135.00
Period of Record:	
Water Levels	11/28/61 - 11/12/92
Water Quality	
Number of Records:	
Water Levels	2732
Water Quality	

Remarks:

History: Don Roe of Vandalia, Ohio drilled the well on March 23, 1954 for observation of ground water levels at the Lamme Road wellfield. The well was equipped with a continuous reading water level recorder that was serviced by Montgomery County personnel until i

Directions: The well is located 160 feet northwest, and 20 feet north of the fence at the west side of the Montgomery County Sanitary Department Maintenance Building on Lamme Road, Moraine, Ohio.

Click below for:

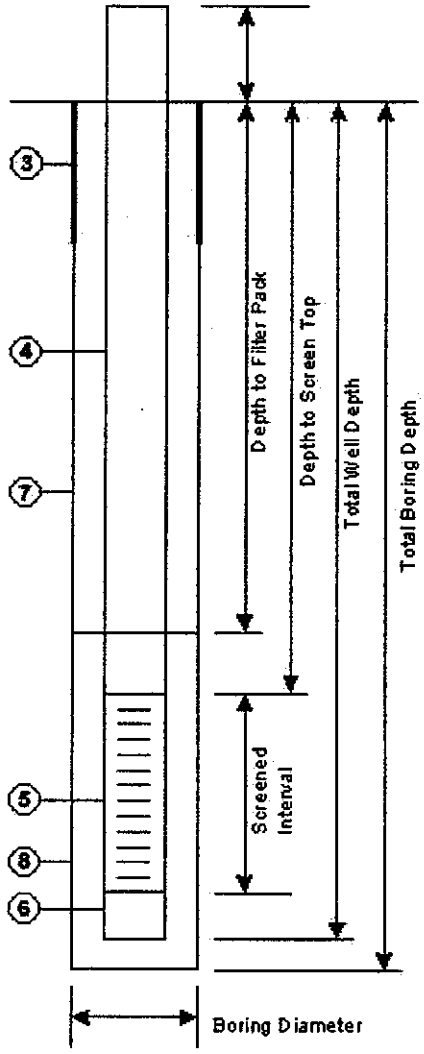
Map Of Site
ODNR Well Log
Well Construction Report and Diagram
Water Level Snapshot
Water Quality Snapshot

Questions? Comments?

Groundwater 2000 Well Construction Report

ODNR Well Log No.
MCD Well ID MT68
Owner Well ID

Well Type	Monitoring
Well Status	Unknown
Drilling Method	Other
Installation Date	3/27/54
1) Reference Point Elevation (ft.)	745.54
Elevation Based On	NGVD29
2) Elevation of Ground Surface (ft.)	743.68
3) # of Telescoping Casings	Unknown
4) Well Casing	
Material	Steel
Diameter (in.)	5 5/8
5) Well Screen	
Materials	Unknown
Slot Type	Unknown
Slot Size (in.)	Unknown
6) Blank Casing	Unknown
7) Grout/Well Seal	
Grout Type	Unknown
Well Seal	Unknown
8) Screen Filter Material	Unknown
9) Wellhead Description	
Type	Above Ground, Concrete Pad Unknown
Lockable?	Unknown
10) Development	Unknown
11) Pumping Test	40 GPM



Depth to Filter Pack (ft.)	Unknown
Depth to Screen Top (ft.)	Unknown
Total Well Depth (ft.)	135.00
Total Boring Depth (ft.)	134.20
Screened Interval (ft.)	Unknown
Boring Diameter (in.)	Unknown

12) Comments

Continuous Stevens recorder in place 11/61 through 7/78

Reference Point Description

The reference point (RP) is the floor of the instrument shelter. The coordinates of the well were estimated by plotting the well location on the Dayton South, Ohio 7.5-minute USGS quadrangle map.

Montgomery County Log MT 69

Fitzpatrick, Nicholas

From: Gillotti, Nancy [NGILLOTT@gmgw.com]
Sent: Tuesday, March 16, 1999 12:57 PM
Fitzpatrick, Nicholas
Subject: Well Information for MT-69

I found some information on MT-69 from a 1996 report. It states that MT-69 was set at approximately 158 feet below ground surface (bgs) in 1973. Till was encountered at approximately 148 bgs. The 18-inch diameter well was constructed of steel and has a 53-foot long well screen. The top of the screen was set at approximately 105 feet bgs. During Phase II of the RFI (1994), the bottom of the well was measured at only 129 feet below the top of the steel casing, which indicates that the lower portion of the well screen may have collapsed.

Nancy Gillotti
ARCADIS Geraghty & Miller
614-764-2310

GROUNDWATER 2000
Groundwater Well Station Description Form

Well Location Information:

Owner	MT CO
Well Address	
County	Montgomery
Township	Moraine
City	Moraine
USGS Quadrant	Dayton South
Coordinates:	
Northing	617650
Easting	1513500
Based On	

Well ID/Construction Information:

ODNR #	420704
Name	MT69
Owner Well ID	
Installation Date	Unknown
Aquifer Type	
Well Depth (ft.)	157.60
Period of Record:	
Water Levels	7/21/72 - 8/3/93
Water Quality	
Number of Records:	
Water Levels	1611
Water Quality	

Remarks:

History: Layne Ohio Company (date) drilled the well for observation of water levels in the Montgomery County well field at the confluence of Holes Creek and The Great Miami River. The Miami Conservancy District obtained permission to install and maintain a contin

Directions: The well is located 275 feet north of St. Rt. 25, 175 feet east of Interstate 75, 80 feet south of the left bank of Holes Creek, and 400 feet above the confluence of Holes Creek and The Great Miami River.

Click below for:

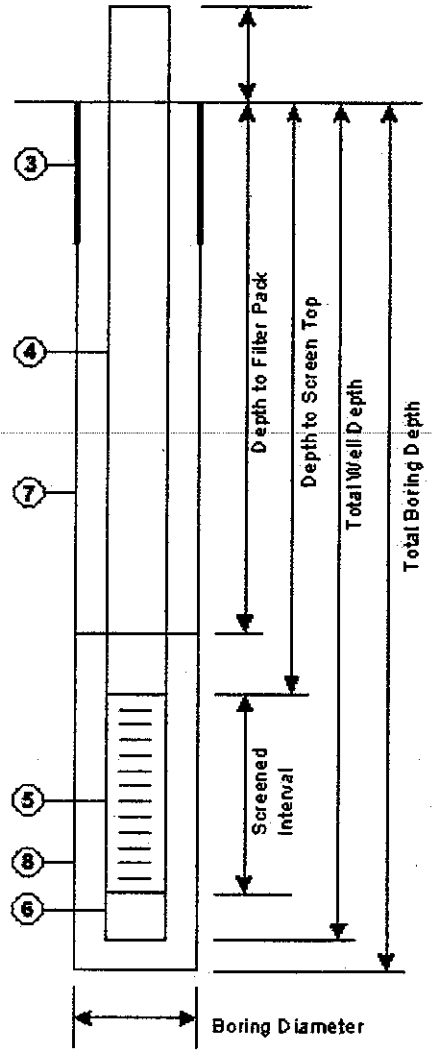
Map Of Site
ODNR Well Log
Well Construction Report and Diagram
Water Level Snapshot
Water Quality Snapshot

Questions? Comments?

Groundwater 2000 Well Construction Report

ODNR Well Log No. 420704
MCD Well ID MT69
Owner Well ID

Well Type	Monitoring
Well Status	Unknown
Drilling Method	Unknown
Installation Date	Unknown
1) Reference Point Elevation (ft.)	722.94
Elevation Based On	Unknown
2) Elevation of Ground Surface (ft.)	719.84
3) # of Telescoping Casings	Unknown
4) Well Casing	
Material	Steel
Diameter (in.)	8.0
5) Well Screen	
Materials	Unknown
Slot Type	Unknown
Slot Size (in.)	Unknown
6) Blank Casing	Unknown
7) Grout/Well Seal	
Grout Type	Unknown
Well Seal	Unknown
8) Screen Filter Material	Unknown
9) Wellhead Description	
Type	Above Ground, Concrete Pad Unknown
Lockable?	Unknown
10) Development	Unknown
11) Pumping Test	Unknown



Depth to Filter Pack (ft.)	Unknown
Depth to Screen Top (ft.)	Unknown
Total Well Depth (ft.)	157.60
Total Boring Depth (ft.)	157.60
Screened Interval (ft.)	Unknown
Boring Diameter (in.)	Unknown

12) Comments

Conintuous Stevens recorder was in place from 7/72 through 7/78.

Reference Point Description

The reference point (RP) is the floor of the instrument shelter. The coordinates of the well were estimated by plotting the well location on the Dayton South, Ohio 7.5-minute USGS quadrangle map.

Montgomery County Log MT 576

USGS WELL	576
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	750
DATE DRILLED	11/55
DEPTH (ft)	90
WATER LEVEL DEPTH	60
DATE	11/18/55
YIELD RATE (gpm)	6
DRAWDOWN (ft)	-----
TYPE OF PUMP	Jet
DIAMETER OF WELL (in)	6
USE	Sanitary
COMMENT	-----

576

750



80

90

EXPLANATION



Sand and gravel



Clay and gravel



Till



Sand



Clay



Shale

SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

MUNICIPAL WELL MT576
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

THE MIAMI CONSERVANCY DISTRICT

COMPUTATION SHEET

SUBJECT GROUNDWATER DATA / STATION OF 930909

KOCOLENE - (Abandoned)

PAGE 1

STATION ~~ACC~~ NO.

Q ~~WAR~~ FILE DAYTON SOUTH

AIR ~~DATE~~ PHOTO

COMPUTED BY _____ DATE _____ CHECKED BY _____

Well No. MT 576 County MONTGOMERY ~~Township~~ CITY OF KETTERING Section 11 R6,T1

River Mile _____ Tributary _____ Subarea _____ River Basin _____

Lat 39°41'52" Long 84°12'31" State Coord. Zone S: x 1,519,270 y 622,880

Location: 3751 S. DIXIE HWY - 132' NW. OF ROAD - 354' S.W. OF HOYLE PL. - 60' N. OF STATION BLDG - W. OF STORAGE BLDG @ N.W. EDGE OF PROPERTY

Elevation of MP 751.53± Elev. Land Surface 750± contour Land Surface Corr. -1.53'

MP TOP OF CASING

WELL:

Total Depth 113.69 ft Depth Cased ___ ft Drilling Method ___ ft Bedrock Depth ___ ft

Casing Type STEEL Diameter 5 5/8" Screen _____

Pump Intake Setting _____ Gravel Pack _____

Pump Capacity _____ Pump Type _____ Hp _____

Date Drilled _____ By: _____

Owner: KOCOLENE SERVICE STATION 3751 S. DIXIE HIGHWAY (NORTH BOUND)

AQUIFER CHARACTERISTICS:

Material _____ Origin _____

Permeability _____ gpd/ft^2 Special Cap. _____ Storage Coeff. _____

REMARKS: _____

Date	Time	Tape	Water Level Cut	Depth, B.M.P. ft.			Sea L. Elev. ft.	Depth from ft.	Depth to ft.		Well Log Description
5/25/72	1500	118.53	-4.00 +0.69	115.22	-1.53	113.69					BOTTOM OF WELL
		93.00	-5.93	87.47							WATER SURFACE
891206	1517	56.00	-12.75	43.25			708.28				" " Punched 12-5-89
900315	1627	54.00	-11.36	42.64			708.89				" " Punched 3-28-9
900615	1628	43.00	-2.23	40.77			710.76				" " Punched 6-22-9
900914	1614	54.00	-12.64	41.36			710.17				" " Punched 9-28-9
901115	1507	43.00	-1.16	41.84			709.69				" " Punched 11-16-90
910307	1530	42.00	-1.99	40.01			711.52				" " Punched 3-7-91
910613	1559	42.00	-1.69	40.31			711.22				" " Punched 6-14-9
910919	1413	45.00	-1.82	43.18			708.35				" " Punched 9-19-91
911111	1331	44.00	+.13	44.13			707.40				" " Punched 12-17-91
920312	1527	48.00	-2.65	45.35			706.18				" " Punched 4-2-92
920630	1352	47.00	-2.36	44.64			706.89 7/15				" " Punched 7-13-92
921021	1350	45.00	-1.65	43.35			708.18				" " Punched 10-9-92
921212	1732	58.00	-13.89	44.11			707.42				" " Punched 1-12-93
930909	1106	49.00	-5.26	43.74			707.79				" "

GROUNDWATER 2000
Groundwater Well Station Description Form

Well Location Information:		Well ID/Construction Information:	
Owner	not available	**ODNR #**	
Well Address		**Name**	MT576
County	Montgomery	**Owner Well ID**	
Township		**Installation Date**	
City	Kettering	**Aquifer Type**	
USGS Quadrant	Dayton South	**Well Depth (ft.)**	113.69
Coordinates:		**Period of Record:**	
Northing	622880	**Water Levels**	12/6/89 - 11/12/92
Easting	1519270	**Water Quality**	
Based On		**Number of Records:**	
		Water Levels	13
		Water Quality	

Remarks:

History: Kocolene Station was abandoned 9/9/93

Directions: 132' NW of Dixie Hwy., 354' SW of Hoyle Pl., 60' N of station bldg., W of storage bldg., NW edge of property.

Click below for:

Map Of Site
ODNR Well Log
Well Construction Report and Diagram
Water Level Snapshot
Water Quality Snapshot

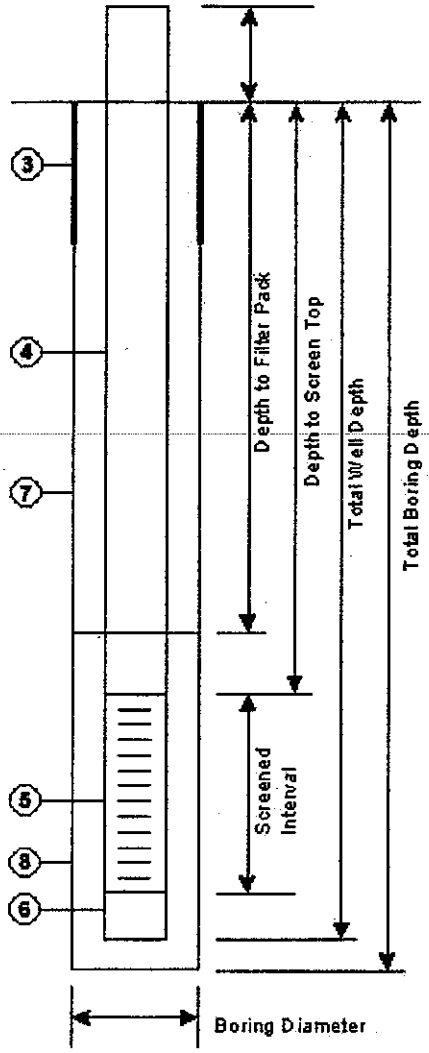
Questions? Comments?

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Groundwater 2000 Well Construction Report

ODNR Well Log No.
MCD Well ID MT576
Owner Well ID

Well Type	Other
Well Status	Abandoned
Drilling Method	Unknown
Installation Date	
1) Reference Point Elevation (ft.)	751.53
Elevation Based On	Unknown
2) Elevation of Ground Surface (ft.)	750
3) # of Telescoping Casings	Unknown
4) Well Casing	
Material	Steel
Diameter (in.)	5 5/8
5) Well Screen	
Materials	Unknown
Slot Type	Unknown
Slot Size (in.)	Unknown
6) Blank Casing	Unknown
7) Grout/Well Seal	
Grout Type	Unknown
Well Seal	Unknown
8) Screen Filter Material	Unknown
9) Wellhead Description	
Type	Above Ground, Concrete Pad
	Unknown
Lockable?	Unknown
10) Development	Unknown
11) Pumping Test	Unknown



Depth to Filter Pack (ft.)	Unknown
Depth to Screen Top (ft.)	Unknown
Total Well Depth (ft.)	113.69
Total Boring Depth (ft.)	113.69
Screened Interval (ft.)	Unknown
Boring Diameter (in.)	Unknown

12) Comments

Reference Point Description

The reference point (RP) is the top of the well casing. The coordinates of the well were estimated by plotting the well location on the Dayton South, Ohio 7.5-minute USGS quadrangle map.

Montgomery County Log MT 596

COMPUTATION SHEET

SUBJECT GROUNDWATER DATA

~~S. DAYTON MOTEL~~ RELAX INN

PAGE 1

STATION ACC. NO.

QWATI FILE DAYTON SOUTH

AIR PHOTO DATE

COMPUTED BY RJW DATE 3-29-90 CHECKED BY

Well No. MT 596 County MONTGOMERY ~~Township~~ CITY OF MORAINE Section 11 R6 T1

River Mile n=A Tributary Subarea River Basin Gr. Miami

Lat 39°42'03" Long 84°12'29" State Coord. Zone S: x 1,520,050 y 623,900

Location: 3333 NORTH BOUND LANE OF S. DIXIE DR. - 200' NE. OF ROAD - 380' SW. OF BIG HILL RD. - AT THE S.W. CORNER OF BUILDING HOUSING OFFICE.

Elevation of MP 760.21 759.25± Elev. Land Surface 759.18 contour 759± Land Surface Corr. -1.03' -0.25

MP TOP OF CAP ON CASING

WELL:

Total Depth 89.38 ~~89.4~~ ft Depth Cased ft Drilling Method ft Bedrock Depth ft

Casing Type STEEL Diameter 5 3/8 Screen

Pump Intake Setting Gravel Pack

Pump Capacity Pump Type NONE Hp

Date Drilled By:

Owner:

AQUIFER CHARACTERISTICS:

Material Origin

Permeability gpd/ft² Special Cap. Storage Coeff.

REMARKS: PUMP HAS BEEN PULLED - COULD NOT GET ANY WATER

LAND SURFACE BUILT UP AFTER FIRE.

WELL CASING EXTENDED .96' AFTER 1988 FIRE

Date	Time	Tape	Water Level Cut	Depth, B.M.P. ft.	LSC		Sea L. Elev. ft.	Depth from ft.	Depth to ft.		Well Log Description
5/22/12	1350	92.74	-4.00 +0.71	89.45	-.25	89.20	669.80				BOTTOM OF WELL
		92.00	4.00	88.00			671.25				WATER SURFACE
3/15/90	1643	60.00	-13.06	46.94			713.27			"	" PUMP PULLED 3-29-90 RJW
4/5/90	1120	48.00	-1.43	46.57			713.64			"	" Punched
6/15/90	1632	49.00	-4.19	44.81			715.40			"	" 6-22-90 RJW
900914	1621	56.00	-10.72	45.28			714.93			"	" Punched 9-28-90 RJW
901115	1512	48.00	-2.18	45.82			714.39			"	" Punched 11-16-90 RJW
910307	1535	46.00	-2.04	43.96			716.25			"	" Punched 3-7-91 RJW
910613	1604	47.00	-3.07	43.93			716.28			"	" Punched 6-19-91 RJW
910919	1417	48.00	-2.16	45.84			714.37			"	" Punched 10-4-91 RJW
911111	1335	49.00	-1.07	47.93			712.28			"	" Punched 12-17-91 RJW
920312	1533	51.00	-1.87	49.13			711.08			"	" Punched 4-2-92 RJW
920630	1359	51.00	-2.41	48.59			711.62			"	" Punched 7-13-92 RJW
921	1354	49.00	-1.80	47.20			713.01			"	" Punched 10-9-92 RJW
921112	1738	50.00	-2.07	47.93			712.28			"	" Punched 1-12-93 RJW
930909	1044	51.00	-3.62	47.38			712.83			"	"

WELL LOG AND DRILLING REPORT

ORIGINAL

PLEASE USE PENCIL OR TYPEWRITER DO NOT USE INK.

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus 12, Ohio

Moraine

No 310674

County Montgomery Township Kettering C. Van Buren Section of Township 3333 S Dixie Hwy

Owner South Dayton Motel Address 3333 S. Dixie Hwy.

Location of property 3333 S. Dixie Hwy. Dayton 0

CONSTRUCTION DETAILS

Casing diameter 5 5/8 Length of casing 85

Type of screen ..... Length of screen .....

Type of pump .....

Capacity of pump .....

Depth of pump setting .....

Date of completion .....

BAILING OR PUMPING TEST

Pumping Rate 40 G.P.M. Duration of test 1 hrs.

Drawdown ~~25~~ ft. Date May 18 64

Static level-depth to water 60 ft.

Quality (clear, cloudy, taste, odor) .....

Pump installed by .....

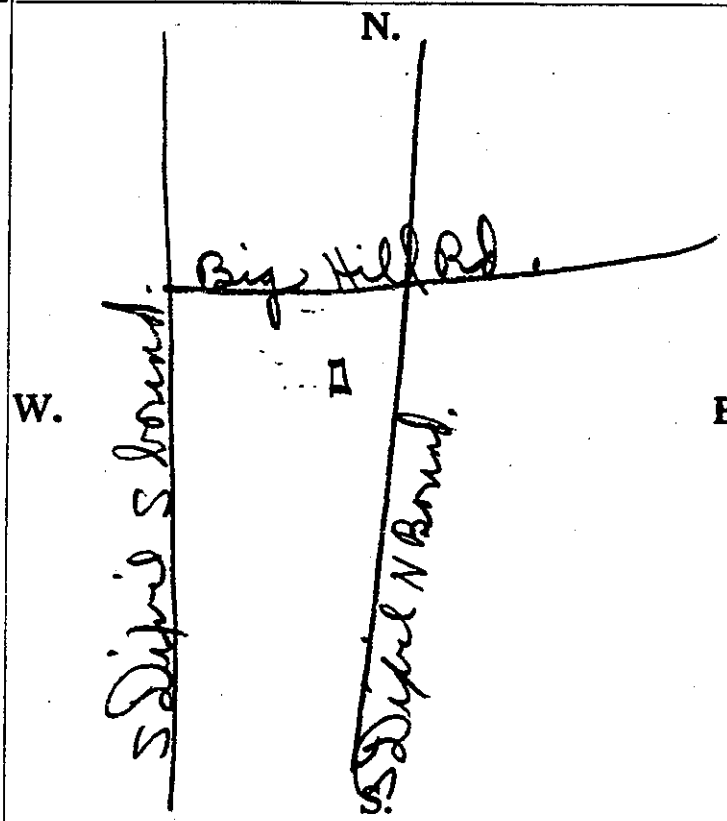
WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
Clay	0 Feet	5 Ft.
gravel.	5	20
Clay	20	28
gravel.	28	60
Clay	60	64
gravel.	64	90

1251

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm CLAY P. GARRISON Date May 25 1964

Address WELL CONTRACTOR 3901 S. DIXIE DR. DAYTON 9, OHIO Signed Clay P. Garrison

HT 596

76

71

GROUNDWATER 2000
Groundwater Well Station Description Form

Well Location Information:		Well ID/Construction Information:	
Owner	not available	**ODNR #**	
Well Address		**Name**	MT596
County	Montgomery	**Owner Well ID**	
Township		**Installation Date**	Unknown
City	Moraine	**Aquifer Type**	
USGS Quadrant	Dayton South	**Well Depth (ft.)**	89.38
Coordinates:		**Period of Record:**	
Northing	623900	**Water Levels**	3/15/90 - 11/12/92
Easting	1520050	**Water Quality**	
Based On		**Number of Records:**	
		Water Levels	13
		Water Quality	

Remarks: Land surface was built up after a fire in 1988.

History:

Directions: 200' NE of S. Dixie Dr., 380' SW of Big Hill Rd., at SW corner of building housing office.

Click below for:

Map Of Site
ODNR Well Log
Well Construction Report and Diagram
Water Level Snapshot
Water Quality Snapshot

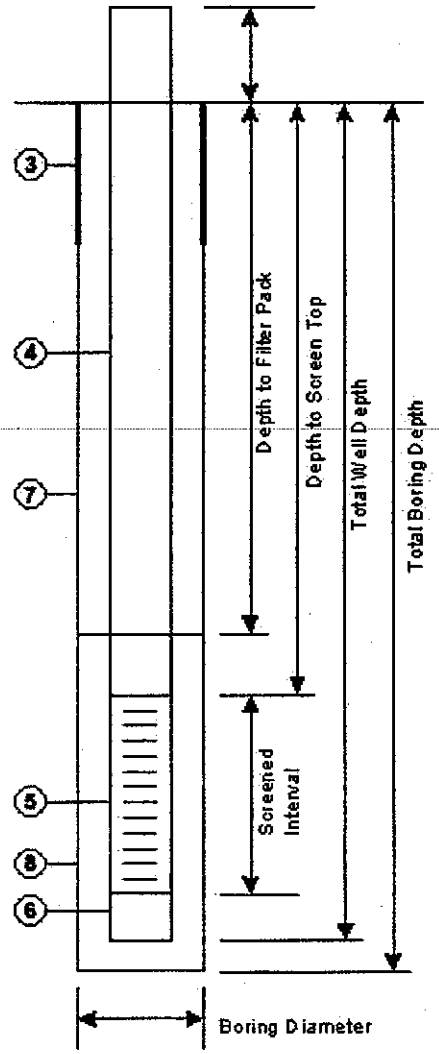
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Groundwater 2000 Well Construction Report

ODNR Well Log No.
MCD Well ID MT596
Owner Well ID

Well Type	Other
Well Status	Unknown
Drilling Method	Unknown
Installation Date	Unknown
1) Reference Point Elevation (ft.)	760.21
Elevation Based On	Unknown
2) Elevation of Ground Surface (ft.)	759.18
3) # of Telescoping Casings	Unknown
4) Well Casing	
Material	Steel
Diameter (in.)	5/58
5) Well Screen	
Materials	Unknown
Slot Type	Unknown
Slot Size (in.)	Unknown
6) Blank Casing	Unknown
7) Grout/Well Seal	
Grout Type	Unknown
Well Seal	Unknown
8) Screen Filter Material	Unknown
9) Wellhead Description	
Type	Above Ground, Concrete Pad Unknown
Lockable?	Unknown
10) Development	Unknown
11) Pumping Test	Unknown



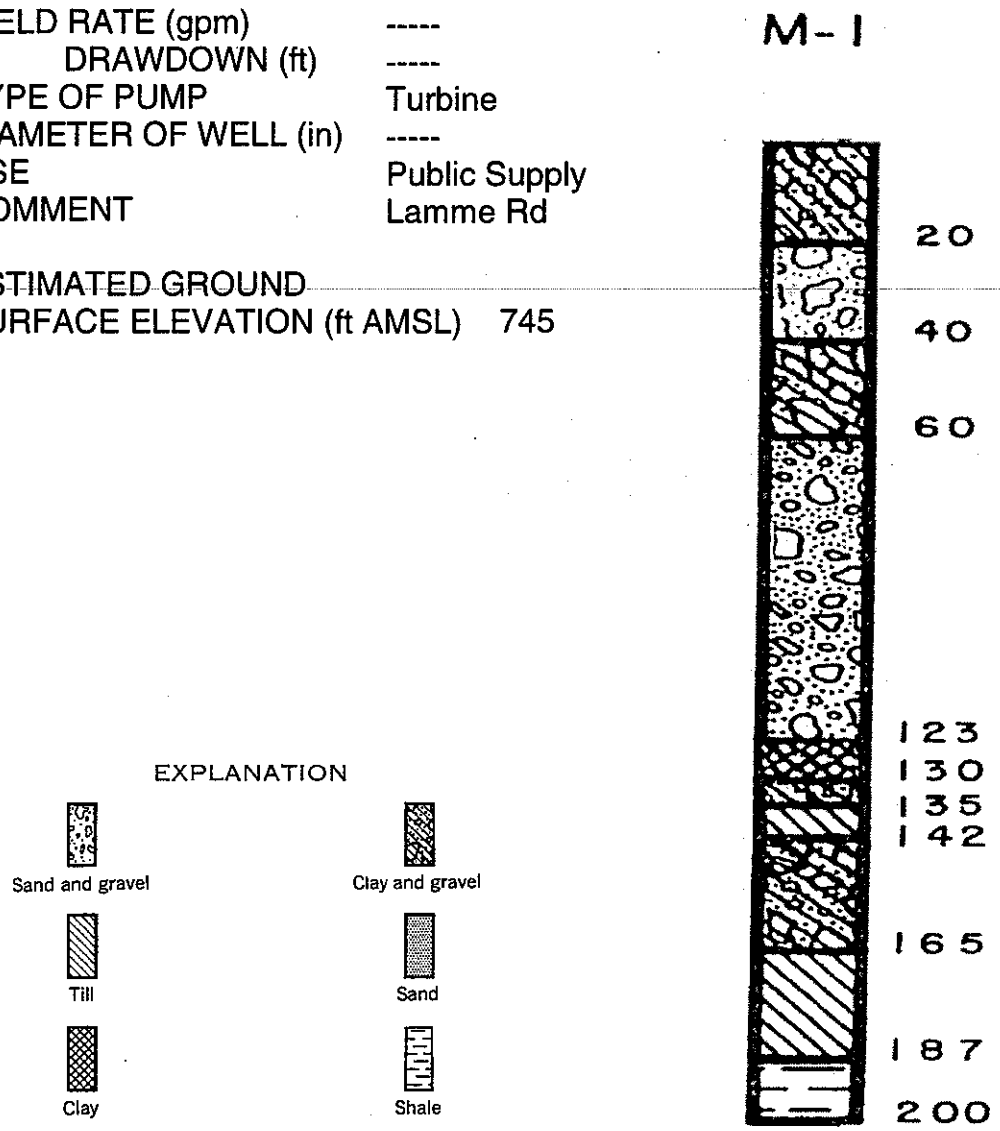
Depth to Filter Pack (ft.)	Unknown
Depth to Screen Top (ft.)	Unknown
Total Well Depth (ft.)	89.38
Total Boring Depth (ft.)	89.38
Screened Interval (ft.)	Unknown
Boring Diameter (in.)	Unknown

12) Comments
Pump was pulled when unable to draw water

Reference Point Description
The reference point (RP) is the top of the cap on the well casing. The coordinates of the well were estimated by plotting the well location on the Dayton South, Ohio 7.5-minute USGS quadrangle map.

Montgomery County Log M -1

MONTGOMERY WELL	M-1
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	744
DATE DRILLED	1949
DEPTH (ft)	123
WATER LEVEL DEPTH	37
DATE	-----
YIELD RATE (gpm)	-----
DRAWDOWN (ft)	-----
TYPE OF PUMP	Turbine
DIAMETER OF WELL (in)	-----
USE	Public Supply
COMMENT	Lamme Rd
ESTIMATED GROUND SURFACE ELEVATION (ft AMSL)	745



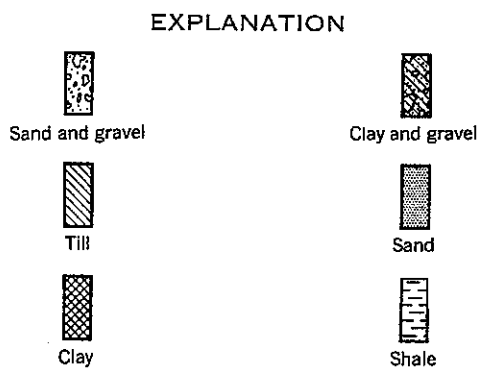
SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

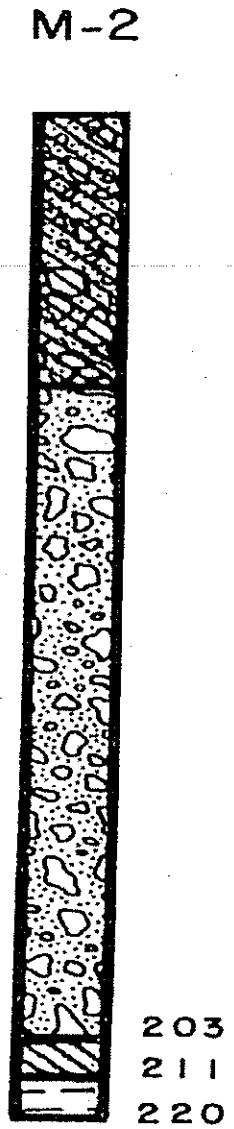
MONTGOMERY COUNTY SANITARY DEPARTMENT WELL M-1
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

Montgomery County Log M -2

MONTGOMERY WELL	M-2
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	749.44
DATE DRILLED	-----
DEPTH (ft)	200
WATER LEVEL DEPTH	47
DATE	-----
YIELD RATE (gpm)	-----
DRAWDOWN (ft)	-----
TYPE OF PUMP	Turbine
DIAMETER OF WELL (in)	20
USE	Public Supply
COMMENT	Lamme Rd
ESTIMATED GROUND SURFACE ELEVATION (ft AMSL)	750





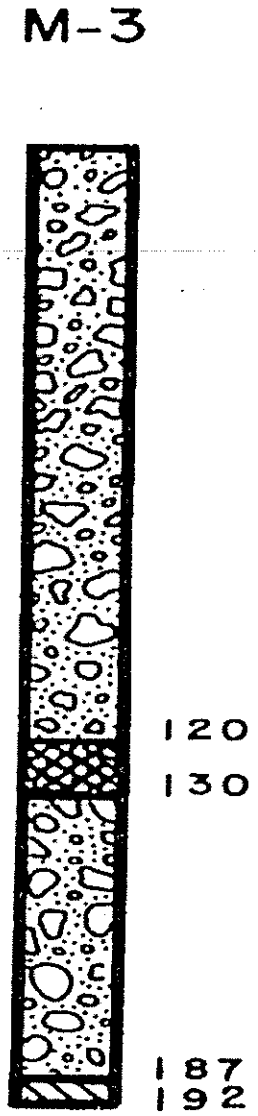
SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

MONTGOMERY COUNTY SANITARY DEPARTMENT WELL M-2
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

MONTGOMERY WELL	M-3
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	745
DATE DRILLED	5/50
DEPTH (ft)	187
WATER LEVEL DEPTH	40
DATE	5/50
YIELD RATE (gpm)	1,000
DRAWDOWN (ft)	17
TYPE OF PUMP	Turbine
DIAMETER OF WELL (in)	16
USE	Public Supply
COMMENT	Lamme Rd

ESTIMATED GROUND
SURFACE ELEVATION (ft AMSL) 745



EXPLANATION

Sand and gravel

Clay and gravel

Till

Sand

Clay

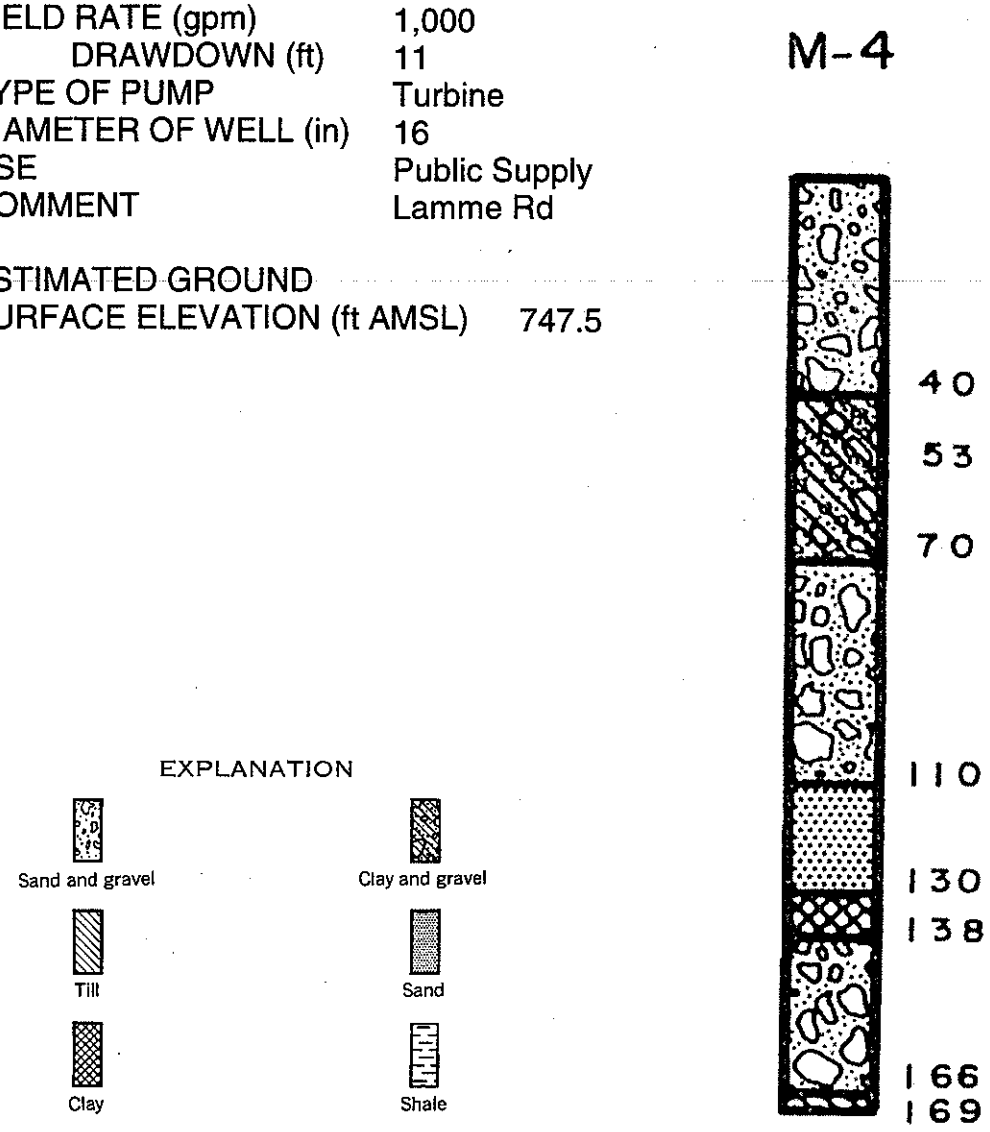
Shale

SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

MONTGOMERY COUNTY SANITARY DEPARTMENT WELL M-3
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

MONTGOMERY WELL	M-4
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	745
DATE DRILLED	6/50
DEPTH (ft)	166
WATER LEVEL DEPTH	33
DATE	6/50
YIELD RATE (gpm)	1,000
DRAWDOWN (ft)	11
TYPE OF PUMP	Turbine
DIAMETER OF WELL (in)	16
USE	Public Supply
COMMENT	Lamme Rd
ESTIMATED GROUND SURFACE ELEVATION (ft AMSL)	747.5



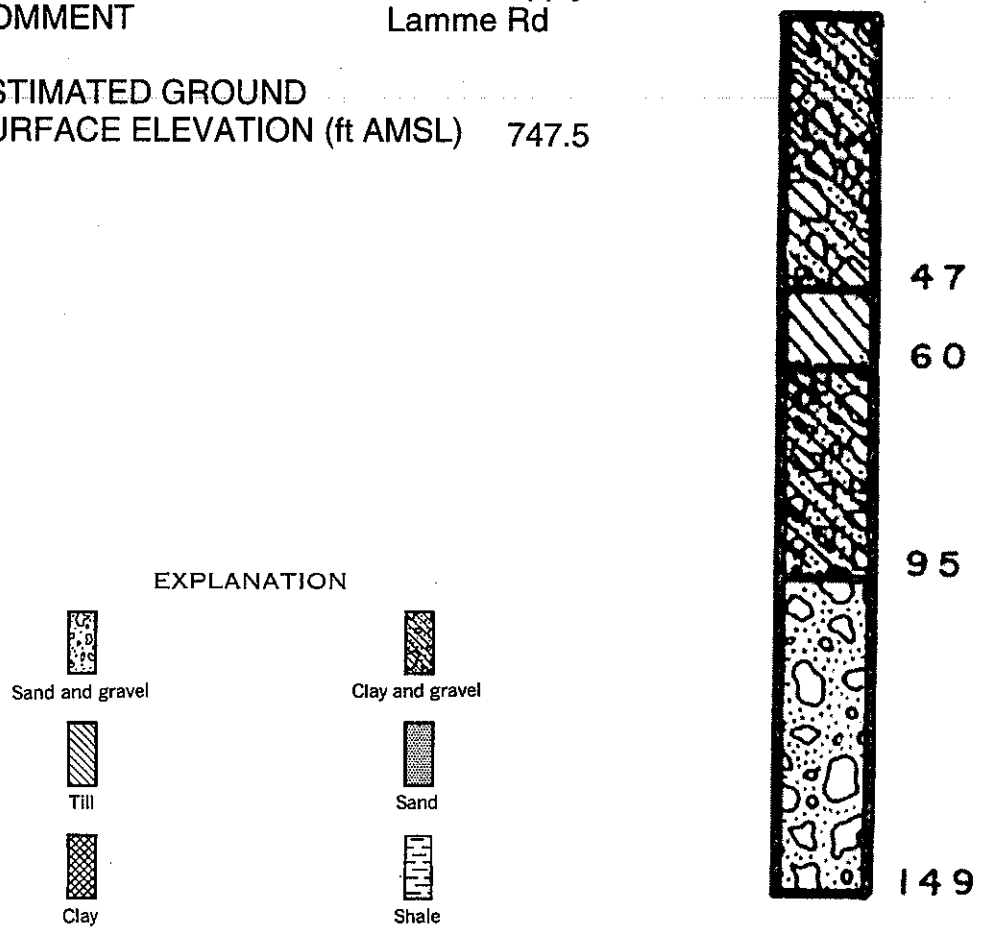
SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

MONTGOMERY COUNTY SANITARY DEPARTMENT WELL M-4
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

Montgomery County Log M -5

MONTGOMERY WELL	M-5
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	755
DATE DRILLED	2/53
DEPTH (ft)	150
WATER LEVEL DEPTH	58
DATE	2/19/53
YIELD RATE (gpm)	1,700
DRAWDOWN (ft)	24
TYPE OF PUMP	Turbine
DIAMETER OF WELL (in)	18
USE	Public Supply
COMMENT	Lamme Rd
ESTIMATED GROUND SURFACE ELEVATION (ft AMSL)	747.5



SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

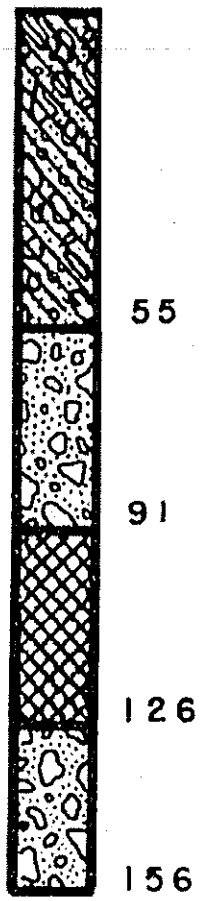
MONTGOMERY COUNTY SANITARY DEPARTMENT WELL M-5
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

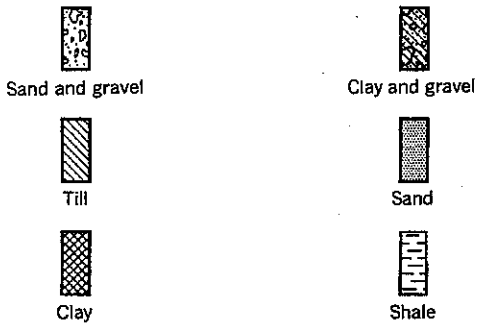
MONTGOMERY WELL	M-6
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	745
DATE DRILLED	2/53
DEPTH (ft)	157
WATER LEVEL DEPTH	38
DATE	2/17/53
YIELD RATE (gpm)	1,700
DRAWDOWN (ft)	43
TYPE OF PUMP	Turbine
DIAMETER OF WELL (in)	18
USE	Public Supply
COMMENT	Lamme Rd

ESTIMATED GROUND
SURFACE ELEVATION (ft AMSL) 737.5

M-6



EXPLANATION

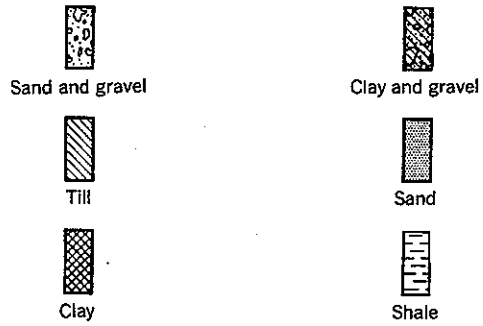


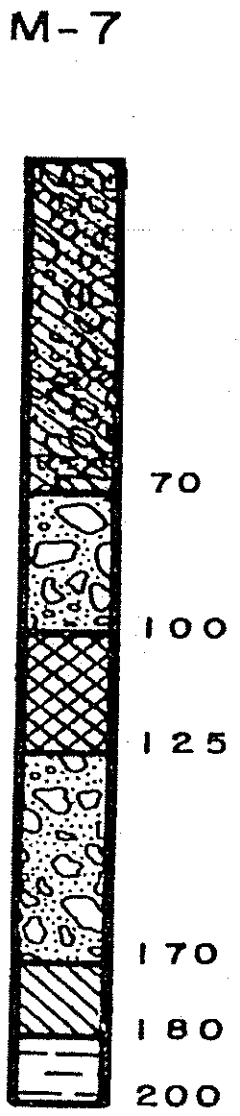
SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

MONTGOMERY COUNTY SANITARY DEPARTMENT WELL M-6
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

MONTGOMERY WELL	M-7
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	740
DATE DRILLED	3/54
DEPTH (ft)	200
WATER LEVEL DEPTH	-----
DATE	-----
YIELD RATE (gpm)	-----
DRAWDOWN (ft)	-----
TYPE OF PUMP	-----
DIAMETER OF WELL (in)	-----
USE	Test
COMMENT	Lamme Rd
ESTIMATED GROUND SURFACE ELEVATION (ft AMSL)	742.5



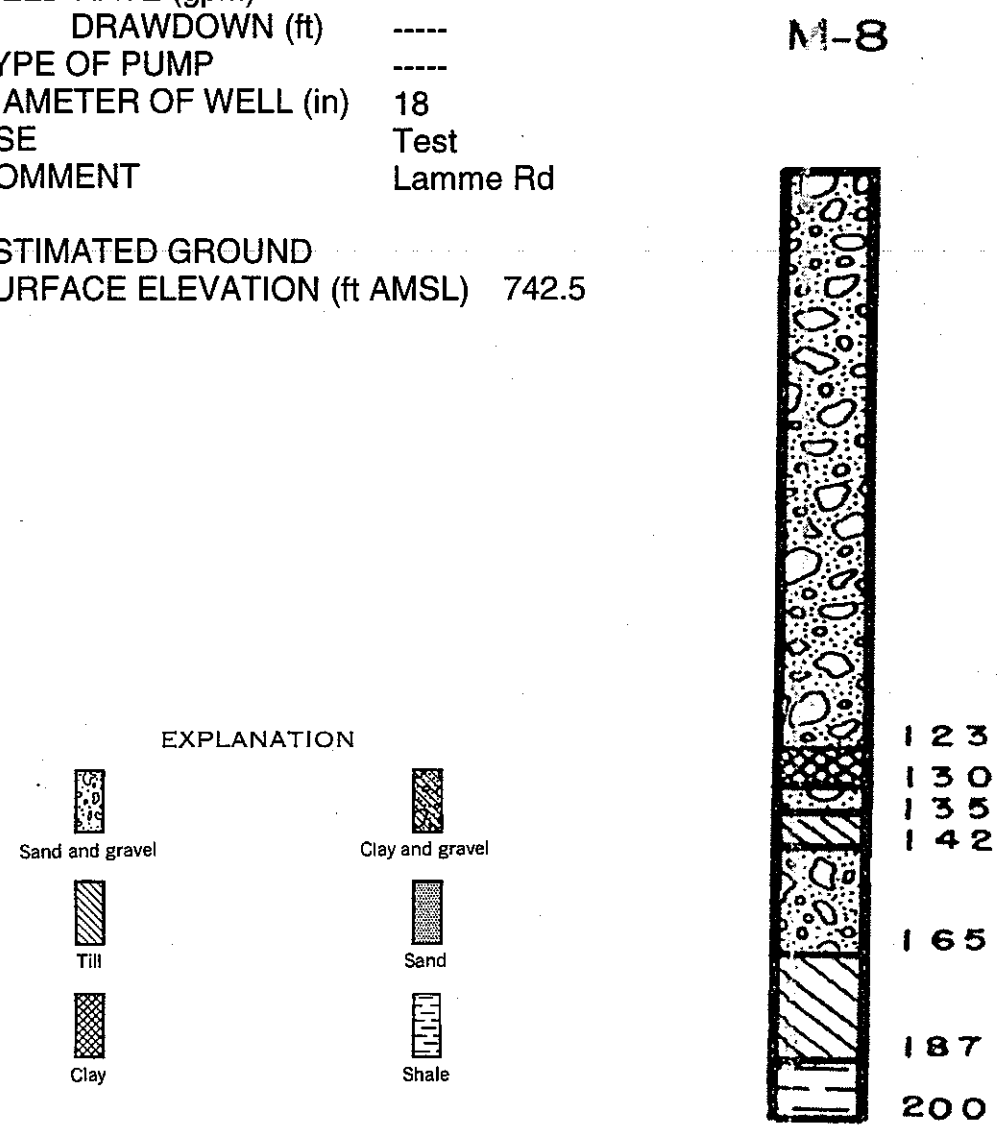


SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

MONTGOMERY COUNTY SANITARY DEPARTMENT WELL M-7
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

MONTGOMERY WELL	M-8
ODNR NUMBER	97900
ALTITUDE (ft AMSL)	740
DATE DRILLED	4/54
DEPTH (ft)	200
WATER LEVEL DEPTH	-----
DATE	-----
YIELD RATE (gpm)	-----
DRAWDOWN (ft)	-----
TYPE OF PUMP	-----
DIAMETER OF WELL (in)	18
USE	Test
COMMENT	Lamme Rd
ESTIMATED GROUND SURFACE ELEVATION (ft AMSL)	742.5



SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

MONTGOMERY COUNTY SANITARY DEPARTMENT WELL M-8
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

WELL LOG AND DRILLING REPORT

ORIGINAL

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Columbus, Ohio

No 97900

County Montgomery Township ~~Madison~~ Moraine Section of Township or Lot Number 10

Owner Montgomery Co. Address Dayton, Ohio

Location of property Lamme Rd Well Field
1/4 M South of Straup Rd on West side of Lamme Rd,

CONSTRUCTION DETAILS

Casing diameter 8" I.D. Length of casing 2ai'

Type of screen — Length of screen —

Type of pump —

Capacity of pump —

Depth of pump setting —

PUMPING TEST

Pumping rate Test Well Casing G.P.M. Duration of test 1 hrs.

Drawdown ft. Date 4 Well Abandoned

Developed capacity

Static level—depth to water ft.

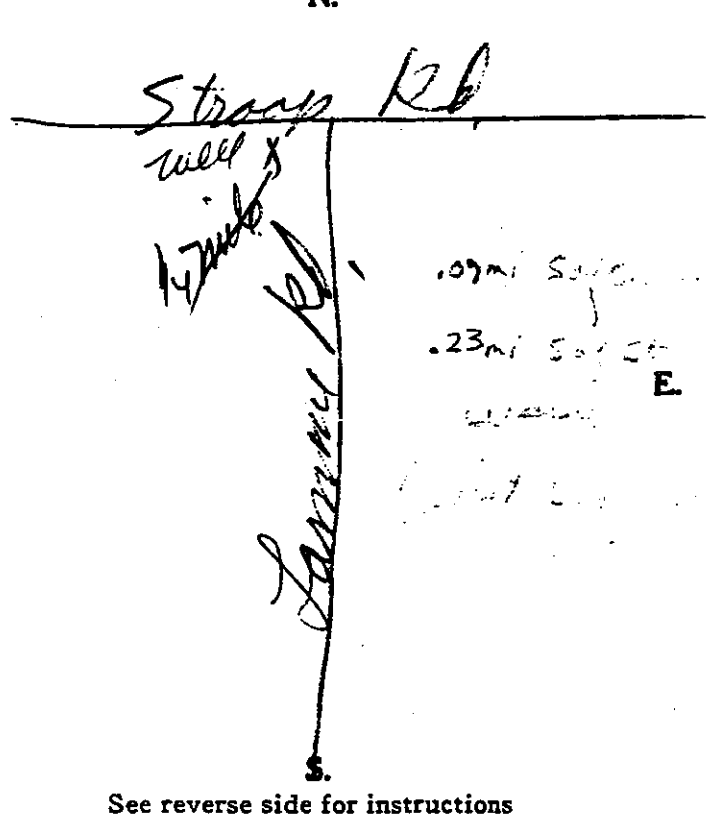
Pump installed by

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
Gravel	0 Feet	5 Ft.
Gravel	5	20
Gravel	20	40
Gravel	40	60
Gravel	60	80
Sand & Gravel	80	108
Gravel	108	120
Gravel	120	123
B. Till	123	130
Gravel	130	135
Till	135	142
Gravel	142	145
D. Gravel	145	165
Till	165	175
Till	175	180
Till	180	187
Shale	187	200

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

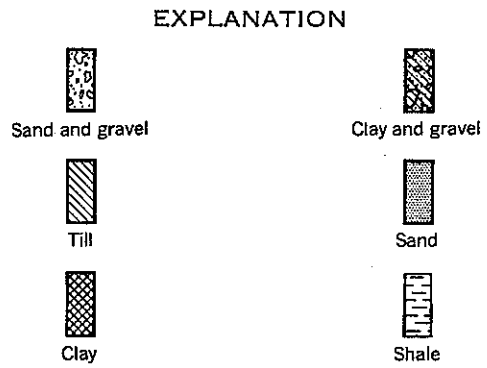
Drilling Firm Donald J Rae Date 4/29/54

Address Vandalia Ohio Signed Don Rae

C77.
4059
M-8

MONTGOMERY WELL	M-10
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	720
DATE DRILLED	7/54
DEPTH (ft)	247
WATER LEVEL DEPTH	29
DATE	7/9/54
YIELD RATE (gpm)	-----
DRAWDOWN (ft)	-----
TYPE OF PUMP	Turbine
DIAMETER OF WELL (in)	8
USE	Public Supply
COMMENT	Dryden Rd

ESTIMATED GROUND
SURFACE ELEVATION (ft AMSL) 720





SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

MONTGOMERY COUNTY SANITARY DEPARTMENT WELL M-10
GENERAL MOTORS CORPORATION
Moraine, Ohio

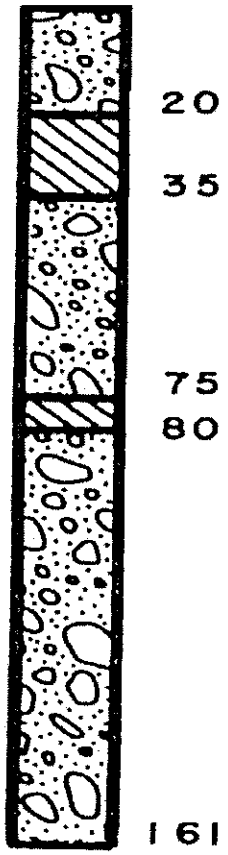
CRA

Montgomery County Log M -11

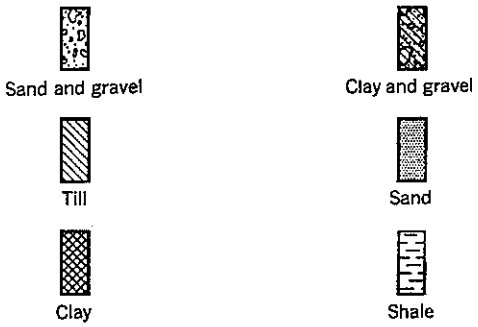
MONTGOMERY WELL	M-11
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	720
DATE DRILLED	-----
DEPTH (ft)	-----
WATER LEVEL DEPTH	-----
DATE	-----
YIELD RATE (gpm)	-----
DRAWDOWN (ft)	-----
TYPE OF PUMP	Turbine
DIAMETER OF WELL (in)	-----
USE	Public Supply
COMMENT	Dryden Rd

ESTIMATED GROUND
SURFACE ELEVATION (ft AMSL) 725

M-11



EXPLANATION



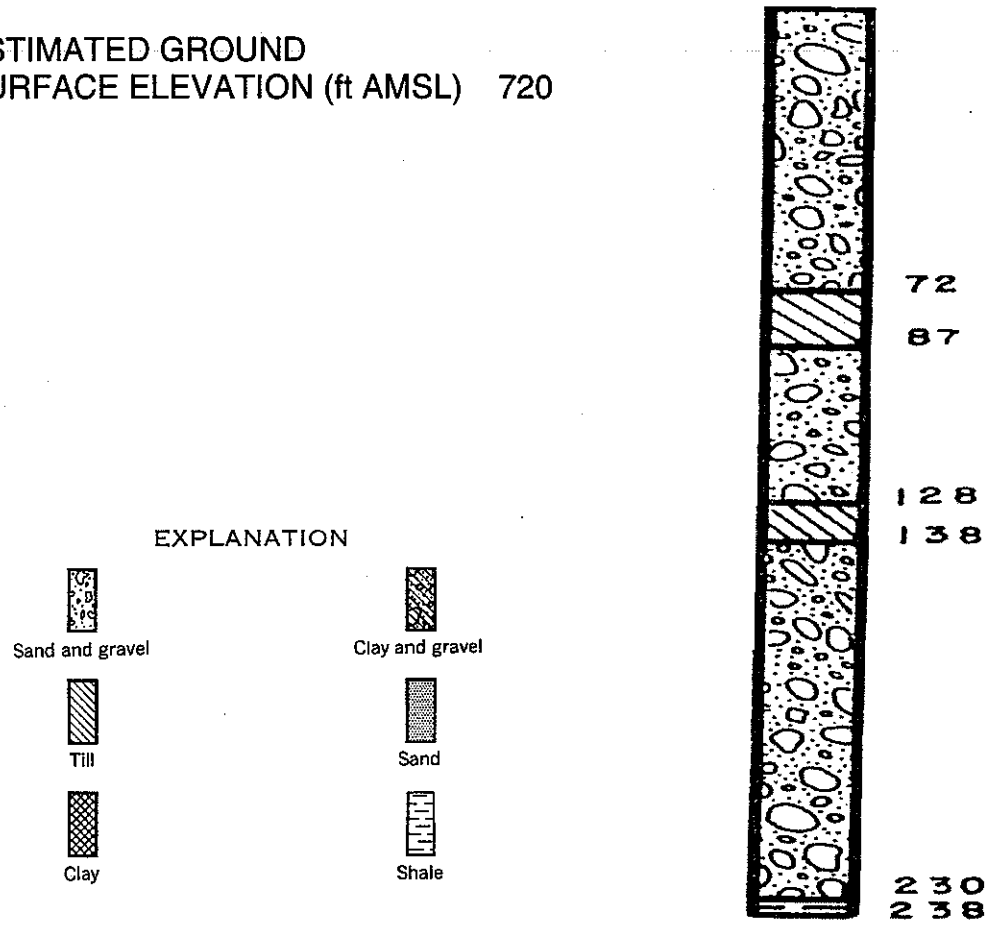
SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

MONTGOMERY COUNTY SANITARY DEPARTMENT WELL M-11
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

MONTGOMERY WELL	M-12
ODNR NUMBER	-----
ALTITUDE (ft AMSL)	720
DATE DRILLED	-----
DEPTH (ft)	-----
WATER LEVEL DEPTH	-----
DATE	-----
YIELD RATE (gpm)	-----
DRAWDOWN (ft)	-----
TYPE OF PUMP	Turbine
DIAMETER OF WELL (in)	-----
USE	Public Supply
COMMENT	Dryden Rd

ESTIMATED GROUND
SURFACE ELEVATION (ft AMSL) 720

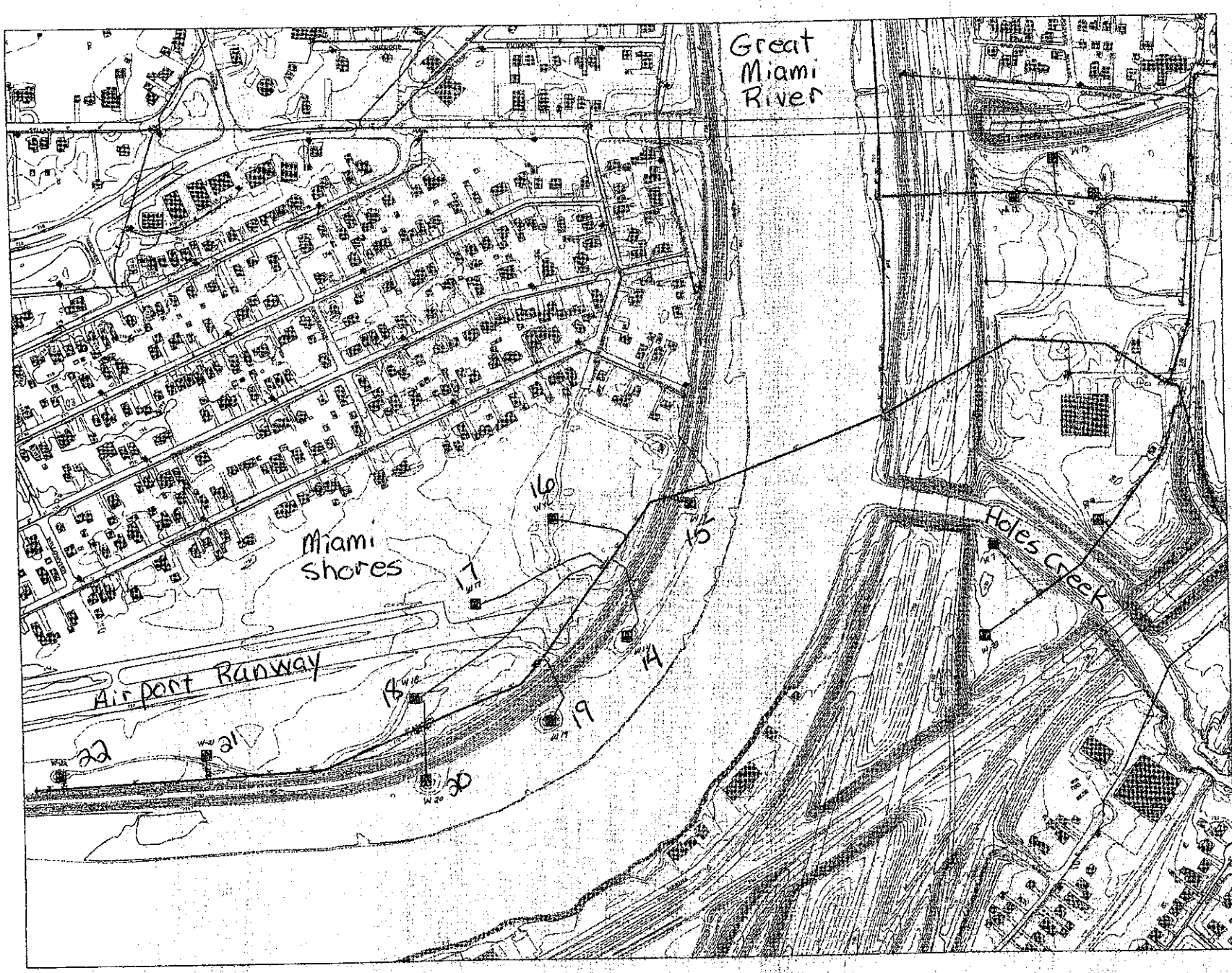


SOURCE: Norris. S.E. and Spieker, A.M. Ground-Water Resources of the Dayton Area, Ohio Geological Survey Water-Supply Paper 1808, 1966

MONTGOMERY COUNTY SANITARY DEPARTMENT WELL M-12
GENERAL MOTORS CORPORATION
Moraine, Ohio

CRA

Miami Shores Well Field Map



MCSED InService Map

Published map created by
Montgomery County
Sanitary Engineering Department

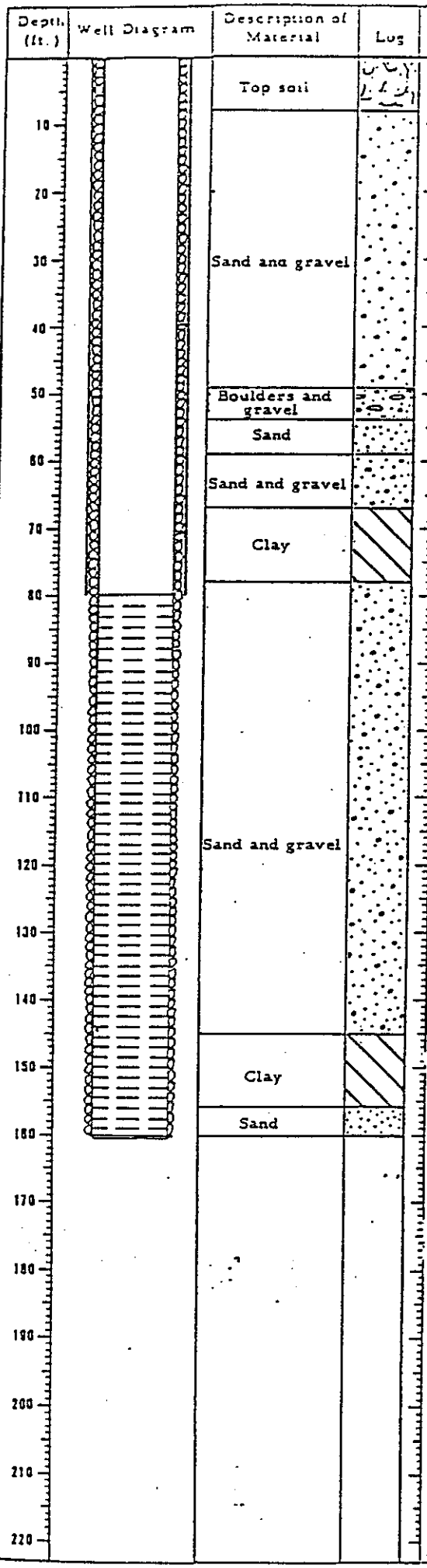
MONTGOMERY COUNTY

1 inch equals 150 feet

WELLFIELD DATA

	WELL DIAMETER	STAGES	DEPTH GRADE	SCREEN LENGTH	STATIC WATER LEVEL	PUMP DATA GPM	MOTOR HP
WELL # 14	14"	4	164'	80'	19'	2700	200
WELL # 15	14"	4	160'-1"	80	8'-9"	3200	200
WELL # 16	14"	4	161'-7"	80'	30'	2700	200
WELL # 17	14"	4	145'-6"	80'	11'	3000	200
WELL # 18	14"	4	153'-6"	80'	11'	2000	200
WELL # 19	13"	4	223'	85'	55'-6"	1400	150
WELL # 20	13"	4	225'	92'	57'	1400	150
WELL # 21	18"	3	220'	90'	29'-8"	1700	200
WELL # 22	18"	3	220'	90'	28'-6"	1700	200
TOTAL PUMPAGE						19,800	GPM
						28.3	MGD

Miami Shores Well Field 14



GREATER MORAINE WATER SYSTEM — WATER WELL DATA

Well No. 14 Location Miami Shores
Driller Layne-Ohio Company Equipment Drilling Rig
Date Started April 24 1959 Completed May 22 1959

Deep CONSTRUCTION DETAILS

Type of Well Vert. Gravel Pack Method Drilled
Outside Casing:
I. D. 38 in. Length: 80 ft. Thickness - in.
Material Steel Connections Welded
Inside Casing:
I. D. ~~36~~ 20 in. Length: 89.7" Thickness - in.
Material Steel Connections Welded
Screen: Stainless
Type Steel shutter I. D. ~~26~~ 20 in. Length: 80 ft.
Openings Material Galv. conc. strained steel Stainless
Bottom Fitting Steel shoe Top Fitting Flush
Gravel: Size Pea gravel Quantity 60 tons
Well Development:
Method Surging Equipment Drilling Rig

PUMPING TEST

Date February 8, 1968 Static W. L. 46 Time 9:00 A. M.
Flow 1800 gpm Length of Test 0.50 hours
Min. pumping level 79 ft. Max. drawdown 32.2 ft.
Specific capacity 56 gpm/ft. Stabilized Yes
Transmissibility - gpd/ft. Storage Coefficient -
Well efficiency 69 % Wire-to-Water eff. 71 %

WATER ANALYSIS

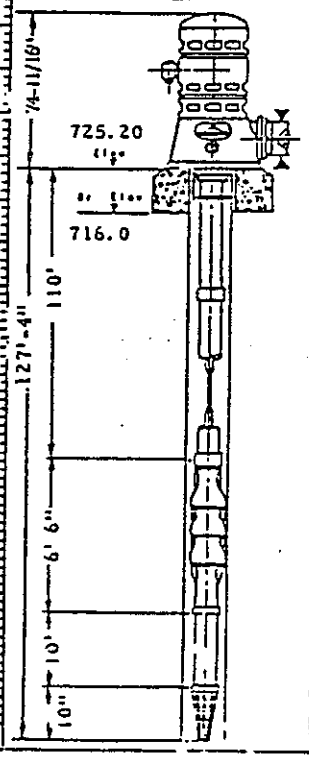
Date of Sample Feb. 8, 1968 Date of Analysis Feb. 8, 1968
Pumping 2 hrs. @ 1800 gpm Appearance Clear
Water Temperature 10°C Air Temperature 4°C
Specific Conductance 650 micromhos-cm @ 25° C.

Total Diss. Solids	423	mg/l	Calcium*	254	mg/l
Total Hardness*	404	mg/l	Iron, Fe	0.40	mg/l
Alkalinity*	316	mg/l	Manganese, Mn	0.10	mg/l
Non-Carb. Hard.*	88	mg/l	Chloride, Cl	32	mg/l
CO_2	32	mg/l	Sulfate, SO_4	88	mg/l
Dissolved Oxygen	-	mg/l	H_2S	-	mg/l

pH 7.3 pHs 7.0 pH - pHs + 0.3
*As $CaCO_3$

PERMANENT PUMPING EQUIPMENT

Pump Layne centrifugal Capacity ~~2200~~ 2000 gpm TDH 305 ft.
Motor 200 HP @ 1800 RPM
Material: Impellers Bronze Bowls 14" TLC
Impeller No. Number of Stages 4



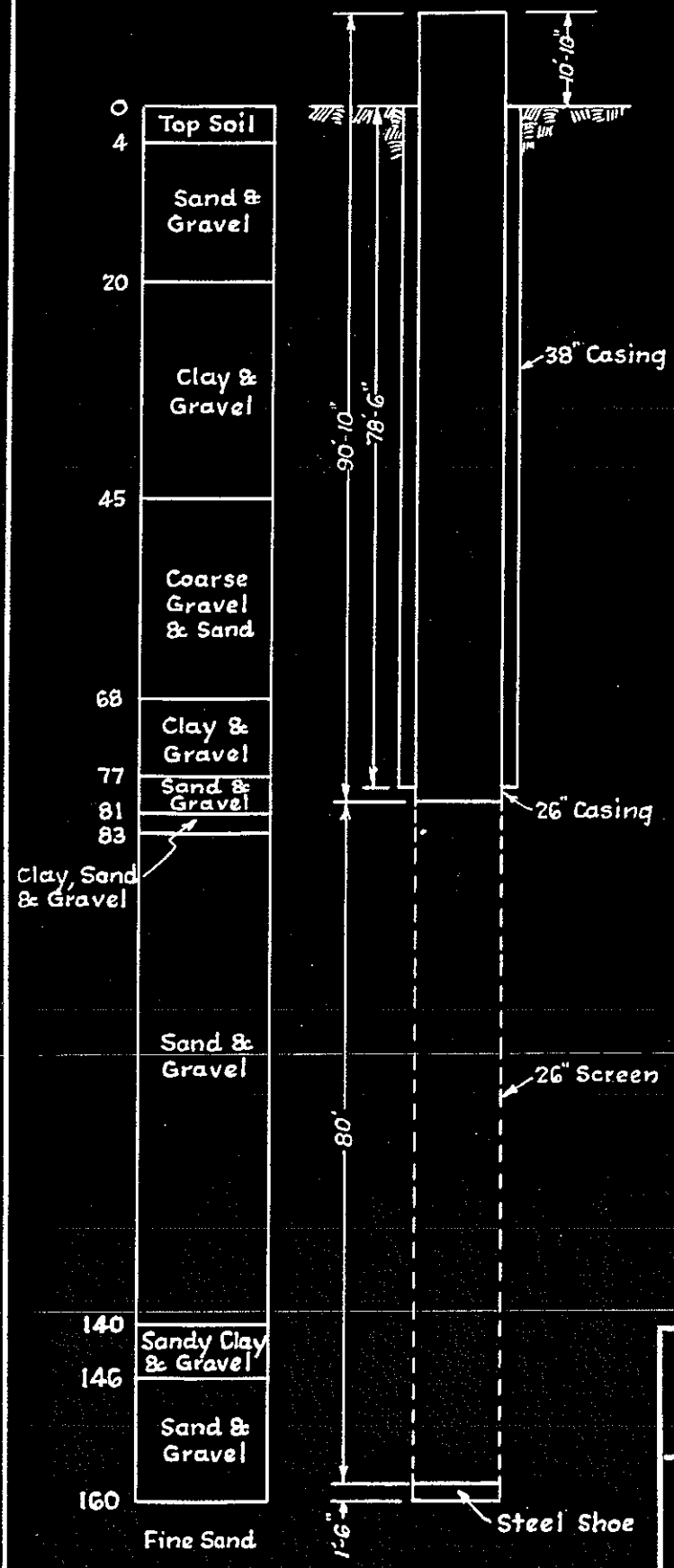
Column: Length 110 ft. ID ~~10~~ 12 in
OD in. Material Steel
Threaded or flange Flange

Shaft: Lubrication Oil
Material Stainless steel Diam. 1-15/16 in.
OD Oil Tube 3 in.
Material Steel

Suction Pipe Yes ID 10 in
OD in. Length 10 ft.
Material Steel
Length of Air Line 85 ft.

2/80 REMARKS
Well revitalized - 80' of stainless screen added, pump repaired

Prepared by:
WOOLPERT CONSULTANTS



MATERIAL:

Pit: 78'-6" of 38" x 5/16" Casing & 90'-10" of 26" x 5/16" Casing.

Screen: 80' of 26" Ingot Iron Shutter Screen.

Cone: 1'-6" of Steel Shoe.

PUMP:

No.		Shop No.	
Type		Size	
Setting		Stages	
Suction		Impellers	
Discharge		Head	
Tubing		Press. B. P.	
Shafting			

MOTOR:

Make		Type	
Volts		Cycle	
Phase		Amp.	
H. P.		R. P. M.	
Frame		Serial	

WELL:

Capacity	3200 G.P.M.	Static Level	8'-9"
Guarantee		P. Level	23'
Started	4-24-59	Pressure	
Finished	5-22-59	Pumped	3200 G.P.M.
Accepted	5-22-59	Depth	160'-1"

REMARKS:

60 Tons of Pea Gravel Used.

Driller: S. Rogers

Installer:

THE LAYNE-OHIO CO.,

WATER SUPPLY CONTRACTORS

COLUMBUS OHIO

MONTGOMERY COUNTY WATER SYSTEM

MIAMI SHORE FIELD

DRAWN BY O. L. MS APPROVED BY

WELL NO. 14 DRAWING NO. 1383

Miami Shores Well Field 15

Depth (ft.)	Description of Material	Log
0	Top soil	
10	Sand and gravel	
20		
30	Clay and gravel	
40		
50	Coarse gravel and sand	
60		
70	Clay and gravel	
80	Sand and gravel	
	Clay, sand and gravel	
90		
100		
110		
120	Sand and gravel	
130		
140	Sandy clay and gravel	
150	Sand and gravel	
160		
170		
180		
190	Fine sand	
200		
210		
220		

GREATER MORAINE WATER SYSTEM — WATER WELL DATA

Well No. 15 Location Miami Shores
Driller Layne-Ohio Company Equipment Drilling Rig
Date Started April 24, 1959 Completed May 22, 1959

CONSTRUCTION DETAILS

Type of Well Gravel Pack Method Drilled
Outside Casing:
I. D. 38 in. Length: 78' 6" Thickness - in.
Material Steel Connections Welded
Inside Casing:
I. D. 26 in. Length: 90' 10" Thickness - in.
Material Steel Connections Welded
Screen:
Type Shutter I. D. 26 in. Length: 80 ft.
Openings - Material Ingot iron
Bottom Fitting - Top Fitting -
Gravel: Size Pea gravel Quantity 60 tons
Well Development:
Method Surging Equipment Drilling Rig

PUMPING TEST

Date Feb. 9, 1968 Static W. L. 47 ft. Time 12:00 M D
Flow 2250 gpm Length of Test 0.50 hours
Min. pumping level 55 ft. Max. drawdown 7.9 ft.
Specific capacity 282 gpm/ft. Stabilized Yes
Transmissibility - gpd/ft. Storage Coefficient -
Well efficiency 100 % Wire-to-Water eff. 78 %

WATER ANALYSIS

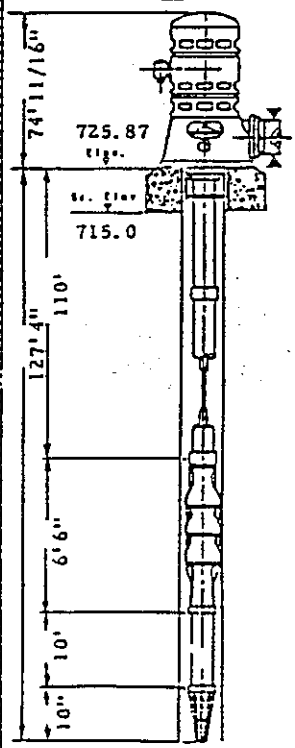
Date of Sample Feb. 9, 1968 Date of Analysis Feb. 9, 1968
Pumping 2250 hrs. @ 2 gpm Appearance Clear
Water Temperature 14°C Air Temperature -1°C
Specific Conductance 600 micromhos-cm @ 25° C.

Total Diss. Solids	390	mg/l	Calcium*	248	mg/l
Total Hardness*	404	mg/l	Iron, Fe	0.40	mg/l
Alkalinity*	312	mg/l	Manganese, Mn	0.04	mg/l
Non-Carb. Hard.*	92	mg/l	Chloride, Cl	29	mg/l
CO_2	29	mg/l	Sulfate, SO_4	84	mg/l
Dissolved Oxygen	-	mg/l	H_2S	-	mg/l

pH 7.3 pHs 7.0 pH - pHs + 0.3
*As $CaCO_3$

PERMANENT PUMPING EQUIPMENT

Layne 2300
Pump Vert. Centrifugal turbine Capacity ~~2125~~ gpm TDH 305 ft.
Motor 200 HP @ 1800 RPM
Material: Impellers Bronze Bowls 14" TLC
Impeller No. Standard Number of Stages 4



Column: Length 110 ft. ID ____ in.
OD 14 1/2 in. Material Steel
Threaded or flange Flange

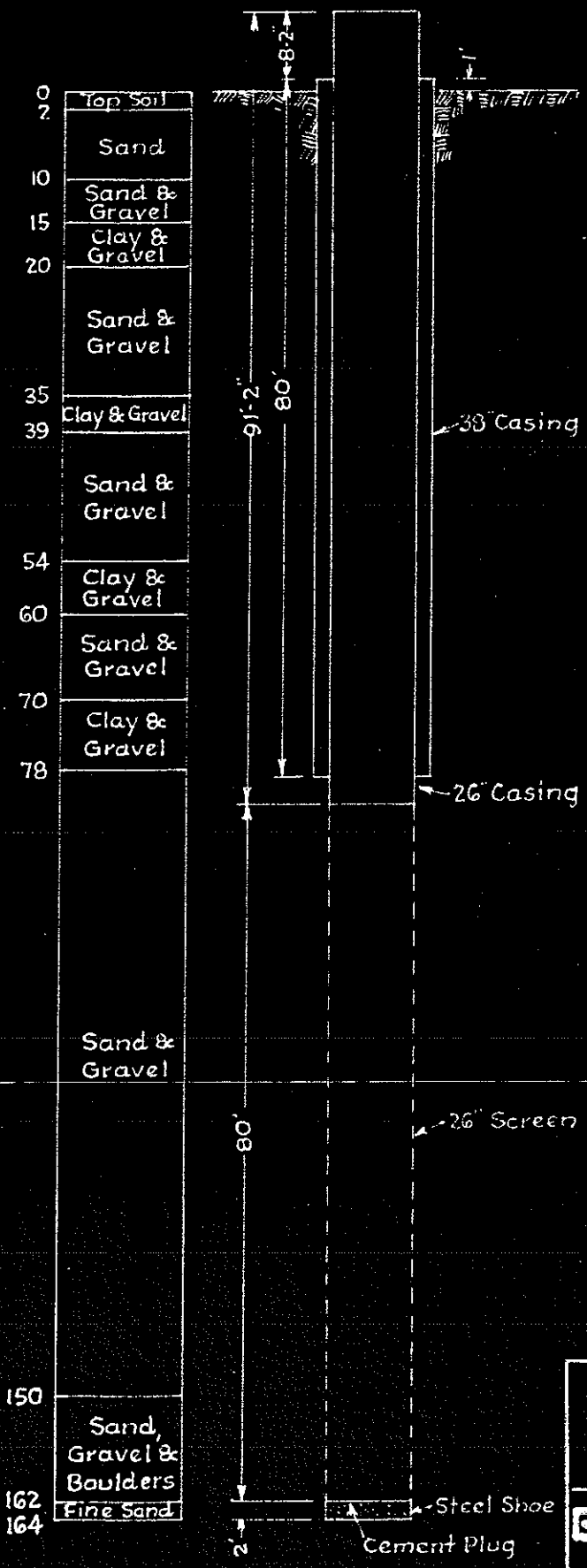
Shaft: Lubrication Oil
Material Stainless Diam. 1-15/16 in.
OD Oil Tube 3 in.
Material Steel

Suction Pipe Yes ID 10 in.
OD 10 in. Length 10 ft.
Material ____
Length of Air Line ~~85~~ 110 ft.

REMARKS

11/74 – Received pump
7/75 – Repaired pump and revitalized

Prepared by:
WOOLPERT CONSULTANTS



MATERIAL:

Pit: 80 of 38" Steel Casing & 91'2" of 26" Steel Casing.

Screen: 80' of 26" Steel Shutter Screen.

Cone: 26"x 2' Steel Shoe.

PUMP:

No.	40729	Serial No.	40729
Type	T.L.C.	Size	14"
Setting	110'	Stages	4
Suction	10"x 10' Long	Impellers	
Discharge	12"	Lead	
Tubing	3"	Press. B. P.	
Shafting	1 15/16"		

MOTOR:

Make	U.S.	Type	C.P.U.
Volts	440	Cycle	60
Phase	3	Amp	
H. P.	200	R. P. M.	1800
Frame	587 P.Y.	Serial	

WELL:

Capacity	2700 G.P.M.	Static Level	19'
Guaranteed	None	P. Level	28'-8"
Started	9-4-59	Pressure	
Finished	9-24-59	Pumped	2700 G.P.M.
Accepted	9-24-59	Depth	164'

REMARKS:

80 Tons of Pea Gravel Used.

Driller: Toledo Rogers
Installer: Elmer Hurles, Jr.

THE LAYNE-OHIO CO.
WATER SUPPLY CONSTRUCTION
COLUMBUS OHIO

BOARD OF COMMISSIONERS
MONTGOMERY, COUNTY
DAYTON, OHIO

O.L.M&

Miami Shores Well Field 16

Depth (ft.)	Well Diagram	Description of Material	Log
0		Top soil	
10		Sand	
20		Sand and gravel	
30		Clay and gravel	
40		Sand and gravel	
50		Clay and gravel	
60		Sand and gravel	
70		Sand and gravel	
80		Clay and gravel	
90		Sand and gravel	
100			
110			
120			
130			
140		Sand, gravel and boulders	
150			
160			
170		Fine sand	
180			
190			
200			
210			
223			

GREATER MIAMI WATER SYSTEM — WATER WELL DATA

Well No. 16 Location Miami Shores
Driller Layne-Ohio Company Equipment Drilling Rig
Date Started August 1959 Completed October 1959

CONSTRUCTION DETAILS

Type of Well Gravel pack Method Drilled
Outside Casing:
I. D. 38 in. Length: 80 ft. Thickness - in.
Material Steel Connections Welded
Inside Casing:
I. D. 26 in. Length: 91' 2" Thickness - in.
Material Steel Connections Welded
Screen:
Type Steel shutter I. D. 26 in. Length: 80 ft.
Openings - Material Stainless steel
Bottom Fitting Steel shoe Top Fitting Flush
Gravel: Size Pea gravel Quantity 80 tons
Well Development:
Method Surging Equipment Rig

PUMPING TEST

Date February 12, 1968 Static W. L. 44 ft. Time 11:30 A.M.
Flow 2300 gpm Length of Test 0.50 hours
Min. pumping level 53 ft. Max. drawdown 8.6 ft.
Specific capacity 268 gpm/ft. Stabilized Yes
Transmissibility - gpd/ft. Storage Coefficient -
Well efficiency 100 % Wire-to-Water eff. 76 %

WATER ANALYSIS

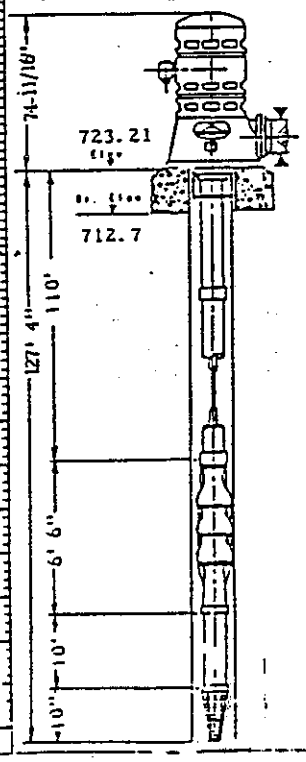
Date of Sample Feb. 12, 1968 Date of Analysis Feb. 12, 1968
Pumping 2 hrs. @ 2300 gpm Appearance Dirty
Water Temperature 12°C Air Temperature -4°C
Specific Conductance 600 micromhos-cm @ 25° C.

Total Diss. Solids	390	mg/l	Calcium*	216	mg/l
Total Hardness*	382	mg/l	Iron, Fe	0.10	mg/l
Alkalinity*	294	mg/l	Manganese, Mn	0.10	mg/l
Non-Carb. Hard.*	88	mg/l	Chloride, Cl	31	mg/l
CO_2	12	mg/l	Sulfate, SO_4	80	mg/l
Dissolved Oxygen	-	mg/l	H_2S		mg/l

pH 7.7 pHs 6.9 pH - pHs + 0.8
*As $CaCO_3$

PERMANENT PUMPING EQUIPMENT

Pump Layne centrifugal turbine Capacity 2000 gpm TDH 305 ft.
Motor 200 HP @ 1800 RPM
Material: Impellers Bronze Bowls 14" TLC
Impeller No. Standard Number of Stages 4



Column: Length 110 ft. ID ____ in.
OD 14 12 in. Material Steel
Threaded or flange Flange

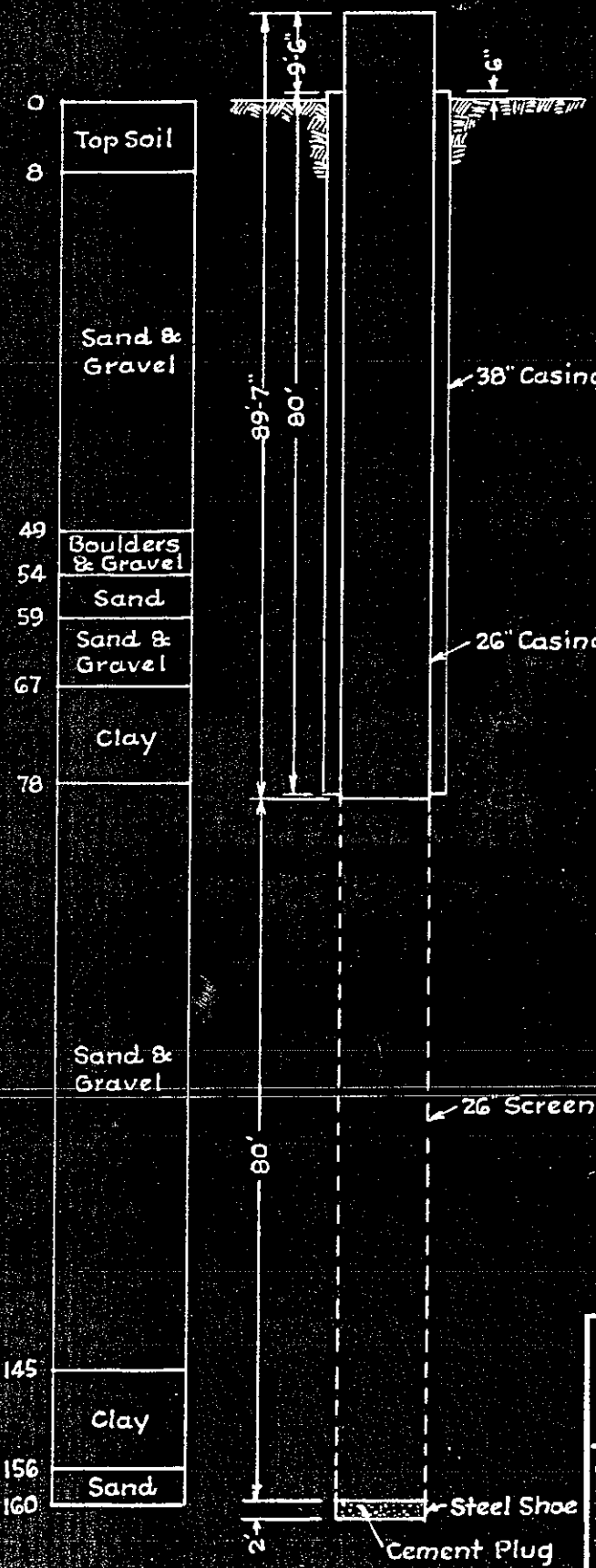
Shaft: Lubrication Oil
Material Stainless steel Diam. 1-15/16 in
OD Oil Tube 3 in.
Material Steel

Suction Pipe Yes ID 10 in.
OD ____ in. Length 10 ft.
Material Steel
Length of Air Line 85 110 ft.

REMARKS

7/75 Revitalized + pump repaired

Prepared by:
WOOLPERT CONSULTANTS



MATERIAL:

Pit: 80' of 38" Steel Casing & 89'-7" of 26" Steel Casing.

Screen: 80' of 26" Steel Shutter Screen.

Cone: 26" × 2' Steel Shoe.

PUMP:

No.	40728	Shop No.	40728
Type	T.L.C.	Size	14"
Setting	110'	Stages	4
Suction	10" × 10'	Impellers	
Discharge	12"	Head	
Tubing	3"	Press. B. P.	
Shafting	1 15/16"		

MOTOR:

Make	U.S.	Type	C.P.U.
Volts	440	Cycle	60
Phase	3	Amp.	
H. P.	200	R. P. M.	1800
Frame	587 P.Y.	Serial	

WELL:

Capacity		Static Level	30'
Guarantee		P. Level	
Started	9-29-59	Pressure	
Finished	10-15-59	Pumped	
Accepted	10-15-59	Depth	161'-7"

REMARKS:

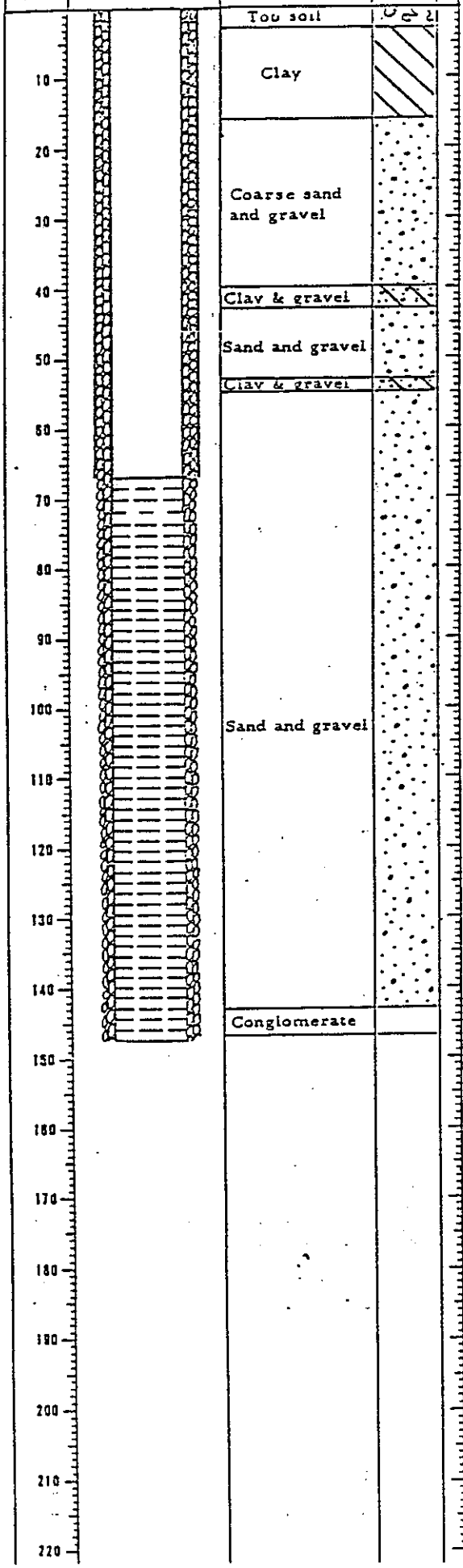
Driller: Toledo Rogers
Installer: Elmer Hurles, Jr.

THE LAYNE-OHIO CO.,
WATER SUPPLY CONTRACTORS
COLUMBUS OHIO

BOARD OF COMMISSIONERS
MONTGOMERY, COUNTY
DAYTON, OHIO

DRAWN BY O. L. M.S. APPROVED BY
WELL NO. 16 DRAWING NO. 1417

Miami Shores Well Field 17



GREATER MORAINE WATER SYSTEM — WATER WELL DATA

Well No. 17 Location Miami Shores
Driller Layne-Ohio Company Equipment Drilled
Date Started May 19, 1961 Completed June 13, 1961

CONSTRUCTION DETAILS

Type of Well Gravel Pack Method Drilled
Outside Casing:
I. D. 38 in. Length: 67'6" Thickness - in.
Material Steel Connections Welded
Inside Casing:
I. D. 26 in. Length: 72'6" Thickness - in.
Material Steel Connections Welded
Screen:
Type Shutter I. D. 26 in. Length: 80 ft.
Openings - Material Steel
Bottom Fitting Steel shoe Top Fitting -
Gravel: Size Pea gravel Quantity 90 tons
Well Development:
Method Surging Equipment Rig

PUMPING TEST

Date Feb 13, 1968 Static W. L. 36 ft. Time 8:30 A. M.
Flow 2200 gpm Length of Test 0.50 hours
Min. pumping level 66 ft. Max. drawdown 29.9 ft.
Specific capacity 73.5 gpm/ft. Stabilized Yes
Transmissibility - gpd/ft. Storage Coefficient -
Well efficiency 70 % Wire-to-Water eff. 76 %

WATER ANALYSIS

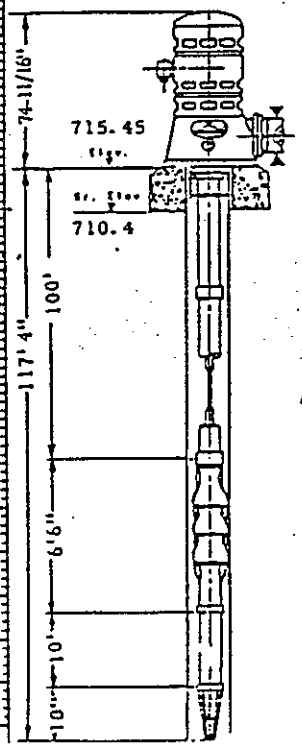
Date of Sample Feb. 13, 1968 Date of Analysis Feb. 13, 1968
Pumping 2 hrs. @ 2000 gpm Appearance Clear
Water Temperature 13°C Air Temperature -3°C
Specific Conductance 650 micromhos-cm @ 25° C.

Total Diss. Solids	423	mg/l	Calcium*	264	mg/l
Total Hardness*	428	mg/l	Iron, Fe	1.5	mg/l
Alkalinity*	324	mg/l	Manganese, Mn	0.07	mg/l
Non-Carb. Hard.*	104	mg/l	Chloride, Cl	32	mg/l
CO_2	24	mg/l	Sulfate, SO_4	100.5	mg/l
Dissolved Oxygen	-	mg/l	H_2S	-	mg/l

pH 7.4 pHs 7.0 pH - pHs + 0.4
*As $CaCO_3$

PERMANENT PUMPING EQUIPMENT

Flow Thru ~~Layne~~
Pump Vert. Centrifugal turbine Capacity 2000 gpm TDH 305 ft.
Motor 200 HP @ 1800 RPM
Material: Impellers Bronze Bowls 14" TLC
Impeller No. Standard Number of Stages 4



Column: Length 100 ft. ID - in
OD 12 ~~14~~ in. Material Steel
Threaded or flange Flange

Shaft: Lubrication Oil
Material Stainless Diam. 1-15/16 in
OD Oil Tube 3 in.
Material Steel

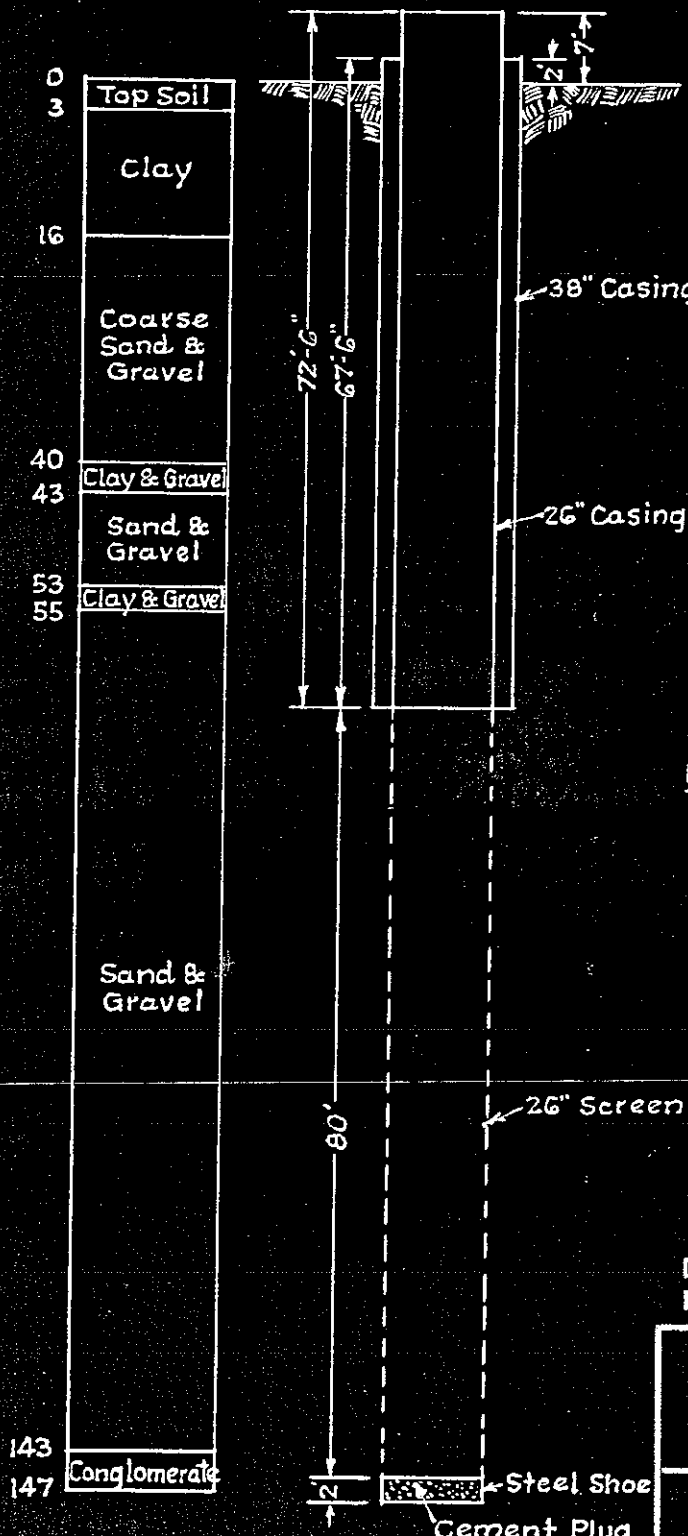
Suction Pipe Yes ID 10 in
OD - in. Length 10 ft.
Material Steel
Length of Air Line ~~85~~ 100 ft.

REMARKS

11/75 - Well revitalized and new pump installed

5/81 - Pump repaired

Prepared by:
WOOLPERT CONSULTANTS



MATERIAL:

Pit: 67'-6" of 38" Steel Casing & 72'-6" of 26" Steel Casing.

Screen: 80' of 26" Steel Shutter Screen.

Cone: 26" × 2' Steel Shoe.

PUMP:

No.	43449	Shop No.	43449
Type	T. L. C.	Size	14"
Setting	100'	Stages	4
Suction	10" × 10' Long	Impellers	
Discharge	10"	Head	
Tubing	3"	Press. B. P.	
Shafting	1 15/16"		

MOTOR:

Make	U.S.	Type	C. F. U.
Volts	440	Cycle	60
Phase	3	Amp.	
H. P.	200	R. P. M.	1800
Frame	587 P.Y.	Serial	

WELL:

Capacity	3000 G.P.M.	Static Level	11'
Guarantee	None	P. Level	24'-10"
Started	5-19-61	Pressure	
Finished	6-13-61	Pumped	3000 G.P.M.
Accepted	6-13-61	Depth	145'-6" Ground Level

REMARKS:

90 Tons of Pea Gravel Used.

Driller: Neil Morris
Installer: Elmer Hurles, Jr.

THE LAYNE-OHIO CO.,
WATER SUPPLY CONTRACTORS
COLUMBUS OHIO

MONTGOMERY COUNTY
DAYTON, OHIO

DRAWN BY O. L. McE
WELL NO. 17
APPROVED BY
DRAWING NO. 1453

Miami Shores Well Field 18

Depth (ft.)	Well Diagram	Description of Material	Log
0		Top soil	
10		Clay	
20		Coarse sand and gravel	
30			
40		Boulders	
		Blue clay	
50		Sand and gravel	
60			
70		Blue clay and gravel	
		Sand & gravel	
80		Blue clay and gravel	
90			
100		Coarse sand and gravel	
110			
120			
130			
140			
150			
160			
170			
180			
190			
200			
210			
220			

GREATER MORAINE WATER SYSTEM — WATER WELL DATA

Well No. 18 Location Miami Shores
Driller Layne-Ohio Company Equipment Drilling Rig
Date Started June 22, 1961 Completed August 4, 1961

CONSTRUCTION DETAILS

Type of Well Gravel Wall Method Drilled
Outside Casing:
I. D. 38 in. Length: 72 ft. Thickness - in.
Material Steel Connections Welded
Inside Casing:
I. D. 26 in. Length: 80.5 ft. Thickness - in.
Material Steel Connections Welded
Screen:
Type Shutter I. D. 26 in. Length: 80 ft.
Openings - Material Steel
Bottom Fitting Steel shoe Top Fitting -
Gravel: Size Pea gravel Quantity 146 tons
Well Development:
Method Surging Equipment Drilling Rig

PUMPING TEST

Date February 14, 1968 Static W. L. 35 ft. Time 11:00 A.M.
Flow 1800 gpm Length of Test 0.50 hours
Min. pumping level 72 ft. Max. drawdown 36.6 ft.
Specific capacity 49.2 gpm/ft. Stabilized Yes
Transmissibility - gpd/ft. Storage Coefficient -
Well efficiency 100 % Wire-to-Water eff. 74 %

WATER ANALYSIS

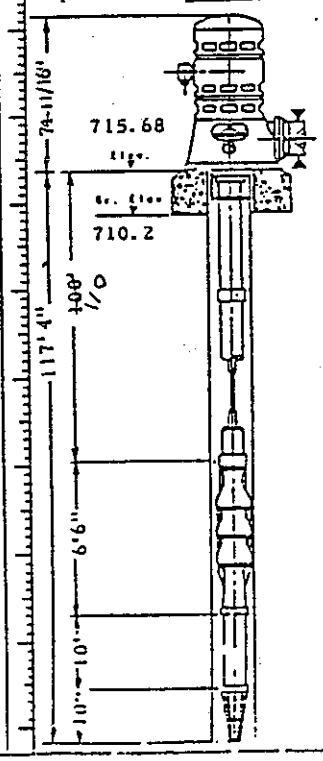
Date of Sample Feb. 14, 1968 Date of Analysis Feb. 14, 1968
Pumping 2 hrs. @ 2000 gpm Appearance Clear
Water Temperature 15°C Air Temperature -3°C
Specific Conductance 650 micromhos-cm @ 25° C.

Total Diss. Solids	423	mg/l	Calcium*	258	mg/l
Total Hardness*	406	mg/l	Iron, Fe	1.5	mg/l
Alkalinity*	312	mg/l	Manganese, Mn	0.04	mg/l
Non-Carb. Hard.*	94	mg/l	Chloride, Cl	32	mg/l
CO_2	23	mg/l	Sulfate, SO_4	94	mg/l
Dissolved Oxygen	-	mg/l	H_2S	-	mg/l

pH 7.4 pHs 7.0 pH - pHs + 0.4
*As $CaCO_3$

PERMANENT PUMPING EQUIPMENT

Layne
Pump Vert. Centrifugal turbine Capacity 2000 gpm TDH 305 ft.
Motor 200 HP @ 1800 RPM
Material: Impellers Bronze Bowls 14" TLC
Impeller No. Standard Number of Stages 4



Column: Length ~~100~~ 110 ft. ID - in
OD ~~12~~ 12 in. Material Steel
Threaded or flange Flange

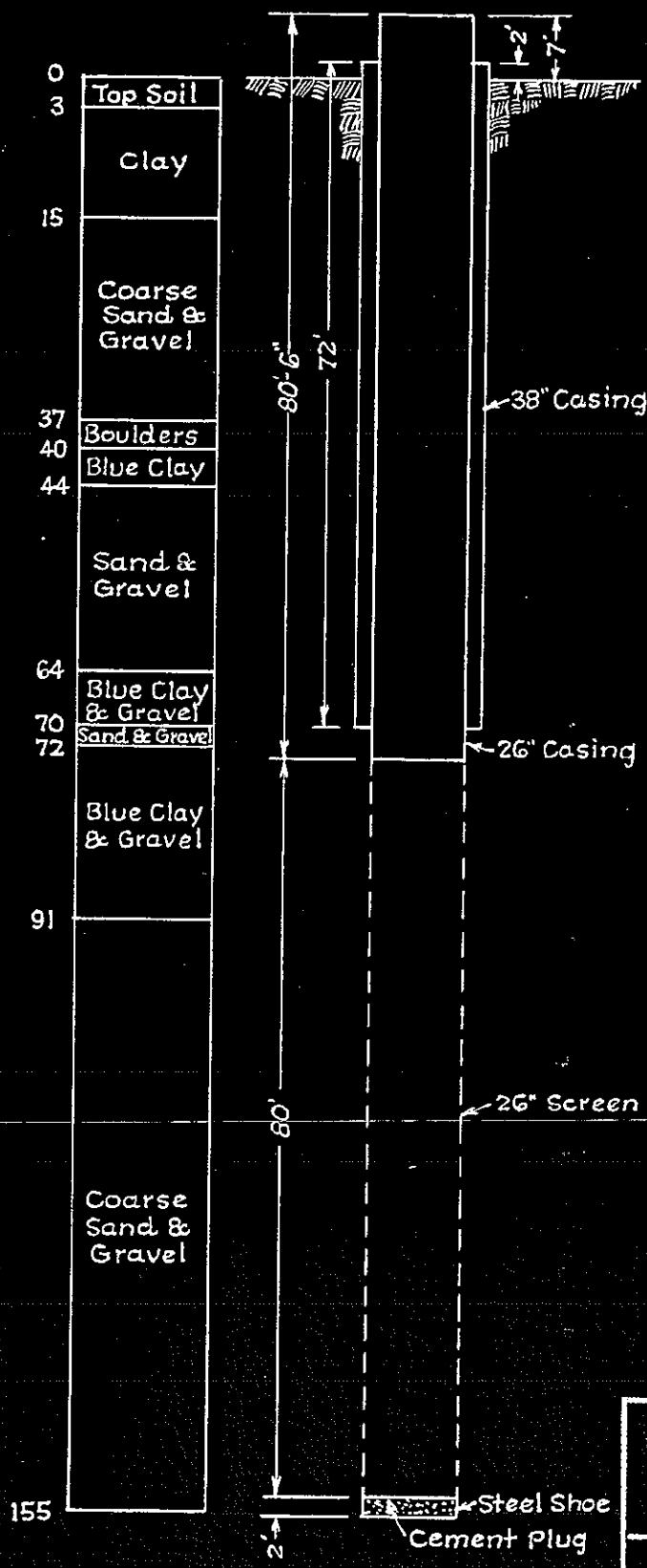
Shaft: Lubrication Oil
Material Stainless Diam. 1-15/16 in
OD Oil Tube 3 in.
Material Steel

Suction Pipe Yes ID 10 in
OD - in. Length 10 ft.
Material Steel
Length of Air Line 88/100 ft.

REMARKS

7/73 - Revitalized, pump repaired and added 10' of column

Prepared by.
WOOLPERT CONSULTANTS



MATERIAL:

Pit: 72' of 38" Steel Casing & 80'-6" of 26" Steel Casing.

Screen: 80' of 26" Steel Shutter Screen.

Cone: 26" × 2' Steel Shoe.

PUMP:

No.	43448	Shop No.	43448
Type	T. L. C.	Size	14"
Setting	100'	Stages	4
Suction	10" × 10' Long	Impellers	
Discharge	10"	Head	
Tubing	3"	Press. B. P.	
Shafting	1 15/16"		

MOTOR:

Make	U.S.	Type	C. F. U.
Volts	440	Cycle	60
Phase	3	Amp.	
H. P.	200	R. P. M.	1800
Frame	587 P. Y.	Serial	

WELL:

Capacity	2000 G.P.M.	Static Level	11'
Guarantee		P. Level	16'-10"
Started	6-22-61	Pressure	
Finished	8-4-61	Pumped	2000 G.P.M.
Accepted	8-4-61	Depth	153'-6" Ground Level

REMARKS:

146 Tons of Pea Gravel Used.

Driller: Neil Morris
Installer: Elmer Hurles, Jr.

THE LAYNE-OHIO CO.,
WATER SUPPLY CONTRACTORS
COLUMBUS OHIO

MONTGOMERY COUNTY
DAYTON, OHIO

DRAWN BY	O. L. M.	APPROVED BY	
WELL NO.	18	DRAWING NO.	1452

Miami Shores Well Field 19

Depth (ft.)	Well Diagram	Description of Material	Log
10–80		Sand and Gravel, Medium Boulders	
80–110		Fine to Coarse Sand, Medium Gravel	
110–130		Coarse Sand, Large Gravel	
130–150		Coarse Sand and Gravel Boulders	
150–170		Red Sand	
170–190		Coarse Red Sand, Large Gravel	
190–210		Coarse Red Sand, Large Gravel, Boulders	

Greater Moraine Water System
Montgomery County, Ohio

WATER WELL DATA

Well No. 19 Location Miami Shores
Driller Moody's of Dayton Equipment Drilling Rig
Date Started August 16, 1971 Completed

CONSTRUCTION DETAILS

Type of Well Method
Outside Casing: Depth of Well
I.D. in. Length: ft. Thickness in.
Material Connections
Inside Casing: 138'
I.D. 18 in. Length: ~~223~~ ft. Thickness in.
Material Steel Connections
Screen:
Type Cook I.D. 12 in. Length: 85 ft.
Openings Varies Material Red drass
Bottom Fitting Ball Plug Top Fitting Lead Packer
Gravel: Size Quantity NA
Well Development:
Method Equipment

PUMPING TEST

Date Static W.L. 55'-6" Time
Flow gpm Length of Test hours
Min. pumping level ft. Max. drawdown ft.
Specific Yield gpm/ft. Stabilized
Transmissibility gpd/ft. Storage Coefficient

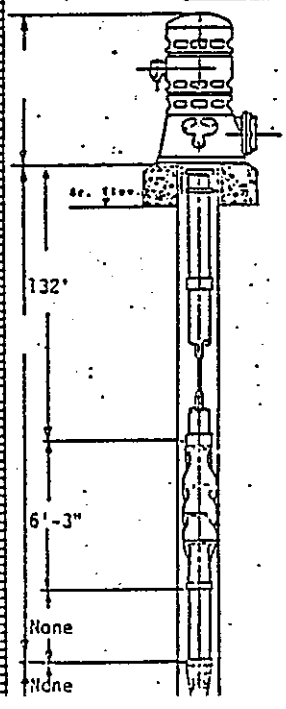
WATER ANALYSIS

Date of Sample Date of Analysis
Pumping hrs. @ gpm Appearance
Water Temperature Air Temperature
Specific Conductance micromhos-cm @ 25° C.

Total Diss. Solids	mg/l	Calcium*	mg/l
Total Hardness*	mg/l	Iron, Fe	mg/l
Alkalinity*	mg/l	Manganese, Mn	mg/l
Non-Carb. Hard.*	mg/l	Chloride, Cl	mg/l
CO_2	mg/l	Sulfate, SO_4	mg/l
Dissolved Oxygen	mg/l	H_2S	mg/l
pH pHs		pH - pHs	

PERMANENT PUMPING EQUIPMENT

Pump Byron Jackson Capacity 1400 gpm TDH 310 ft.
Motor 150 HP @ 1800 RPM
Material: Impellers Bronze Bowls 13 MQ
Impeller No. Number of Stages 4



132'
Column: Length ~~138'-3"~~ ft. ID 10" in.
OD in. Material Steel
Threaded or flange Flanged
Line
Shaft: Lubrication Oil
Material Stainless Diam 1-15/16 in.
OD Oil Tube 3 in.
Material

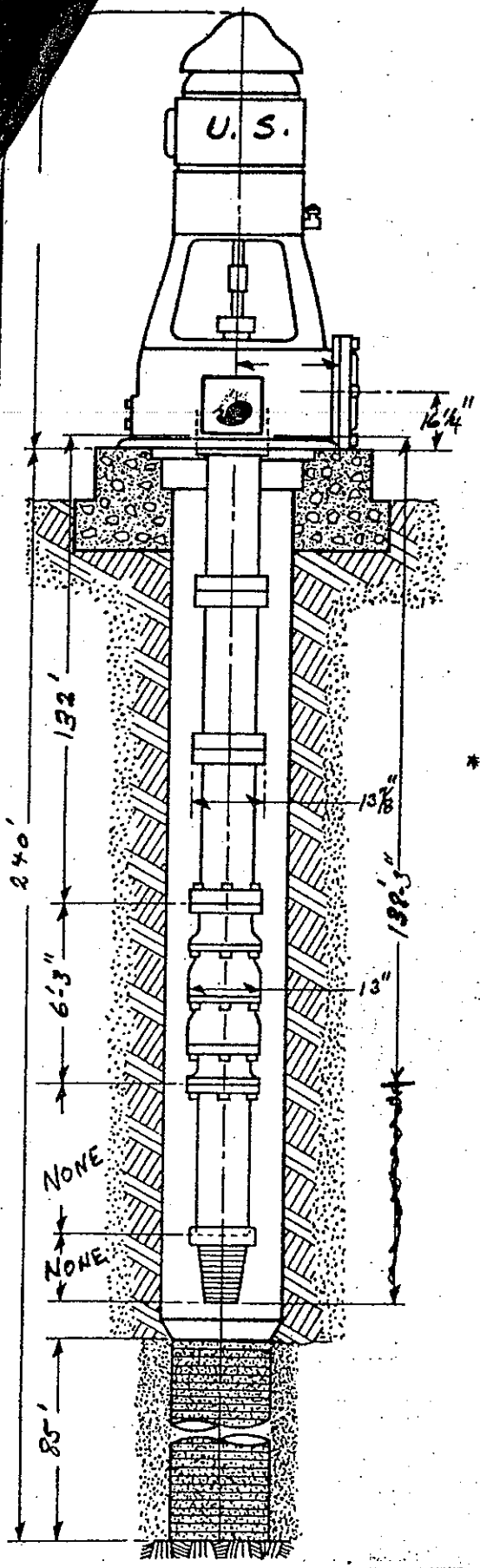
Suction Pipe ID in.
OD in. Length ft.
Material
Length of Air Line 130 ft.

REMARKS

3/79- Repaired pump

Prepared by:
WOOLPERT CONSULTANTS

MOODY'S OF DAYTON, INC.
VANDALIA, OHIO



TURBINE PUMP INSTALLATION FOR:
MONTGOMERY CO.

WELL DESIGNATION NO. #19.

721-C-1634 SERIAL NUMBER
1400 GALLONS PER MINUTE
310' TOTAL HEAD IN FEET
13MQ 4 STAGES
1800 MOTOR SPEED
132' FEET OF SETTING
10" SIZE COLUMN FLANGED
3" OIL TUBE
1 13/16" LINE SHAFT
— — SUCTION PIPE
150 H.P. 460 VOLT. ____ CURRENT ____
OIL LUBRICATION
130' FEET OF AIRLINE-COPPER
7/5/72. DATE INSTALLED

18" O.D. OF WELL
240' FEET DEEP FROM FOUNDATION
223' FEET DEEP FROM GRADE
* 85' STRAINER LENGTH — SLOT ____
55'-6" STATIC LEVEL — DATE 8/16/71.
____ " " — " ____
____ " " — " ____
____ " " — " ____
8/16/71. DATE DRILLED

PUMP REPAIRED — DATE ____
" " — " ____
" " — " ____

WELL ACID TREATED — DATE ____
" " " — " ____

COMMENTS —

* 12" NOMINAL SIZE - RED BRASS.
SEE LETTER 7/15/71

FORM TPI-762

LITHO IN U.S.A.

file

July 16, 1971

Ralph Woolperts & Associates
2324 Stanley Ave.
Dayton, Ohio 45404

ATTN: Jim Herman

Subject: Montgomery County
Well #2 19

Gentlemen:

The drillers' log on the subject well is as follows:

By Everett Wheeler

0' - 1'	Top soil
1' - 84'	Sand and gravel; medium to large small boulders
84' - 116'	Sand- fine to coarse, medium gravel
116' - 149'	Sand- coarse, gravel- large
149' - 166'	Sand- coarse, gravel- large 50% boulders
166' - 172'	Sand- red, fine to coarse, gravel- small
172' - 202'	Sand- red, coarse, gravel- large
202' - 223'	Sand red, coarse, gravel- large, many boulders
223' - 224'	Clay, yellow
224' - 225'	Shale, blue

Per our recent meeting with Rick Bethard from the Cook Well Strainer Company, we have ordered the following screen for the subject well. Cook 12" nominal strainer, red brass material with .1875 bar and .1467 wire complete with lead packer and bail plug. Slot openings will be comprised as follows:

138' - 165'	- 27'	-	100 Slot
165' - 173'	- 8'	-	40 Slot
173' - 175'	- 2'	-	70 Slot
175' - 190'	- 15'	-	100 Slot
190' - 212'	- 22'	-	90 Slot
212' - 223'	- 11'	-	125 Slot

85

Miami Shores Well Field 20

Depth (ft.)	Well Diagram	Description of Material	Log

Greater Moraine Water System
Montgomery County, Ohio

WATER WELL DATA

Well No. 20 Location Miami Shores
Driller Moody's of Dayton Equipment Drilling Rig
Date Started August 6, 1971 Completed

CONSTRUCTION DETAILS

Type of Well Method
Outside Casing: Depth of Well
I. D. in. Length: ft. Thickness in.
Material Connections
Inside Casing: 133
I. D. 18 in. Length: ~~225~~ ft. Thickness in.
Material Steel Connections
Screen:
Type Cook I. D. 12 in. Length: 92 ft.
Openings Material
Bottom Fitting Top Fitting
Gravel: Size Quantity NA
Well Development:
Method Equipment

PUMPING TEST

Date September 1, 1971 Static W. L. 57' Time
Flow gpm Length of Test hours
Min. pumping level ft. Max. drawdown ft.
Specific Yield gpm/ft. Stabilized
Transmissibility gpd /ft. Storage Coefficient

WATER ANALYSIS

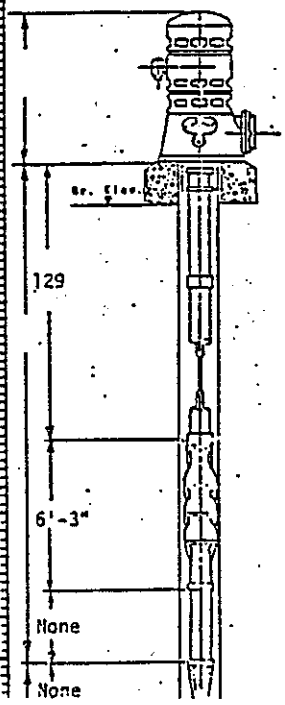
Date of Sample Date of Analysis
Pumping hrs. @ gpm Appearance
Water Temperature Air Temperature
Specific Conductance micromhos-cm @ 25° C.

Total Diss. Solids	mg/l	Calcium*	mg/l
Total Hardness*	mg/l	Iron, Fe	mg/l
Alkalinity*	mg/l	Manganese, Mn	mg/l
Non-Carb. Hard.*	mg/l	Chloride, Cl	mg/l
CO_2	mg/l	Sulfate, SO_4	mg/l
Dissolved Oxygen	mg/l	H_2S	mg/l

pH pHs pH - pHs

PERMANENT PUMPING EQUIPMENT

Pump Byron Jackson Capacity 1400 gpm TDH 310 ft.
Motor 150 HP @ 1800 RPM
Material: Impellers Bronze Bowls 13 MQ
Impeller No. Number of Stages 4



Column: Length ~~135'-3"~~ 129' ft. ID in.
OD 10" in. Material Steel
Threaded or flange Flanged
Line
Shaft: Lubrication Oil
Material SS Diam 1-15/16 in.
OD Oil Tube 3 in.
Material

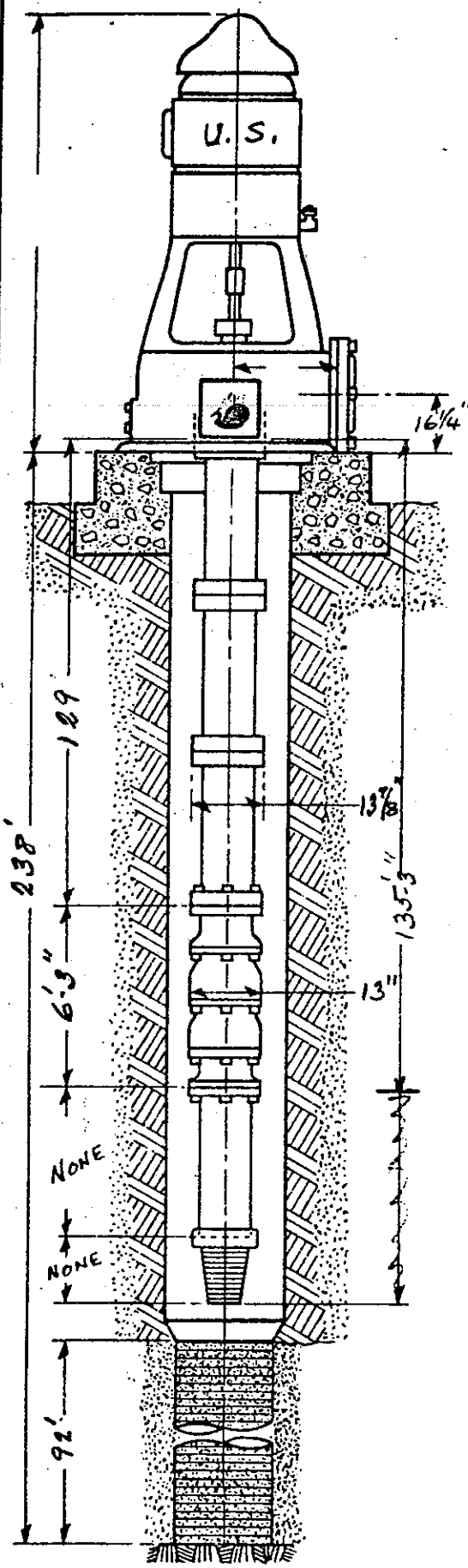
Suction Pipe ID in.
OD in. Length ft.
Material
Length of Air Line 129 ft.

REMARKS

10/76 - Pump repaired
10/80 - Pump repaired

Prepared by:
WOOLPERT CONSULTANTS

MOODY'S OF DAYTON, INC.
VANDALIA, OHIO



TURBINE PUMP INSTALLATION FOR:
MONTGOMERY CO.

WELL DESIGNATION NO. #20.

721-C-1634 SERIAL NUMBER
1400 GALLONS PER MINUTE
310' TOTAL HEAD IN FEET
13MQ 4 STAGES
1800 MOTOR SPEED
132' FEET OF SETTING
10" SIZE COLUMN FLANGED
3" OIL TUBE
1 15/16" LINE SHAFT
— — SUCTION PIPE
150 H.P. 460 VOLT. CURRENT
OIL LUBRICATION
129' FEET OF AIRLINE COPPER
6/21/72 DATE INSTALLED

18" O.D. OF WELL
238' FEET DEEP FROM FOUNDATION
225' FEET DEEP FROM GRADE
* 92' STRAINER LENGTH — SLOT
57' STATIC LEVEL — DATE 9/1/76
" " — "
" " — "
" " — "
8/6/72 DATE DRILLED

PUMP REPAIRED — DATE
" " — "
" " — "

WELL ACID TREATED — DATE
" " " — "

COMMENTS —
* 12" NOMINAL SIZE - RED BRASS

FORM TPI-762

LITHO IN U.S.A.

July 21, 1971

Ralph Woolperts & Associates
2324 Stanley Avenue
Dayton, Ohio 45404

ATTN: Jim Herman

Subject: Montgomery County
Well #20

Gentlemen:

The drillers' log on the subject well is as follows:

By Everett Wheeler
Approximate Static 60'

0' - 3'	-	Top Soil
3' - 28'	-	Sand and gravel (dry)
28' - 60'	-	Coarse sand and coarse gravel (dry)
60' - 886'	-	Gray clay
86' - 131'	-	Coarse sand and coarse gravel
131' - 145'	-	Coarse sand and coarse gravel (few boulders)
145' - 156'	-	Coarse sand and coarse gravel (red color)
156' - 163'	-	Medium sand and medium gravel
163' - 200'	-	Medium sand and medium gravel (red color)
200' - 216'	-	Coarse sand and coarse gravel (red color)
216' - 227'	-	Coarse sand and coarse gravel (red color)
227' - 232'	-	Blue shale (bedrock)

We are enclosing two (2) copies of the sand sample analysis from 185' thru 227'. One (1) copy of all data is being forwarded to Cook Well Strainer Co., ATTN: Rick Bethard. He will be in touch with you concerning recommendations for length of strainer, slot openings, and bar and wire sizes. If you have any questions, or need more information, please advise.

Very truly yours,

MOODY'S OF DAYTON, INC.

Edward B. Wagner
President

EBW/cmw
cc Cook Well Strainer Co
ATTN: Rick Bethard

Miami Shore Well Field 21

Depth (ft.)	Well Diagram	Description of Material	Log
0–10		Topsoil	
10–30		Sand and Gravel	
30–60		Coarse Sand and Gravel	
60–100		Coarse Sand and Gravel with Boulders	
100–130		Coarse Sand and Gravel	
130–170		Coarse Sand and Gravel Some Boulders	
170–220		Coarse Sand and Gravel	

Greater Moraine Water System
Montgomery County, Ohio

WATER WELL DATA

Well No. 21 Location Miami Shores
Driller Reynolds Equipment Drilling Rig
Date Started _____ Completed _____

CONSTRUCTION DETAILS

Type of Well Gravel Pack Method _____
Outside Casing: Depth of Well
I. D. 24 in. Length: _____ ft. Thickness _____ in.
Material _____ Connections _____
Inside Casing: 130'
I. D. 18 in. Length: ~~220~~ ft. Thickness _____ in.
Material _____ Connections _____
Screen:
Type Johnson I. D. 12 in. Length: 90 ft.
Openings _____ Material Stainless Steel
Bottom Fitting _____ Top Fitting _____
Gravel: Size _____ Quantity NA
Well Development:
Method _____ Equipment _____

PUMPING TEST

Date _____ Static W. L. _____ Time _____
Flow _____ gpm Length of Test _____ hours
Min. pumping level _____ ft. Max. drawdown _____ ft.
Specific Yield _____ gpm/ft. Stabilized _____
Transmissibility _____ gpd /ft. Storage Coefficient _____

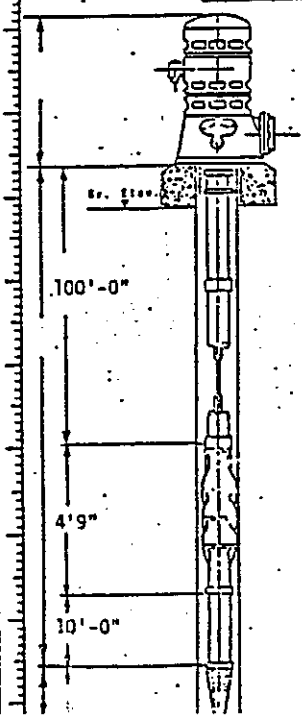
WATER ANALYSIS

Date of Sample _____ Date of Analysis _____
Pumping _____ hrs. @ _____ gpm Appearance _____
Water Temperature _____ Air Temperature _____
Specific Conductance _____ micromhos-cm @ 25° C.

Total Diss. Solids	mg/l	Calcium*	mg/l
Total Hardness*	mg/l	Iron, Fe	mg/l
Alkalinity*	mg/l	Manganese, Mn	mg/l
Non-Carb. Hard.*	mg/l	Chloride, Cl	mg/l
CO_2	mg/l	Sulfate, SO_4	mg/l
Dissolved Oxygen	mg/l	H_2S	mg/l
pH pHs		pH - pHs	

PERMANENT PUMPING EQUIPMENT

Pump Layne Capacity 1700 gpm TDH 205 ft.
Motor 200 HP @ 1800 RPM
Material: Impellers _____ Bowls 15" ORHC
Impeller No. _____ Number of Stages 3



Column: Length ~~104.75~~ 100' ft. ID ~~14~~ 10" in.
OD _____ in. Material Steel
Threaded or flange Flanged
Line
Shaft: Lubrication Oil
Material _____ Diam 1-15/16 in
OD Oil Tube 3 in.
Material _____

Suction Pipe _____ ID 10 in.
OD _____ in. Length 10 ft.
Material _____
Length of Air Line 100 ft.

REMARKS

Prepared by:
WOOLPERT CONSULTANTS

Miami Shore Well Field 22

Depth (ft.)	Well Diagram	Description of Material	Log

Greater Moraine Water System
Montgomery County, Ohio

WATER WELL DATA

Well No. 22 Location Miami Shores
Driller Reynolds Equipment Drilling Rig
Date Started _____ Completed _____

CONSTRUCTION DETAILS

Type of Well Gravel Pack Method _____
Outside Casing: Depth of Well
I. D. 24 in. Length: _____ ft. Thickness _____ in.
Material _____ Connections _____
Inside Casing: 130'
I. D. 18 in. Length: ~~200~~ ft. Thickness _____ in.
Material _____ Connections _____
Screen:
Type Johnson I. D. 12" in. Length: 90 ft.
Openings _____ Material Stainless Steel
Bottom Fitting _____ Top Fitting _____
Gravel: Size _____ Quantity NA
Well Development:
Method _____ Equipment _____

PUMPING TEST

Date _____ Static W. L. 28'-6" Time _____
Flow _____ gpm Length of Test _____ hours
Min. pumping level _____ ft. Max. drawdown _____ ft.
Specific Yield _____ gpm/ft. Stabilized _____
Transmissibility _____ gpd /ft. Storage Coefficient _____

WATER ANALYSIS

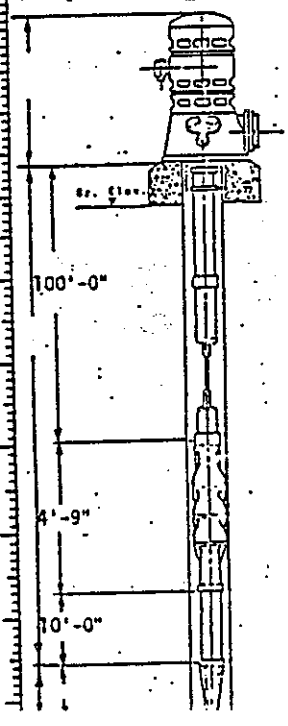
Date of Sample _____ Date of Analysis _____
Pumping _____ hrs. @ _____ gpm Appearance _____
Water Temperature _____ Air Temperature _____
Specific Conductance _____ micromhos-cm @ 25° C.

Total Diss. Solids	mg/l	Calcium*	mg/l
Total Hardness*	mg/l	Iron, Fe	mg/l
Alkalinity*	mg/l	Manganese, Mn	mg/l
Non-Carb. Hard.*	mg/l	Chloride, Cl	mg/l
CO_2	mg/l	Sulfate, SO_4	mg/l
Dissolved Oxygen	mg/l	H_2S	mg/l

pH _____ pHs _____ pH - pHs _____

PERMANENT PUMPING EQUIPMENT

Pump Layne Capacity 1700 gpm TDH 205 ft.
Motor 200 HP @ 1800 RPM
Material: Impellers _____ Bowls 15" ORHC
Impeller No. _____ Number of Stages 3



Column: Length ~~104.75~~ 100' ft. ID _____ in
OD ~~14"~~ 10 in. Material Steel
Threaded or flange Flanged
Line Shaft: Lubrication Oil
Material Diaml-15/16in
OD Oil Tube 3 in.
Material _____
Suction Pipe _____ ID 10 in
OD _____ in. Length 10 ft.
Material _____
Length of Air Line 100 ft.

REMARKS

Prepared by:
WOOLPERT CONSULTANTS

Section 7

General Motors Logs
For Unknown Locations

HR Series and W Series

WELL LOG AND DRILLING REPORT

ORIGINAL

NO CARBON PAPER NECESSARY— SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
65 S. Front St., Rm. 815 Phone (614) 469-2646
Columbus, Ohio 43215

445405

County Montgomery Township Miami Section of Township 17

Owner Frigidaire Address Dayton Ohio

Location of property Dryden Rd. west side of Frigidaire Plant

CONSTRUCTION DETAILS

Casing diameter 5 5/8 Length of casing 101

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion

BAILING OR PUMPING TEST
(Specify one by circling)

Test Rate 20 G.P.M. Duration of test 1 hrs

Drawdown 10 ft. Date

Static level-depth to water 83 ft.

Quality (clear) cloudy, taste, odor)

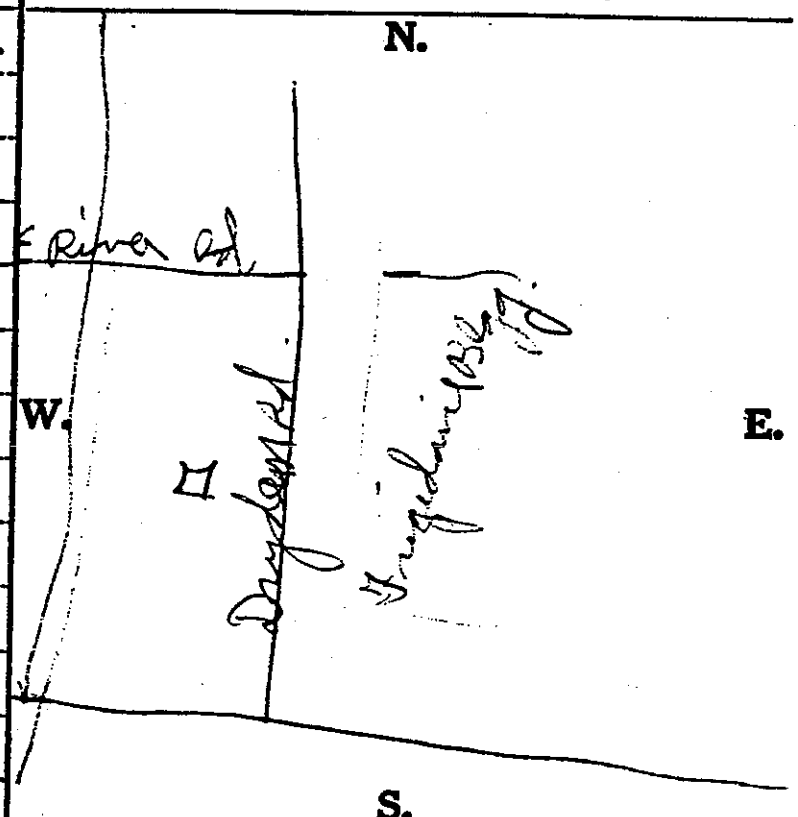
Pump installed by

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
Clay.	0 Feet	10 Ft.
gravel	10	40
Clay.	40	60
Sand.	60	80
gravel.	80	101
1251.		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



Drilling firm CLAY P. GARRISON
WELL CONTRACTOR
Address 3901 S. DIXIE DRIVE
DAYTON, OHIO 45439

Date July 18 73

Signed Clay P. Garrison

*If additional space is needed to complete well log, use next consecutive numbered form.

WELL LOG AND DRILLING REPORT

ORIGINAL

NO CARBON PAPER NECESSARY— SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
65 S. Front St., Rm. 815 Phone (614) 469-2646
Columbus, Ohio 43215

445406

County Montgomery Township Jefferson Section of Township 17

Owner Fairdale Address Dayton Ohio

Location of property Drilled rear of Fairdale Bldg.

CONSTRUCTION DETAILS

Casing diameter 5 5/8 Length of casing 104

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion

BAILING OR PUMPING TEST
(Specify one by circling)

Test Rate 20 G.P.M. Duration of test 1 hrs

Drawdown 12 ft. Date

Static level-depth to water 81 ft.

Quality (clear) cloudy, taste, odor)

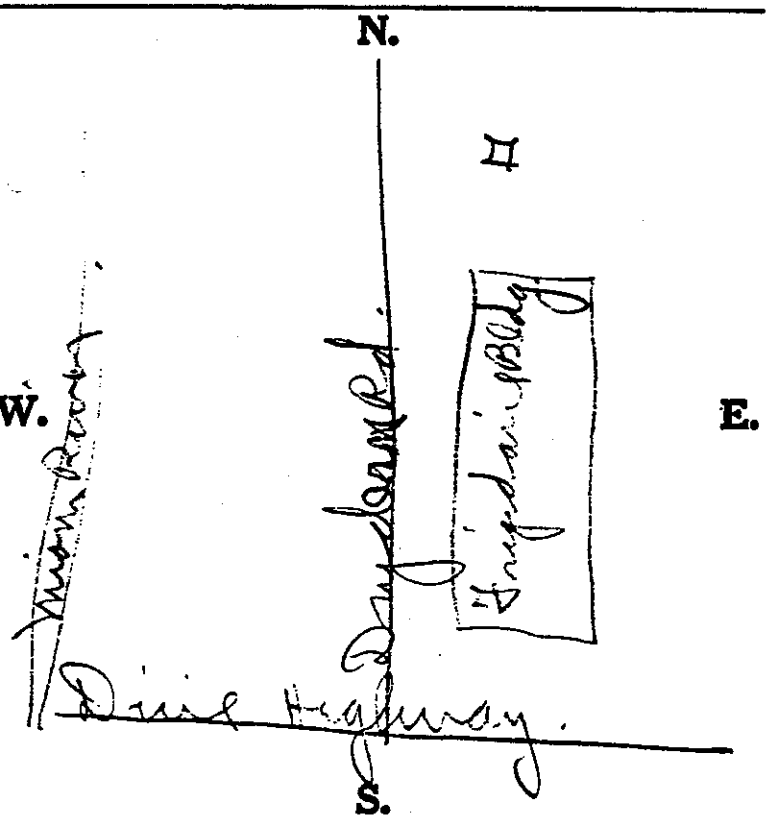
Pump installed by

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
Clay.	0 Feet	12 Ft.
Gravel.	12	41
Clay.	41	64
gravel	64	104
1251		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



Drilling Firm CLAY P. GARRISON WELL CONTRACTOR

Address 3901 S. DIXIE DRIVE DAYTON, OHIO 45439

Date July 18 1972

Signed Clay P Garrison

*If additional space is needed to complete well log, use next consecutive numbered form.

WELL LOG AND DRILLING REPORT

ORIGINAL

PLEASE USE PENCIL OR TYPEWRITER
DO NOT USE INK.

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus, Ohio ~~43212~~ Moraine

№ 360307

County Montgomery Township [illegible] Section of Township

Owner Frigidaire Div. GMC Address Dayton, Ohio

Location of property NE of Plant -5c E. of old C.E. Records well

CONSTRUCTION DETAILS

Casing diameter 20" Length of casing 96'
Type of screen Cook Length of screen 40'
Type of pump Layne
Capacity of pump 1200 GPM
Depth of pump setting 120'
Date of completion 1-5-67

BAILING OR PUMPING TEST

Pumping Rate 1200 G.P.M. Duration of test 8 hrs.
Drawdown 12'11" ~~ft.~~ Date
Static level-depth to water 68'3" ~~ft.~~
Quality (clear, ~~cloudy, taste, odor~~)
Pump installed by Layne Ohio Co

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
Top Soil	0 Feet	3 Ft.
Sandy Clay	3	5
Sand & gravel	5	40
Sand & boulders	40	45
Sand & gravel	45	50
Sand; some gravel	50	75
Sand & gravel	75	100
Sand & gravel	100	116
Sand; a little gravel	116	150
Sandy clay & gravel	150	155
Sand & gravel	155	170
Clay	170	171
5353		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.

N.

RT 25

W. E.

S.

See reverse side for instructions

Drilling Firm Layne Ohio Co Date

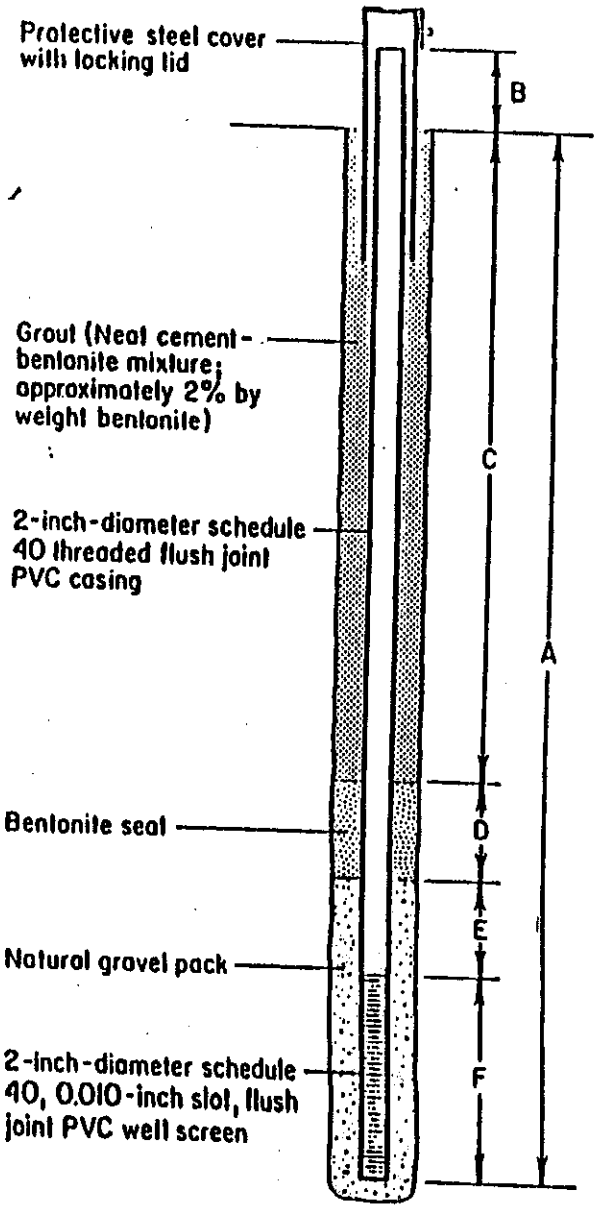
Address Columbus, Ohio Signed

*If additional space is needed to complete well log, use next consecutive numbered form.

Section 8

Harrison Radiator Logs
HR Series and W Series

HR-1 through HR-17
W-1-N through W-4-N
W-1-S through W-4-S



Well No.	A	B	C	D	E	F	Top of Casing Elevation
HR-1	56.7′	0.1′	36.7′	5′	5′	10′	730.20
HR-2	56.6′	2.1′	36.6′	5′	5′	10′	734.72
HR-3	59.6′	2.4′	39.6′	5′	5′	10′	736.71
HR-4	65.0′	2.0′	45.0′	5′	5′	10′	742.61
HR-5	53.6′	0.1′	25.6′	5′	13′	10′	731.05
HR-6	53.0′	0.1′	33.0′	5′	5′	10′	730.28
HR-7	56.8′	0.8′	36.8′	5′	5′	10′	731.80
HR-8	64.2′	0.1′	44.2′	5′	5′	10′	740.94

Figure 3. Construction Details for Wells Installed at the Harrison Facility.

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TEST BORING REPORT

CLIENT Geraghty & Miller, Inc. ORDER No. 10191.002

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. HR-1

LOCATION As directed

DRILLER Willard Martin DRILL No. 36 DATE STARTED 7-11-83

ELEVATION REFERENCE DATE COMPLETED 7-11-83

CASING: DIAMETER 3.5" I. D. Hollow Stem Auger HAMMER WT. FALL

SAMPLER: DIAMETER & TYPE 2" O. D. Split Spoon HAMMER WT. 140# FALL 30"

DEPTH TO WATER: IMMEDIATE 35.5 UPON COMPLETION

DEPTH TO WATER DAYS AFTER COMPLETION WATER USED IN DRILLING

ELEVATION	DEPTH 0'	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Rec
		4" Asphalt					
		Sand, medium to coarse and gravel to 3", little fine sand and silt occasional clay "chunks" fill, light brown dry		0.5-2	SS	13-15-20	
		Sand medium to coarse and gravel, little fine sand and silt, probable fill, light grown, dry		5-6.5	SS	14-16-23	
		Sand, medium, trace silt and sand fine to coarse gravelly with coarse sand in tip, brown, dry		10-11.5	SS	8-14-23	
		Sand, medium, trace silt, some gravel at top of interval, brown, dry		15-16.5	SS	10-7-10	
		Sand, medium to coarse and gravel, little silt and fine sand, brown, dry		20-21.5	SS	20-38-50	

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of load bearing, stability, excavating or other physical

Respectfully submitted,
THE H. C. NUTTING CO.

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. HR-1

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Re
		Sand, coarse and gravel little silt and fine to medium sand, brown, trace clay, moist		25-26.5	SS	16-35-54	
		Sand, coarse and gravel trace silt and fine to medium sand, brown, dry		30-31.5	SS	16-43-30	
		Gravel, some coarse sand, little medium to fine sand and silt, brown, wet		35-36.5	SS	21-20-16	
		Sand, coarse and gravel, little fine - medium sand and silt, brown wet		40-41.5	SS	13-14-16	
	44.0'	Till - silt and clay some gravel little coarse sand gray at top of spoon, brown at bottom, medium sand in tip, moist		45-46.5	SS	20-41-63	
	46.4'	Sand coarse, little gravel, silt and fine sand, brown, wet		50-51.5	SS	21-35-40	
		Sand with clay, gray, minor fraction of probable sized rock		55-56.5	SS	22-26-38	
		Sandy clay, gray, sand fraction is fine grained where incorporated with clay; sand lenses, fine to medium grained		60-61.0	SS	41-112/6	
	61.0'	Set well at 57.7'; See monitor well details					
		BORING COMPLETED					

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8-10-83 vf

TEST BORING REPORT

CLIENT Geraghty & Miller, Inc. ORDER No. 10191.002

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. HR-2

LOCATION As directed

DRILLER Willard Martin DRILL No. 36 DATE STARTED 7-12-83

ELEVATION REFERENCE DATE COMPLETED 7-13-83

CASING: DIAMETER 3.5" I. D. Hollow Stem Auger HAMMER WT. FALL

SAMPLER: DIAMETER & TYPE 2" O. D. Split Spoon HAMMER WT. 140# FALL 30"

DEPTH TO WATER: IMMEDIATE 35.0' UPON COMPLETION

DEPTH TO WATER DAYS AFTER COMPLETION WATER USED IN DRILLING

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Re
	0'	Sand, fine to coarse and silt, some gravel, trace organics and clay, brown, dry to moist, fill		0-1.5	SS	14-15-12	
		Sand, fine to coarse and silt, some gravel, trace organics and clay, brown, dry to moist, fill		5-5.5	SS	10	
	5.5'	Silt, some clay, trace fine - medium sand and organics, dark brown, moist		5.5-6.5	SS	10-8-4	
		Gravel in end of spoon prevented recovery		10-11.5	SS	12-14-12	
		Sand, coarse and gravel, trace silt and fine to medium sand, brown, moist		15-16.5	SS	6-14-20	
		Sand, medium to coarse and gravel, little to trace fine sand and silt and clay, brown, moist		20-21.5	SS	12-20-28	

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of load bearing, stability, excavating or other physical characteristics of materials penetrated in the boring.

Respectfully submitted,
THE H. C. NUTTING CO.

By

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. HR-2

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	R
		Sand, medium to coarse and gravel, little to trace fine sand and silt and clay, brown, moist		25-25.5	SS	16	
		Sand medium, little fine and coarse sand and silt, dry light brown		25.5-26.5	SS	42-30	
		Sand coarse and gravel, little fine to medium sand, trace silt, dry brown		30-31.5	SS	17-38-50	
	35.0'	Till, silt, some clay, little gravel, brown at contact with overlying outwash to gray through out spoon, moist		35-36.5	SS	20-13-13	
	37.0'	Sand, coarse sand gravel, little fine to medium sand, silt and clay wet - (possible dry spots)		37-38	SS	34-56	
		Sand, coarse and gravel, trace silt and fine to medium sand, brown, wet		40-41.5	SS	36-62	
		Gravel and coarse sand, trace silt, brown, wet		45-46.5	SS	41-84	
		Sand coarse and gravel, some medium sand little silt and clay lense of dense higher clay content, brown, wet		50-51.5	SS	41-47-41	
		Gravel and coarse sand little to trace silt and fine to medium sand light brown, wet		55-56.5	SS	44-63	
	57.0'						

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. HR-2

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	R
	57.0'						
		Till, silt, some gravel little fine to medium sand, gray, moist		57-58.5	SS	24-42-56	
	58.5						
		Set well at 56.6'; See monitor well details					
		BORING COMPLETED					

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TEST BORING REPORT

CLIENT Geraghty & Miller, Inc. ORDER No. 10191.002

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. HR-3

LOCATION As directed

DRILLER Willard Martin DRILL No. 36 DATE STARTED 7-13-83

ELEVATION REFERENCE DATE COMPLETED 7-14-83

CASING: DIAMETER 3.5" I. D. Hollow Stem Auger HAMMER WT. FALL

SAMPLER: DIAMETER & TYPE 2" O. D. Split Spoon HAMMER WT. 140# FALL 30"

DEPTH TO WATER: IMMEDIATE 38.0' UPON COMPLETION

DEPTH TO WATER DAYS AFTER COMPLETION WATER USED IN DRILLING

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Rec
	0'	Sand, fine to coarse and gravel, some silt and organics, brown to dark brown, dry to moist		0-1.5	SS	6-9-12	
		Sand, medium, little gravel, trace silt fine to medium sand light brown, dry		5-6.5	SS	9-14-15	
		Sand, medium to coarse and gravel trace silt and fine sand, light brown, dry		10-11.5	SS	14-18-26	
		Sand medium to coarse and gravel trace silt and fine sand, brown, moist		15-16.5	SS	16-22-28	
		Sand medium to coarse and gravel trace silt and fine sand, brown, moist		20-21.5	SS	17-38-52	
		Sand medium to coarse, some gravel, trace silt and fine sand, brown, moist		25-26.5	SS	18-28-34	

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of load bearing, stability, excavating or other physical

Respectfully submitted,
THE H. C. NUTTING CO.

PROJECT GMC, Harrison Radiator Division, Monitoring Wells HOLE No. HR-3
Moraine, Ohio

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.
		Sand medium to coarse, some gravel moist brown		30-31.5	SS	34-68
		Sand, coarse and gravel, little fine to medium sand and silt, moist brown		35-36.5		
		Sand coarse and gravel, trace silt and fine to medium sand, brown, wet		40-41.5	SS	34-62
		Gravel and coarse sand, trace silt brown, wet		45-46.5	SS	48-72
		Sand, coarse and gravel, little silt and clay, brown wet		50-51.5	SS	36-74
		Sand, coarse and gravel, little silt and clay, brown wet		55-56.5	SS	42-54
	60.5'			60-60.5	SS	22
		Silt, some gravel and clay, trace fine - coarse sand, gray, moist		60.5-61.5	SS	34-46
	61.5'					
		Set well at 59.6'; See monitor well details				
		BORING COMPLETED				

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TEST BORING REPORT

CLIENT Geraghty & Miller, Inc. ORDER No. 10191.002

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. HR-4

LOCATION As directed

DRILLER Willard Martin DRILL No. 36 DATE STARTED 7-14-83

ELEVATION REFERENCE

CASING: DIAMETER 3.5" I. D. Hollow Stem Auger DATE COMPLETED 7-14-83

SAMPLER: DIAMETER & TYPE 2" O. D. Split Spoon HAMMER WT. FALL

DEPTH TO WATER: IMMEDIATE 41.0' HAMMER WT. FALL

DEPTH TO WATER DAYS AFTER COMPLETION UPON COMPLETION

WATER USED IN DRILLING

ELEVATION	DEPTH 0'	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Recov
		Sand, fine to coarse and gravel silt, little clay, brown dry		0-0.5	SS	21	
		Silt and fine to medium sand little clay, brown dry - moist		0.5-1.5	SS	22-12	
		Sand fine to coarse, and gravel, little silt, light brown, dry		5-6.5	SS	12-14-20	
		Sand fine to coarse, some to little gravel, little silt, light brown, dry		10-11.5	SS	11-15-16	
		Sand fine to coarse and gravel little silt, light brown, dry		15-16.5	SS	14-34-44	
		Sand fine to coarse and gravel little silt, light brown, dry		20-21.5	SS	13-22-24	
		Sand fine to coarse and gravel little to trace silt, light brown, dry		25-26.5	SS	12-23-34	

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of load bearing, stability, excavating or other physical

Respectfully submitted,
THE H. C. NUTTING CO.

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. HR-4

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	R
		Sand medium sand and gravel, some fine to coarse sand little silt light brown, dry		30-31.5	SS	31-37-41	
		Large gravel prevented recovery		35-36.5	SS	94-64	
		Gravel and coarse sand, little fine to medium sand brown Wet at tip		40-41.5	SS	40-44-41	
		Gravel, little sand fine to coarse, wet		45-46.5	SS	25-55	
		Sand coarse and gravel, little fine to medium sand trace silt, brown, wet		50-51.5	SS	74-82	
		Sand coarse and gravel, little fine to medium sand trace silt, brown, wet		55-56.5	SS	72-94	
		Sand medium to coarse, some gravel little fine sand and silt, brown wet		60-61.5	SS	45-76	
	65.5'	Silt and fine sand little clay, orange brown, moist - till		65.5-66	SS	112	
		Silt, some fine sand and gravel gray, moist possible coarse sandy layer on top - till		66-67	SS	44-65	
	67.0'	Set well at 65.0'; See monitor well details					
		BORING COMPLETED					

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8-10-83 vf

TEST BORING REPORT

CLIENT Geraghty & Miller, Inc. ORDER No. 10191.002

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. HR-5

LOCATION As directed

DRILLER Willard Martin DRILL No. 36 DATE STARTED 7-15-83

ELEVATION REFERENCE DATE COMPLETED 7-15-83

CASING: DIAMETER 3.5" I. D. Hollow Stem Auger HAMMER WT. FALL

SAMPLER: DIAMETER & TYPE 2" O. D. Split Spoon HAMMER WT. 140# FALL 30"

DEPTH TO WATER: IMMEDIATE 33.0' UPON COMPLETION

DEPTH TO WATER DAYS AFTER COMPLETION WATER USED IN DRILLING

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Rec
	0'	Approximately 4" asphalt					
		Silt, clay and gravel, little fine to coarse sand, dark brown, moist fill		4"-1.5	SS	5-6-7	
		Sand, fine to coarse and gravel little silt, brown, dry		5-6.5	SS	6-8-11	
		Sand, medium to coarse and gravel little fine sand and silt, light brown, dry		10-11.5	SS	15-21-31	
		Sand medium to coarse and gravel, trace fine sand and silt, light brown, dry		15-16.5	SS	11-16-30	
		Sand medium to coarse and gravel, trace fine sand, light brown, dry		20-21.5	SS	12-25-32	
		Sand medium to coarse and gravel, trace fine sand, light brown, dry		25-26.5	SS	35-51	
		Sand medium to coarse and gravel, trace fine sand with zone of higher fine sand content, light brown dry to moist		30-31.5	SS	21-42-60	

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of load bearing, stability, excavating or other physical

Respectfully submitted,
THE H. C. NUTTING CO.

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. HR-5

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	R
		Sand coarse, little gravel, trace fine to medium sand and silt, brown, wet		35-36.5	SS	16-21-31	
	38.0'						
		Till, silt, some gravel and coarse sand, little fine sand, gray moist		40-41.5	SS	10-18-24	
		Till, silt, some gravel and coarse sand, little fine sand, gray moist		45-46.5	SS	10-17-27	
	47.5'						
		Sand coarse and gravel, some silt and clay, gray, wet		50-51.5	SS	21-38-56	
		Sand medium to coarse, trace silt and fine sand, gray, brown, wet sand		52-53.5	SS	28-51	
		Sand coarse and gravel, some silt and clay, gray, wet, sand medium to coarse, trace silt and fine sand, gray - brown, wet		55.5-56		35	
	56.0'	Till, silt and clay, some gravel and coarse sand, trace fine to medium sand, gray, wet		56-56.5	SS	52	
		Till, silt and clay, some gravel and coarse sand, trace fine to medium sand, gray, wet		57.5-59	SS	30-41-60	
	59.0'						
		Set well at 53.6'; See monitoring well details					
		BORING COMPLETED					

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TEST BORING REPORT

CLIENT Geraghty & Miller, Inc. ORDER No. 10191.002

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. HR-6

LOCATION As directed

DRILLER Willard Martin DRILL No. 36 DATE STARTED 7-15-83

ELEVATION REFERENCE

CASING: DIAMETER 3.5" I. D. Hollow Stem Auger DATE COMPLETED 7-16-83

SAMPLER: DIAMETER & TYPE 2" O. D. Split Spoon HAMMER WT. FALL

DEPTH TO WATER: IMMEDIATE 43.5' HAMMER WT. 140# FALL 30"

DEPTH TO WATER DAYS AFTER COMPLETION UPON COMPLETION

WATER USED IN DRILLING

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Re
	0'	2" of asphalt					
		Silt, fine to coarse sand and gravel, brown, moist, fill		2"-1.5	SS	6-8-10	
		Silt, fine to coarse sand and gravel, brown, moist, fill, very moist		5-6.5	SS	2-3-3	
		Sand medium to coarse and gravel, trace silt, brown, moist		10-11.5	SS	6-8-11	
		Sand medium to coarse and gravel, grace silt, brown, moist		15-16.5	SS	8-14-17	
		Sand fine to medium, trace silt, brown, moist		20-21	SS	10-14	
		Sand coarse and gravel, little fine to medium sand, trace silt very moist to wet		21-21.5	SS	19	
		Very hard drilling, boulder ? 24.0'					
	30.0'	Sand medium to coarse, and gravel, brown moist		25-26.5	SS	11-15-21	

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of load bearing, stability, excavating or other physical

Respectfully submitted,
THE H. C. NUTTING CO.

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. HR-6

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.
	30.0'	Silt and clay, some coarse sand and gravel, brown for 6" then gray, moist		30-31.5	SS	14-18-28
		Silt, some clay, gravel, little fine to coarse sand, gray, moist		35-36.5	SS	10-12-16
	43.5'	Silt, some clay,gravel, little fine to coarse sand, gray, moist		40-41.5	SS	11-14-23
		Sand, medium to coarse, some gravel, little silt and clay, light brown, wet		45-46.5	SS	21-42-70
		Sand coarse sand gravel, brown, wet - may be slough much of sample lost		50-51.5	SS	31-64
		Sand medium to coarse and gravel, little, silt, brown, wet		55-56.5	SS	25-36-38
	57.5'	Till - silt, some clay, little gravel and fine to coarse sand, brown first 2", gray, moist		57.5-59	SS	28-62
	59.0'					
		Set well at 53.0'; See monitoring well details				
		BORING COMPLETED				

THE H. C. NUTTING COMPANY
GEOTECHNICAL AND TESTING ENGINEERS SINCE 19
4120 AIRPORT ROAD • P.O. BOX C • CINCINNATI, OHIO 45226 • 513-321-58
912 MORRIS STREET • CHARLESTON, WEST VIRGINIA 25301 • 304-344-08
BOX NUMBER 11 • HIGHLAND HEIGHTS, KENTUCKY 41076 • 606-261-20

"AS A MUTUAL PROTECTION TO CLIENTS, THE PUBLIC, AND OURSELVES, ALL REPORTS ARE SUBMITTED AS THE CONFIDENTIAL PROPERTY OF CLIENTS, AND AUTHORIZATION FOR PUBLICATION OF STATEMENTS, CONCLUSIONS, OR EXTRACTS FROM OR REGARDING OUR REPORTS IS RESERVED PENDING OUR WRITTEN APPROVAL."

TEST BORING REPORT

CLIENT Geraghty & Miller, Inc. ORDER No. 10191.002

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. HR-7

LOCATION As directed

DRILLER Willard Martin DRILL No. 36 DATE STARTED 7-16-83

ELEVATION REFERENCE DATE COMPLETED 7-17-83

CASING: DIAMETER 3.5" I. D. Hollow Stem Auger HAMMER WT. FALL

SAMPLER: DIAMETER & TYPE 2" O. D. Split Spoon HAMMER WT. 140# FALL 30"

DEPTH TO WATER: IMMEDIATE 36.5' UPON COMPLETION

DEPTH TO WATER DAYS AFTER COMPLETION WATER USED IN DRILLING

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Recover
	0'	Silt, little fine to coarse sand and gravel, brown, trace roots and organics, moist		0-1.5	SS		
		Silt and fine to medium sand, little clay, brown, moist		5-6.5	SS		
		Sand fine to coarse and gravel, trace silt, light brown dry		10-11.5	SS		
		Sand, coarse and gravel little fine to medium sand and silt, light brown, dry		15-16.5	SS		
		Sand, medium to coarse, some gravel, trace fine sand and silt brown dry to moist		20-21.5	SS		
		Sand, coarse and gravel, trace fine to medium sand, brown, moist		25-26.5	SS		
		Sand, medium, brown, moist trace trace coarse sand		30-31.5	SS		
	32.5'	Till					
	35.0'						

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of load bearing, stability, excavating or other physical

Respectfully submitted,
THE H. C. NUTTING CO.

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. HR-7

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.
	35.0'	Sand coarse and gravel, little silt and fine to medium sand, brown wet to very moist		35-36.5	SS	
		Sand coarse and gravel, little silt and fine to medium sand, brown wet to very moist		40-41.5	SS	
		Sand, medium to coarse, trace silt, brown, wet		45-46.5	SS	
	51.0'	Sand, medium to coarse, trace silt, brown, wet		50-51	SS	
		Sand medium to coarse, some gravel brown, wet		51-51.5	SS	
		Sand medium to coarse, and gravel little silt and fine sand, brown wet		55-56	SS	
		Sand medium to coarse and gravel trace fine sand and silt, gray wet		56-56.5	SS	
	57.0'	Silt, little fine to coarse sand and gravel and clay, gray, moist		57-58.5	SS	
	58.5	Set well at 57.0'; See monitoring well details				
		BORING COMPLETED				

THE H. C. NUTTING COMPA
GEOTECHNICAL AND TESTING ENGINEERS SINC
4120 AIRPORT ROAD • P.O. BOX C • CINCINNATI, OHIO 45226 • 513-32
912 MORRIS STREET • CHARLESTON, WEST VIRGINIA 25301 • 304-34
BOX NUMBER 11 • HIGHLAND HEIGHTS, KENTUCKY 41076 • 606-26

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8-10-83 vf

TEST BORING REPORT

CLIENT Geraghty & Miller, Inc. ORDER No. 10191.002

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. HR-8

LOCATION As directed

DRILLER Willard Martin DRILL No. 36 DATE STARTED 7-18-83

ELEVATION REFERENCE

CASING: DIAMETER 3.5" I. D. Hollow Stem Auger DATE COMPLETED 7-18-83

SAMPLER: DIAMETER & TYPE 2" O. D. Split Spoon HAMMER WT. FALL

DEPTH TO WATER: IMMEDIATE 41.0' HAMMER WT. 140# FALL 30"

DEPTH TO WATER DAYS AFTER COMPLETION UPON COMPLETION

WATER USED IN DRILLING

ELEVATION	DEPTH 0'	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Rec
	0.5'	5"-6" of asphalt		0.5-1.5	SS		
		Crushed stone					
	1.5'	Silt, and fine to coarse sand, some gravel, dark brown moist little clay, fill, trace organics		1.5-2	SS		
		Silt, some fine to coarse sand and gravel, little clay, roots, trace organics, dark brown, moist, fill ?		5-6.5	SS		
		Sand fine to medium, with some gravel in lenses near beginning and end of interval, trace silt, light brown, dry		10-11.5	SS		
		Sand medium to coarse and gravel trace fine sand and silt, light brown, dry		15-16.5	SS		
		Sand coarse and gravel, trace medium fine sand and silt, brown moist		20-21.5	SS		

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of load bearing, stability, excavating or other physical characteristics of materials encountered.

Respectfully submitted,
THE H. C. NUTTING CO.

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. HR-8

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Re
		Sand coarse and gravel, trace medium to fine sand and silt, brown, moist, (only driven 6" refusal on large cobble-?)		25-26.5	SS		
		Sand, coarse, some gravel trace fine to medium sand, light brown, moist		30-31.5	SS		
	35.0'	Large gravel, cobbles, boulders ? could not drive spoon, hard drilling					
	38.0'						
		Sand coarse and gravel, wet		40-41.5	SS		
		Sand coarse and gravel, wet		45-46.5	SS		
		Sand, medium to coarse and gravel, trace silt and fine sand, brown, wet		50-51.5	SS		
		Sand, medium to coarse and gravel, trace silt and fine sand, brown, wet		55-56.5	SS		
		Sand coarse and gravel, little silt and fine sand, brown, wet		60-61.5	SS		
	66.0'			65-66	SS		
		Sand fine to coarse and silt, trace gravel, orange brown, very moist to wet		66-66.5	SS		
		Sand medium, trace small gravel and silt, wet, brown		70-71.5	SS		
		Silt, trace clay, gray, wet		75-76.5			
	76.0'	Set well at 64.2'; See monitoring well details I-18					
		BORING COMPLETED					

GERAGHTY & MILLER, INC.
Ground-Water Consultants

PROJECT NO. OH0610DY05	BORE HOLE NO. HR-9
PROJECT Harrison Radiator	LOCATION Moraine, Ohio
DRILLING CONTRACTOR Moody's of Dayton, Inc.	DRILLING EQUIPMENT CME 75 Hollow Stem Auger
HYDROGEOLOGIST John Elrod	DRILLER Herb Williams
DATE START / TIME 8/22/88 4:00 PM	DATE FINISH / TIME 8/24/88 3:00 PM
SURFACE ELEVATION 741.0'	TOTAL DEPTH 76.5'
WELL CASING 2" PVC, sch 40	SCREEN TYPE 2" PVC
LENGTH 10'	SLOT 10

REMARKS

BORE HOLE LOG

DEPTH (FT.)	SAMPLE (NO.)	BLOW COUNT PER 6 IN.	RECOVERY (FT.)	LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)
				Asphalt		
	S-1	7-8-19	12	Med-cs GRAVEL and SILT, tr fine sand, brown		
5	S-2	8-14-13	7	Med-cs GRAVEL, little med-cs sand, tr silt, tr clay, dk brown (fill?)	Asphalt remnants from surface	
10	S-3	11-13-30	8	Cs SAND, some med-cs gravel, some silt, tr fine-med sand, med brown		
15	S-4	13-22-27	7	Med-cs SAND, some gravel, tr silt, med brown, moist		
20	S-5	17-9-12	7	GRAVEL, some med-cs sand, tr silt, grayish brown, moist		
25	S-6	8-8-9	12	Med SAND, little gravel, gray, moist		
30	S-7	28-32-45	18	Med-cs SAND, little med-cs gravel, gray, moist	Most gravel is limestone	

GERAGHTY & MILLER, INC.
Ground-Water Consultants

PROJECT NO. OH0610DY05

BORE HOLE NO. HR-9

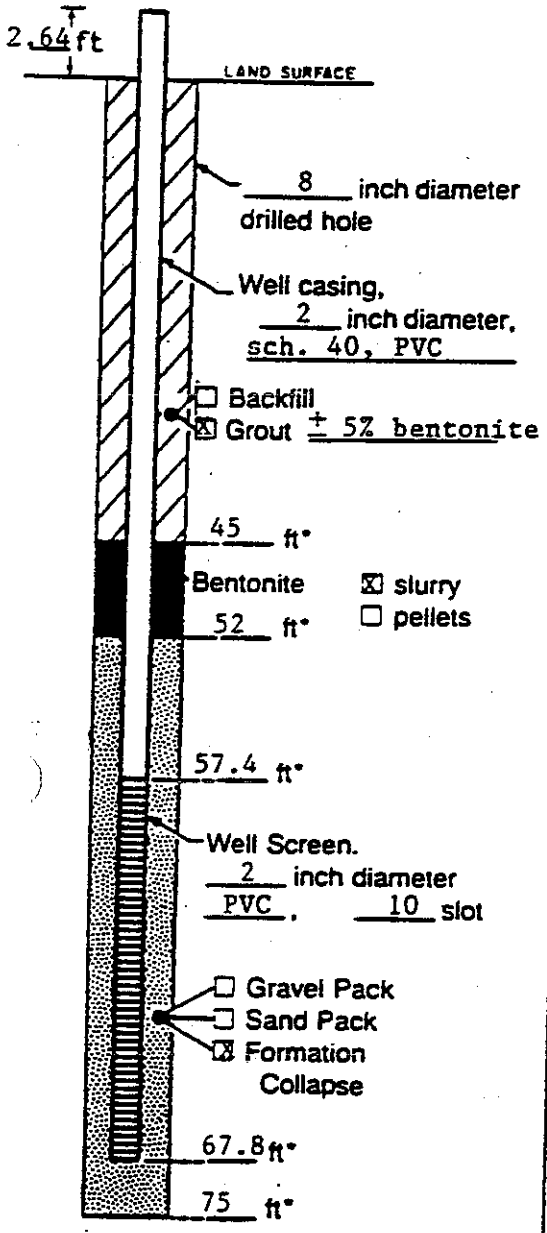
PROJECT Harrison Radiator

LOCATION Moraine, Ohio

REMARKS

DEPTH (FT.)	SAMPLE NO.	BLOW COUNT PER 6 IN.	RECOVERY (FT)	LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)
	S-8	45-100	6	Med-cs SAND and GRAVEL, little silt, moist	Hit large cobble after 6" penetration	
40	S-9	32-26-27	18	Med-cs SAND, some silt, little med-cs gravel, tr fine sand, brown, wet		
45	S-10	24-30-46	18	Med-cs SAND and GRAVEL, some silt, little fine-med sand, brown, wet		
50	S-11	41-32-37	18	Med-cs SAND and GRAVEL, brown, wet		
55	S-12	25-24-26	18	Med-cs SAND and GRAVEL, some silt, some clay, brown, wet		
60	S-13	36-19-23	18	GRAVEL and med-cs SAND, brown, wet		
65	S-14	32-46-33	18	Med SAND and GRAVEL, little cs sand, little silt, brown, wet		
70	S-15	45-78-45	18	GRAVEL and fine-med SAND, brown, wet		
75	S-16	23-25-52	18	Fine-med SAND, some silt, some clay, tr gravel, brown, wet		

WELL CONSTRUCTION LOG



Measuring Point is Top of PVC Well Casing Unless Otherwise Noted.

*Depth Below Land Surface

Project Harrison Radiator Well HR-9

Town/City Moraine

County Montgomery State Ohio

Permit No. _____

Land-Surface Elevation =741.0

and Datum _____ feet ☒ surveyed

MP=743.64 ☐ estimated

Installation Dates(s) 8/22/88 - 8/24/88

Drilling Method 4" ID Hollow-Stem Auger

Drilling Contractor Moody's of Dayton, Inc.

Drilling Fluid None

Development Techniques(s) and Date(s)

Brainard-Kilman Hand Pump, 9/23/88

Fluid Loss During Drilling _____ gallons

Water Removed During Development 250 gallons

Static Depth to Water 38.97 (9/23/88) feet below M.P.

Pumping Depth to Water _____ feet below M.P.

Pumping Duration _____ hours

Yield _____ gpm Date _____

Specific Capacity _____ gpm/ft

Well Purpose Ground-Water Quality and Elevation Monitoring

Remarks MP=Top of PVC well casing

Prepared by John Elrod, Kathy Shannon

GERAGHTY & MILLER, INC.
Ground-Water Consultants

PROJECT NO. 0H0610DY05	BORE HOLE NO. HR-10
PROJECT Harrison Radiator	LOCATION Moraine, Ohio
DRILLING CONTRACTOR Reynolds Supply, Inc.	DRILLING EQUIPMENT Bucyrus Erie 6TL
HYDROGEOLOGIST John Elrod	DRILLER Steve Back
DATE START / TIME 9/12/88	DATE FINISH / TIME 9/15/88
SURFACE ELEVATION 740.9'	TOTAL DEPTH 125'
WELL CASING 4" PVC, sch 40	SCREEN TYPE 4" PVC
LENGTH 10'	SLOT 10
REMARKS	

BORE HOLE LOG

DEPTH (FT.)	SAMPLE (NO.)	LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)
	1	SILT and CLAY and med-cs SAND, med brown	strong diesel aroma @ 1.5-3.0	
5	2	Med-cs SAND, some gravel, tr fine sand, grayish brown		
10	3	Fine-cs SAND, some cs sand, grayish brown		
15	4	GRAVEL, some cs sand, tr fine-med sand, grayish brown		
20	5	GRAVEL, some cs sand, tr fine-med sand, grayish brown		
25	6	GRAVEL, some cs sand, grayish brown		
30	7	GRAVEL and med SAND, grayish brown		
35	8	GRAVEL and med-cs SAND, grayish brown		
40	9	Fine-med GRAVEL, some med-cs sand, tr fine sand, grayish brown		
45	10	Fine-med GRAVEL, some med-cs sand, tr fine sand, grayish brown		
50	11	Med-cs SAND, some gravel, tr fine sand, grayish brown		
55	12	Med-cs SAND, some fine sand, tr gravel, tr silt, grayish brown		
60	13	Med-cs SAND, some fine sand, tr gravel, tr silt		
65	14	Fine-cs SAND and silt, tr gravel grayish green, GRAVEL, little fine-cs sand, little silt, grayish green		

& MILLER, INC.
Ground-Water Consultants

PROJECT NO. OH0610DY05

BORE HOLE NO. HR-10

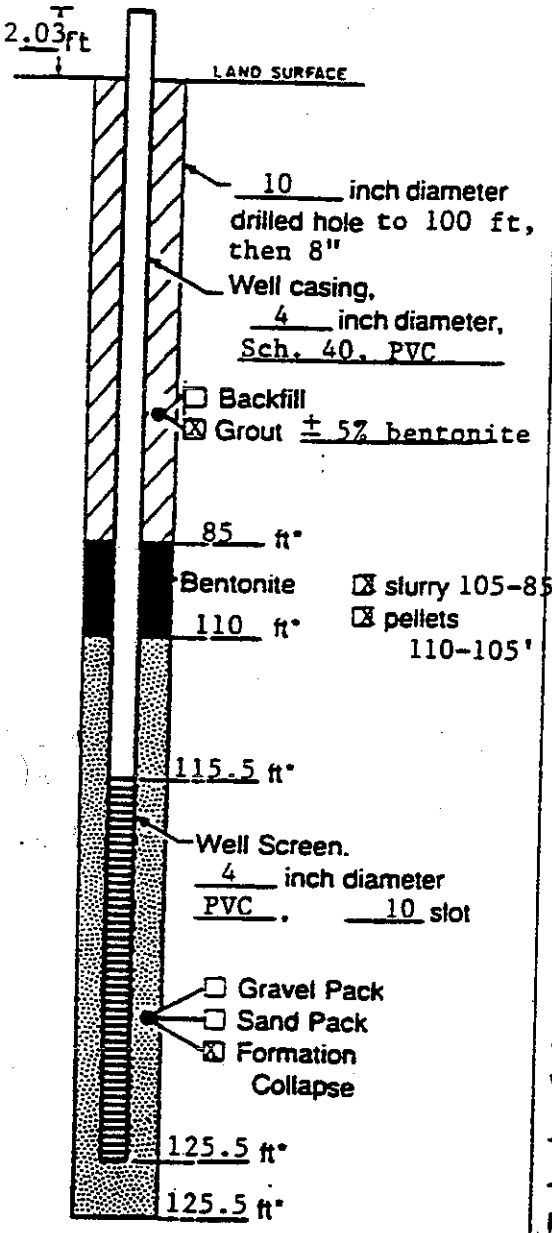
PROJECT Harrison Radiator

LOCATION Moraine, Ohio

REMARKS

DEPTH (FT.)	SAMPLE NO.	LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)
75	15	GRAVEL, some med-cs sand, gray		
80	16	Med-cs SAND, tr gravel, tr silt, gray		
85	17	Med-cs SAND, tr gravel, tr silt, gray		
90	18	Med-cs SAND, tr gravel, tr silt, grayish green		
95	19	GRAVEL, some cs sand, tr fine-med sand, grayish brown	Very hard bailing	
100	20	GRAVEL and fine-med SAND, tr silt, grayish brown		
105	21	Fine-med SAND, some cs sand, some gravel, little silt, grayish brown		
110	22	Fine-med SAND, some cs sand, some gravel, little silt, grayish brown		
115	23	Fine-med GRAVEL, tr fine-cs sand, grayish brown		
120	24	Fine-med GRAVEL, little fine-cs sand, grayish brown		
125	25	Med-cs GRAVEL, tr cs sand, tr fine gravel, grayish brown		
130				
135				
140				
145				

WELL CONSTRUCTION LOG



Measuring Point is Top of PVC Well Casing Unless Otherwise Noted.

*Depth Below Land Surface

Project Harrison Radiator Well HR-10

Town/City Moraine

County Montgomery State Ohio

Permit No. _____

Land-Surface Elevation =740.9 feet

and Datum _____ feet ☒ surveyed

MP=742.93 feet ☐ estimated

Installation Dates(s) 9/12/88 - 9/15/88

Drilling Method Cable Tool

Drilling Contractor Reynolds Supply, Inc.

Drilling Fluid City of Dayton Water Supply

Development Techniques(s) and Date(s)

Submersible pump, 9/23/88

Fluid Loss During Drilling _____ gallons

Water Removed During Development 780 gallons

Static Depth to Water 38.24 (9/23/88) feet below M.P.

Pumping Depth to Water _____ feet below M.P.

Pumping Duration _____ hours

Yield _____ gpm Date _____

Specific Capacity _____ gpm/ft

Well Purpose Ground-Water Quality and Elevation Monitoring

Remarks MP=Top of PVC well casing

Prepared by John Elrod, Kathy Shannon

GERAGHTY & MILLER, INC.
Ground-Water Consultants

PROJECT NO. 0HO610DY05	BORE HOLE NO. HR-11
PROJECT Harrison Radiator	LOCATION Moraine, Ohio
DRILLING CONTRACTOR Moody's of Dayton, Inc.	DRILLING EQUIPMENT CME 75 Hollow Stem
HYDROGEOLOGIST John Elrod	DRILLER Herb Williams
DATE START / TIME 8/26/88 4:30 PM	DATE FINISH / TIME 8/27/88 12 Noon
SURFACE ELEVATION 740.9'	TOTAL DEPTH 76.5'
WELL CASING 2" PVC, sch 40	SCREEN TYPE 2" PVC
LENGTH 10'	SLOT 10
REMARKS	

BORE HOLE LOG

DEPTH (FT.)	SAMPLE (NO.)	BLOW COUNT PER 6 IN.	RECOVERY (FT.)	LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)	GRAPHIC
5	S-1	7-5-10	12	Med SAND, some silt, some clay, tr gravel, dk brown			
10	S-2	7-12-19	6	GRAVEL and med SAND, some silt, med brown			
15	S-3	3-14-19	3	Med-cs SAND, some gravel, greenish brown			
20	S-4	6-51-53	5	Fine-med GRAVEL, some fine-med sand, lt brown			
25	S-5	36-36-34	12	GRAVEL and fine-med SAND, some silt, little cs sand, med brown to green			
30	S-6	20-51-53	15	Fine-cs SAND and GRAVEL, some silt	Limonitic		

GERAGHTY & MILLER, INC.
Ground-Water Consultants

PROJECT NO. OHO610DY02

BORE HOLE NO. HR-11

PROJECT Harrison Radiator

LOCATION Moraine, Ohio

REMARKS

DEPTH (FT.)	SAMPLE NO.	BLOW COUNT PER 6 IN.	RECOVERY (FT.)	LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)	GRAPHIC LOG
	S-7	40-105 -67	12	GRAVEL, some fine-med sand, silt, tr cs sand, brown	Limonitic		
40	S-8	42-97 -68	18	Top 1.0' = SILT and CLAY, little gravel, grayish green, dry, Btm.5' = Cs SAND, some silt, little med sand, wet	Limonitic		
45	S-9	9-18-41	18	Med-cs SAND, tr gravel, brown, wet			
50	S-10	18-40 -48	18	Med-cs SAND and GRAVEL, little silt, tr fine sand, brown, wet			
55	S-11	23-41 -45	18	Cs SAND and GRAVEL, some silt, little fine-med sand, med brown, wet			
60	S-12	27-27 -35	18	Cs SAND and GRAVEL, some silt, little fine-med sand, brown, wet			
65	S-13	39-42 -50	15	Cs SAND and GRAVEL, some med sand, little silt, little clay, brown, wet	Stopped hammer @ 50 blows - no penetration		
70	S-14	32-34 -58	18	Med-cs SAND, little fine sand, little silt, tr gravel, brown, wet			
75	S-15	33-44 -39	18	Med-cs SAND, some fine sand, tr clay, tr gravel, brown, wet			

GERAGHTY & MILLER, INC.
Ground-Water Consultants

PROJECT NO. OH0610DY05	BORE HOLE NO. HR-12
PROJECT Harrison Radiator	LOCATION Moraine, Ohio
DRILLING CONTRACTOR Reynolds Supply, Inc.	DRILLING EQUIPMENT Bucyrus Erie 6TL
HYDROGEOLOGIST John Elrod	DRILLER Steve Back
DATE START / TIME 8/31/88	DATE FINISH / TIME 9/8/88
SURFACE ELEVATION 741.0'	TOTAL DEPTH 130'
WELL CASING 4" PVC, sch 40	SCREEN TYPE 4" PVC
LENGTH 10'	SLOT 10

REMARKS

BORE HOLE LOG

DEPTH (FT.)	SAMPLE (NO.)	LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)	GRAPHIC LOG
	1	Fine-med SAND, little silt, tr clay, dk brown			
5	2	Cs SAND and GRAVEL, med brown			
10	3	Fine-cs SAND, some silt, tr gravel, med brown			
15	4	SILT and CLAY, some fine-cs sand, lt brown			
20	5	Med-cs SAND, little gravel, tr fine sand, tr clay, lt brown			
25	6	Cs SAND and GRAVEL, little fine-med sand, tr gravel, med brown			
30	7	Fine-med SAND, little cs sand, little gravel, med brown			
35	8	SILT and CLAY, little med-cs sand, tr gravel, grayish green			
40	9	Cs SAND and GRAVEL, med brown			
45	10	Cs SAND and GRAVEL, med brown			
50	11	Fine-med SAND and GRAVEL, med brown			
55	12	Fine-med SAND and GRAVEL, tr silt, med brown			
60	13	Cs SAND, little gravel, med brown			
65	14	Cs SAND, some gravel, tr fine sand, med brown			

GERAGHTY & MILLER, INC.
Ground-Water Consultants

PROJECT NO. OH0610DY05

BORE HOLE NO. HR-12

PROJECT Harrison Radiator

LOCATION Moraine, Ohio

REMARKS

DEPTH (FT.)	SAMPLE NO.	LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)	GRAPHIC
75	15	Med SAND, some gravel, trace fine sand, tr silt, reddish brown			
	16	Fine-med GRAVEL, some cs sand, reddish brown			
80	17	Fine-med GRAVEL, some cs sand, tr fine sand, tr silt, grayish brown			
85	18	Fine-med GRAVEL, some cs sand, tr fine sand, grayish brown			
90	19	Fine-med SAND, tr silt, grayish brown			
95	20	Fine-cs SAND and GRAVEL, little silt, grayish brown			
100	21	Cs SAND, little gravel, tr fine sand, tr silt, grayish brown			
105	22	Fine-med SAND, grayish brown			
110	23	Fine-med SAND, grayish brown			
115	24	GRAVEL and cs SAND, grayish brown			
120	25	GRAVEL, some cs sand, grayish brown			
125					
	26	Med-cs SAND, some gravel, grayish brown			
130					
135					
140					
145					

GERAGHTY & MILLER, INC.
Ground-Water Consultants

PROJECT NO. OH0610DY05	BORE HOLE NO. HR-13
PROJECT Harrison Radiator	LOCATION Moraine, Ohio
DRILLING CONTRACTOR Reynolds Supply, Inc.	DRILLING EQUIPMENT Bucyrus Erie 6TL
HYDROGEOLOGIST John Elrod	DRILLER Steve Back
DATE START / TIME 8/22/88	DATE FINISH / TIME 8/29/88
SURFACE ELEVATION 733.2'	TOTAL DEPTH 85'
WELL CASING 4" PVC, sch 40	SCREEN TYPE 4" PVC
LENGTH 10'	SLOT .10
REMARKS	

BORE HOLE LOG

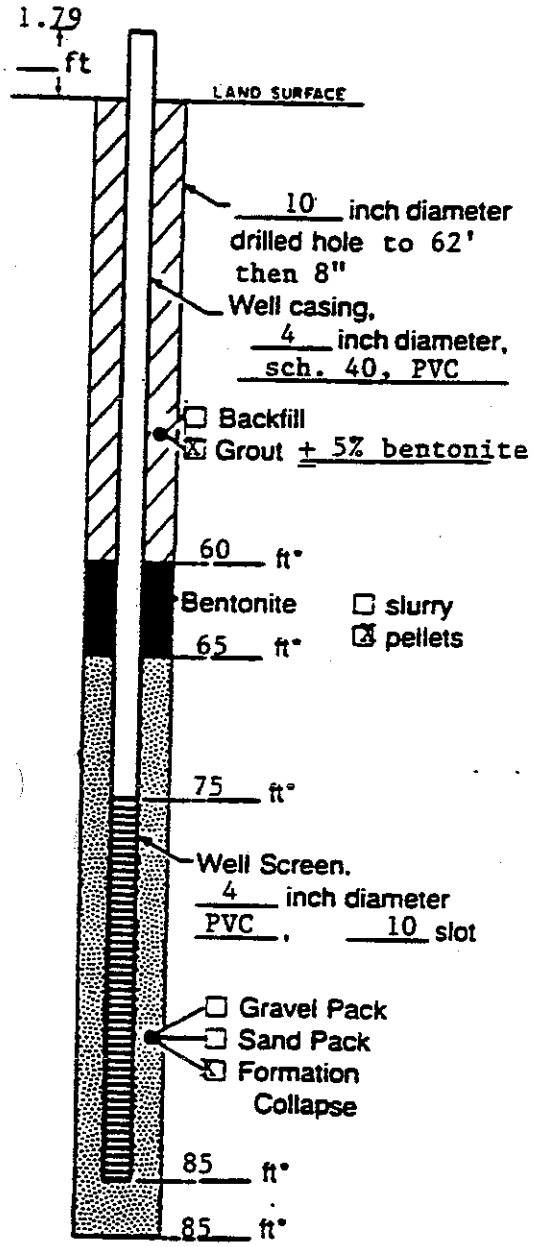
DEPTH (FT.)	SAMPLE (NO.)	LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)	GRAPHIC
5	1	Fine-cs GRAVEL and cs SAND, some silt, some clay, brown			
	2	Fine-cs GRAVEL and cs SAND, tr silt, tr clay, brown			
10	3	SILT and CLAY, some fine-med gravel, some med-cs sand, brown			
15	4	Med-cs SAND and GRAVEL, some silt, brown			
20	5	Med-cs SAND, some gravel, brown			
25	6	Cs SAND and GRAVEL, brown			
30	7	Cs SAND and GRAVEL, lt brown			
35	8	Cs SAND and GRAVEL, tr clay, tr silt, med brown			
40	9	Cs SAND and GRAVEL, little silt, little clay, lt brown			
45	10	Cs SAND and GRAVEL, some silt, lt brown			
50	11	Med-cs SAND, little fine sand, little gravel, tr silt, brown			
55	12	GRAVEL and med-cs SAND, tr silt, brown			
60	13	SILT and CLAY, little cs sand, grayish green			
65	14	SILT and CLAY, little cs sand, grayish green			

GERAGHTY & MILLER, INC.
Ground-Water Consultants

PROJECT NO. 0H0610DY05
BORE HOLE NO. HR-13
PROJECT Harrison Radiator
LOCATION Moraine, Ohio
REMARKS

DEPTH (FT.)	SAMPLE NO.	LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)
75	15	GRAVEL, little med-cs sand, tr silt, tr clay		
	16	Med-cs SAND, some gravel, brown		
80	17	Med-cs SAND and GRAVEL		
85				
90				
95				
100				
105				
110				
115				
120				
125				
130				
135				
140				
145				

WELL CONSTRUCTION LOG



Measuring Point is Top of PVC Well Casing Unless Otherwise Noted.

*Depth Below Land Surface

Project Harrison Radiator Well HR-13

Town/City Moraine

County Montgomery State Ohio

Permit No. _____

Land-Surface Elevation = 733.2

and Datum _____ feet ☒ surveyed

MP=734.99 feet ☐ estimated

Installation Dates(s) 8/22/88 - 8/30/88

Drilling Method Cable Tool

Drilling Contractor Reynolds Supply, Inc.

Drilling Fluid City of Dayton Water Supply

Development Techniques(s) and Date(s)

Submersible pump, 9/26/88

Fluid Loss During Drilling _____ gallons

Water Removed During Development 675 gallons

Static Depth to Water 32.18 (9/26/88) feet below M.P.

Pumping Depth to Water _____ feet below M.P.

Pumping Duration _____ hours

Yield _____ gpm Date _____

Specific Capacity _____ gpm/ft

Well Purpose Ground-Water Quality and Elevation Monitoring

Remarks MP=Top of PVC well casing

Ten-inch diameter steel casing left in place to 62'.

Prepared by John Elrod, Kathy Shannon

GERAGHTY & MILLER, INC.
Ground-Water Consultants

PROJECT NO. OH019.05	BORE HOLE NO. HR-14
PROJECT Harrison Radiator	LOCATION Moraine, Ohio
DRILLING CONTRACTOR Reynolds Supply, Inc.	DRILLING EQUIPMENT Cable Tool Bucyrus Erie 60
HYDROGEOLOGIST S. K. Ackers	DRILLER R. Wilmot
DATE START / TIME 10/25/89 12:45 p.m.	DATE FINISH / TIME 10/27/89 1:00 p.m.
SURFACE ELEVATION	TOTAL DEPTH 88'
WELL CASING 4-inch PVC, sch 40	SCREEN TYPE 4-inch PVC, sch 40
LENGTH 10 feet	SLOT 0.010 inch
REMARKS	

BORE HOLE LOG

DEPTH (FT.)	SAMPLE (NO.)	LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)	GRAPHIC LOG
5		CLAY (50%); Some fine-cs sand (30%); tr fine-cs gravel (10%); tr pebbles (10%); dk olive brn; damp, loose	3' tr cobbles 5' color change to light olive brn		
10		Med-cs SAND (30%); some fine-med gravel (30%); little fine sand (20%); little silt & clay (20%); light olive brn, subangular Fine-med GRAVEL (30%); some med-cs sand (30%); little vf-f sand (15%); little cs gravel (15%); tr silt & clay (10%) PEBBLES & COBBLES (60%); little cs sand (20%); little fine-med sand (15%); tr fine sand (5%); angular to subangular, light olive brn			
15					
20					
25		Med-cs SAND (60%); little cs gravel (15%); tr vf-f sand (10%); tr silt & clay (10%); tr pebbles & cobbles (5%); subangular to subrounded, light olive brn	unit becoming dirtier 25' drilling easier. 27' color change Fe staining reddish brn		
30		Med SAND (80%); tr fine sand (10%); tr fine-cs gravel & pebbles (5%); reddish brn; subangular subrounded, WATER BEARING	Tr drk brn organic film on water		

GERAGHTY & MILLER, INC.
Ground-Water Consultants

PROJECT NO. OH019.05
BORE HOLE NO. HR-14
PROJECT Harrison Radiator
LOCATION Moraine, Ohio
REMARKS

DEPTH (FT.)	SAMPLE NO.	LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)	GRAPHIC LOG
		No significant change from above	Color change: light Tan at 35'		
40			41' some drk brn organic film		
45		Med SAND (65%); little silt & clay (20%); tr fine sand (10%); tr fine-cs gravel & pebbles (5%); reddish brn; subangular-subrounded	47' less organic residue		
50					
		Fine-med SAND (85%); tr Clay-silt (10%); tr med-fine gravel (5%); angular to subrounded; light brn color	56' tr Cobbles (5%)		
55					
		CLAY (50%); Some cs-med sand (30%); little cs-med gravel (20%); clay is olive grey; damp-moist	62' tr f sand (10%); tr f-med gravel (5%)		
60					
		Cs-med GRAVEL (50%); Some cs-med sand (30%); tr clay & silt (10%); tr med-med f sand (5%); olive grey Cs-med SAND (80%); tr f-med sand (10%); tr med-f gravel (5%); tr clay & silt (5%); angular to subangular			
65					
		Cs-med SAND (40%); Some cs-med gravel (25%); little cs-med pebbles (20%); tr cs-f cobbles (10%); tr cs-f sand (5%); rounded to subrounded			
70					

GERAGHTY & MILLER, INC.
Ground-Water Consultants

PROJECT NO. OH019.05

BORE HOLE NO. HR-14

PROJECT Harrison Radiator

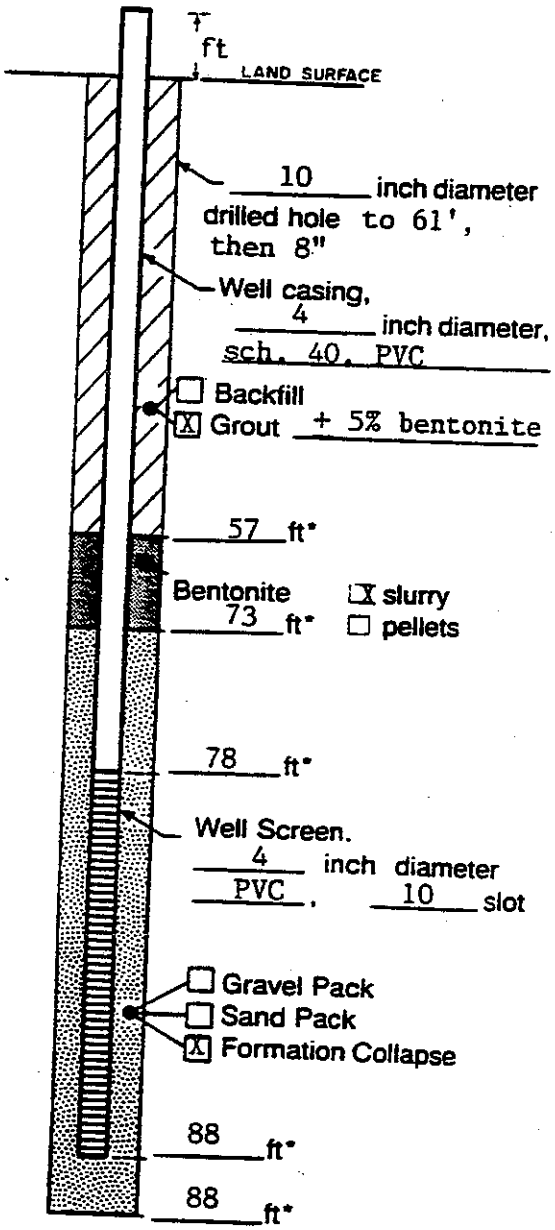
LOCATION Moraine, Ohio

REMARKS

DEPTH (FT.)	SAMPLE NO.	LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)	GRAPHIC LOG
		Cs-med SAND (75%); Little med-f gravel (15%); tr f-vf sand (5%); tr clay & silt (5%); rounded-subrounded			
80		Cs-med SAND (85%); tr f sand; tr med-f gravel (5%); tr clay & silt (5%); rounded-subrounded; light brn			
		Med-f SAND (60%); little cs sand (20%); tr med-f gravel (10%); tr cobbles (7%)			
85		Med-cs GRAVEL (40%); little med-f pebbles (20%); tr cobbles (10%); tr cs-med sand (15%); tr f-vf sand (15%); rounded-subrounded	dirty boring fluid		
		Cs-med SAND (70%); little med-f gravel (20%); tr f-vf sand (10%); angular-subangular			
		END OF BORING 88'			
90					
95					
100					
105					
110					

GERAGHTY & MILLER, INC.
Ground-Water Consultants

WELL CONSTRUCTION LOG
(UNCONSOLIDATED)



Measuring Point is Top of Well Casing Unless Otherwise Noted.

*Depth Below Land Surface

Project Harrison Radiator Well HR-14

Town/City Moraine

County Montgomery State Ohio

Permit No.

Land-Surface Elevation= 729.9 ft.

and Datum feet ☒ Surveyed

MP= 731.63 ft. msl ☐ Estimated

Installation Date(s) 10/27/89

Drilling Method Cable Tool

Drilling Contractor Reynolds Supply, Inc.

Drilling Fluid City of Dayton Water Supply

Development Technique(s) and Date(s)
Submersible pump, 11/22/89

Fluid Loss During Drilling gallo

Water Removed During Development 751 gallo

Static Depth to Water 24.81' (11/22/89) feet below M.

Pumping Depth to Water feet below M.

Pumping Duration 1.3 hours

Yield 9.5 gpm Date 11/22/8

Specific Capacity gpm/ft

Well Purpose Ground-Water Quality and Elevation Monitoring

Remarks MP=Top of PVC well casing

Ten-inch diameter steel casing left in place to 61' bg

Prepared by Scott K. Ackers

G&M Form 05 5-87

Southern 87-1776

GERAGHTY & MILLER, INC.
Ground-Water Consultants

PROJECT NO. OH019.05	BORE HOLE NO. HR-15
PROJECT Harrison Radiator	LOCATION Moraine, Ohio
DRILLING CONTRACTOR Reynolds Supply, Inc.	DRILLING EQUIPMENT Cable Tool Bucyrus Erie 60
HYDROGEOLOGIST A. G. McCorkle	DRILLER R. Wilmot
DATE START/TIME 10/17/89 9:00 a.m.	DATE FINISH/TIME 10/23/89 1:00 p.m.
SURFACE ELEVATION	TOTAL DEPTH 110'
WELL CASING 4-inch PVC	SCREEN TYPE 4-inch PVC
LENGTH 10 feet	SLOT 0.010 inch

REMARKS: Bottom of well set at 98 feet below ground

BORE HOLE LOG

DEPTH (FT.)	SAMPLE (NO.)	LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)	GRAPHIC LOG
		CLAY (40%); Some f-cs sand (30%); Some f-cs gravel (30%); tr cobble & pebbles, dk olive brn, damp, med stiff			
		Fine-cs GRAVEL (40%); Some f-cs sand (30%); Some silt & clay (30%); tr pebbles & cobbles; med olive brn, damp			
5					
		Med-cs SAND (50%); Some vf-med gravel (30%); tr cs gravel & pebbles (10%); tr clay (10%); tr vf-f sand (10%); med olive brn			
10					
		PEBBLES & COBBLES (40%); Some f-cs gravel (30%); Some f-cs sand (30%); well rounded gravel, med brn grey	tr pebbles & cobbles, slight HC odor		
15					
20					
25					
		Fine-cs SAND (50%); Some f-cs gravel; little pebbles & cobbles (20%); well rounded gravel, med olive grey, water bearing			
30					

GERAGHTY & MILLER, INC.
Ground-Water Consultants

PROJECT NO. OH019.05
BORE HOLE NO. HR-15
PROJECT Harrison Radiator
LOCATION Moraine, Ohio
REMARKS

DEPTH (FT.)	SAMPLE NO.	LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)	GRAPHIC LOG
40		Fine-med SAND (60%); little pebbles (20%); little cs sand-cs gravel (20%); greyish tan	No evidence of clay		
		Fine-med SAND (60%); Some cs sand & f gravel (30%); tr pebbles (10%); tr med-cs gravel, tannish grey subangular to subrounded	Hard to drill through		
45					
50					
55		CLAY (70-80%); Little fine-med. gravel (10-20%); little fine-cs sand (10-20%); med olive grey; dense; damp to moist	CLAY w/Gravel		
60					
65					
70					

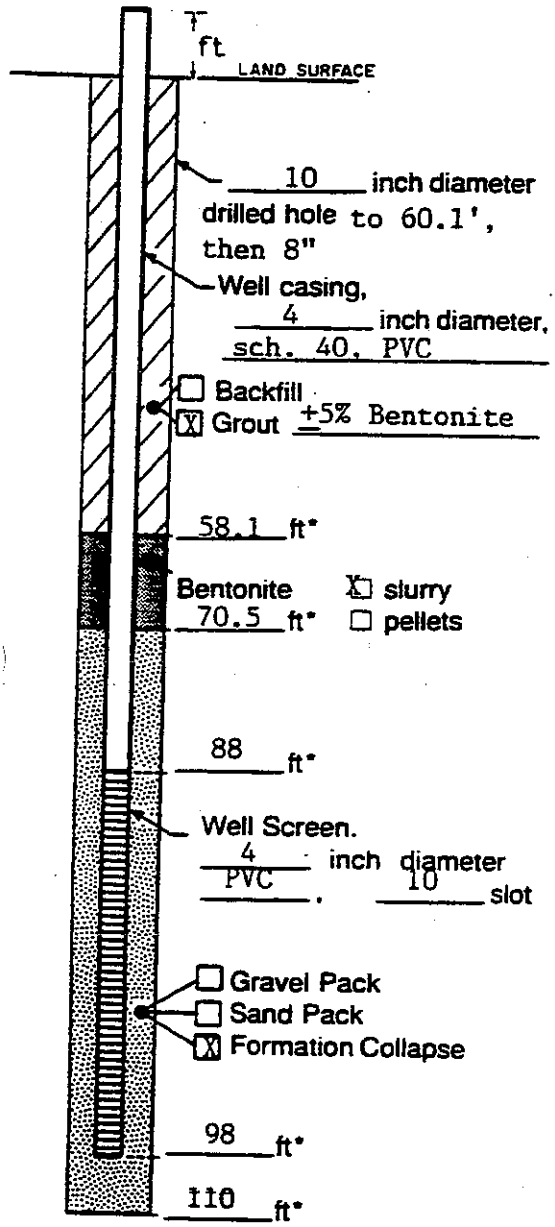
GERAGHTY & MILLER, INC.
Ground-Water Consultants

PROJECT NO. OH019.05
BORE HOLE NO. HR-15
PROJECT Harrison Radiator
LOCATION Moraine, Ohio
REMARKS

DEPTH (FT.)	SAMPLE NO.	LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)	GRAPHIC LOG
80		Med-cs SAND, fine-med gravel; tr cs gravel & pebbles; med olive grey			
85					
90		Med-cs SAND (70-80%); Little vf-f sand (10-20%); tr fine-med gravel (0-10%); med olive grey, subangular			
95		PEBBLES & COBBLES (40%); little med-cs gravel (20%); little cs sand & fine gravel (20%); little fine-med sand (20%); brownish grey, well rounded			
100					
105					
110		END OF BOREHOLE LOG			

GERAGHTY & MILLER, INC.
Ground-Water Consultants

WELL CONSTRUCTION LOG
(UNCONSOLIDATED)



Measuring Point is Top of Well Casing Unless Otherwise Noted.

*Depth Below Land Surface

Project Harrison Radiator Well HR-15

Town/City Moraine

County Montgomery State Ohio

Permit No. _____

Land-Surface Elevation = 732.1 ft.

and Datum _____ feet ☒ Surveyed

MP= 733.74 ft. msl ☐ Estimated

Installation Date(s) 10/23/89

Drilling Method Cable Tool

Drilling Contractor Reynolds Supply, Inc.

Drilling Fluid City of Dayton Water Supply

Development Technique(s) and Date(s)
Submersible pump, 11/22/89

Fluid Loss During Drilling _____ gallo

Water Removed During Development 788 gallo

Static Depth to Water 27.04 (11/22/89) feet below M.

Pumping Depth to Water _____ feet below M.

Pumping Duration 1.75 hours

Yield 7.5 gpm Date 11/22/89

Specific Capacity _____ gpm/ft

Well Purpose Ground-Water Quality and Elevation Monitoring

Remarks MP=Top of PVC well casing

Ten-inch diameter steel casing left in place to 60.1' bg

Prepared by Scott K. Ackers

G&M Form 05 5-87

Southpoint 87-1776

GERAGHTY & MILLER, INC.
Ground-Water Consultants

PROJECT NO. OH019.05	BORE HOLE NO. HR-16
PROJECT Harrison Radiator	LOCATION Moraine, Ohio
DRILLING CONTRACTOR Reynolds Supply, Inc.	DRILLING EQUIPMENT Cable Tool Bucyrus Erie 60
HYDROGEOLOGIST S. Ackers	DRILLER Rick Wilmot
DATE START / TIME 11/2/89 9:40 a.m.	DATE FINISH / TIME 11/6/89 10:15 a.m.
SURFACE ELEVATION	TOTAL DEPTH 70'
WELL CASING 4-inch, sch 40 PVC	SCREEN TYPE 4-inch PVC
LENGTH 20 feet	SLOT .010 inch

REMARKS: Bottom of well set at 62.5 feet below ground

BORE HOLE LOG

DEPTH (FT.)	SAMPLE (NO.)	LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)	GRAPHIC LOG
		CLAY - silt (75%); tr cs-med sand(10%); tr f-vf sand (10%); tr cs gravel (5%)	2' little cs-f sand tr med cobble tr cs gravel		
5		CLAY - silt (60%); some cs-md gravel (20%); some cs-f sand (20%); yellowish brown	8' tr cs-f cobbles (5%)		
10		No change			
		CS-md SAND (50%); Some f-vf sand(30%); tr silt-clay(10%); tr med-f gravel(5%); tr f-md cobbles(5%); greyish orange	Clay-silt lessening		
15		CS-med GRAVEL (50%); Some Cs-md sand (35%); tr f-vf sand(10%);tr med-f cobbles (5%)	16' noticed tile in bailer sample		
20		Med-f SAND (85%); tr silt & clay (10%); tr cs sand (5%) Greyish orange; angular-subangular	24' tr cs gravel tr cs sand		
25					
		Med-f GRAVEL (60%); Some cs-md sand (30%); tr f-vf			
30		sand (5%) angular-subangular			
		Med-vf SAND (85%); tr cs sand (5%) silty clay (10%)			
		Cs-med SAND (60%); Some f-vf sand (30%); tr silty clay (10%), greyish orange			

GERAGHTY & MILLER, INC.
Ground-Water Consultants

PROJECT NO. OH019.05

BORE HOLE NO. HR-16

PROJECT Harrison Radiator

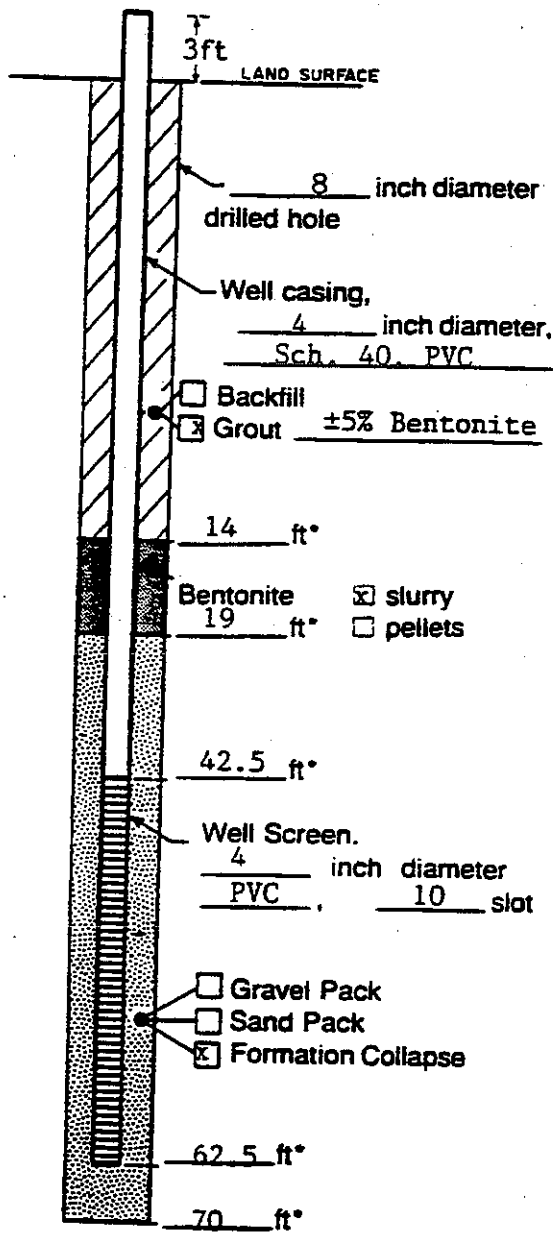
LOCATION Moraine, Ohio

REMARKS

DEPTH (FT.)	SAMPLE NO.	LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)	GRAPHIC LOG
		CLAY (85%); tr f-vf sand(10%);trf-vf gravel (5%)	Grey to olive grey in color		
40		F-vf SAND(75%); little cs sand (15%); tr md-f gravel (5%); tr silt clay(10%); color greyish orange No clay nodules			
		Cs-md SAND (50%); Some cs-md gravel (30%); tr f-vf sand (10%); tr med-f cobbles (10%) tr clay nodules; greyish orange, wet-moist			
45					
50					
55					
60		Cs-f GRAVEL (60%); some cs-med sand (30%) tr f-med sand (10%)	Iron staining on on gravel		
65		CLAY (80%); tr f-vf sand (10%); tr cs-md sand (5%) tr med-f gravel (5%); olive grey; moist-damp	65' dark oil residue on sample (organic)		
70		Cs-md SAND (85%); tr f-vf gravel (10%); tr cs gravel (5%)			
		End of Boring 70'			

GERAGHTY & MILLER, INC.
Ground-Water Consultants

WELL CONSTRUCTION LOG
(UNCONSOLIDATED)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

*Depth Below Land Surface

Project Harrison Radiator Well HR-16

Town/City Moraine

County Montgomery State Ohio

Permit No. _____

Land-Surface Elevation

and Datum _____ feet ☐ Surveyed

_____ ☐ Estimated

Installation Date(s) 11/6/89

Drilling Method Cable Tool

Drilling Contractor Reynolds Supply, Inc.

Drilling Fluid City of Dayton Water Supply

Development Technique(s) and Date(s)

Submersible pump, 11/21/89

Fluid Loss During Drilling _____ gallo

Water Removed During Development 902 gallo

Static Depth to Water 21.67' (11/21/89) feet below M.

Pumping Depth to Water _____ feet below M.

Pumping Duration 1.4 hours

Yield 11 gpm Date 11/21/89

Specific Capacity _____ gpm/ft

Well Purpose Ground-Water Quality and Elevation Monitoring

Remarks MP=Top of PVC well casing
Eight inch casing left in ground to 19' below ground surface (because grout being absorbed)

Prepared by Scott Ackers

G&M Form 05 5-87

GERAGHTY & MILLER, INC.
Ground-Water Consultants

PROJECT NO. OH019.05	BORE HOLE NO. HR-17
PROJECT Harrison Radiator	LOCATION Moraine, Ohio
DRILLING CONTRACTOR Reynolds Supply, Inc.	DRILLING EQUIPMENT Cable Tool Bucyrus Erie 60
HYDROGEOLOGIST S. Ackers	DRILLER Rick Wilmot
DATE START / TIME 11/9/89 9:30 am	DATE FINISH / TIME 11/10/89 4:00 pm
SURFACE ELEVATION	TOTAL DEPTH 56'
WELL CASING 4-inch, sch 40 PVC	SCREEN TYPE 4-inch PVC
LENGTH 20 feet	SLOT 010 inch

REMARKS: Bottom of well set at 47 feet below ground

BORE HOLE LOG

DEPTH (FT.)	SAMPLE (NO.)	LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)	GRAPHIC LOG
5		SANDY LOAM (top soil); clay (60%); some f-md sand (30%) tr Cs-md sand (5%); tr f-md pebbles (5%); yellowish brown; rounded- sub-rounded			
		Cs-VCS SAND (60%); little f-vf sand (15%);clay & silt (15%) tr md-f pebbles (5%)	7' tr md-f cobbles		
10		VCS-md SAND (60%); little md-f gravel (20%); tr md-f sand (10%); tr clay-silt (10%); angular- sub-angular; light yellowish brown	9' cobble 10" in diameter 13' drilling becomes difficult		
15		Cs-md SAND (65%); tr VC sand (10%); tr silt and clay (10%); tr f-vf pebbles (10%); tr md gravel (5%); sub-angular to rounded; greyish orange			
20			20' no significant change		
25			23' drilling is difficult		
			28' drilling becomes softer		
30		md-f GRAVEL (50%); some Cs-md sand (30%); tr f-vf pebbles (10%); tr silty-clay (10%); angular to sub-rounded; greyish orange	31-32' tr md-f cobbles		
			34' no signif.change		

GERAGHTY & MILLER, INC.
Ground-Water Consultants

PROJECT NO. OH019.05

BORE HOLE NO. HR-17

PROJECT Harrison Radiator

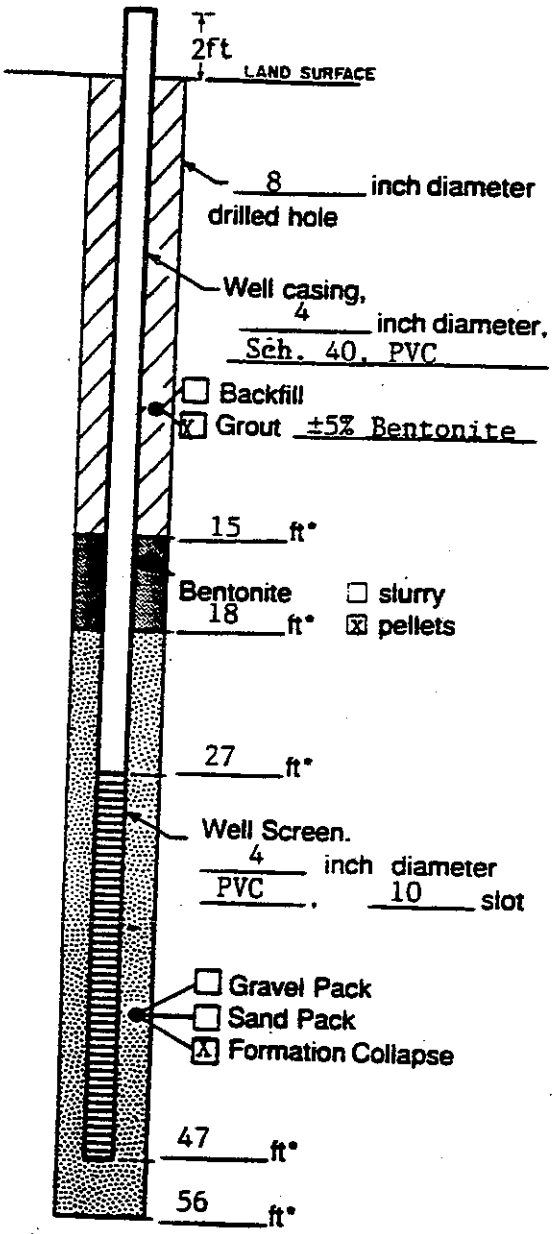
LOCATION Moraine, Ohio

REMARKS

DEPTH (FT.)	SAMPLE NO.	LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)	GRAPHIC
40		VCS–md SAND (60%); little f–md sand (20%); some silty clay (15%); tr f gravel (5%)	38'–40' color change moderate yellowish brown 41' color change: greyish orange. 40' drilling is difficult		
		44' SAND & gravel shows sign of oxidation	43' oil sheen on drilling fluid		
45		VC–Cs SAND (80%); tr clay nodules (10%); tr–f gravel (5%); tr f–vf sand (5%); dusky yellow–light olive; damp–moist			
			48' CLAY (90%)tr VCS–CS sand (10%) yellowish grey–light olive; organic brown residue		
50					
		53' CLAY (as above); damp, bailing difficult			
55		End of Boring 56'			
60					
65					
70					

GERAGHTY & MILLER, INC.
Ground-Water Consultants

WELL CONSTRUCTION LOG
(UNCONSOLIDATED)



Measuring Point is Top of Well Casing Unless Otherwise Noted.

*Depth Below Land Surface

Project Harrison Radiator Well HR-17

Town/City Moraine

County Montgomery State Ohio

Permit No. _____

Land-Surface Elevation and Datum _____ feet ☐ Surveyed ☐ Estimated

Installation Date(s) 11/10/89 - 11/13/89

Drilling Method Cable Tool

Drilling Contractor Reynolds Supply, Inc.

Drilling Fluid City of Dayton Water Supply

Development Technique(s) and Date(s)
Submersible pump, 11/21/89

Fluid Loss During Drilling _____ gallo

Water Removed During Development 670 gallo

Static Depth to Water 20.87' (11/21/89) feet below M.

Pumping Depth to Water _____ feet below M.

Pumping Duration 1.1 hours

Yield 10 gpm Date 11/21/89

Specific Capacity _____ gpm/ft

Well Purpose Ground-Water Quality and Elevation Monitoring

Remarks MP=Top of PVC well casing

Prepared by Scott K. Ackers

W-1-N to W-4-N
W-1-S to W-4-S

Reynolds
Supply. Inc.

January 14, 1987

Harrison Radiator
Dryden Road
Dayton, OH 45439

Re: North Fire Pump Well
Rehabilitation

Attention: Mr. Mike Hrosso

Dear Mr. Hrosso:

In accordance with Reynolds Supply. Inc. (Reynolds) authorization, we are pleased to report the successful repair of the North Fire Pump Well. The submission of this report constitutes completion of the above referenced authorization.

Technical Discussion

During the last inspection and testing, the pump failed to deliver the required pressure and flow. Upon inspection by the writer, it was noted that the strainer on the control line contained considerable amount of sand. Thus, it was apparant that the pump was off its performance curve.

Reynolds field personnel pulled the pump on November 17, 1986. Upon removal of the pump, two full diameter centering devices were noted on the pump column. Our hydropneaumatic developing tool was installed in the well to commerce surging. Difficulty was encountered in entering the screen. Agitation in the upper part of the screen produced considerable amounts of sand and gravel. Access to the lower part of the screen was obstructed. After reviewing the original bill of materials, it appeared the tail pipe from the pump was missing. Before attempting to "fish" the pipe out, a closed circuit inspection of the well was preformed to evaluate well structure and the position of the pipe.

Following sufficient settling time, the camera was lower in the well. The water was extremely cloudy and worsen near the top of the well screen. The misalignment with depth was very apparent. Upon reaching the packer difficulty was encountered in entering the well screen. After entering the screen, the visibility was poor so it was decided to stop and remove the camera. In doing so, it became fast at the packer.

P O Box 230
816 W Main Street
Paoli, Indiana 47454
812 723-2108

P O Box 120
Highway 60 East
Owensboro, Ky 42301
502 684-5075

1421 Mellwood Ave.
Louisville, Ky 40206
502/585-1241

6451 Germantown Road
Middletown, Ohio 45042
513/424-7287

1730 South Harding St.
Indianapolis, Ind 46221
317/636-1996

Thus, it was apparent that the packer was damaged and not sealing the well screen to the casing which would account for the gravel.

It was necessary to remove the packer before going any further. Therefore, a rig was placed over the well, and a "Fishing Tool" used to remove the packer. The magnitude of this problem was greatly increased due to the misalignment of the well. The packer was finally pulled up and it was possible to televise, and remove the tail pipe. During this process, it was discovered that the screen is fabricated of bronze.

The surge was again installed in the well and the agitation continued. Following initial surging, sulfamic acid and chlorine were introduced directly into the well screen and forced laterally into the aquifer. After sufficient contact time the well was surged to waste until the formation had stablized, and the well had returned to its maximum effeciency. A repair packer and sleeve was installed to seal the screen and the well casing, and a grout plug poured in the bottom.

Following repair of the pump, it was installed in the well and a step drawdown test conducted. The results of the test are summarily presented in Table 1.

Harrison Radiator

North Fire Pump Fire Well

Step Drawdown Test After Cleaning

Step	Q	Pumping Level	Drawdown	Specific Capacity	Dis. Press. #
1	1524 gpm	48.33 ft.	17.25	88.33 gpm/ft	130
2	1803	51.40	20.42	88.33	110
3	2044	55.25	24.17	84.6	100
4	2458	58.25	27.17	90.5	70

- Static Water level 31.08' below top of casing
- Discharge pressure does not include water lift or fitting losses

The well responsed quite favorable to the repair and rehabilitation efforts employed. Thus, the unit should be ready to be placed back into service. Should you have any questions or desire clarification please feel free to call.

Yours truly,

REYNOLDS SUPPLY, INC.

Leon Simpson
Ohio District Manager

August 6, 1974

Frigidaire Division
~~General Motors Corporation~~
Dayton, Ohio 45401

Attention: Mr. James Courtright

Subject: P.O.#~~AW17489~~
~~Fire Pump~~ Installation
Well Pumping Test

Gentlemen:

Well work on the subject job has been completed and we are pleased to submit our report more fully described as follows.

The total well depth is 166 ft. from grade and complete with 128' of 24" O.D. casing. The bottom of the screens is set at 166' below grade. We installed fifty feet of Cook 24" nominal strainer with 20' of 60 slot openings and 30 ft. of 125 slot openings. The well was developed by the surge block method and a pumping test was conducted during the week of July 22, 1974.

Pumping Test - By Paul Cossins
Approx. Static Level - 75'10" from grade
Pumping Test readings taken 6'2" above grade.
Orifice Size 10" x 8"

Time	Orifice	Capacity	Pumping Level	Draw Down	Specific Yield
9:00 AM	6¾"	755 GPM	91'	9'	83 GPM/ft DD.
9:15	"	"	"	"	"
9:30	"	"	"	"	"
9:45	"	"	"	"	"
9:55	"	"	"	"	"
10:00	11¼"	1005 GPM	93'	11'	91 GPM/ft DD.
10:15	11¼"	1005 GPM	93'	11'	"
10:30	"	"	"	"	"
10:45	"	"	"	"	"
10:55	"	"	"	"	"
11:00	28¾"	1583 GPM	96'	14'	111 GPM/ft DD.
11:15	"	"	"	"	"

Irrigation Division
[illegible] 3, 1974
Page 2.

Time	Orifice	Capacity	Pumping Level	Draw Down	Specific Yield
11:30 AM	2 3/4"	1563 GPM	96'	14'	111 GPM/ft. DD.
11:45	"	"	"	"	"
11:55	"	"	"	"	"
12:00 Noon	45"	1987 GPM	100'	18'	110 GPM/ft DD.
12:15	"	"	"	"	"
12:30	"	"	"	"	"
12:45	"	"	"	"	"
12:55	"	"	"	"	"
1:00 PM	72"	2518 GPM	107'	25'	100 GPM/ft DD.
1:30	"	"	"	"	"
2:00	"	"	"	"	"
2:30	"	"	"	"	"
3:00	"	"	"	"	"
3:30	"	"	"	"	"
4:00	"	"	"	"	"
4:30	"	"	"	"	"
5:00	"	"	"	"	"
5:30	"	"	"	"	"

TEST PUMP SHUT DOWN

This is an excellent well and should pass the final F.I.A. test with no difficulties. If you have any questions or need more information, please contact us at your convenience.

Very truly yours,

MOODY'S OF DAYTON, INC.

EDWARD B. WAGNER
President

EBW/jd

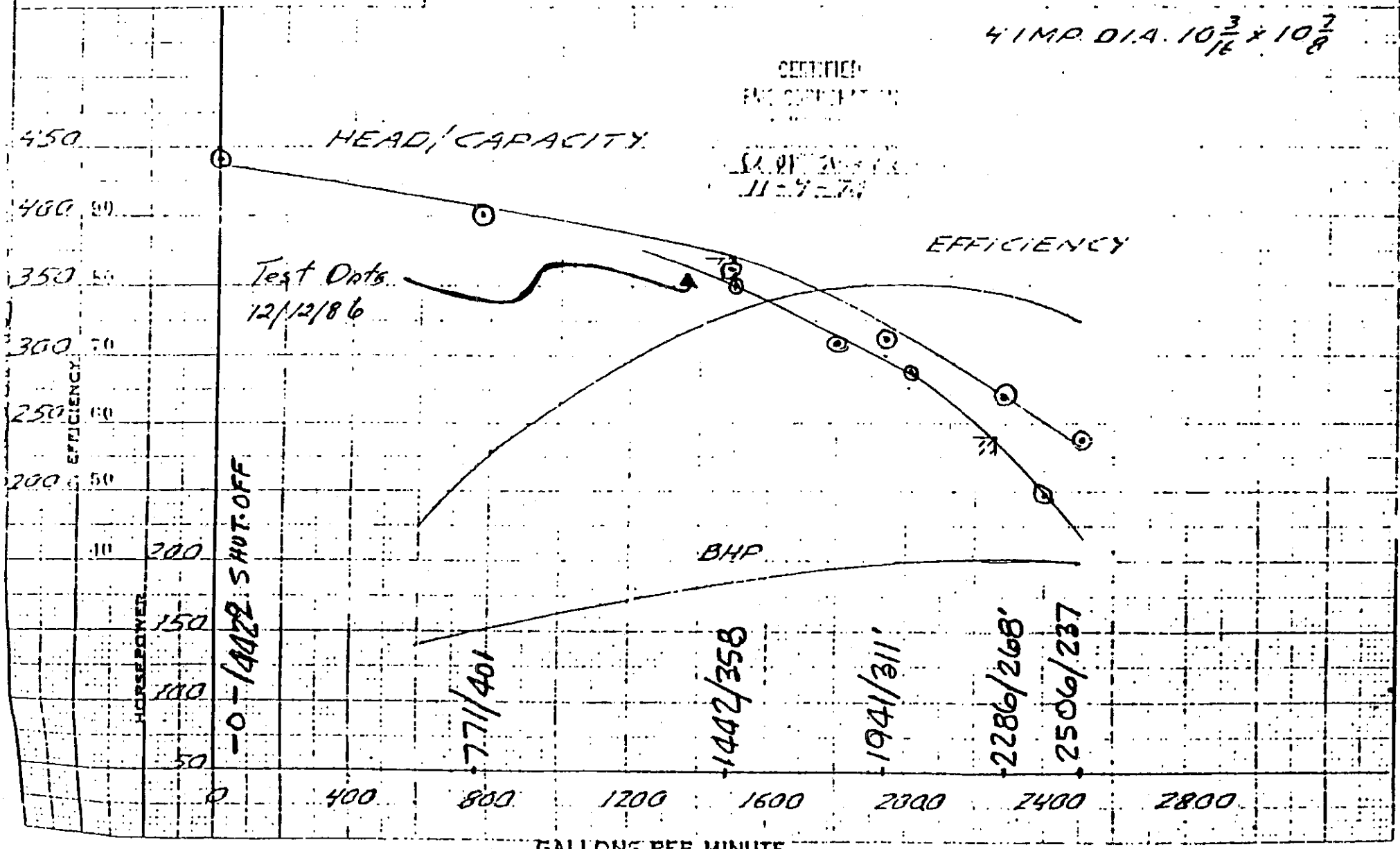
WELL LOG

[illegible]	Ft. to 3 Ft.	Formation	Soil
3	Ft. to 61 Ft.	Formation	Dry Gravel
61	Ft. to 67 Ft.	Formation	Clay and gravel
67	Ft. to 95 Ft.	Formation	Hard pan
95	Ft. to 123 Ft.	Formation	Muddy gravel
123	Ft. to 143 Ft.	Formation	Clean gravel
143	Ft. to 143½ Ft.	Formation	Clay streak
143½	Ft. go 165 Ft.	Formation	Fine sand and gravel
	Ft. to Ft.	Formation	
	Ft. to Ft.	Formation	
	Ft. to Ft.	Formation	
	Ft. to Ft.	Formation	
	Ft. to Ft.	Formation	
	Ft. to Ft.	Formation	
	Ft. to Ft.	Formation	
	Ft. to Ft.	Formation	
	Ft. to Ft.	Formation	
	Ft. to Ft.	Formation	
	Ft. to Ft.	Formation	
	Ft. to Ft.	Formation	

IF ROCK WELL AT DEPTH WAS ROCK ENCOUNTERED

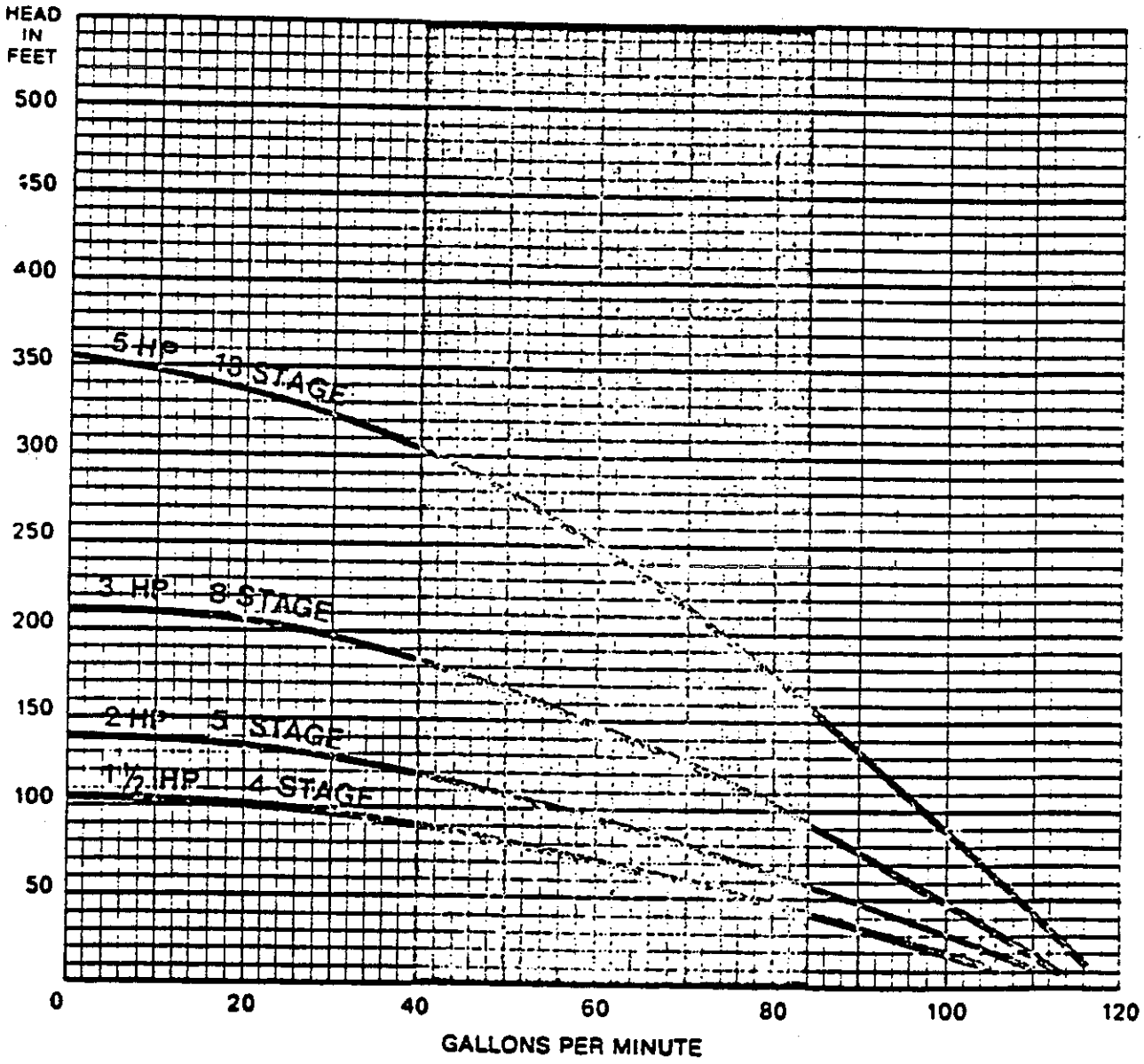
PEERLESS PUMP DIVISION
FMC CORPORATION

C145163
14M
10 X 17/2 OLS
2626067 rIE 4
1760 2626083
367147 4VF81073
4 IMP DIA. $10\frac{3}{16} \times 10\frac{7}{8}$



PLOTTED BY A.P. FROM TEST NO. 145163 DATE 11-1-74

H.P.	VOLT	NO. WR'S	NO. STG'S	"P" LENGTH	"M" LENGTH	"L" LENGTH
1 1/2	230	2	7	22"	30 9/16"	52 9/16"
1 1/2	230	3	7	22"	22 7/16"	52 9/16"
2	230	3	10	25"	25 7/16"	50 7/16"
2	440	3	10	25"	25 7/16"	50 7/16"
3	230	3	13	34"	28 7/16"	62 7/16"
3	440	3	13	34"	28 7/16"	62 7/16"
5	230	3	17	49"	48 5/8"	97 5/8"
5	440	3	17	49"	48 5/8"	97 5/8"



THREE PHASE
60 CYCLE

2 POLE & 4 POLE

12-3 Cable

WIRE SIZE A.W.G.	*MAX. LENGTH CABLE—MOTOR TO STARTER—FEET																	
	5 H.P.			7½ H.P.			10 H.P.			15 H.P.			20 H.P.			25 H.P.		
	230V	460V	575V	230V	460V	575V	230V	460V	575V	230V	460V	575V	230V	460V	575V	230V	460V	575V
NO. 14		620	956		434	694		331	518									
12	246	960	1470		687	1095		511	800		351	532						
10	390	1560	2400	270	1083	1730	208	830	1300		554	865		430	677			
8	685	2740		477	1910	3045	365	1460	2280	244	975	1520		756	1190		565	895
6	953			663	2650		508	2030		339	1350	2110	258	1050	1655		885	1390
4	1465			1020			781			521	2080		398	1615	2545	325	1350	2125
2				1550			1180			790			602			520	2050	3240
1							1450			965			736			640	2775	
0										1070			816			700		
00										1280			975			860		
000										1500			1145			1000		
0000													1348			1180		

WIRE SIZE A.W.G.	*MAX. LENGTH CABLE—MOTOR TO STARTER—FEET																	
	30 H.P.			40 H.P.			50 H.P.			60 H.P.			75 H.P.			90 H.P.		
	230V	460V	575V	230V	460V	575V	230V	460V	575V	230V	460V	575V	230V	460V	575V	230V	460V	575V
No. 14																		
12																		
10																		
8		476	740			625			927									
6		662	1030		555	865		680	1288		530	935			745			
4		1020	1584		855	1335	670	1045	1980	525	820	1520		655	1210			
2	386	1543	2400	285	1295	2025	1015	1585	3050	800	1250	2320	640	1000	1850		840	1550
1	472	1890	2940	347	1580	2470	1240	1935		975	1520	2825	780	1220	2260	650	1020	1885
0	524			386	1750	2735	1377	2151		1080	1685	3130	870	1360	2525	730	1140	2115
00	625			460	2090		1640	2560		1280	2000		1020	1600	2960	875	1365	2540
000	735			540	2460		1932	3020		1520	2375		1200	1875	3480	1025	1600	2970
0000	863			636	2890		2270			1790	2800		1430	2235	4150	1200	1875	3480

Based on a 5% voltage drop at motor whjile motor is running assuming full rated voltage at control terminals @ 75°C.

SELECTION CHART

	DIS-CHARGE PRESSURE	HEAD IN FEET																									
	0	45	50	60	70	80	90	100	120	140	160	170	180	200	225	250	275	300	400	450	500	600	700	800	900	1000
PUMP TYPE	HP	GALLONS PER MINUTE																								
N70-4	1½	83	79	70	62	52	40																			
N70-5	2			84	77	71	64	57	40																	
N70-8	3							81	73	65	55	49	42													
N70-13	5										83	81	79	73	67	60	50	42								

LOG OF BORING NO. W-1-N

GROUNDWATER MONITORING WELLS, HARRISON RADIATOR, DAYTON OPERATIONS, MORAINE, OHIO

BORING LOCATION: As shown on boring location plan **DATE STARTED:** 9-16-81

SURFACE ELEVATION: 737.61' **DATE COMPLETED:** 9-21-81

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	Brown clay, trace of sand, trace of gravel				
2.0'	Brown sand and gravel - damp				
10'					
20'					
30'					
	(Becomes wet at 35.0')				
40'					
50'					
60'					
	(continued on next page)				

METHOD: DRIVE CASING

TECHNICIAN: BARRETT

JOB NO.: 26418 (kab)

WATER OBSERVATIONS

INITIAL DEPTH: 35.0'

COMPLETION DEPTH: 37.5'

DEPTH AFTER: 72 HRS. 37.5'

TYPE SAMPLER:

___ A. SPLIT SPOON

___ B.

___ C. SHELBY TUBE

BOWSER – MORNER
TESTING LABORATORIES, INC.

LOG OF BORING NO. W-1-N (second page)

GROUNDWATER MONITORING WELLS, HARRISON RADIATOR, DAYTON OPERATIONS, MORAINE, OHIO

BORING LOCATION: As shown on boring location plan **DATE STARTED:** 9-16-81

SURFACE ELEVATION: 737.61' **DATE COMPLETED:** 9-21-81

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
60'	(continued)				
65.0'	Gray silt and clay - damp				
66.0'	Brown sand and gravel - wet				
70'	Bottom of boring at 70.0'				
80'					
90'					
100'					
110'					
120'					

METHOD: DRIVE CASING

TECHNICIAN: BARRETT

JOB NO.: 26418 (kab)

WATER OBSERVATIONS

INITIAL DEPTH: 35.0'

COMPLETION DEPTH: 37.5'

DEPTH AFTER: 72 HRS. 37.5'

TYPE SAMPLER:

____ A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

BOWSER – MORNER
TESTING LABORATORIES, INC.

LOG OF WELL NO. W-1-N

GROUNDWATER MONITORING WELLS, HARRISON RADIATOR,
DAYTON OPERATIONS, MORAINE, OHIO

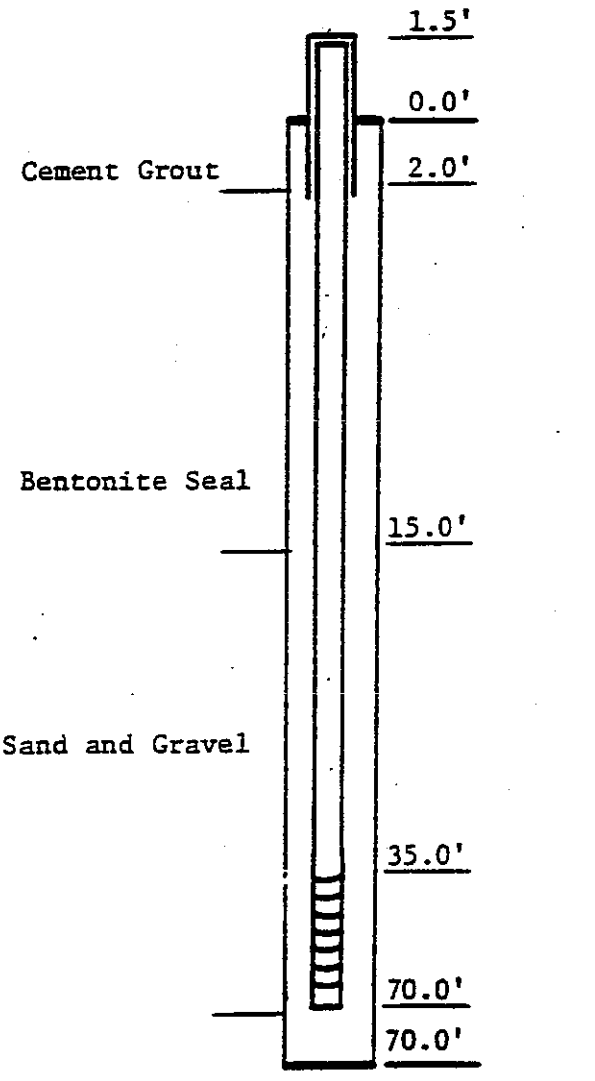
BORING LOCATION: As shown on boring location plan
DATE INSTALLED: 9-21-81

SURFACE ELEVATION: 737.61'
TOP OF PIPE ELEVATION: 739.16'*

TYPE OF PIEZOMETER: Monitoring Well - 4" Schedule 40 PVC Casing

DATE	WATER SURFACE DEPTH (FT.)	WATER SURFACE ELEV. (FT.)	
9-21-81	37.5	700.1	
9-24-81	37.5	700.1	
10-5-81	38.4	699.2	

INSTALLATION DESCRIPTION



TECHNICIAN BARRETT

JOB NO. 26418

NOTES: PVC screen length - 35 feet
Screen slot size - 0.010 inches
Guard pipe - 5" x 4' 2" black iron with locking cap
*Elevation given is top of guard pipe without cap

LOG OF BORING NO. W-2-N

GROUNDWATER MONITORING WELLS, HARRISON RADIATOR, DAYTON OPERATIONS, MORAINE, OHIO

BORING LOCATION: As shown on boring location plan **DATE STARTED:** 9-22-81

SURFACE ELEVATION: 729.68' **DATE COMPLETED:** 9-22-81

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Asphalt and base				
1.0'	(FILL) Brown silt and sand, some gravel - moist				
7.0'	(ORIGINAL) Brown sand and gravel - moist				
10'					
20'					
30'	(Becomes wet at 32.0')				
40'					
50'					
60'					

(continued on next page)

METHOD: DRIVE CASING

TECHNICIAN: BARRETT

JOB NO.: 26418 (kab)

WATER OBSERVATIONS

INITIAL DEPTH: 32.0'

COMPLETION DEPTH: 32.0'

DEPTH AFTER: 24 HRS. 32.0'

TYPE SAMPLER:

A. SPLIT SPOON

B.

C. SHELBY TUBE

BOWSER – MORNER
TESTING LABORATORIES, INC.

LOG OF BORING NO. W-2-N (second page)

GROUNDWATER MONITORING WELLS, HARRISON RADIATOR, DAYTON OPERATIONS, MORAINE, OHIO

BORING LOCATION: As shown on boring location paln **DATE STARTED:** 9-22-81

SURFACE ELEVATION: 729.68' **DATE COMPLETED:** 9-22-81

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
60'	(continued)				
	Bottom of borin at 60.0'				
70'					
80'					
90'					
100'					
110'					
120'					

METHOD: DRIVE CASING

TECHNICIAN: BARRETT

JOB NO.: 26418 (kab)

WATER OBSERVATIONS

INITIAL DEPTH: 32.0'

COMPLETION DEPTH: 32.0'

DEPTH AFTER: 24 HRS. 32.0'

TYPE SAMPLER:

____ A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

BOWSER – MORNER
TESTING LABORATORIES, INC.

LOG OF WELL NO. [illegible]

GROUNDWATER MONITORING WELLS, HARRISON RADIATOR,
DAYTON OPERATIONS, MORAINE, OHIO

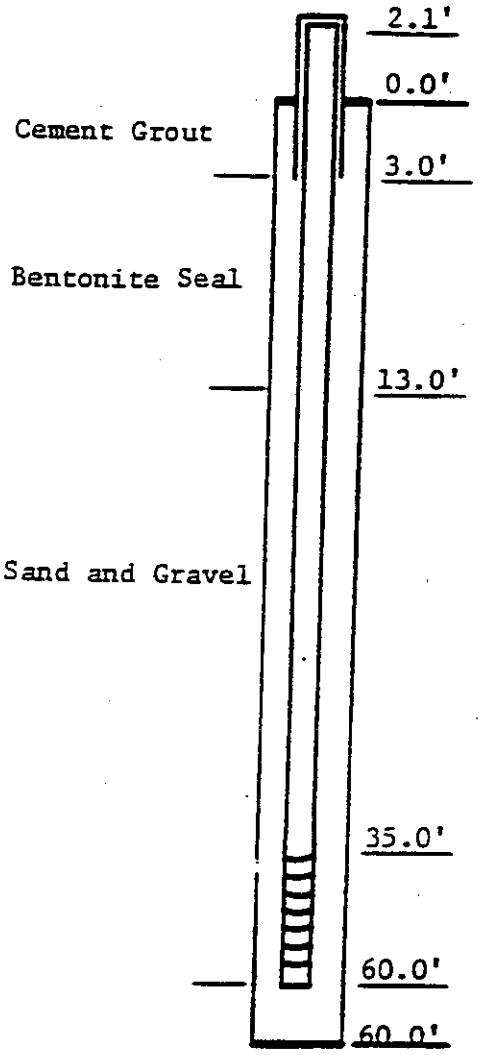
BORING LOCATION: As shown on boring location plan
DATE INSTALLED: 9-22-81

SURFACE ELEVATION: 729.68'
TOP OF PIPE ELEVATION: 731.77'*

TYPE OF PIEZOMETER: Monitoring Well - 4" Schedule 40 PVC Casing

DATE	WATER SURFACE DEPTH (FT.)	WATER SURFACE ELEV. (FT.)
9-28-81	32.0	697.7
10-5-81	32.7	697.0

INSTALLATION DESCRIPTION



TECHNICIAN BARRETT

[illegible] NO. 26418

NOTES: PVC screen length - 25 feet
Screen slot size - 0.010 inches
Guard pipe - 5" x 4' 2" black iron with locking cap
*Elevation given is top of guard pipe without cap

LOG OF BORING NO. W-3-N

GROUNDWATER MONITORING WELLS, HARRISON RADIATOR, DAYTON OPERATIONS, MORAINE, OHIO

BORING LOCATION: As shown on boring location plan **DATE STARTED:** 9-8-81

SURFACE ELEVATION: 731.98' **DATE COMPLETED:** 9-9-81

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	Brown silt, trace of sand, trace of gravel - damp				
2.0'	Brown sand and gravel, trace of silt - damp				
10'					
20'					
	(Becomes wet at 25.5')				
30'					
40'					
50'					
60'	Bottom of boring at 57.0'				

METHOD: HOLLOW STEM AUGER
TECHNICIAN: CHRISTY
JOB NO.: 26418 (kab)

WATER OBSERVATIONS
INITIAL DEPTH: 25.5'
COMPLETION DEPTH: 25.5'
DEPTH AFTER: 24 HRS. 26.0'

TYPE SAMPLER:
____ A. SPLIT SPOON
____ B.
____ C. SHELBY TUBE

BOWSER – MORNER
TESTING LABORATORIES, INC.

LOG OF WELL NO. W-3-N

GROUNDWATER MONITORING WELLS, HARRISON RADIATOR,
DAYTON OPERATIONS, MORAINE, OHIO

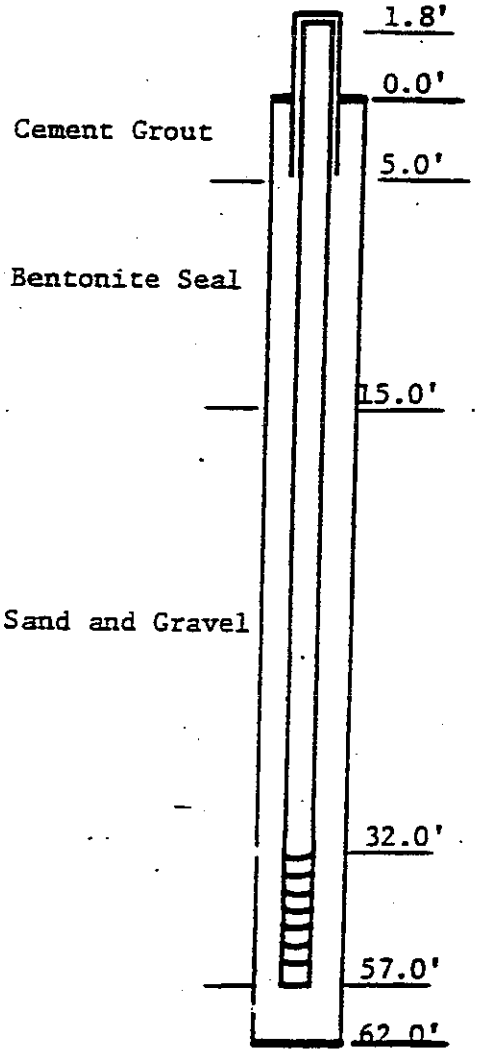
BORING LOCATION: As shown on boring location plan
DATE INSTALLED: 9-9-81

SURFACE ELEVATION: 731.98'
TOP OF PIPE ELEVATION: 733.82' *

TYPE OF PIEZOMETER:

DATE	WATER SURFACE DEPTH (FT.)	WATER SURFACE ELEV. (FT.)	
9-9-81	25.5	706.5	
9-10-81	26.0	706.0	
10-5-81	35.1	696.9	

INSTALLATION DESCRIPTION



TECHNICIAN CHRISTY

JOB NO. 26418

NOTES: PVC screen length - 25 feet
Screen slot size - 0.010 inches
Guard pipe - 5" x 4' 2" black iron with locking cap
*Elevation given in top of guard pipe without cap

LOG OF BORING NO. W-4-N

GROUNDWATER MONITORING WELLS, HARRISON RADIATOR, DAYTON OPERATIONS, MORAINE, OHIO

BORING LOCATION: As shown on boring location plan **DATE STARTED:** 9-10-81

SURFACE ELEVATION: 729.88' **DATE COMPLETED:** 9-10-81

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Brown sand and gravel, some silt				
2.0'	(FILL) Brown clay, trace of sand, trace of gravel				
3.0'	(ORIGINAL) Brown sand and gravel, some cobbles, trace of silt				
10'					
20'					
30'	(Becomes wet at 32.0')				
40'					
50'					
60'					

(continued on next page)

METHOD: HOLLOW STEM AUGER

TECHNICIAN: CHRISTY

JOB NO.: 26418 (kab)

WATER OBSERVATIONS

INITIAL DEPTH: 32.0'

COMPLETION DEPTH: 26.5'

DEPTH AFTER: 24 HRS. 32.3'

TYPE SAMPLER:

____ A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

BOWSER – MORNER
TESTING LABORATORIES, INC.

LOG OF BORING NO. W-4-N (second page)

GROUNDWATER MONITORING WELLS, HARRISON RADIATOR, DAYTON OPERATIONS, MORAINE, OHIO

BORING LOCATION: As shown on boring location plan **DATE STARTED:** 9-10-81

SURFACE ELEVATION: 729.88' **DATE COMPLETED:** 9-10-81

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
60'	(continued)				
61.0'	Gray silt and clay - moist				
62.0'	Brown sand and gravel, trace of silt				
	Bottom of boring at 65.0'				
70'					
80'					
90'					
100'					
110'					
120'					

METHOD: HOLLOW STEM AUGER

TECHNICIAN: CHRISTY

JOB NO.: 26418 (kab)

WATER OBSERVATIONS

INITIAL DEPTH: 32.0'

COMPLETION DEPTH: 26.5'

DEPTH AFTER: 24 HRS. 32.3'

TYPE SAMPLER:

____ A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

BOWSER – MORNER
TESTING LABORATORIES, INC.

LOG OF WELL NO. W-4-N

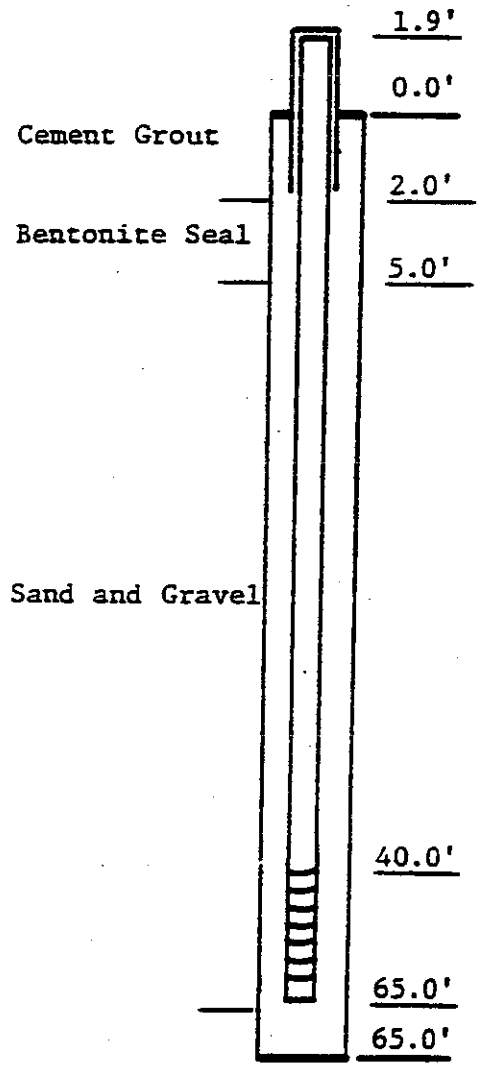
GROUNDWATER MONITORING WELLS, HARRISON RADIATOR,
DAYTON OPERATIONS, MORAINE, OHIO

BORING LOCATION: As shown on boring location plan
DATE INSTALLED: 9-24-81
SURFACE ELEVATION: 729.88'
TOP OF PIPE ELEVATION: 731.78'*

TYPE OF PIEZOMETER: Monitor Well - 4" Schedule 40 PVC Casing

DATE	WATER SURFACE DEPTH (FT.)	WATER SURFACE ELEV. (FT.)
9-10-81	26.5	703.4
9-25-81	32.3	697.6
9-28-81	33.5	696.4
10-5-81	32.8	697.1

INSTALLATION DESCRIPTION



TECHNICIAN PATTERSON

JOB NO. 26418

NOTES: PVC screen length - 25 feet
Screen slot size - 0.010 inches
Guard pipe - 5" x 4' 2" black iron with locking cap
* Elevation given is top of guard pipe without cap

LOG OF BORING NO. W-1-S

GROUNDWATER MONITORING WELLS, HARRISON RADIATOR, DAYTON OPERATIONS, MORAINE, OHIO

BORING LOCATION: As shown on boring location plan **DATE STARTED:** 9-23-81

SURFACE ELEVATION: 728.23' **DATE COMPLETED:** 9-25-81

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Brown silt and concrete fragments, trace of bricks - moist				
10'					
15.0'					
17.0'	(ORIGINAL) Brown clay, some silt, trace of sand - moist				
20'	Brown sand and gravel - moist				
30'					
	(Becomes wet at 36.6')				
40'					
50'					
60'					
	(continued on next page)				

METHOD: DRIVE CASING

TECHNICIAN: BARRETT

JOB NO.: 26418 (kab)

WATER OBSERVATIONS

INITIAL DEPTH: 36.6'

COMPLETION DEPTH: 36.6'

DEPTH AFTER: 24 HRS. 36.5'

TYPE SAMPLER:

A. SPLIT SPOON

B.

C. SHELBY TUBE

BOWSER – MORNER
TESTING LABORATORIES, INC.

LOG OF BORING NO. W-1-S (second page)

GROUNDWATER MONITORING WELLS, HARRISON RADIATOR, DAYTON OPERATIONS, MORAINE, OHIO

BORING LOCATION: As shown on boring location plan **DATE STARTED:** 9-23-81

SURFACE ELEVATION: 728.23' **DATE COMPLETED:** 9-25-81

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
60'	(continued)				
	Gray silt, some sand, trace of gravel - moist				
	Bottom of boring at 60.0'				
70'					
80'					
90'					
100'					
105'					
110'					

METHOD: DRIVE CASING

TECHNICIAN: BARRETT

JOB NO.: 26418 (kab)

WATER OBSERVATIONS

INITIAL DEPTH: 36.6'

COMPLETION DEPTH: 36.6'

DEPTH AFTER: 24 HRS. 36.5'

TYPE SAMPLER:

____ A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

BOWSER – MORNER
TESTING LABORATORIES, INC.

LOG OF WELL NO. W-1-S

GROUNDWATER MONITORING WELLS, HARRISON RADIATOR,
DAYTON OPERATIONS, MORAINE, OHIO

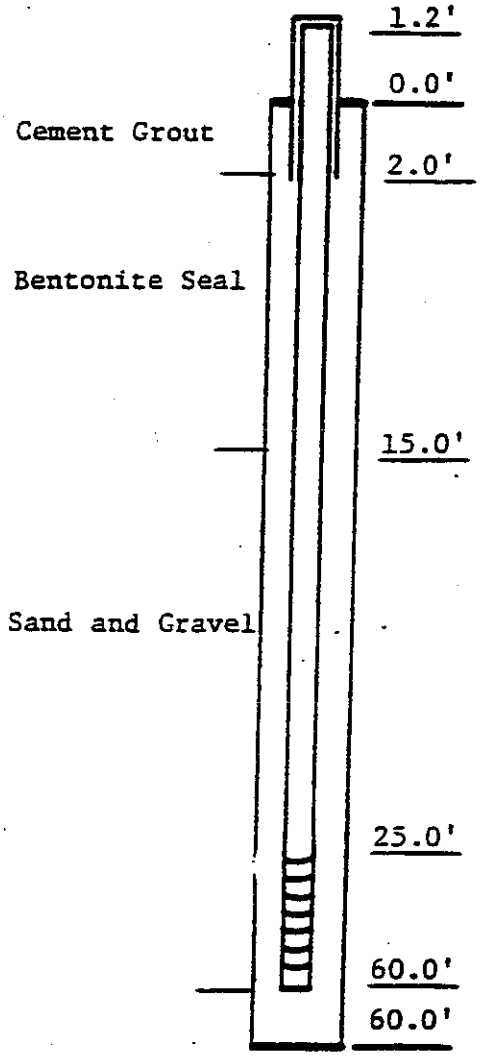
BORING LOCATION: As shown on boring location plan
DATE INSTALLED: 9-25-81

SURFACE ELEVATION: 728.23'
TOP OF PIPE ELEVATION: 729.39' *

TYPE OF PIEZOMETER:

DATE	WATER SURFACE DEPTH (FT.)	WATER SURFACE ELEV. (FT.)
9-24-81	36.6	691.1
9-25-81	36.6	691.6
10-5-81	36.0	692.2

INSTALLATION DESCRIPTION



TECHNICIAN BARRETT

JOB NO. 26418

NOTES: PVC screen length - 35 feet
Screen slot size - 0.010 inches
Guard pipe - 5" x 4' 2" black iron with locking cap
*Elevation given is top of guard pipe without cap

LOG OF BORING NO. W-2-S

GROUNDWATER MONITORING WELLS, HARRISON RADIATOR, DAYTON OPERATIONS, MORAINE, OHIO

BORING LOCATION: As shown on boring location plan **DATE STARTED:** 9-18-81

SURFACE ELEVATION: 725.01' **DATE COMPLETED:** 9-21-81

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	Brown clay, trace of sand, trace of gravel				
3.0'	Brown sand and gravel - damp				
10'					
20'					
30'					
	(Becomes wet at 35.5')				
40'					
50'					
60'					

(continued on next page)

METHOD: DRIVE CASING

TECHNICIAN: PATTERSON

JOB NO.: 26418 (kab)

WATER OBSERVATIONS

INITIAL DEPTH: 35.0'

COMPLETION DEPTH: 34.5'

DEPTH AFTER: 24 HRS. 35.3'

TYPE SAMPLER:

A. SPLIT SPOON

B.

C. SHELBY TUBE

BOWSER – MORNER
TESTING LABORATORIES, INC.

LOG OF BORING NO. W-2-S

GROUNDWATER MONITORING WELLS, HARRISON RADIATOR, DAYTON OPERATIONS, MORAINE, OHIO

BORING LOCATION: As shown on boring location plan **DATE STARTED:** 9-18-81

SURFACE ELEVATION: 725.01' **DATE COMPLETED:** 9-21-81

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
60'	(continued)				
63.0'	Gray silt, trace of clay - moist				
64.0'	Brown sand and gravel - wet				
70'	Bottom of boring at 65.0'				
80'					
90'					
100'					
110'					
120'					

METHOD: DRIVE CASING

TECHNICIAN: PATTERSON

JOB NO.: 26418 (kab)

WATER OBSERVATIONS

INITIAL DEPTH: 35.0'

COMPLETION DEPTH: 34.5'

DEPTH AFTER: 24 HRS. 35.3'

TYPE SAMPLER:

____ A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

BOWSER – MORNER
TESTING LABORATORIES, INC.

LOG OF WELL NO. W-2-S

GROUNDWATER MONITORING WELLS, HARRISON RADIATOR,
DAYTON OPERATIONS, MORAINE, OHIO

BORING LOCATION: As shown on boring location plan
DATE INSTALLED: 9-21-81

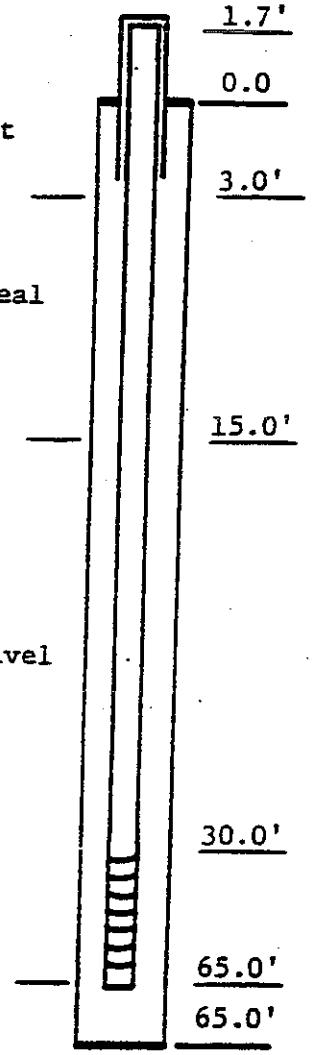
SURFACE ELEVATION: 725.01'
TOP OF PIPE ELEVATION: 726.75'*

TYPE OF PIEZOMETER: Monitor Well - 4" Schedule 40 PVC Casing

DATE	WATER SURFACE DEPTH (FT.)	WATER SURFACE ELEV. (FT.)
9-21-81	34.5	690.5
9-22-81	35.3	689.7
10-5-81	35.3	689.7

INSTALLATION DESCRIPTION

DESCRIPTION	DEPTH (FT.)
	1.7'
	0.0
Cement Grout	
	3.0'
Bentonite Seal	
	15.0'
Sand and Gravel	
	30.0'
	65.0'
	65.0'



TECHNICIAN PATTERSON

JOB NO. 26418

NOTES: PVC screen length - 35 feet
Screen slot size - 0.010 inches
Guard pipe - 5" x 4' 2" black iron with locking cap
* Elevation given is top of guard pipe without cap

LOG OF BORING NO. W-3-S

GROUNDWATER MONITORING WELLS, HARRISON RADIATOR, DAYTON OPERATIONS, MORAINE, OHIO

BORING LOCATION: As shown on boring location plan **DATE STARTED:** 9-23-81

SURFACE ELEVATION: 731.47' **DATE COMPLETED:** 9-23-81

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Topsoil and sand and gravel - moist				
6.0'	(ORIGINAL) Brown sand and gravel - moist				
10'					
20'					
30'					
40'	(Becomes wet at 41.0')				
50'					
60'					

(continued on next page)

METHOD: DRIVE CASING

TECHNICIAN: PATTERSON

JOB NO.: 26418 (kab)

WATER OBSERVATIONS

INITIAL DEPTH: 41.0'

COMPLETION DEPTH: 41.0'

DEPTH AFTER: 24 HRS. 41.0'

TYPE SAMPLER:

A. SPLIT SPOON

B.

C. SHELBY TUBE

BOWSER – MORNER
TESTING LABORATORIES, INC.

LOG OF BORING NO. W-3-S (second page)

GROUNDWATER MONITORING WELL, HARRISON RADIATOR, DAYTON OPERATIONS, MORAINE, OHIO

BORING LOCATION: As shown on boring location plan **DATE STARTED:** 9-23-81

SURFACE ELEVATION: 731.47' **DATE COMPLETED:** 9-23-81

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
60'	(continued)				
70'					
	Bottom of boring at 76.0'				
80'					
90'					
100'					
110'					
120'					

METHOD: DRIVE CASING

TECHNICIAN: PATTERSON

JOB NO.: 26418 (kab)

WATER OBSERVATIONS

INITIAL DEPTH: 41.0'

COMPLETION DEPTH: 41.0'

DEPTH AFTER: 24 HRS. 41.0'

TYPE SAMPLER:

A. SPLIT SPOON

B.

C. SHELBY TUBE

BOWSER – MORNER
TESTING LABORATORIES, INC.

LOG OF WELL NO. W-3-S

GROUNDWATER MONITORING WELLS, HARRISON RADIATOR,
DAYTON OPERATIONS, MORAINE, OHIO

BORING LOCATION: As shown on boring location plan
DATE INSTALLED: 9-23-81

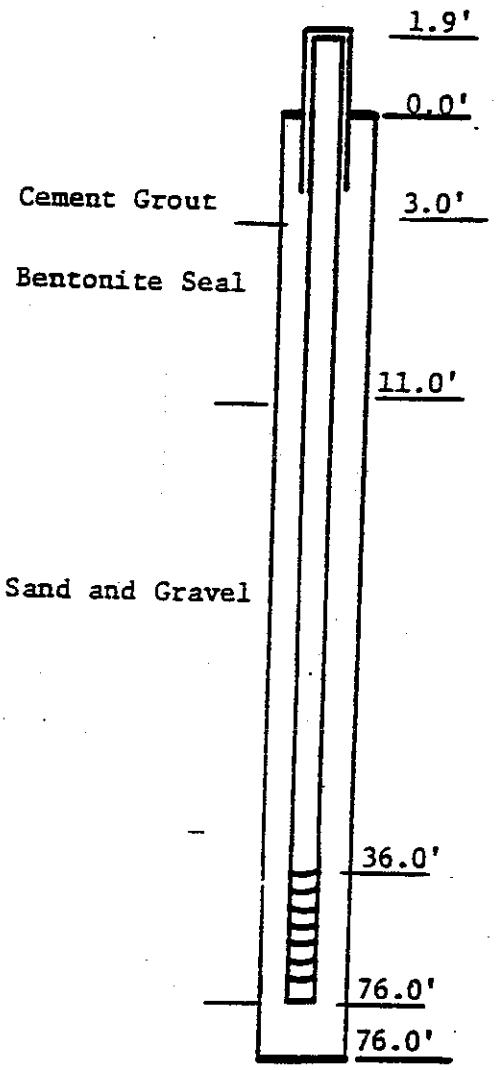
SURFACE ELEVATION: 731.47'
TOP OF PIPE ELEVATION: 733.39'*

TYPE OF PIEZOMETER: Monitoring Well - 4" Schedule 40 PVC Casing

DATE	WATER SURFACE DEPTH (FT.)	WATER SURFACE ELEV. (FT.)	
9-23-81	41.0	690.5	
9-24-81	41.0	690.5	
10-5-81	42.0	689.5	

INSTALLATION DESCRIPTION

DESCRIPTION	DEPTH (FT.)



TECHNICIAN PATTERSON

JOB NO. 26418

NOTES: PVC screen length - 40 feet
Screen slot size - 0.010 inches
Guard pipe - 5" x 4' 2" black iron with locking cap
*Elevation given is top of guard pipe without cap

LOG OF BORING NO. W-4-S

GROUNDWATER MONITORING WELLS, HARRISON RADIATOR, DAYTON OPERATIONS, MORAINE, OHIO

BORING LOCATION: As shown on boring location plan **DATE STARTED:** 9-25-81

SURFACE ELEVATION: 726.66' **DATE COMPLETED:** 9-28-81

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	Brown sand and gravel, some silt, trace of cobbles				
10'					
20'					
30'					
	(Becomes wet at 37.5')				
40'					
50'					
60'					
	(continued on next page				

METHOD: DRIVE CASING

TECHNICIAN: PATTERSON

JOB NO.: 26418 (kab)

WATER OBSERVATIONS

INITIAL DEPTH: 37.5'

COMPLETION DEPTH: 37.5'

DEPTH AFTER: 24 HRS. 37.5'

TYPE SAMPLER:

____ A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

BOWSER – MORNER
TESTING LABORATORIES, INC.

LOG OF BORING NO. W-4-S (second page)

GROUNDWATER MONITORING WELLS, HARRISON RADIATOR, DAYTON OPERATIONS, MORAINE, OHIO

BORING LOCATION: As shown on boring location plan

DATE STARTED: 9-25-81

SURFACE ELEVATION: 726.66'

DATE COMPLETED: 9-28-81

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
60'	(continued)				
70'	Bottom of boring at 70.0'				
80'					
90'					
100'					
110'					
120'					

METHOD: DRIVE CASING

TECHNICIAN: PATTERSON

JOB NO.: 26418 (kab)

WATER OBSERVATIONS

INITIAL DEPTH: 37.5'

COMPLETION DEPTH: 37.5'

DEPTH AFTER: 24 HRS. 37.5'

TYPE SAMPLER:

A. SPLIT SPOON

B.

C. SHELBY TUBE

BOWSER – MORNER
TESTING LABORATORIES, INC.

LOG OF WELL NO. W-4-S

GROUNDWATER MONITORING WELLS, HARRISON RADIATOR,
DAYTON OPERATIONS, MORAINE, OHIO

BORING LOCATION: As shown on boring location plan
DATE INSTALLED: 9-28-81

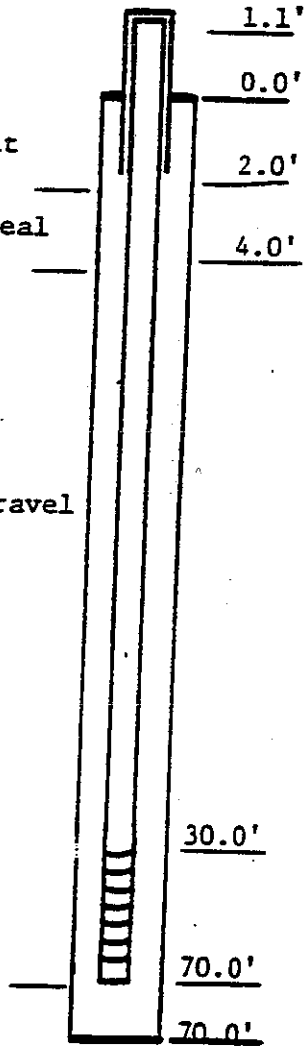
SURFACE ELEVATION: 726.66'
TOP OF PIPE ELEVATION: 727.80'*

TYPE OF PIEZOMETER: Monitoring Well - 4" Schedule 40 PVC Casing

DATE	WATER SURFACE DEPTH (FT.)	WATER SURFACE ELEV. (FT.)
9-28-81	37.6	689.1
9-29-81	37.6	689.1
10-5-81	37.3	689.4

INSTALLATION DESCRIPTION

DESCRIPTION	DEPTH (FT.)
	1.1'
	0.0'
Cement Grout	
	2.0'
Bentonite Seal	
	4.0'
Sand and Gravel	
	30.0'
	70.0'
	70.0'



TECHNICIAN PATTERSON

JOB NO. 26418

NOTES: PVC screen length - 40 feet
Screen slot size - 0.010 inches
Guard pipe - 5" x 4' 2" black iron with locking cap
* Elevation given is top of guard pipe without cap

Section 9

Former Moraine Engine
Plant Logs ME Series

ME-1 through ME-6

GERAGHTY & MILLER, INC.
Environmental Services

SAMPLE/CORE LOG

Boring/Well ME-1 Project/No. CPC - Moraine Engine Plant / OH055.01 Page 1 of 2

Site Location Moraine, Ohio Drilling Started 1300 Drilling Completed 1600

Total Depth Drilled 40 feet Hole Diameter 8 inches Type of Sample/ Coring Device Split-spoon

Length and Diameter of Coring Device 24" x 2" diameter Sampling Interval 5 feet

Land-Surface Elev. 728.30 feet ☒ Surveyed ☐ Estimated Datum Mean Sea Level

Drilling Fluid Used None Drilling Method Hollow Stem Auger

Drilling Contractor Reynolds Driller McDonald Helper Danny Allen

Prepared By S. Ackers Hammer Weight 130 lbs. Hammer Drop 30 inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description	HNU Headspace
3	5	1.0	9 -12 13 -12	CLAY - (40-50%); medium to coarse gravel (20-30%); sand (10-20%); silt (0-10%); medium brown, damp, medium stiff.	NR
8	10	.3	10 -6 16 -20	Med.-cs. GRAVEL (50-60%); fine-med sand (20-30%); silt (0-10%); damp.	0.3
13	15	1.5	19 -49 63 -60	Med.-cs GRAVEL (40-50%); fine-med. sand (50%); damp.	0.5
18	20	1.0	14 -20 23 -39	Medium to coarse SAND (60-70%); medium to coarse gravel (20%); silt (10%); moist.	0.2
23	25	1.0	13 -11 12 -21	Coarse to very coarse SAND (70%); silt (30%); very moist to wet. No sample taken in lithology sequence.	0.1
28	30	1.0	45-64 37 -46	Medium to coarse SAND (60%); fine gravel (20%); fine Sand (10%); Silt (10%); saturated.	0.2

GERAGHTY & MILLER, INC.
Environmental Services

SAMPLE/CORE LOG (Cont.d)

Boring/Well ME-1

Prepared By S. Ackers

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description	HNU Headspace (ppm)
33	35	1.3	13 -18 19 -14	fine to medium GRAVEL (60%); fine-medium sand (30%); silt (10%); wet-saturated.	0.6
38	40	1.5	55 -61 91 -29	fine - coarse GRAVEL (40-60%); fine to coarse sand (30%); silt 10%; saturated.	0.8
				40.0 END OF LOG	
				2- inch monitor well installed in borehole	
				Well set at 37.0 ft.	
				NR = No Response	

GERAGHTY & MILLER, INC.
Environmental Services

SAMPLE/CORE LOG

Boring/Well ME-2 Project/No. CPC - Moraine Engine Plant / OH055.01 Page 1 of 2

Site Location Moraine, Ohio Drilling Started 1646 Drilling Completed 1750

Total Depth Drilled 33.0 feet Hole Diameter 8 inches Type of Sample/ Coring Device Split-spoon

Length and Diameter of Coring Device 24" x 2" Diameter Sampling Interval 5 feet

Land-Surface Elev. 728.63 feet ☒ Surveyed ☐ Estimated Datum

Drilling Fluid Used None Drilling Method Hollow Stem Auger

Drilling Contractor Reynolds Driller McDonald Chuck Helper Danny Allen

Prepared By S. Ackers Hammer Weight 130 lbs. Hammer Drop 30 inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description	HNU Headspace (ppm)
3	5	1	6 -8 4 -4	fine to medium SAND (80%); fine-gravel (10%); silt (10%); damp.	0.2
8	10	1.3	1 -2 2 -3	fine to medium SAND (80%); clay (10%); Coarse sand (5%); silt (5%); moist to wet.	0.3
13	15	1	15 -12 18 -31	medium to coarse GRAVEL (limestone (80%); fine to medium (sand) (15%); silt (5%); damp.	0.0
18	20	1	8 -15 18 -21	medium to coarse GRAVEL (limestone) (60%); medium to coarse sand (30%); very fine to fine sand (5%); silt (5%); Damp.	0.8
23	25	1.2	16 -24 32 -37	medium to coarse fine SAND (80%); fine sand (10%); fine - gravel (5%); silt (5%); moist.	0.8
28	30	0		medium to coarse SAND (80%) fine sand (15%); Silt (5%); wet.	NS

GERAGHTY & MILLER, INC.
Environmental Services

SAMPLE/CORE LOG (Cont.d)

Boring/Well MF-2 Page 2 of 2

Prepared By S. Ackers

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description	HNU Headspace (ppm)
	33	0		fine to medium SAND (80%); coarse sand	0.4
				(10%); silt (10%); wet	
				END OF LOG 33'	
				WELL SET AT 33'	
				NS = Not Sampled	

G&M Form 04 4-89

Southern 89-0910

GERAGHTY & MILLER, INC.
Environmental Services

SAMPLE/CORE LOG

Boring/Well ME-3 Project/No. CPC - Moraine Engine Plant / OH055.01 Page 1 of 2

Site Location Moraine, Ohio Drilling Started 0800 Drilling Completed 1100

Total Depth Drilled 35 feet Hole Diameter 8 inches Type of Sample/ Coring Device Split-spoon

Length and Diameter of Coring Device 8" Sampling Interval 5' feet

Land-Surface Elev. 728.33 feet ☒ Surveyed ☐ Estimated Datum Mean Sea Level

Drilling Fluid Used None Drilling Method Hollow Stem Auger

Drilling Contractor Reynolds Driller McDonald Helper Danny Allen

Prepared By S. Ackers Hammer Weight 135 lbs. Hammer Drop 24 inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description	HNU Headspace (ppm)
3	5	1.4	15 -61 63 -65	fine to medium SAND; fine to coarse gravel (30%);	0.2
				silt (10%); damp.	
8	10	1.2	3 -24 26 -30	fine to coarse SAND (10%); fine to medium gravel	0.2
				(25%); silt (5%); damp.	
13	15	1.5	17 -15 78 -64	fine to coarse GRAVEL (60%); fine to medium sand	0.2
				(30%); silt (10%); damp.	
18	20	0	100/3"	Split-Spoon Refusal	
23	25	.2	34 -39 46 -32	Pebble/Cobble: almost spoon refusal	0.2
				fine to medium SAND (80%); coarse sand (10%);	
				gravel (5%); silt (5%); wet.	
28	30	.2	26 -10 13 -30	fine to medium SAND (60%); fine to medium gravel	0.2
				(20%); silt (20%); wet.	
33	35	0	Bailer 0-0-0	fine to medium GRAVEL (80%); coarse gravel (5%);	0.2
				fine to coarse (5%); silt (5%); saturated.	

GERAGHTY & MILLER, INC.
Environmental Services

SAMPLE/CORE LOG (Cont.d)

Boring/Well ME-3

Prepared By S. Ackers

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description	HNU Headspace (ppm
34	35	0	Bailer 0-0-0-0	fine to coarse SAND (80%); silt (20%); saturated.	0.4
				END OF LOG 35'	

GERAGHTY & MILLER, INC.
Environmental Services

SAMPLE/CORE LOG

Boring/Well ME-4 Project/No. CPC - Moraine Engine Plant / OH055.01 Page 1 of 1

Site Location Moraine, Ohio Drilling Started 0800 Drilling Completed 1059

Total Depth Drilled 35 feet Hole Diameter 8 inches Type of Sample/ Coring Device Split-Spoon

Length and Diameter of Coring Device 8" Sampling Interval 5 feet

Land-Surface Elev. 728.58 feet ☒ Surveyed ☐ Estimated Datum Mean Sea Level

Drilling Fluid Used None Drilling Method Hollow Stem Auger

Drilling Contractor Reynolds Driller McDonald Helper Danny Allen

Prepared By S. Ackers Hammer Weight 130 lbs. Hammer Drop 30 inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description	HNU Headspace (ppm)
3	5	1.3	3 -4 5 -3	fine to coarse SAND (80%); Silt (20%); black, wet.	27
8	10	.2	15 -14 11 -10	fine to medium SAND (85%); fine to medium gravel (10%); silt (5%); moist.	4.6
13	15	1.5	4 -16 34 -38	fine to medium SAND (60%); coarse sand (15%); fine gravel (10%) silt (5%); wet.	11
18	20	1.5	4 -20 29 -31	fine to medium GRAVEL (60%); medium to coarse sand (20%); fine sand (10%); silt (10%); saturated.	0.4
23	25	.8	12 -10 17 -19	fine to medium GRAVEL (50%); medium to coarse sand (35%); fine sand (10%); silt (5%); wet.	0.4
28	30	0	0-0 0-0	fine to medium SAND (60%); coarse sand (15%) fine to medium gravel (15%); silt (10%); wet.	0.4
33	35	0	0-0 0-0	Same as above 35' END OF LOG 2-inch diameter monitor well installed in Borehole well	0.2

GERAGHTY & MILLER, INC.
Environmental Services

SAMPLE/CORE LOG

Boring/Well ME-5 Project/No. CPC - Moraine Engine Plant / 0H055.01 Page 1 of 2

Site Location Moraine, Ohio Drilling Started 5/30/90 Drilling Completed 5/30/90

Total Depth Drilled 34 feet Hole Diameter 10 inches Type of Sample/ Coring Device Split-spoon

Length and Diameter of Coring Device 2 ft. / 2 in. Sampling Interval 5 feet

Land-Surface Elev. 728.64 feet ☒ Surveyed ☐ Estimated Datum Mean Sea Level

Drilling Fluid Used None Drilling Method Hollow Stem Auger

Drilling Contractor Reynolds Driller McDonald Chuck Helper Danny Allen

Prepared By Dave Frederick Hammer Weight 130 Hammer Drop 30 inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description	HNU Headspace (ppm)
0	0.5			asphalt	
2	4	0.6	14 -6 3 -6	CLAY: CLAY (90%); pebbles (Tr.), sand (Tr);	0.5
				gray to brown.	
7	9	0.7	14 -21 32 -23	MEDIUM SAND (30%), fine sand (20%),	NR
				coarse sand (20%), cobbles (20%), pebbles (10%);	
				brown.	
12	14	0		no recovery (pebble)	
17	19	1.0	13-24 16 -23	SAND and GRAVEL as above	NR
22	24	1.0	15 -17 37 -24	COARSE SAND (50%), medium sand (20%),	NS
				pebbles (15%), fine sand (10%), cobbles (Tr);	
				gray brown, wet, solvent odor (analytical sample)	
27	29	0.5	9 -16 24 -33	MEDIUM SAND (30%), coarse sand (20%),	NS
				fine sand (20%), pebbles (10%), silt (10%),	
				clay (Tr); gray, solvent odor	

GERAGHTY & MILLER, INC.
Environmental Services

SAMPLE/CORE LOG (Cont.d)

Boring/Well ME-5

Prepared By D. Frederick

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description	HNU Headspace (pp
32	34	1.0	7-12 18-26	PEBBLES (30%), COARSE SAND (30%),	NS
				medium sand (20%), fine sand (10%), silt (10%),	
				cobbles (Tr); gray brown, solvent odor.	
				34' END OF LOG	
				WELL SET AT 32'	
				NR = No Response	
				NS = Not Sampled	

GERAGHTY & MILLER, INC.
Environmental Services

SAMPLE/CORE LOG

Boring/Well ME-6 Project/No. CPC - Moraine Engine Plant / OH055.01 Page 1 of 2

Site Location Moraine, Ohio Drilling Started 5/31/90 Drilling Completed 5/31/90

Total Depth Drilled 32 feet Hole Diameter 10 inches Type of Sample/ Coring Device Split-spoon

Length and Diameter of Coring Device 2 ft. / 2 in. Sampling Interval 5 feet

Land-Surface Elev. 728.64 feet ☒ Surveyed ☐ Estimated Datum Mean Sea Level

Drilling Fluid Used None Drilling Method Hollow Stem Auger

Drilling Contractor Reynolds Driller McDonald Chuck Helper Danny Allen

Prepared By D. Frederick Hammer Weight 130 lbs. Hammer Drop 30 inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description	HNU Headspace (ppm)
0	0.5			asphalt	
2	4	0.6	21-9 6-6	SILT (40%), fine sand (30%), medium sand (10%), clay (10%), pebbles (Tr), coarse sand (Tr); gray, moist	1.0
7	9	0.7	5-9 11-14	COARSE SAND (30%), medium sand (20%), fine sand (20%), pebbles (10%), silt (Tr), cobbles (Tr); gray brown, damp.	0.5
13	15	1.1	58-27 26-25	COARSE SAND (40%), medium sand (20%), cobbles (10%), pebbles (15%), fine sand (10%); gray brown, dry.	0.5
17	19	1.0	9-15 23-23	Same as above	0.5
22	24	1.1	31-15 28-32	COARSE SAND (40%), pebbles (20%), cobbles (15%), medium sand (10%), fine sand (10%), silt (Tr); gray, wet. (analytical sample)	0.5

GERAGHTY & MILLER, INC.
Environmental Services

SAMPLE/CORE LOG (Cont.d)

Boring/Well ME-6

Prepared By D. Frederick

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description	HNU Headspace (p
27	29	1.0	~~15-80~~ 34-74	COARSE SAND (30%), pebbles (20%),	NR
				cobbles (20%), medium sand (10%), fine sand	
				(10%), silt (10%), clay (Tr); gray	
32			Bailed	COARSE SAND (40%), medium sand (20%),	NS
				fine sand (20%), pebbles (10%), cobbles (Tr),	
				silt (Tr); gray.	
				NR = No Response	
				NS = Not Sampled	

Section 10

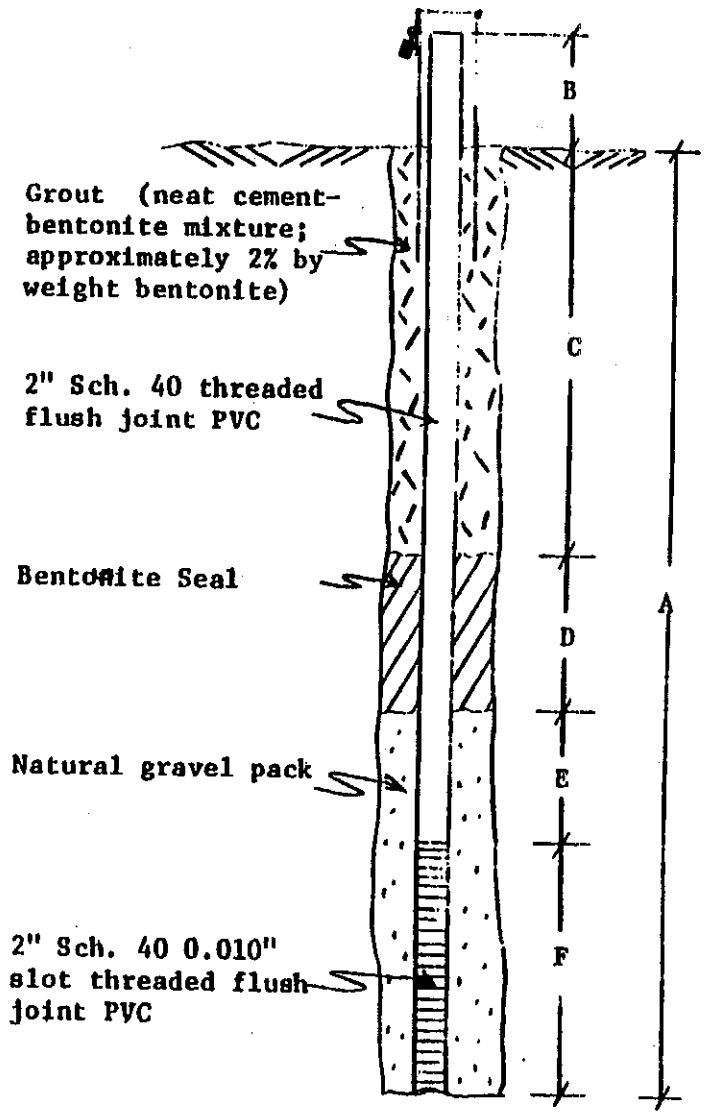
General Motor Logs
GM Series

GM-1 through GM-84
“D” and “S” logs for
GM-19
GM-20 (“D” only)
GM-65
GM-67
GM-68
GM-74
GM-75
GM-76
GM-77

E H. C. NUTTING COMPANY
220 AIRPORT ROAD
CINCINNATI, OHIO 45226

MON R WELL DETAILS

GERAGHTY AND MILLER
HARRISON RADIATOR DIV. (GMC)
MORAINE, OHIO



Well No	A	B	C	D	E	F
1	100'	2.04'	78'	5'	7'	10'
2	55'	2.07'	33'	5'	7'	10'
3	100'	1.86'	78'	5'	7'	10'
4	150'	2.76'	130'	5'	5'	10'
5	100'	1.58'	78'	5'	7'	10'
6	45'	1.78'	23'	5'	7'	10'
7	100'	2.32'	78'	5'	7'	10'
8	50'	1.85'	28'	5'	7'	10'
9	100'	0'	78'	5'	7'	10'
10	50'	0'	28'	5'	7'	10'
11	100'	0'	78'	5'	7'	10'
12	150'	0'	130'	5'	5'	10'
13	100'	0'	78'	5'	7'	10'
14	150'	0'	130'	5'	5'	10'
15	100'	0'	78'	5'	7'	10'
16	58'	0'	35'	5'	8'	10'
17	50'	0'	28'	5'	7'	10'
18	55'	0'	33'	5'	7'	10'

7R

Note: GM-7 was abandoned in August 1992 and replaced by GM-7R

RECD OCT 25 1982

THE H. C. NUTTING COMPANY
GEOTECHNICAL AND TESTING ENGINEERS SINCE 192

912 MORRIS STREET
CHARLESTON, W. VA 25301
304-344-0821

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CINCINNATI, OHIO 45226
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HIGHLAND HEIGHTS, KY 41076
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"AS A MUTUAL PROTECTION TO CLIENTS, THE PUBLIC, AND OURSELVES, ALL REPORTS ARE SUBMITTED AS THE CONFIDENTIAL PROPERTY OF CLIENTS, AND AUTHORIZATION FOR PUBLICATION OF STATEMENTS, CONCLUSIONS OR EXTRACTS FROM OR REGARDING OUR REPORTS IS RESERVED PENDING OUR WRITTEN APPROVAL."

10-18-82 v

FIELD **TEST BORING REPORT**

CLIENT Geraghty & Miller, Inc. ORDER No. 10191.001

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. GM-1

LOCATION As shown on well location plan

DRILLER Willard Martin DRILL No. 36 DATE STARTED 9-1-82

ELEVATION REFERENCE Top of ex-well guard pipe adj. to GM-5; with cap off (see well location plan) Elev. 731.48 DATE COMPLETED 9-2-82

CASING: DIAMETER 3.5" I. D. Hollow Stem Auger HAMMER WT. ____ FALL ____

SAMPLER: DIAMETER & TYPE 2" O. D. Split Spoon HAMMER WT. 140# FALL 30"

DEPTH TO WATER: IMMEDIATE 45.0' UPON COMPLETION below 73.5' (150 gal.)

DEPTH TO WATER ____ DAYS AFTER COMPLETION ____ WATER USED IN DRILLING ____

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Recov
733.0	0'						
		Gravel with sand, silt and possibly some clay, brown, gravel is small to large	1	0-1.5	SS	6-12-17	15"
		Fill, silt, clay, piece of wood, gravel a damp zone (1") of clayey material, white	2	5-6.5	SS	5-17-37	15"
		Silt, fine sand, some clay, gray, some vegetation, moist to wet	3	10-11.5	SS	1-1-2	18"
		Sand, medium, some gravel, well sorted, brown could be natural	4	15-16.5	SS	5-5-5	6"
		Sand medium gravel, poorly sorted, brown some other colors, somewhat of a smell that may be natural	5	20-21.5	SS	10-15-17	12"
		Sand and gravel, poorly sorted, light brown, some other colors, slight oily smell	6	25-26.5	SS	8-13-16	18"
		Sand and gravel, poorly sorted, mostly brown, gravel is angular	7	30-31	SS	26-52	10"

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of load bearing, stability, excavating or other physical

Respectfully submitted,
THE H. C. NUTTING CO.

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. GM-1

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Re
		Sand and gravel, poorly sorted, mostly brown, gravel is angular	8	35-36.5	SS	21-40-41	14
		Sand and gravel, varying color, poorly sorted, damp to moist toward bottom	9	40-41.5	SS	49-40-52	15
		Gravel, little sand, varying size and color, wet	10	45-46	SS	31-88	17
		Sand, medium well sorted, mostly brown, wet 6" gravel and sand, poorly sorted, wet	11	50-51.5	SS	14-23-30	
		Gravel, poorly sorted, some sand	12	55-56.6	SS	22-32-42	18'
		Till zone, silt and clay with gravel throughout, gray	13	60-61.5	SS	21-34-50	18'
		Till zone, silt and clay with gravel throughout, gray hard	14	65-66	SS	34-53	15"
		Till zone, silt and clay with gravel throughout, gray hard	15	70-71.5	SS	24-40-70	15"
		Sand and gravel, poorly sorted, varying color, varying size from small to large	16	75-75.8	SS	55-70/4	18"
		Silt and sand layers, brown to gray sand is fine to medium and more towards bottom, well sorted, clean, silt is swirled, maybe some clay, silt is also sandy	17	80-81.5	SS	17-35-60	18"
		Sandy, medium, well sorted, little fine and coarse, mostly brown with lot of other colors	18	85-86.5	SS	15-29-40	16"
		Sand, fine to medium, some coarse and small gravel, mostly brown, poorly sorted	19	90-91	SS	32-55	16"

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. GM-1

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.
		Sand, fine to medium, some coarse and small gravel, mostly brown, poorly sorted	20	95-96.5	SS	31-42-55
		Sand top 12" fine to medium, some coarse and small gravel, mostly brown poorly sorted, gravel in bottom	21	100-101	SS	34-51
		BORING COMPLETED				
		REMARKS: 1. Logged by G.F. Schank (G & M) 2. Monitoring well set at 100.0' (see well detail table) 3. Till layer 58.0' to 73.5' 4. 2-3 ft. of heave inside augers. Added water.				

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FIELD TEST BORING REPORT

10-18-82 vf

CLIENT Geraghy & Miller, Inc. ORDER No. 10191.001

PROJECT GMC, Harrison Radiator Divsion, Monitoring Wells, Moraine, Ohio HOLE No. GM-2

LOCATION As shown on well location plan

DRILLER Willard Martin DRILL No. 36 DATE STARTED 9-2-82

ELEVATION REFERENCE Top of ex-well guard pipe adj. to GM-5; with cap off (see well location plan) Elev. 731.48

CASING: DIAMETER 3.5" I. D. Hollow Stem Auger DATE COMPLETED 9-2-82

SAMPLER: DIAMETER & TYPE None HAMMER WT. _____ FALL _____

DEPTH TO WATER: IMMEDIATE _____ HAMMER WT. _____ FALL _____

DEPTH TO WATER _____ DAYS AFTER COMPLETION _____ UPON COMPLETION _____

WATER USED IN DRILLING _____

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Recovery
733.2	0'						
		55.0' No samples - see log for GM-1					
	55.0'						
		BORING COMPLETED					
		REMARKS:					
		1. Monitoring well set at 55.0' (See well detail table)					

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of load bearing, stability, excavating or other...

Respectfully submitted,
THE H. C. NUTTING CO.

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FIELD TEST BORING REPORT

CLIENT Geraghty & Miller, Inc. ORDER No. 10191.001

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. GM-3

LOCATION As shown on well location plan

DRILLER Willard Martin DRILL No. 36 DATE STARTED 9-15-82

ELEVATION REFERENCE Top of ex-well guard pipe adj. to GM-5; with cap off (see well location plan) Elev. 731.48 DATE COMPLETED 9-15-82

CASING: DIAMETER 3.5" I. D. Hollow Stem Auger HAMMER WT. ____ FALL ____

SAMPLER: DIAMETER & TYPE 2" O. D. Split Spoon HAMMER WT. 140# FALL 30"

DEPTH TO WATER: IMMEDIATE 36.0' UPON COMPLETION ____

DEPTH TO WATER ____ DAYS AFTER COMPLETION ____ WATER USED IN DRILLING ____

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Recove
728.6	0'						
		Sand, gravel and clay, mixed, dark brown to light brown, gray zones, oil odor - fill	1	5-6.5	SS	6-8-11	18"
		Sand with gravel, poorly sorted, fine to coarse, moistly light brown and white	2	10-11.5	SS	7-22-40	16"
		Sand with gravel, poorly sorted, fine to coarse, mostly light brown and white	3	15-16.5	SS	12-14-29	16"
		Sand and gravel, poorly sorted, wet	4	35-36	SS	16-54	6"
		Sand and gravel, poorly sorted, wet	5	40-41	SS	16-75	8"
		Till - top 3" sand lense, medium gray, wet bottom 7" silt, with gravel inter-bedded, clayey hard gray	6	45-46	SS	30-52	10"
		Silt, clayey, sand lenses (moist); gravel throughout, dark gray	7	50-51.5	SS	27-37-50	18"

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of load bearing, stability, excavating or other physical

Respectfully submitted,
THE H. C. NUTTING CO.

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. GM-3

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	R
		Silt. clayey, sand lenses, (moist); gravel throughout, dark gray, sandier, does not appear as competent as all previous till zones found. Sandier, damper	8	55-56.5 58-58	SS ST	12-22-26	1
		Silt, clayey, sand lenses (moist); gravel throughout, dark gray	9	60-61	SS	30-51	1
		Silt, clayey, sand lenses (moist); gravel throughout, dark gray	10	65-66.5	SS	16-25-43	1
		BORING COMPLETED					
		REMARKS: 1. Logged by G. F. Schank, (G&M) 2. Set well at 100.0' (see well detail table) 3. See log for GM-4 4. Till layer 44 to 68'					

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FIELD **TEST BORING REPORT**

CLIENT Geraghty & Miller, Inc. ORDER No. 10191.001

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. GM-4

LOCATION As shown on well location plan

DRILLER Russel Fields (Moody's) DRILL No. Cable tool #1 DATE STARTED 9-1-82

ELEVATION REFERENCE Top of ex-well guard pipe adj. to GM-5; with cap off (see well location plan) Elev. 731.48 DATE COMPLETED 9-14-82

CASING: DIAMETER 8" HAMMER WT. ____ FALL ____

SAMPLER: DIAMETER & TYPE Bailer HAMMER WT. ____ FALL ____

DEPTH TO WATER: IMMEDIATE ____ UPON COMPLETION ____

DEPTH TO WATER ____ DAYS AFTER COMPLETION ____ WATER USED IN DRILLING Full depth

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Recove
728.9	0'	Silt, little fine sand and organics, dark brown	1	0-1			
		Sand, fine to coarse, some gravel, silt and clay, brown, hard	2	5-10			
		Sand, fine to coarse, some gravel, silt and clay, brown, hard	3	10-15			
		Sand, medium to coarse and gravel, some fine sand, silt and clay, gravel, cobbles and pebbles, little fine to coarse sand, silt and clay, brown (may contain water)	4	15-20			
		Gravel, cobbles and pebbles and coarse sand, trace fine sand, silt and clay	5	20-25			
		Gravel, cobbles and pebbles and coarse sand, trace fine sand, silt and clay	6	25-30			
		Gravel, cobbles and pebbles and corase sand, trace fine sand, silt and clay	7	30-35			

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Respectfully submitted,
THE H. C. NUTTING CO.

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. GM-4

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	R
		Gravel, cobbles and pebbles and coarse sand, trace fine sand, silt and clay	8	35-40			
		Gravel, cobbles and pebbles and coarse sand, trace fine sand, silt and clay, some fine to coarse sand and pebble gray (fill) (oil film maybe from rods)	9	40-45			
		Gravel, cobbles and pebbles and coarse sand, trace fine sand, silt and clay	10	45-50			
		Gravel, cobbles and pebbles and coarse sand, trace fine sand, silt and clay	11	50-55			
		Gravel, cobbles and pebbles and coarse sand, trace fine sand, silt and clay	12	55-60			
		Silt and clay, some fine to coarse sand and pebble, gray (till)	13	60-65			
		Silt and clay, some fine to coarse sand and pebble, gray (till), with larger gravel	14	65-70			
		Gravel, cobbles, pebbles, coarse sand	15	70-75			
		Sand, medium to coarse, poorly sorted, some gravel, mostly brown	16	75-80			
		Sand, medium, well sorted, trace fine brown	17	80-85			
		Sand, medium, well sorted, trace fine brown, trace coarse	18	85-90			
		Sand and gravel, poorly sorted, trace fines, 1 foot clay lense from 91 to 92 feet.	19	90-95			
		Gravel and sand poorly sorted	20	95-100			
		Gravel and sand, coarse, changing to sand with gravel, silty, trace clay, poorly sorted	21	100-105			

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. GM-4

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.
		Sand. medium, well sorted, trace fine, trace coarse brown	22	105-110		
		Gravel with sand, coarse, poorly sorted	23	110-115		
		Gravel with sand, coarse, poorly sorted	24	115-120		
		Gravel with sand, coarse, poorly sorted sandier	25	120-125		
		Gravel with sand, coarse, poorly sorted sandier	26	125-130		
		Sand, medium to coarse, poorly sorted; gravel	27	130-135		
		Gravel, coarse, some sand, some larger than gravel	28	135-140		
		Gravel, very coarse and larger than gravel	29	140-145		
		Very coarse sand and gravel	30	145-150		
		BORING COMPLETED				

REMARKS:

1. Logged by J. R. Mildenberger & G. F. Schank (G & M)
2. Monitoring well set at 150.0, (see well detail table)
3. Till layer 43' to 7'±

WELL LOG AND DRILLING REPORT

NO CARBON PAPER NECESSARY— SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Fountain Square
Columbus, Ohio 43224

593778

COUNTY Montgomery TOWNSHIP Moraine SECTION OF TOWNSHIP _____

OWNER Harrison Radiator Div. GMC ADDRESS Moraine, Ohio

LOCATION OF PROPERTY in landfill on Dryden Road

CONSTRUCTION DETAILS

Casing diameter 2" Length of casing 140'

Type of screen PVC Length of screen 10'

Type of pump _____

Capacity of pump _____

Depth of pump setting _____

Date of completion 9/12/82

BAILING OR PUMPING TEST
(specify one by circling)

Test rate N/A gpm Duration of test _____ hrs

Drawdown _____ ft Date _____

Static level (depth to water) _____ ft

Quality (clear, cloudy, taste, odor) _____

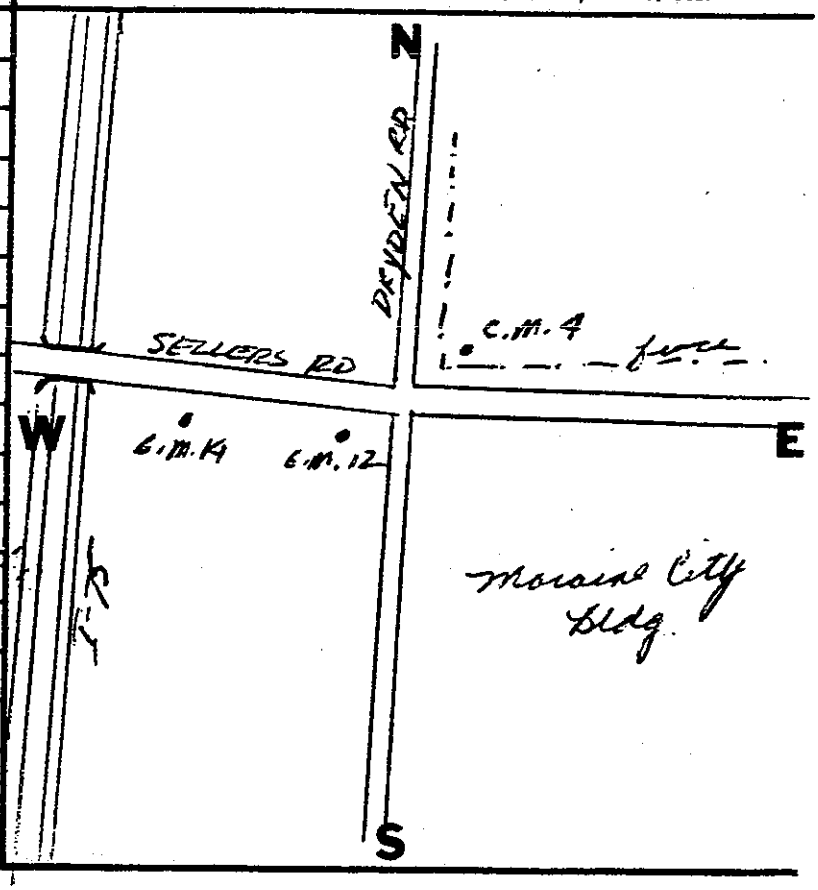
Pump installed by _____

WELL LOG* 6.M.4

Formations: sandstone, shale, limestone, gravel, clay	From	To
Overburden	0 ft	5 ft
Dry Sand and Gravel	5	50
Glacial till	50	65
Sand and gravel	65	150
5412		

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM Moody's of Dayton, Inc. DATE October 26, 1982

ADDRESS P.O. Box 123, Miamisburg, Oh. 45342 SIGNED Kenneth Cramer

*If additional space is needed to complete well log, use next consecutive numbered form.

C66

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WELL LOG AND DRILLING REPORT

NO CARBON PAPER NECESSARY— SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Fountain Square
Columbus, Ohio 43224

593778

COUNTY Montgomery TOWNSHIP Moraine SECTION OF TOWNSHIP

OWNER Harrison Radiator Div. GMC ADDRESS Moraine, Ohio

LOCATION OF PROPERTY in landfill on Dryden Road

CONSTRUCTION DETAILS

Casing diameter 2" Length of casing 140'

Type of screen PVC Length of screen 10'

Type of pump

Capacity of pump

Depth of pump setting

Date of completion 9/12/82

BAILING OR PUMPING TEST
(specify one by circling)

Test rate N/A gpm Duration of test hr

Drawdown ft Date

Static level (depth to water) ft

Quality (clear, cloudy, taste, odor)

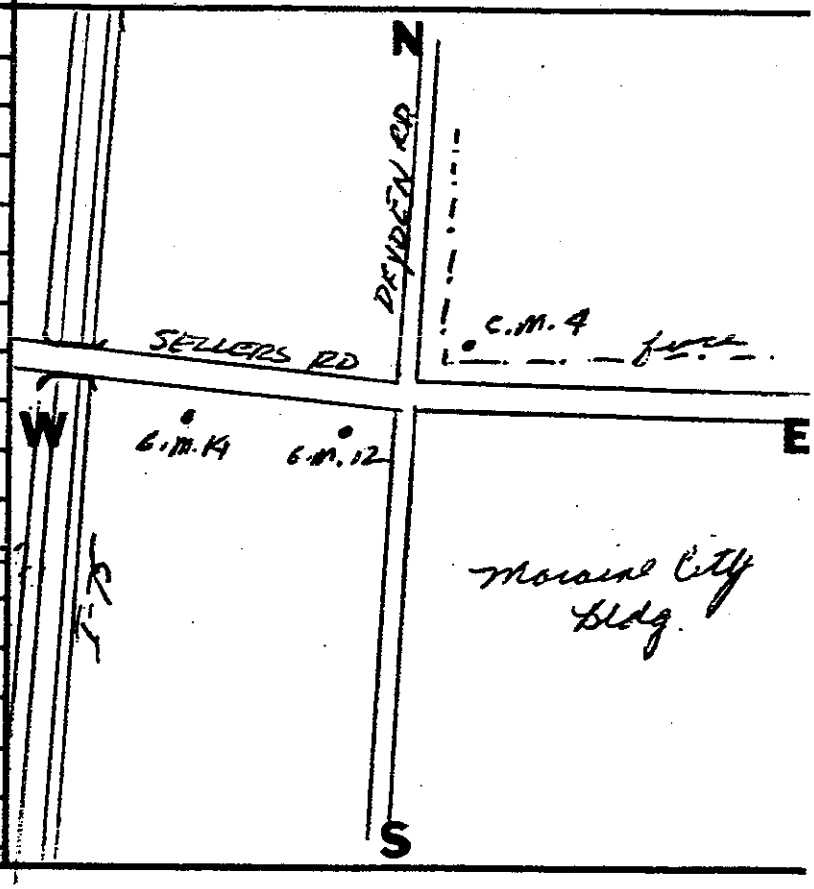
Pump installed by

WELL LOG* 6.M.4

Formations: sandstone, shale, limestone, gravel, clay	From	To
Overburden	0 ft	5 ft
Dry Sand and Gravel	5	50
Glacial till	50	65
Sand and gravel	65	150
5412		

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



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FIELD TEST BORING REPORT

CLIENT Geraghty & Miller, Inc. ORDER No. 10191.001

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. GM-5

LOCATION As shown on well location plan

DRILLER Willard Martin DRILL No. 36 DATE STARTED 9-7-82

ELEVATION REFERENCE Top of ex-well guard pipe adj. to GM-5; with cap off (see well location plan) Elev. 731.48 DATE COMPLETED 9-7-82

CASING: DIAMETER 3.5" I. D. Hollow Stem Auger HAMMER WT. ____ FALL ____

SAMPLER: DIAMETER & TYPE 2" O. D. Split Spoon HAMMER WT. 140# FALL 35"

DEPTH TO WATER: IMMEDIATE 38.0' UPON COMPLETION ____

DEPTH TO WATER ____ DAYS AFTER COMPLETION ____ WATER USED IN DRILLING ____

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER (or % Core Rec.)	Recover
729.6	0'						
		Silt, and sand and gravel, (fill), moist, brown	1	0-1.5	SS	9-17-17	12"
		Sand, fine to medium and silt some gravel, little metal debris, black to brown sweet odor, (fill)	2	5-6.5	SS	10-10-5	6"
		Sand, fine, light brown, moist, trace silt, sand fine to coarse and gravel, trace silt, moist (slight oil odor) light brown	3	10-11	SS	12-52	8"
		Sand fine to coarse and gravel, trace silt, moist (oil odor), light brown	4	15-16.5	SS	6-16-27	10"
		Sand fine to coarse and gravel - pebble, trace silt, moist (slight oil odor), light brown	5	20-21.5	SS	13-30-30	12"
		Sand fine to coarse, and gravel, little silt and clay, moist, light brown	6	25-26.5	SS	13-30-3	16"

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of load bearing, stability, excavating or other physical

Respectfully submitted,
THE H. C. NUTTING CO.

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Morain, Ohio HOLE No. GM-5

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	F
		Sand, fine to coarse, and gravel, little silt and clay, moist, light brown	7	30-31.5	SS	15-30-3	1
		Sand fine to coarse, little gravel, pebble, moist, light brown (slight oil odor)	8	35-36.5	SS	14-31-40	1
		Sand fine to coarse and gravel, wet, brown (slight oil odor)	9	40-41.5	SS	16-21-28	1
		Gravel and fine to coarse sand, trace silt and clay with 3" silty clay lense, brown, wet (slight oil odor)	10	45-46.5	SS	10-24-31	1
		Silt, trace clay, light orange brown grading down to gray very moist	11	50-51.5	SS	17-34-4	1
		Silt, some clay and fine sand, little medium to coarse sand and gravel, gray, moist (till)	12	55-56	SS	30-60	1
		Silt, some clay and fine sand and gravel, pebble, little medium to coarse sand with fine to coarse sand lenses, gray moist, (till)	13	60-61	SS	21-53	1
		Silt, some clay and sand and gravel, pebble little medium to coarse sand, with fine to medium sand stringers, gray, moist (till)	14	65-66	SS	35-72	1
		Sand and gravel - no sample	15	70-71	SS	25-54	C
		Sand fine to coarse, little gravel, pebble, trace silt orange brown, wet, silt, some clay and fine sand, gray, moist	16	75-76.5	SS	20-38-44	10
		Sand fine to medium, little coarse sand and gravel, pebble, trace silt, wet, brown	17	80-81.5	SS	24-48-60	14

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. GM-5

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.
		Sand, fine trace medium sand and silt brown, wet	18	85-86	SS	22-58
		Sand, fine trace medium sand and silt brown, wet	19	90-91	SS	41-70
		Sand, fine to coarse and gravel, little silt and clay, brown, wet	20	95-96.5	SS	21-44-65
		Sand and gravel, - no sample -	21	100-101	SS	38-55
		BORING COMPLETED				
		REMARKS: 1. Logged by J. R. Mildenberger 2. Monitoring well set at 100.0' (see well detail table)				

THE H. C. NUTTING COMPANY
GEOTECHNICAL AND TESTING ENGINEERS
SINCE 1921

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10-18-82 vf

FIELD TEST BORING REPORT

CLIENT Geraghty & Miller, Inc. ORDER No. 10191.001

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. GM-6

LOCATION As shown on well location plan

DRILLER Willard Martin DRILL No. 36 DATE STARTED 9-16-82

ELEVATION REFERENCE Top of ex-well guard pipe adj. to GM-5; with cap off (see well location plan) Elev. 731.48 DATE COMPLETED 9-16-82

CASING: DIAMETER 3.5" I. D. Hollow Stem Auger HAMMER WT. ____ FALL ____

SAMPLER: DIAMETER & TYPE None HAMMER WT. ____ FALL ____

DEPTH TO WATER: IMMEDIATE ____ UPON COMPLETION ____

DEPTH TO WATER ____ DAYS AFTER COMPLETION ____ WATER USED IN DRILLING ____

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Recove
728.4	0'						
		45.0' No samples - see log for GM-3 and 4					
683.4'	45.0'						
		BORING COMPLETED					
		REMARKS:					
		1. Monitoring well set at 45' (see well detail table)					

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of load bearing, stability, excavating or other physical

Respectfully submitted,
THE H. C. NUTTING CO.

THE H. C. NUTTING COMPANY
GEOTECHNICAL AND TESTING ENGINEERS SINCE 1921

912 MORRIS STREET
CHARLESTON, W. VA 25301
304-344-0821

4126 AIRPORT ROAD
P.O. BOX C
CINCINNATI, OHIO 45226
513-321-5816

BOX NUMBER 11
HIGHLAND HEIGHTS, KY 41076
606-261-2043

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FIELD TEST BORING REPORT

CLIENT Geraghty & Miller, Inc. ORDER No. 10191.001

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. GM-7

LOCATION As shown on well location plan

DRILLER Willard Martin DRILL No. 36 DATE STARTED 9-8-82

ELEVATION REFERENCE Top of ex-well guard pipe adj. to GM-5; with cap off (see well location plan) Elev. 731.48 DATE COMPLETED 9-8-82

CASING: DIAMETER 3.5" I. D. Hollow Stem Auger HAMMER WT. ____ FALL ____

SAMPLER: DIAMETER & TYPE 2" O. D. Split Spoon HAMMER WT. 140# FALL 30"

DEPTH TO WATER: IMMEDIATE 44' UPON COMPLETION ____

DEPTH TO WATER ____ DAYS AFTER COMPLETION ____ WATER USED IN DRILLING ____

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Recove
732.7	0'						
		Silt, some sand gravel and debris, black to brown, moist (fill)	1	0-1.5	SS	10-19-20	14"
		Silt, little sand, gravel and wood debris, black, moist (fill), (slight odor)	2	5-6.5	SS	10-11-10	16"
		Silt and fine sand, some gravel and debris, black, very wet, (fill), (slight odor) (3 tries for spoon rec'y)	3	10-11.5	SS	9-6-6	
		Sand, fine to coarse and gravel, little silt, light orange brown moist	4	15-16.5	SS	10-14-16	10"
		Sand, fine to coarse and gravel, little silt, light orange brown moist	5	20-21.5	SS	7-13-22	10"
		Sand, fine to coarse and gravel, little silt, light orange brown moist	6	25-26.5	SS	21-38-42	12"
		Gravel and fine to coarse sand, trace silt	7	30-31	SS	22-51	5"

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of load bearing, stability, excavation

Respectfully submitted,
THE H. C. NUTTING CO.

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. GM-7

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Rec
		Clay, silty, some gravel little fine to medium sand, brown, moist, gravel little silty clay and sand, brown moist	8	35-36.5	SS	12-21-21	
		Sand, fine to coarse and gravel, trace silt, light brown, moist	9	40-41	SS	26-52	8'
		Sand, fine to coarse and gravel, trace silt, light brown, wet	10	45-46	SS	26-62	8'
		Sand, fine to coarse and gravel, little silt, brown, wet	11	50-51	SS	54-64	8'
		Silt, trace fine sand and clay, gray very moist (till)	12	55-56	SS	34-56	12"
		Silt, some fine sand and clay little medium to coarse sand and gravel, pebble, gray, moist (till)	13	60-61.5	SS	16-31-4	18"
		Sand, fine to coarse and gravel, some silt gray wet (till)	14	65-66	SS	44-60	12"
		Silt, some fine sand and clay, little medium to coarse sand and gravel, pebble (till)	15	70-71	SS	28-60	12"
		Sand fine to coarse and gravel, trace to little silt, brown wet	16	75-76	SS	41-64	10"
		Sand fine to coarse and gravel, trace to little silt, brown wet	17	80-81	SS	44-54	12"
		Sand fine to coarse, some gravel, trace silt, brown, wet	18	85-86	SS	36-52	12"
		Sand, fine to coarse, little gravel, trace silt, brown, wet	19	90-91	SS	34-60	10"

THE H. C. NUTTING COMPANY
GEOTECHNICAL AND TESTING ENGINEERS SINCE 19

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606-261-2043

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FIELD TEST BORING REPORT

10-18-82 vf

CLIENT Geraghty & Miller, Inc. ORDER No. 10191.001

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. GM-8

LOCATION As shown on well location plan

DRILLER Willard Martin DRILL No. 36 DATE STARTED 9-9-82

ELEVATION REFERENCE Top of ex-well guard pipe adj. to GM-5; with cap off (see well location plan) Elev. 731.48

CASING: DIAMETER 3.5" I. D. Hollow Stem Auger DATE COMPLETED 9-9-82

SAMPLER: DIAMETER & TYPE None HAMMER WT. _____ FALL _____

DEPTH TO WATER: IMMEDIATE _____ HAMMER WT. _____ FALL _____

DEPTH TO WATER _____ DAYS AFTER COMPLETION _____ UPON COMPLETION _____

WATER USED IN DRILLING _____

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Recove
732.8	0'	No samples - see log for GM-7					
	50.0'	BORING COMPLETED					

REMARKS:

1. Monitoring well set at 50.0'

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of load bearing, stability, excavating or other physical characteristics of [illegible]

Respectfully submitted,
THE H. C. NUTTING CO.

THE H. C. NUTTING COMPANY
GEOTECHNICAL AND TESTING ENGINEERS SINCE 192?

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FIELD **TEST BORING REPORT**

10-18-82 vf
Page 1 of 2

CLIENT Geraghty & Miller, Inc. ORDER No. 10191.001

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. GM-9

LOCATION As shown on well location plan

DRILLER Willard Martin DRILL No. 36 DATE STARTED 9-10-82

ELEVATION REFERENCE Top of ex-well guard pipe adj. to GM-5; with cap off (see well location plan) Elev731.48 DATE COMPLETED 9-10-82

CASING: DIAMETER 3.5" I. D. Hollow Stem Auger HAMMER WT. ____ FALL ____

SAMPLER: DIAMETER & TYPE 2" O. D. Split Spoon HAMMER WT. 140# FALL 30"

DEPTH TO WATER: IMMEDIATE 35.0' UPON COMPLETION ____

DEPTH TO WATER ____ DAYS AFTER COMPLETION ____ WATER USED IN DRILLING ____

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Recove
723.6'	0'	Silt, some fine sand, trace clay, roots, brown, crumbly, dry	1	0-1.5	SS	4-7-7	18"
		Sand, medium, silty, trace clay, trace gravel, well sorted, brown	2	5-6.5	SS	2-2-2	16"
		Gravel and sand, poorly sorted, oil odor	3	10-11.5	SS	18-22-22	14"
		Gravel and sand, poorly sorted, no oil smell	4	15-16.5	SS	11-24-25	16"
		Sand with gravel, poorly sorted, sand is tan to off white, gravel is small to coarse (chert)	5	20-21.5	SS	7-28-26	16"
		Sand with gravel, poorly sorted, sand is tan to off white, gravel is small to coarse (chert), wet zones	6	25-26.5	SS	11-16-22	12"
		Gravel and sand, iron stains, wet zones, oil smell, poorly sorted	7	30-31.5	SS	7-26-38	16"
		Sand and gravel, poorly sorted, wet, very slight oil odor	8	35-36.5	SS	22-28-35	16"

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of load bearing, stability, excavating or other physical

Respectfully submitted,
THE H. C. NUTTING CO.

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. GM-9

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	R
		Sand and gravel, poorly sorted, wet, no oil odor	9	40-41	SS	25-51	1
		sand and gravel, poorly sorted, wet, very slightly oil odor, trace clay	10	45-46.5	SS	28-32-42	1
		Clay, gray, gravel interbedded, some sand lenses, hard	11	50-51	SS	28-60	1
		Silt, clayey, trace fine sand, gravel throughout, hard, some vegetation, gray, some large gravel	12	55-56.5	SS	17-36-44	1
		Silt, clayey, trace fine sand, gravel throughout, hard, some vegetation, gray some large gravel	13	60-61.5	SS	21-35-51	1
		Silt, clayey, trace fine sand, gravel throughout, hard, some vegetation, gray, some large gravel, some sand lenses, brown and gray	14	65-66.5	SS	21-35-50	18
		Sand with gravel, poorly sorted	15	70-71.5	SS	19-31-42	16
		Sand, medium to coarse, with gravel, poorly sorted, brown	16	75-76	SS	31-54	8
		Sand and gravel, poorly sorted	17	80-81	SS	61-75	12
		Sand and gravel, poorly sorted	18	85-86.5	SS	25-28-33	15
		Sand and gravel, poorly sorted	19	90-91	SS	41-61	12
		Sand and gravel, poorly sorted	20	95-96.5	SS	19-20-21	14
		Sand and gravel, poorly sorted	21	100-101.5	SS	32-40-40	14
		BORING COMPLETED					

REMARKS:
1. Logged by G.F. Schank (G&M)
2. Monitoting well set at 100' (see well detail table)
3. Till layer 50 to 69'

THE H. C. NUTTING COMPANY
GEOTECHNICAL AND TESTING ENGINEERS SINCE 192?

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10-18-82 vf

FIELD TEST BORING REPORT

CLIENT Geraghty & Miller, Inc. ORDER No. 10191.001

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. GM-10

LOCATION As shown on well location plan

DRILLER Willard Martin DRILL No. 36 DATE STARTED 9-11-82

ELEVATION REFERENCE Top of ex-weel guard pipe adj. to GM-5; with cap off (see well location plan) Elev. 731.48 DATE COMPLETED 9-11-82

CASING: DIAMETER 3.5" I. D. Hollow Stem Auger HAMMER WT. ____ FALL ____

SAMPLER: DIAMETER & TYPE none HAMMER WT. ____ FALL ____

DEPTH TO WATER: IMMEDIATE ____ UPON COMPLETION ____

DEPTH TO WATER ____ DAYS AFTER COMPLETION ____ WATER USED IN DRILLING ____

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Recover
723.5	0'						
		50.0' No samples - see log for GM-9					
	50.0'						
		BORING COMPLETED					
		REMARKS:					
		1. Monitoring well set at 50.0' (see well detail table)					

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of load bearing, stability, excavating or other physical characteristics of materials

Respectfully submitted,
THE H. C. NUTTING CO.

THE H. C. NUTTING COMPANY
GEOTECHNICAL AND TESTING ENGINEERS SINCE 19

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10-18-82 vf

FIELD TEST BORING REPORT

CLIENT Geraghty & Miller, Inc. ORDER No. 10191.001

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. GM-11

LOCATION As shown on well location plan

DRILLER Willard Martin DRILL No. 36 DATE STARTED 9-5-82

ELEVATION REFERENCE Top of ex-well guard pipe to GM-5; with cap off (see well location plan) Elev. 731.48 DATE COMPLETED 9-5-82

CASING: DIAMETER 3.5" I. D. Hollow Stem Auger HAMMER WT. ____ FALL ____

SAMPLER: DIAMETER & TYPE 2" O. D. Split Spoon HAMMER WT. 140# FALL 30"

DEPTH TO WATER: IMMEDIATE 35' UPON COMPLETION ____

DEPTH TO WATER ____ DAYS AFTER COMPLETION ____ WATER USED IN DRILLING below 64'(150ga

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Rec
723.6	0'						
		Sand and silt, fine, trace clay, some vegetation, reddish brown	1	0-1.5	SS	3-8-9	18'
		Sand and gravel, medium to coarse, gravel is small, trace silt, brown	2	5-6.5	SS	6-13-15	18"
		Gravel with sand, small to large, mostly brown, slight oil smell	3	10-11.5	SS	20-28-28	16"
		Gravel with sand, small to large, mostly borwn, slight oil smell, some dampness	4	15-16.5	SS	13-18-20	14"
		Gravel and sand, poorly sorted, sand is brown, very slight oil odor, some dampness	5	20-21.5	SS	12-27-27	16"
		Gravel and sand, poorly sorted, sand is brown, very light oil odor, some dampness	6	25-26.5	SS	16-33-41	14"
		Gravel and sand, poorly sorted, sand is brown, no odor, 3 inches in top are wet, dry in bottom	7	30-31.5	SS	11-21-54	12"

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of load bearing, stability, excavating or other physical

Respectfully submitted,
THE H. C. NUTTING CO.

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. GM-11

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	
		Sand and gravel, poorly sorted, wet, sand is brown (approx. 9"run-up in augers)	8	35-36.5	SS	150-21-22	1
		Gravel and sand, poorly sorted, 3"sand lenses in top, wet	9	40-41.5	SS	23-33-48	1
		Gravel and sand, poorly sorted, sandier toward bottom	10	45-46	SS	36-54	1
		Till, clay and silt, trace sand, inter-bedded gravel, grayish green, hard	11	50-51	SS	27-54	1
		Till, clay and silt, trace sand, inter-bedded gravel, grayish green, hard, piece of wood in tip, siltier	12	55-56	SS	24-51	1
		Till, clay and ilst, trace sand, inter-bedded gravel, grayish green, hard, trace of vegetation	13	60-61	SS	22-62	1
		Sand with gravel, medium to coarse, poorly sorted, mostly brown	14	65-66.5	SS	17-34-53	1
		Sand with gravel, medium to coarse poorly sorted, mostly brown	15	70-71.5	SS	16-38-48	1
		Sand, medium, well sorted, brown,. some coarse	16	75-76	SS	22-70	1
		Sand, fine to medium, fairly well sorted, brown, trace coarse, trace silt	17	80-81	SS	45-75	1
		Silt, clayey, trace fine sand, plastic gray, (driller said felt like clay from 84-86 ft.)	18	85-86	SS	51-72	1
		Gravel with some sand, poorly sorted	19	90-91.5	SS	13-24-40	1

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. GM-11

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	#
		Gravel with some sand, poorly sorted very coarse	20	95-96.5	SS	13-24-40	1
		Sand and gravel, poorly sorted	21	100-101	SS	28-55	1
		BORING COMPLETED					
		REMARKS: 1. Logged by G. F. Schank (G&M) 2. Monitoring well set at 100.0' (see well detail table) 3. Till layer 49 to 64' 4. 2 ft. run-up in augers at 64'					

THE H. C. NUTTING COMPANY
GEOTECHNICAL AND TESTING ENGINEERS
SINCE 1921

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FIELD TEST BORING REPORT

10-18-82 vf

CLIENT Geraghty & Miller, Inc. ORDER No. 10191.001

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. GM-12

LOCATION As shown on well location plan

DRILLER Siebert Hill (Moody's) DRILL No. Cable tool #2 DATE STARTED 9-7-82

ELEVATION REFERENCE Top of ex-well guard pipe adj. to GM-5: with cap off (see well location plan) Elev. 731.48 DATE COMPLETED 9-18-82

CASING: DIAMETER 8" HAMMER WT. ____ FALL ____

SAMPLER: DIAMETER & TYPE Bailer HAMMER WT. ____ FALL ____

DEPTH TO WATER: IMMEDIATE ____ UPON COMPLETION ____

DEPTH TO WATER ____ DAYS AFTER COMPLETION ____ WATER USED IN DRILLING below 20'

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Recovery
723.8	0'						
		0-100' No samples - see log for GM-11					
		Sand, fine to coarse and gravel, trace silt, brown	1	100-105			
		Gravel and coarse sand, little medium fine sand, trace silt, brown	2	105-110			
		Sand fine to coarse and gravel, trace silt, brown	3	110-115			
		Sand, fine to coarse, little gravel, trace silt, brown	4	115-120			
		Sand, fine to coarse, little gravel, trace silt, brown	5	120-125			
		Sand, fine to coarse and gravel, trace silt, brown	6	125-130			
		Sand, fine to coarse and gravel, little silt, brown	7	130-135			
		Sand fine to coarse, some gravel, little silt, brown	8	135-140			

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of load bearing, stability, excavating or other physical characteristics of materials encountered.

Respectfully submitted,
THE H. C. NUTTING CO.

PROJECT GMC, Harrison Radiator Division, Monitoring Wells Moraine, Ohio HOLE No. GM-12

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.
		Sand, fine to coarse and gravel, little silt, brown	9	140-145		
		Sand, fine to coarse and gravel, little silt, brown	10	145-150		
		BORING COMPLETED				
		REMARKS: 1. Auger rig drilled 20' hole for starting casing 2. Logged by J. R. Mildenberger (G&M) 3. Monitoring well set at 150.0' (see well detail table)				

WELL LOG AND DRILLING REPORT

NO CARBON PAPER NECESSARY– SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Fountain Square
Columbus, Ohio 43224

593779

COUNTY Montgomery TOWNSHIP Moraine SECTION OF TOWNSHIP

OWNER Harrison Radiator Div. GMC ADDRESS Moraine, Ohio

LOCATION OF PROPERTY Park across street from City Building

CONSTRUCTION DETAILS

Casing diameter 2" Length of casing 140'

Type of screen PVC Length of screen 10'

Type of pump N/A

Capacity of pump

Depth of pump setting

Date of completion 9/16/82

BAILING OR PUMPING TEST
(specify one by circling)

Test rate N/A gpm Duration of test h

Drawdown ft Date

Static level (depth to water)

Quality (clear, cloudy, taste, odor)

Pump installed by

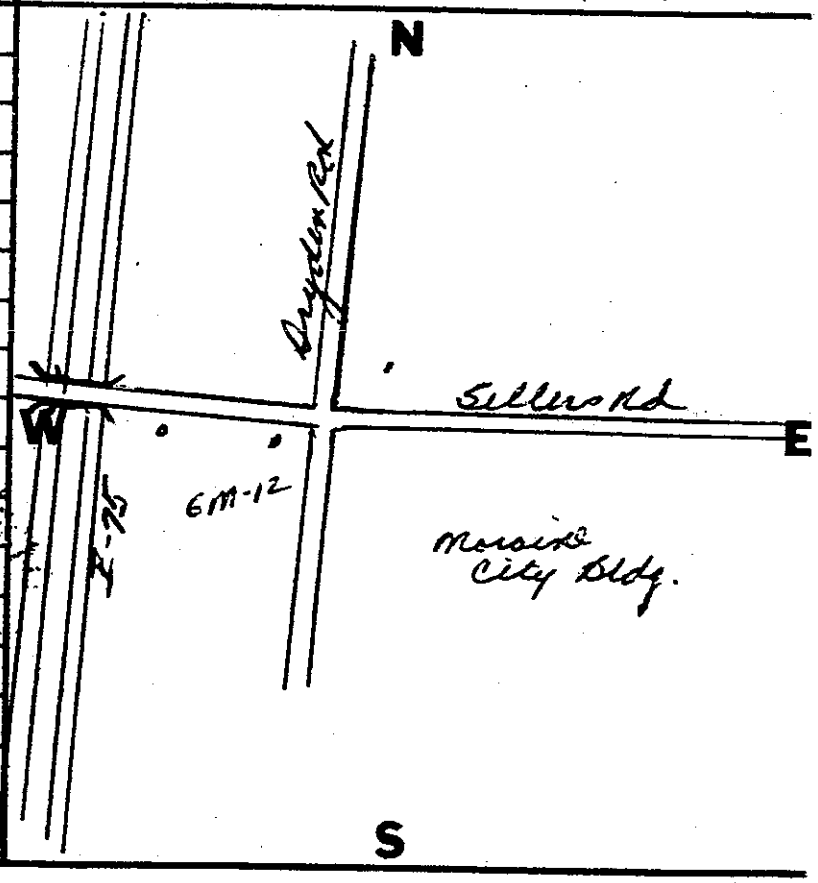
G.M. #12

WELL LOG*

Formations: sandstone, shale, limestone, gravel, clay	From	To
Overburden	0 ft	4 ft
Sand & gravel	4	49
Glacial till	49	64
Coarse sand & gravel	64	150
5412		

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM Moody's of Dayton, Inc. DATE October 26, 1982

ADDRESS P.O. Box 123, Miamisburg, Oh. 45342 SIGNED Kenneth Cramer

*If additional space is needed to complete well log, use next consecutive numbered form.

ORIGINAL COPY - ODNR DIVISION OF WATER FOUNTAIN SQ COLS OHIO 43224

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FIELD TEST BORING REPORT

CLIENT Geraghty & Miller, Inc. ORDER No. 10191.001

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. GM-13

LOCATION As shown on well location plan

DRILLER Willard Martin DRILL No. 36 DATE STARTED 9-3-82

ELEVATION REFERENCE Top of ex-well guard pipe adj. to GM-5; with cap off (see well location plan) Elev. 731.48 DATE COMPLETED 9-4-82

CASING: DIAMETER 3.5" I. D. Hollow Stem Auger HAMMER WT. ____ FALL ____

SAMPLER: DIAMETER & TYPE 2" O. D. Split Spoon HAMMER WT. 140# FALL 30"

DEPTH TO WATER: IMMEDIATE 34' UPON COMPLETION ____

DEPTH TO WATER ____ DAYS AFTER COMPLETION ____ WATER USED IN DRILLING below 64' (150 g

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Rec
723.7	0'	Silt, some fine to medium sand, trace clay and organics, dark reddish brown, moist (6" topsoil)	1	0-1.5	SS	3-5-6	1
		Sand, fine to coarse, some gravel, little silt, brown, moist	2	5-6.5	SS	5-15-32	1
		Sand, fine to coarse and gravel, trace, silt, light brown, moist	3	10-11.5	SS	10-22-30	14
		Sand medium to coarse some gravel, light brown, moist	4	15-16.5	SS	6-10-22	16
		Sand, medium to coarse and gravel, little fine sand, trace silt, light brown, moist	5	20-21.5	SS	16-24-20	16
		Sand, fine to coarse and gravel, little silt and clay, light brown, moist (slight oil odor)	6	25-26	SS	36-52	10
		28ft. - very hard drilling, boulder or large cobble 29'					

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of load bearing, stability, excavating or other physical

Respectfully submitted,
THE H. C. NUTTING CO.

PROJECT GMC, Harrison Radiator Divison, Monitoring Wells, Moraine, Ohio HOLE No. GM-13

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	
		Sand. fine to coarse and gravel, little silt and clay, moist to very moist, some F_e stained lenses, (slight oil odor)	7	30-31.5	SS	13-19-35	
		Gravel, some fine to coarse sand, little silt and clay, wet, brown (slight oil odor)	8	35-36.5	SS	11-17-20	
		Sand, medium to coarse (with lenses of fine to medium) and gravel - pebbles trace silt, brown, wet, (slight oil odor)	9	40-41.5	SS	17-27-34	1
		Sand, medium to coarse (with lenses of fine to medium) and gravel-pebbles trace silt, brown, wet (slight oil odor)	10	45-46	SS	16-53	1
		Sand, fine to coarse some gravel, little silt and clay, brown, wet (slight oil odor)	11	50-51.5	SS	36-38-37	1
		Sand, fine to coarse some gravel, little silt and clay, brown, wet, (slight oil odor)	12	55-56	SS	27-57	1
		Silt and clay, some fine sand, little medium to coarse sand and gravel, dark gray moist (till)	13	60-61	SS	27-70	1
		Sand, fine to coarse, some gravel, little silt, brown, wet	14	65-66	SS	32-52	1
		Sand, fine to medium, uniform, little coarse sand and gravel, pebble, light brown, wet	15	70-71	SS	30-54	1
		Sand, fine uniform, trace medium sand and silt, some zones of F_e staining, brown, wet	16	75-76.5	SS	17-34-42	1

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Morain, Ohio HOLE No. GM-13

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	R
		Sand. fine, little medium to coarse sand and gravel, trace silt, brown, wet	17	80-81	SS	42-74	1
		Gravel, some fine to coarse sand, little silt, light brown, wet, (slight oil odor)	18	85-86	SS	32-104	1
		Sand, fine to coarse, little gravel and silt, brown, wet	19	90-91	SS	38-57	8
		Sand, fine to coarse, and gravel, little silt, brown, wet	20	95-96.5	SS	14-23-30	1
		Sand, fine to coarse, and gravel, little silt, brown, wet (cobble blocked spoon)	21	100-101.5	SS	28-31-30	3
		BORING COMPLETED					
		REMARKS: 1. Logged by J. R. Mildenberger (G&M) 2. Monitoring well set at 100.0' (see well detail table) 3. Till layer 57-64'					

THE H. C. NUTTING COMPANY
GEOTECHNICAL AND TESTING ENGINEERS SINCE 192

912 MORRIS STREET
CHARLESTON, W. VA 25301
304-344-0821

4120 AIRPORT ROAD
P.O. BOX C
CINCINNATI, OHIO 45226
513-321-5816

BOX NUMBER 11
HIGHLAND HEIGHTS, KY 41076
606-261-2043

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10-18-82 vf

FIELD TEST BORING REPORT

CLIENT Geraghty & Miller, Inc. ORDER No. 10191.001

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. GM-14

LOCATION As shown on well location plan

DRILLER Bob Myers (Moody's) DRILL No. Cable tool #1 DATE STARTED

ELEVATION REFERENCE Top of ex-well guard pipe adj. to GM-5; with cap off (see well location plan) Elev. 731.48 DATE COMPLETED

CASING: DIAMETER 8" HAMMER WT. FALL

SAMPLER: DIAMETER & TYPE -Bailer HAMMER WT. FALL

DEPTH TO WATER: IMMEDIATE UPON COMPLETION

DEPTH TO WATER DAYS AFTER COMPLETION WATER USED IN DRILLING Full depth

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Recove
723.4	0'						
		100.0' See GM-13					
		Gravel and sand, poorly sorted, fossiliferous, small to large	1	100-105			
		Gravel and sand, poorly sorted, fossiliferous, small to large	2	105-110			
		Gravel and sand, poorly sorted, fossiliferous, small to large, trace white clay	3	110-115			
		Gravel and sand, poorly sorted, fossiliferous, small to large	4	115-120			
		Gravel and sand, poorly sorted, fossiliferous, small to large	5	120-125			
		Gravel and sand, poorly sorted, fossiliferous, small to large	6	125-130			
		Gravel and sand poorly sorted, fossiliferous, small to large, gravel is coarser	7	130-135			

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of load bearing, stability, excavating or other physical characteristics of materials encountered.

Respectfully submitted,
THE H. C. NUTTING CO.

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. GM-14

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.
		Coarse gravel with sand	8	135-140		
		Coarse gravel with sand, sandier	9	140-145		
		Coarse gravel with sand, gravel not as coarse	10	145-150		
		BORING COMPLETED				
		REMARKS: 1. Logged by G.F. Schank (G&M) 2. Monitoring well set at 150.0' (see well detail table)				

WELL LOG AND DRILLING REPORT

NO CARBON PAPER NECESSARY– SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Fountain Square
Columbus, Ohio 43224

593780

COUNTY Montgomery TOWNSHIP Moraine SECTION OF TOWNSHIP

OWNER Harrison Radiator Div. GMC ADDRESS Moraine, Ohio

LOCATION OF PROPERTY Park across street from City Building

CONSTRUCTION DETAILS

Casing diameter 2" Length of casing 140'

Type of screen PVC Length of screen 10'

Type of pump N/A

Capacity of pump

Depth of pump setting

Date of completion 9/28/82

BAILING OR PUMPING TEST
(specify one by circling)

Test rate N/A gpm Duration of test hr

Drawdown ft Date

Static level (depth to water) f

Quality (clear, cloudy, taste, odor)

Pump installed by

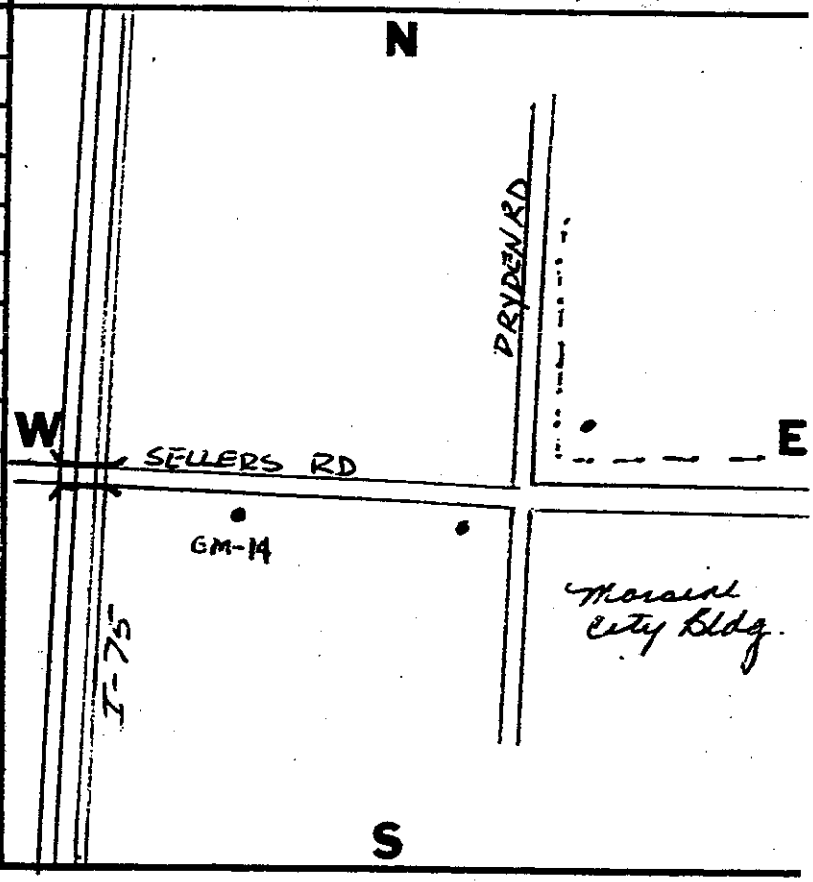
G.M. #14

WELL LOG*

Formations: sandstone, shale, limestone, gravel, clay	From	To
Overburden	0 ft	4 ft
Sand & Gravel	4	56
Glacial till	56	75
Sand and gravel	75	150
5412		

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM Moody's of Dayton, Inc. DATE October 26, 1982

ADDRESS P.O. Box 123, Miamisburg, Oh. 45342 SIGNED Ernest Cramer

*If additional space is needed to complete well log, use next consecutive numbered form.

ORIGINAL COPY - ODNR DIVISION OF WATER FOUNTAIN SQ COLS OHIO 43224

55

THE H. C. NUTTING COMPANY
GEOTECHNICAL AND TESTING ENGINEERS SINCE 1921

912 MORRIS STREET
CHARLESTON, W. VA 25301
304-344-0821

4128 AIRPORT ROAD
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513-321-5816

BOX NUMBER 11
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606-261-2043

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FIELD TEST BORING REPORT

CLIENT Geraghty & Miller, Inc. ORDER No. 10191.001

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. GM-15

LOCATION As shown on well location plan

DRILLER Willard Martin DRILL No. 36 DATE STARTED 9-13-82

ELEVATION REFERENCE Top of ex-well guard pipe adj. to GM-5; with cap off (see well location plan) Elev. 731.48

CASING: DIAMETER 3.5" I. D. Hollow Stem Auger DATE COMPLETED 9-13-82

SAMPLER: DIAMETER & TYPE 2" O. D. Split Spoon HAMMER WT. FALL

DEPTH TO WATER: IMMEDIATE 35.0' HAMMER WT. 140# FALL 30"

DEPTH TO WATER DAYS AFTER COMPLETION UPON COMPLETION

WATER USED IN DRILLING

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Recov.
724.6	0'						
		Silt, topsoil, roots, some fine sand, brown	1	0-1.5	SS	6-14-15	18"
		Sand and gravel, poorly sorted, brown sand is fine to medium, gravel is coarse	2	5-6.5	SS	10-13-9	18"
		Sand and gravel, poorly sorted, brown, sand is fine to medium, gravel is fine to coarse, 1" of sand was damp	3	10-11.5	SS	13-25-25	10"
		Gravel and sand, poorly sorted, very slight oil odor	4	15-16.5	SS	16-30-4	12"
		Sand and gravel, poorly sorted, oil odor, some damp spots	5	20-21.5	SS	15-26-27	15"
		Sand and gravel, poorly sorted, no odor, iron stains	6	25-26	SS	12-60	10"
		Sand and gravel, fine to coarse, brown, iron stains, moist to wet in top of spoon	7	30-31.5	SS	16-32-48	18"
		Encountered water at 35.0'					

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of load bearing, stability, excavating or other physical

Respectfully submitted,
THE H. C. NUTTING CO.

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. GM-15

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	R
		Sand. medium to coarse and gravel, little silt and fine sand, wet, brown	8	35-36.5	SS	12-50-26	1
		Sand, medium to coarse and gravel, little silt and fine sand, wet, brown	9	40-41.5	SS	21-28-38	
		Sand, medium to coarse some gravel, little silt and fine sand, wet, brown	10	45-46.5	SS	16-31-40	1
		Gravel, some fine to coarse sand, trace silt, brown, wet	11	50-51.5	SS	15-18-36	
		Sand, fine to coarse, some gravel, little silt, brown, wet	12	55-56.5	SS	21-28-4	1
		Sand, fine to coarse, some gravel, little silt, brown, wet, silt, some fine sand and gravel - pebble, gray	13	60-61	SS	41-60	
		Silt, some fine to coarse sand and gravel, gray, moist, little clay	14	65-66	SS	21-62	12
		Silt and fine sand, little medium to coarse sand and gravel and clay, gray, moist	15	70-71.5	SS	12-21-33	18
		Sand, fine, some silt, gray, wet	16	75-76	SS	38-55	16
		Sand, fine, some silt, gray, wet	17	80-81	SS	47-62	12
		Sand, fine, some silt, gray, wet	18	85-86	SS	37-56	
		Sand, fine to coarse, little gravel and silt, brown, wet	19	90-91	SS	36-58	
		Sand, fine to coarse and gravel, trace silt, brown, wet	20	95-96	SS	50-62	
		No sample BORING COMPLETED	21	100-101.5	SS	23-25-37	

REMARKS:
1. Logged by G.F. Schank (G&M)
2. Monitoring well set at 100.0' (see well detail table)

THE H. C. NUTTING COMPANY
GEOTECHNICAL AND TESTING ENGINEERS
SINCE 192

912 MORRIS STREET
CHARLESTON, W. VA 25301
304-344-0821

4129 AIRPORT ROAD
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BOX NUMBER 11
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10-18-82 vf

FIELD TEST BORING REPORT

CLIENT Geraghty & Miller, Inc. ORDER No. 10191.001

PROJECT GMC, Harrison Radiator Division, Monitoring Wells HOLE No. GM-16
Moraine, Ohio

LOCATION As shown on well location plan

DRILLER Willard Martin DRILL No. 36 DATE STARTED 9-14-82

ELEVATION REFERENCE Top of ex-well guard pipe adj. to GM-5; with cap off (see well location plan) Elev. 731.48 DATE COMPLETED 9-14-82

CASING: DIAMETER 3.5" I. D. Hollow Stem Auger HAMMER WT. FALL

SAMPLER: DIAMETER & TYPE None HAMMER WT. FALL

DEPTH TO WATER: IMMEDIATE UPON COMPLETION

DEPTH TO WATER DAYS AFTER COMPLETION WATER USED IN DRILLING

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Re:
724.6'	0'						
		60.0' No samples, see GM-15					
664.6	60.0'						
		BORING COMPLETED					
		REMARKS:					
		1. Monitoring well set at 58.0' (see well detail table)					

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of load bearing, stability, excavating or other physical

Respectfully submitted,
THE H. C. NUTTING CO.

Burns

THE H. C. NUTTING COMPANY
GEOTECHNICAL AND TESTING ENGINEERS SINCE 19

912 MORRIS STREET
CHARLESTON, W. VA 25301
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4120 AIRPORT ROAD
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513-321-5816

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HIGHLAND HEIGHTS, KY 41076
606-261-2043

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10-18-82 vf

FIELD TEST BORING REPORT

CLIENT Geraghty & Miller, Inc. ORDER No. 10191.001

PROJECT GMC, Harrison Radiator Division, Monitoring Wells, Moraine, Ohio HOLE No. GM-17

LOCATION As shown on well location plan

DRILLER Willard Martin DRILL No. 36 DATE STARTED 9-11-82

ELEVATION REFERENCE Top of ex-well guard pipe adj. to GM-5; with cap off (see well location plan) Elev. 731.48 DATE COMPLETED 9-12-82

CASING: DIAMETER 3.5" I. D. Hollow Stem Auger HAMMER WT. ____ FALL ____

SAMPLER: DIAMETER & TYPE ____ HAMMER WT. ____ FALL ____

DEPTH TO WATER: IMMEDIATE ____ UPON COMPLETION ____

DEPTH TO WATER ____ DAYS AFTER COMPLETION ____ WATER USED IN DRILLING ____

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Recov
723.6	0'	No samples, see GM-11 and GM-12					
673.6	50.0'	BORING COMPLETED					

REMARKS:

1. Monitoring well set at 50.0' (see well detail table)

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpreta-

Respectfully submitted,
THE H. C. NUTTING CO.

THE H. C. NUTTING COMPANY
GEOTECHNICAL AND TESTING ENGINEERS SINCE 19

912 MORRIS STREET
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TEST BORING REPORT

10-18-82 vf

CLIENT Geraghty & Miller, Inc. ORDER No. 10191.001

PROJECT GMC, Harrison Radiator Division, Monitoring Wells HOLE No. GM-18
Moraine, Ohio

LOCATION As shown on well location plan

DRILLER Willard Martin DRILL No. 36 DATE STARTED 9-9-82

ELEVATION REFERENCE Top of ex-well guard pipe adj. to GM-5; with cap off (see well location plan) Elev. 731.48

CASING: DIAMETER 3.5" I. D. Hollow Stem Auger DATE COMPLETED 9-9-82

SAMPLER: DIAMETER & TYPE None HAMMER WT. ____ FALL ____

DEPTH TO WATER: IMMEDIATE ____ HAMMER WT. ____ FALL ____

DEPTH TO WATER ____ DAYS AFTER COMPLETION ____ UPON COMPLETION ____

WATER USED IN DRILLING ____

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Rec
723.6	0'						
		No samples, see GM-13, GM-14					
	55.0'						
		BORING COMPLETED					
		REMARKS:					
		1. Monitoring well set at 55.0' (see well detail table)					

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of load bearing, stability, excavating or other physical

Respectfully submitted,
THE H. C. NUTTING CO.

GERAGHTY & MILLER, INC.
Environmental Services

SAMPLE/CORE LOG

Boring/Well GM-19D Project/No. OHD19.05 Page 1 of 1

Site Location Moraine, Ohio (G.M.) Drilling Started 10/2/89 Drilling Completed 10/6/89

Total Depth Drilled 150.2 feet Hole Diameter 10" inches Type of Sample/ Coring Device Grab Catch

Length and Diameter of Coring Device _____ Sampling Interval approx. 5 feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Drilling Fluid Used _____ Drilling Method Cable Tool with Catcher

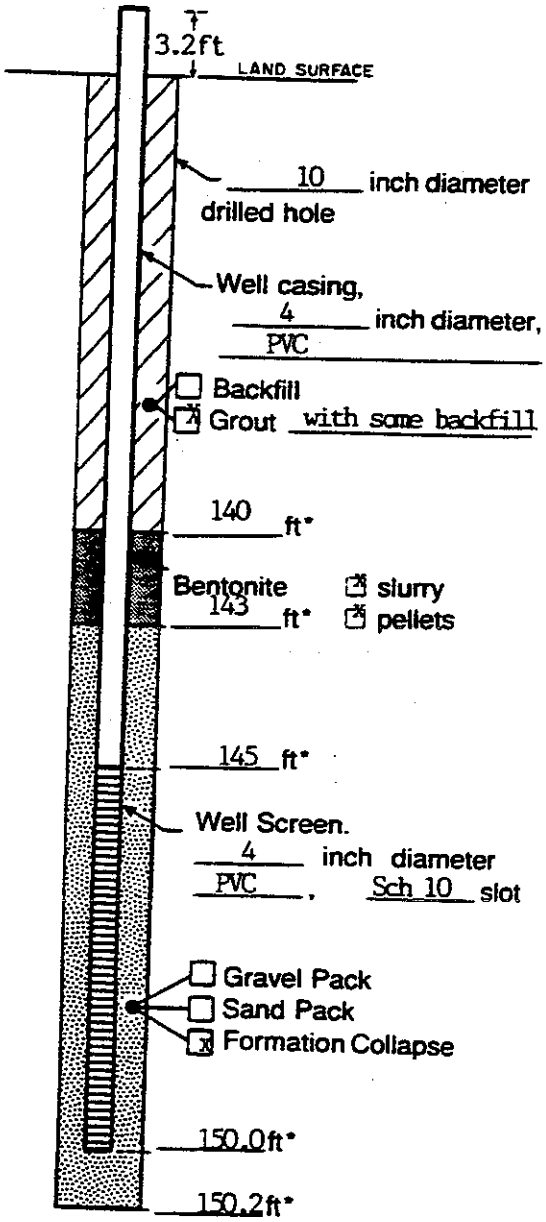
Drilling Contractor Reynold's Driller Ken Helper Steve

Prepared By G. Barrientes Hammer Weight N/A Hammer Drop _____ inches

Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
0	5	-	-	Topfill/gravel top like pieces; large gravel stones.
5	10	-	-	Large gravel stones and pebbles.
10	15	-	-	Hard, stones and gravel; wet
15	20	-	-	Hard, stones and gravel; wet
20	25	-	-	Hard, stones and gravel; wet
25	30	-	-	Hard, stones and gravel; wet
30	40	-	-	Stones, hard material and some large pieces; still wet
40	60	-	-	Stones, hard material and some large pieces; still wet
60	74	-	-	Hard pan, wet, stones with large to med. sizes
74	82	-	-	Clayey material, brownish-grey colors with med. size stones
82	100	-	-	Silty material, still has hard consistency, wet with med. to
				small size pebbles
100	150	-	-	Silty material, still has hard consistency, wet with med. to
				small size pebbles

GERAGHTY & MILLER, INC.
Ground-Water Consultants

WELL CONSTRUCTION LOG
(UNCONSOLIDATED)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

*Depth Below Land Surface

Project OHD19.05 Well GM-19D

Town/City Moraine

County Montgomery State Ohio

Permit No. _____

Land-Surface Elevation

and Datum _____ feet ☐ Surveyed

_____ ☐ Estimated

Installation Date(s) 10/2 through 10/7 of 1989

Drilling Method Cable-Tool

Drilling Contractor Reynold's

Drilling Fluid _____

Development Technique(s) and Date(s)

Fluid Loss During Drilling _____ gallon

Water Removed During Development _____ gallon

Static Depth to Water _____ feet below M.P

Pumping Depth to Water _____ feet below M.P

Pumping Duration _____ hours

Yield _____ gpm Date _____

Specific Capacity _____ gpm/ft

Well Purpose Monitoring; pumping test

Remarks Hardpan/gravel present down to depth @ 74'; clayey gravel to depth @ 82'; silty gravel to depth @ 150'.

Prepared by G. Barrientes

GERAGHTY & MILLER, INC.
Ground-Water Consultants

PROJECT NO. OHD19.05			BORE HOLE NO. GM-19S
PROJECT Harrison Radiator		LOCATION Moraine, Ohio	
DRILLING CONTRACTOR Reynolds Supply, Inc.		DRILLING EQUIPMENT Moble Drill B-61 4¼" IDHSA	
HYDROGEOLOGIST A.G. McCorkle		DRILLER Chuck McDonald	
DATE START / TIME 10/20/89	DATE FINISH / TIME 10/20/89	SURFACE ELEVATION	TOTAL DEPTH 58.0 ft
WELL CASING 2" sch 40 PVC	SCREEN TYPE 2" sch 40 PVC	LENGTH 10 ft	SLOT 0.010 inch
REMARKS			

DEPTH (FT.)	SAMPLE (NO.)	BLOW COUNT PER 6 IN.	RECOVERY (FT.)	BORE HOLE LOG — LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)	GRAPHIC LOG
				0.5' ASPHALT AND GRAVEL BASE FILL: SAND (80%); gravel and pebbles (10%); clay (10%); trace metal shards; black, damp, loose			
5							
10				FILL: silty, sandy CLAY with metal shards; black, damp, loose.			
15				silty CLAY, little sand, little pebbles, dk. olive brown, damp to moist, loose	(former soil Horison - ?)		
20				Med-cs. GRAVEL (70-80%), fine-cs. sand (10-20%); tr. pebbles; tr. clay, med. olive brown, damp.			
25					water @ 25.7'		
30				fine-med. GRAVEL (30%); med-cs. sand (30%); v. fine-fine sand (30%); tr.cs.gravel (10%); reddish brown (Fe staining); water bearing, subrounded, poorly sorted.			

GERAGHTY & MILLER, INC.
Ground-Water Consultants

PROJECT NO. OH019.05

BORE HOLE NO. GM-20S

PROJECT Harrison Radiator

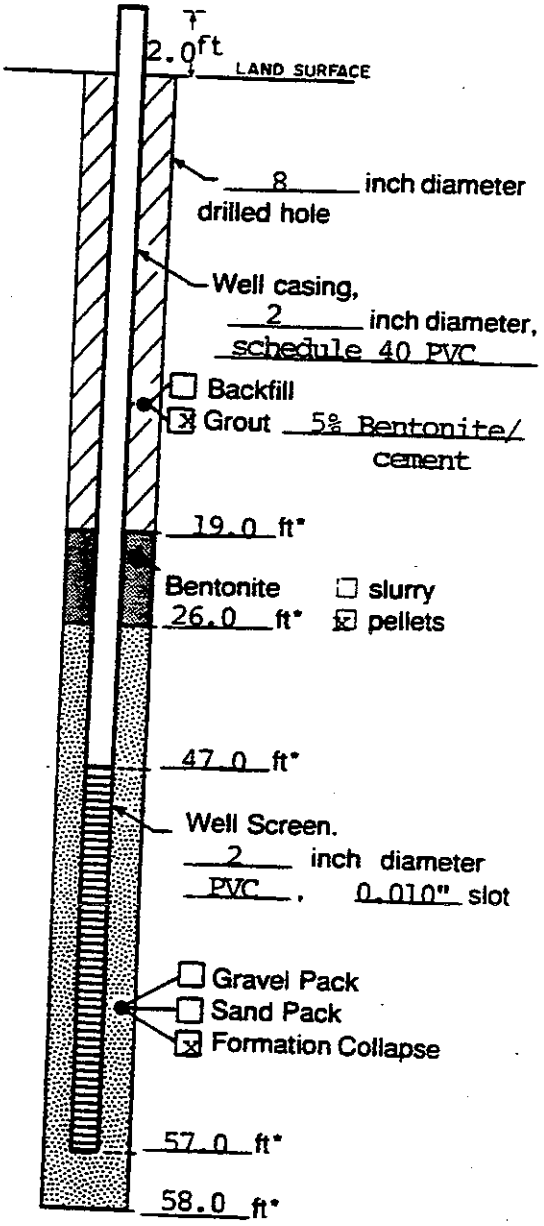
LOCATION Moraine, Ohio

REMARKS

DEPTH (FT.)	SAMPLE NO.	BLOW COUNT PER 6 IN.	RECOVERY (FT.)	LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)	GRAPHIC
40				SAND & GRAVEL (as above)			
45				fine-med. SAND (80%); fine gravel (10%); med-cs. gravel (10%); med. olive brown, water bearing, subrounded.			
50				fine-med. SAND (80-90%); cs.sand (10%); v. fine sand (0-10%); med. olive brown, water bearing, subangular.	sorted (?)		
55				CLAY @ 58' (no sample recovered)			
60							
65							
70							

GERAGHTY & MILLER, INC.
Ground-Water Consultants

WELL CONSTRUCTION LOG
(UNCONSOLIDATED)



Measuring Point is Top of Well Casing Unless Otherwise Noted.

*Depth Below Land Surface

Project Harrison Radiator/ OH019.05 Well GM-19S

Town/City Moraine

County Montgomery State Ohio

Permit No. _____

Land-Surface Elevation and Datum _____ feet ☐ Surveyed ☐ Estimated

Installation Date(s) 10/20/89

Drilling Method 4¼ I.D. Hollow - Stem Auger

Drilling Contractor Reynolds Supply, Inc.

Drilling Fluid none

Development Technique(s) and Date(s)
11/3/89 - Centrifugel pump

Fluid Loss During Drilling none gallo

Water Removed During Development approx. 200 gallo

Static Depth to Water _____ feet below M.

Pumping Depth to Water _____ feet below M.

Pumping Duration _____ hours

Yield _____ gpm Date _____

Specific Capacity _____ gpm/ft

Well Purpose _____

Remarks _____

Prepared by A.G. McCorkle

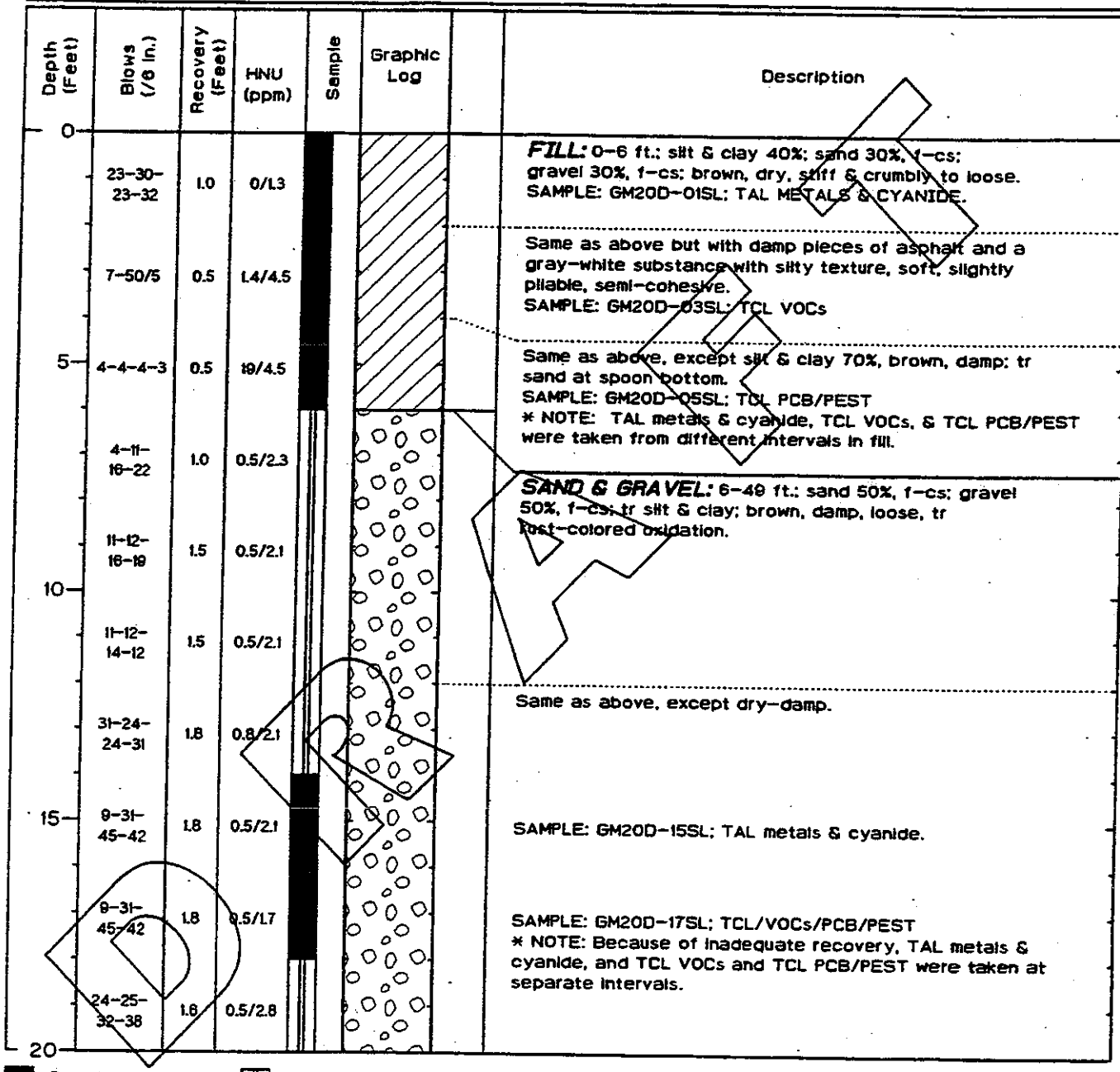
G&M Form 05 5-87

Southpoint 87-1776

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: GM-20D

HARRISON RADIATOR – OH0019.018 Moraine, Ohio



■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling/Reynolds
Driller: R. Fisher/S. Belt
Drilling Method: Hollow-Stem/Cable
Drilling Fluid: None/Plant Potable Water
Remarks: Split-Spoon to 36'. Cable to 99'.
OH0019.018

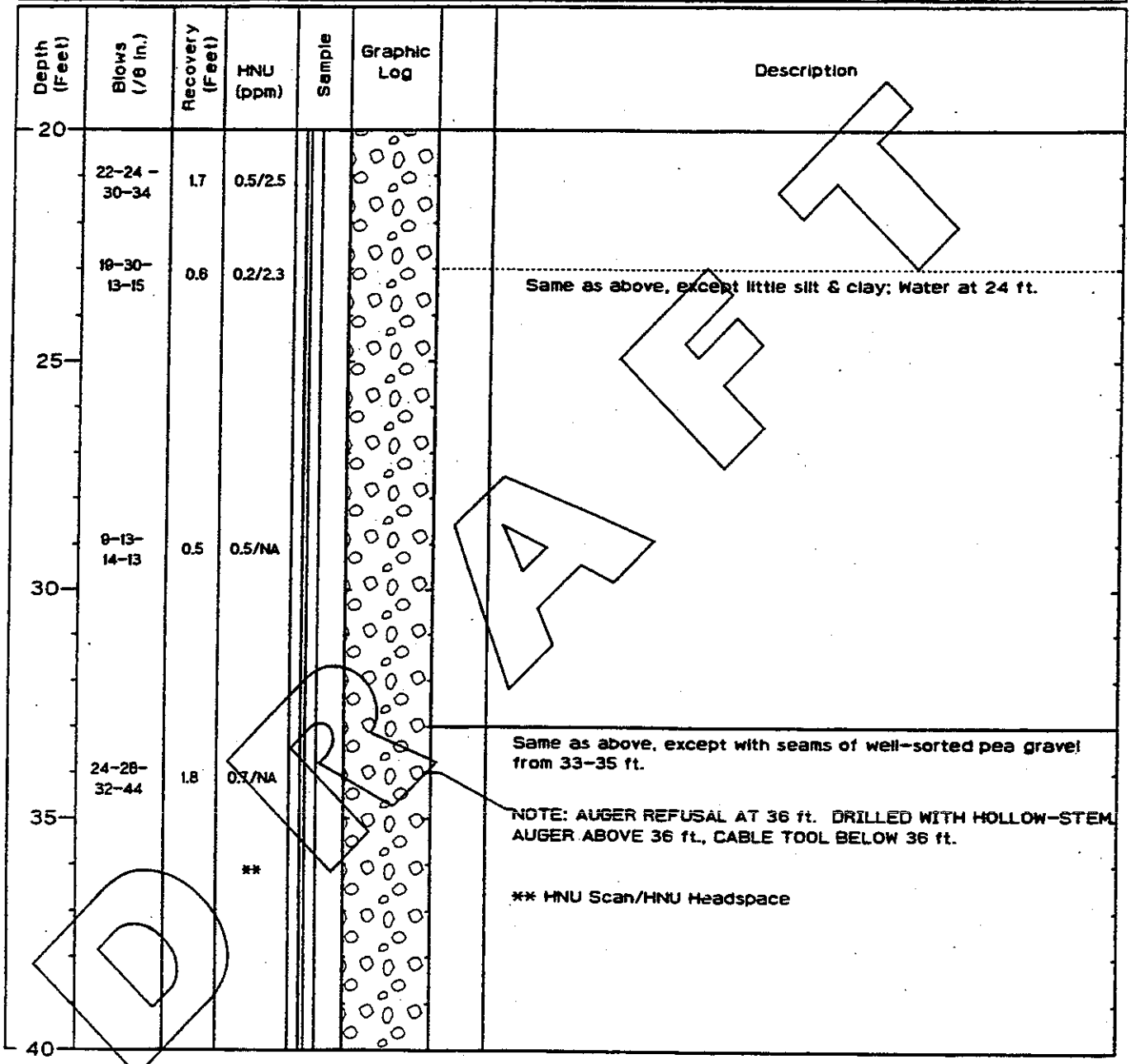
Geologist: R. Astle
Total Depth: 99
Surface Elev.:
Datum:
West Coor.:

Begin Drilling: 10/03/94
End Drilling: 10/13/94
Converted to Well: Yes
Well Name: GM-20D
South Coor.:
GM-20D

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: GM-20D

HARRISON RADIATOR – OH0019.018 Moraine, Ohio



■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Betasco Drilling/Reynolds
Driller: R. Fisher/S. Belt
Drilling Method: Hollow-Stem/Cable
Drilling Fluid: None/Plant Potable Water
Remarks: Split-Spoon to 36'. Cable to 99'.
OH0019.018

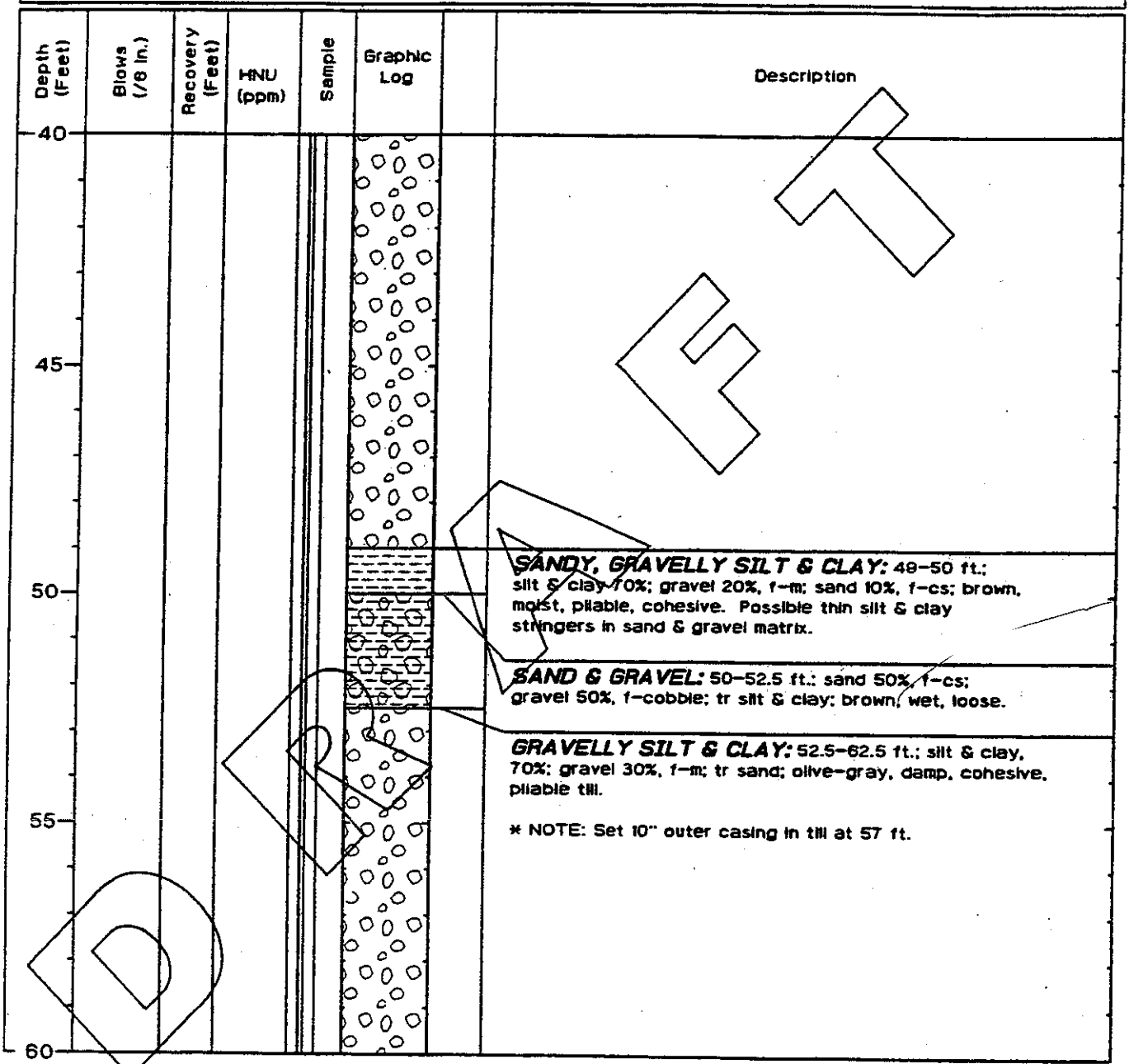
Geologist: R. Astle
Total Depth: 99
Surface Elev.:
Datum:
West Coor.:

Begin Drilling: 10/03/94
End Drilling: 10/13/94
Converted to Well: Yes
Well Name: GM-20D
South Coor.:
GM-20D

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: GM-20D

HARRISON RADIATOR – OH0019.018 Moraine, Ohio



■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling/Reynolds
Driller: R. Fisher/S. Belt
Drilling Method: Hollow–Stem/Cable
Drilling Fluid: None/Plant Potable Water
Remarks: Split–Spoon to 36'. Cable to 99'.
OH0019.018

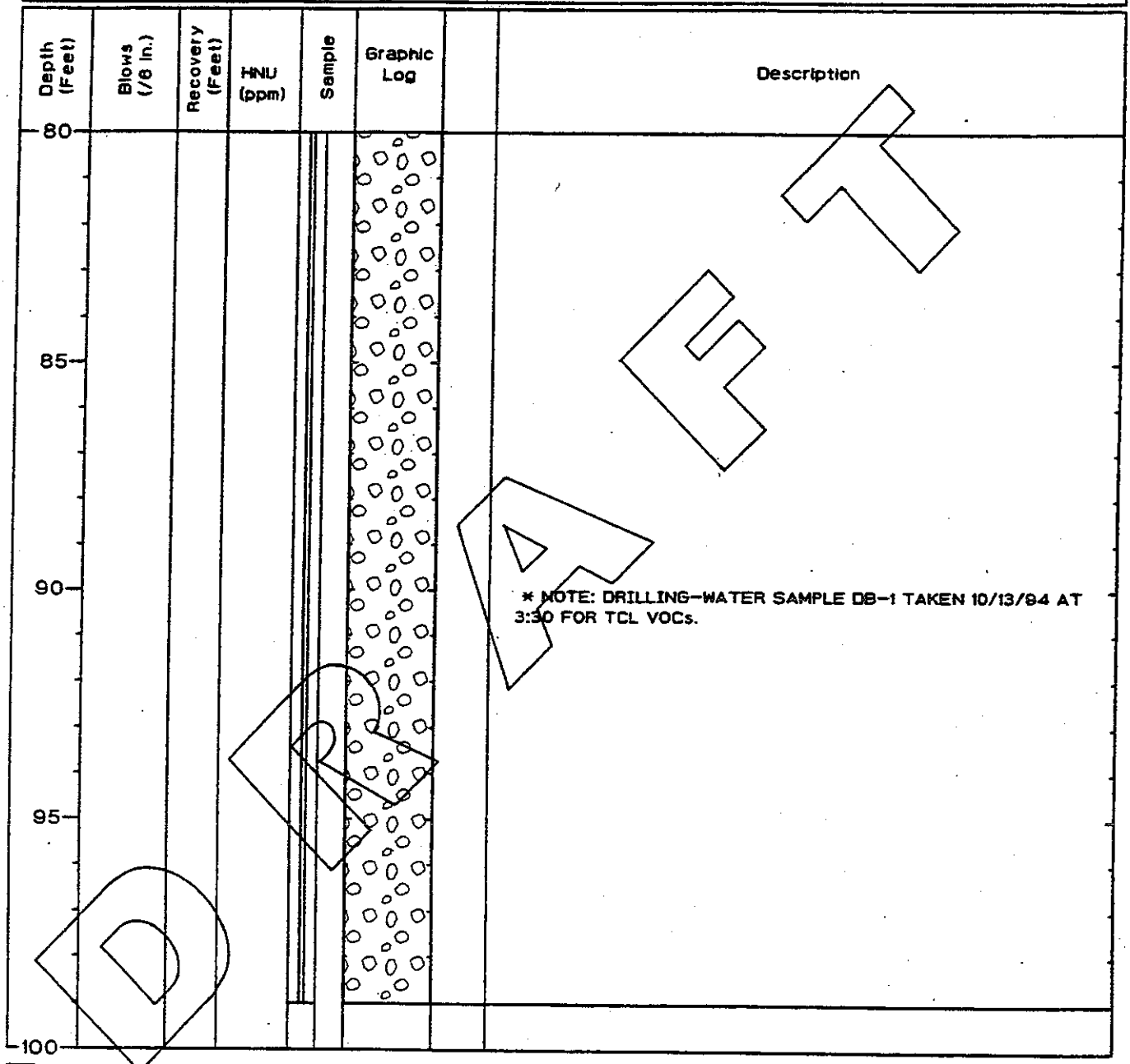
Geologist: R. Astle
Total Depth: 99
Surface Elev.:
Datum:
West Coor.:

Begin Drilling: 10/03/94
End Drilling: 10/13/94
Converted to Well: Yes
Well Name: GM–20D
South Coor.:
GM–20D

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: GM-20D

HARRISON RADIATOR - OH0019.018 Moraine, Ohio



Sample to Lab Sample Not Analyzed

Drilling Co.: Belasco Drilling/Reynolds
Geologist: R. Astle
Begin Drilling: 10/03/94
Driller: R. Fisher/S. Belt
Total Depth: 99
End Drilling: 10/13/94
Drilling Method: Hollow-Stem/Cable
Surface Elev.:
Converted to Well: Yes
Drilling Fluid: None/Plant Potable Water
Datum:
Well Name: GM-20D
Remarks: Split-Spoon to 36'. Cable to 99'.
West Coor.:
South Coor.:

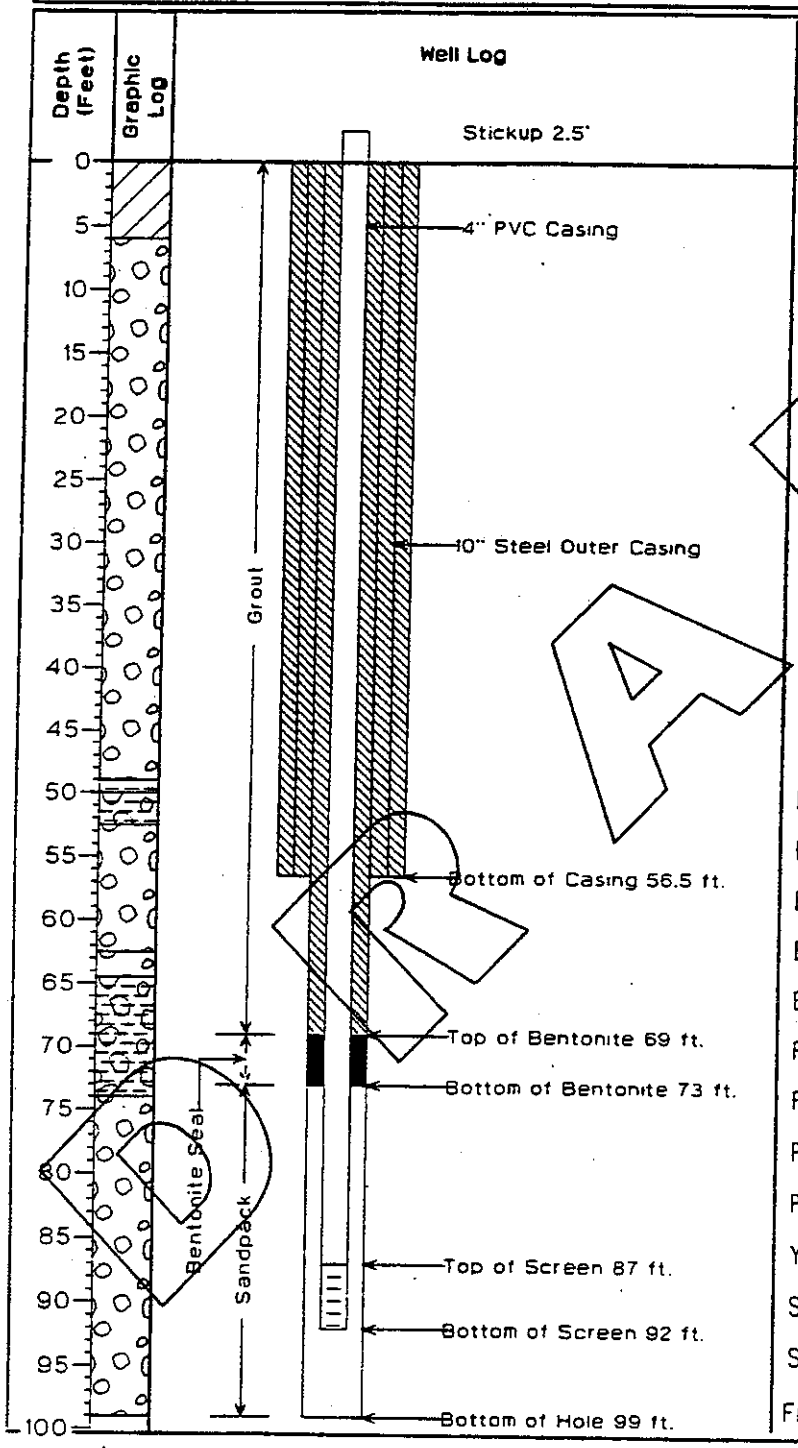
OH0019.018

GM-20D

Geraghty & Miller, Inc.
Environmental Services

Well Construction Log: GM-20D

HARRISON RADIATOR – OH0019.018 Moraine, Ohio



Well Construction Details

Well Type: Monitor Well
Total Depth Drilled: 99
Surface Elev.:
Meas. Point Elev.:
Meas. Point Desc.:
Datum:
Drilling Co.: Belasco Drilling/Reynolds
Driller: R. Fisher/S. Belt
Drilling Method: Hollow-Stem/Cable
Drilling Fluid: None/Plant Potable Water
Begin Drilling: 10/03/94
End Drilling: 10/13/94
Begin Well Instal.: 10/14/94
End Well Instal.: 10/14/94
Development Tech.: 2" Submersible Pump/Bailer
Begin Development: 10/19/94
End Development: 11/01/94
Fluid Loss: 1750 (1000 in Lower Aquifer)
Fluid Developed: 1190
Pumping DTW: 36.33
Pumping Duration: 6 hrs.
Yield: 2
Specific Capacity:
Static Water Level: 26.25
Fracture Zones:

For Lithologic Descriptions See Log of Boring: *GM-20D*

West Coor.: South Coor.:

Remarks: Bentonite fell into well; removed w/ bailer.

Geologist: R. Astle

OH0019.018

GM-20D

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison/OH0019.018 Page 1 of 5

Site Location Moraine, Ohio

Sample No. GM20D-01SL Coded/ Replicate No. DUP-28 Date 10/3/94

Weather Cool; Overcast Time Sampling Began 11:50 a.m. Time Sampling Completed 12:00 p.m.

Sampling Method and Material 2" stainless steel split spoon

Grab x Composite

From	To	Soil/Sediment Description
0'	2'	Sand, gravel and silt and clay, brown, dry, stiff, crubly to loose.

Other (OVA; HNU; etc.) HNu scan: 2.4 ppp; HNu headspace

Constituents Sampled	Container Description From Lab x or G&M	Preservative
TCL VOCs	4 oz glass jar	cool

Remarks Highest headspace reading 2-4 ft. and 4-6 ft., only TCL VOCs were taken due to poor recovery.

Sampling Personnel R. Astle

DRAFT

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison/OH0019.018 Page 2 of 5

Site Location Moraine, Ohio

Sample No. GM20D-03SL Coded/ Replicate No. DUP-28 Date 10/3/94

Weather Cool; Overcast Time Sampling Began 12:30 p.m. Time Sampling Completed 12:40 p.m.

Sampling Method and Material 2" stainless steel split spoon

Grab x Composite ___

From	To	Soil/Sediment Description
4'	6'	Silt and clay with sand and gravel; brown; damp.

Other (OVA; HNU; etc.) HNU scan: 19 ppm; HNU headspace: 4.5 ppm

Constituents Sampled	Container Description From Lab x or G&M ___	Preservative
TCL PCBs/Pesticides	8 oz glass jar	cool

Remarks Highest headspace reading 2-4 ft. and 4-6 ft., only TCL PCBs/Pesticides were taken due to poor recovery.

Sampling Personnel R. Astle

DRAFT

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison/OH0019.018 Page 3 of 5

Site Location Moraine, Ohio

Sample No. GM20D-03SL Coded/ Replicate No. DUP-28 Date 10/3/94

Weather Cool; Overcast Time Sampling Began 12:10 p.m. Time Sampling Completed 12:20 p.m.

Sampling Method and Material 2" stainless-steel split spoon

Grab x Composite

From	To	Soil/Sediment Description
2'	4'	Sand, gravel, silt and clay with asphalt and gray-white substance with silt-like texture; brown; damp, soft, slightly pliable, semi-cohesive.

Other (OVA; HNU; etc.) HNU scan: 2.4 ppm

Constituents Sampled	Container Description From Lab x or G&M	Preservative
TCL VOCs	4 oz glass jar	cool

Remarks Highest headspace reading 2-4 ft. and 4-6 ft.; only TCL VOCs were taken due to poor recovery.

Sampling Personnel R. Astle

DRAFT

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison/OH0019.018 Page 4 of 5

Site Location Moraine, Ohio

Sample No. GM20D-15SL Coded/ Replicate No. Date 10/3/94

Weather Cool; Overcast Time Sampling Began 2:00 p.m. Time Sampling Completed 2:10 p.m.

Sampling Method and Material 2" stainless steel split spoon

Grab x Composite

From	To	Soil/Sediment Description
14'	16'	Sand and gravel; fine-coarse; brown; damp; loose.

Other (OVA; HNU; etc.) HNU scan: 0.5 ppm; HNU headspace: 2.1 ppm

Constituents Sampled	Container Description From Lab x or G&M	Preservative
TAL Metals & TAL Total Cyanide	16 oz glass jar	cool

Remarks Lowest headspace reading 16-18 ft. Because of inadequate recovery, TAL metals and TAL Total cyanide were sampled from 14-16 ft. TCL VOCs and PCBs/Pesticides were sampled from 16-18 ft.

Sampling Personnel R. Astle

DRAFT

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison/OH0019.018 Page 5 of 5

Site Location Moraine, Ohio

Sample No. GM20D-17SL Coded/ Replicate No. Date 10/3/94

Weather Cool; Overcast Time Sampling Began 2:10 p.m. Time Sampling Completed 2:20 p.m.

Sampling Method and Material 2" stainless steel split spoon

Grab x Composite

From	To	Soil/Sediment Description
16'	18'	Sand and gravel; fine-coarse; brown; damp; loose.

Other (OVA; HNU; etc.) HNU scan: 0.5 ppm; HNU headspace: 1.7 ppm

Constituents Sampled	Container Description From Lab x or G&M	Preservative
TCL VOCs	4 oz glass jar	cool
TCL PCBs/Pesticides	8 oz glass jar	cool

Remarks Lowest headspace reading 16-18 ft. Only TCL VOCs and PCBs/Pesticides sampled due to inadequate recovery. TAL metals and cyanide were sampled from 16-18 ft.

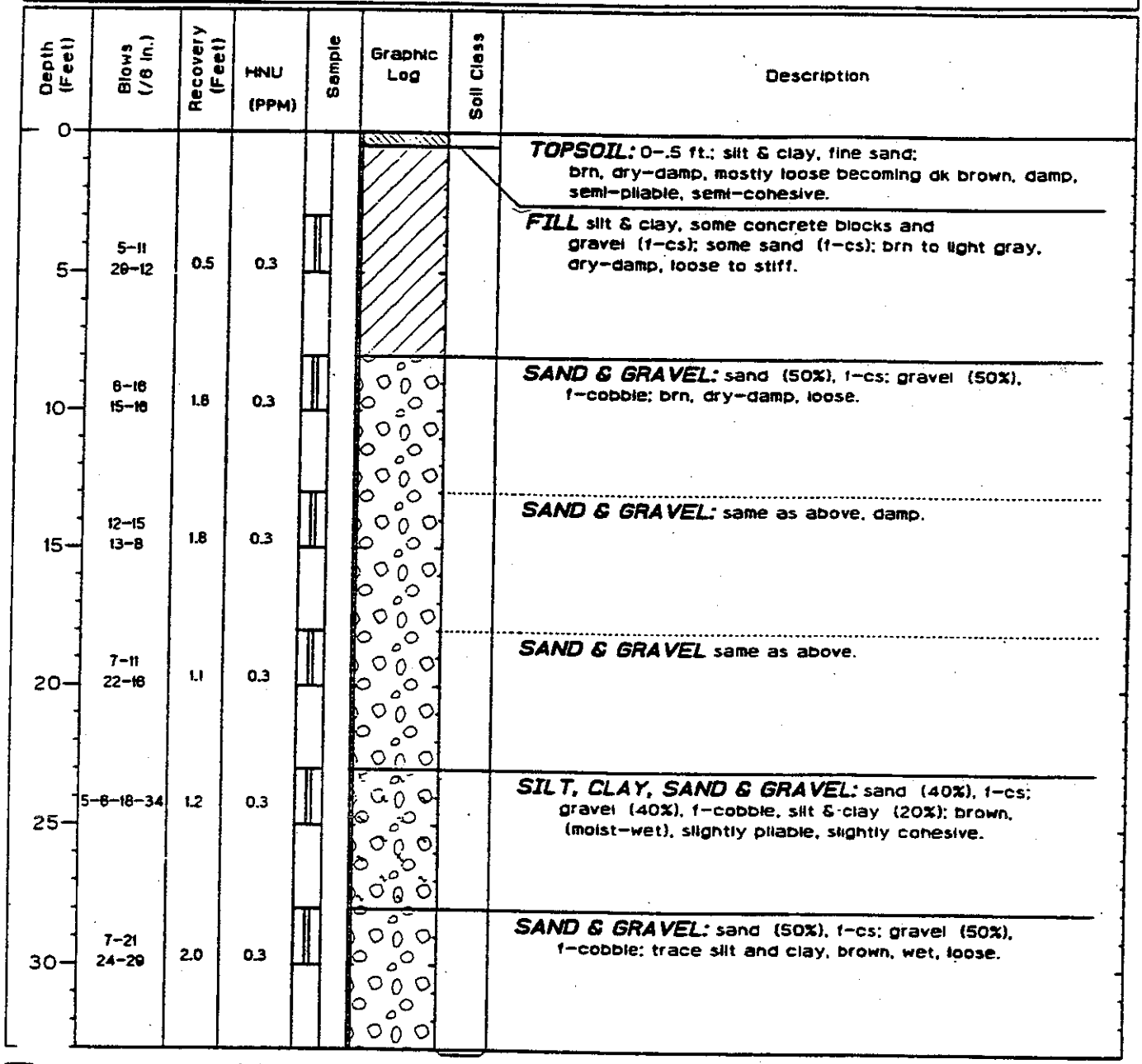
Sampling Personnel R. Astle

DRAFT

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: GM-21

MORAINE ENGINE PLANT — Moraine, Ohio



☒ Composite to Lab ■ VOC to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Burlington Environmental
Driller: Dan Fisher
Drilling Method: HSA 4 1/4"
Drilling Fluid: Plant Potable Water
Remarks:

Geologist: R. Astle
Total Depth: 62
Surface Elev.:
Datum: Feet, MSL
West Coor.: 8051

Begin Drilling: 08/01/94
End Drilling: 08/03/94
Converted to Well: Yes
Well Name: GM-21
South Coor.: 1518

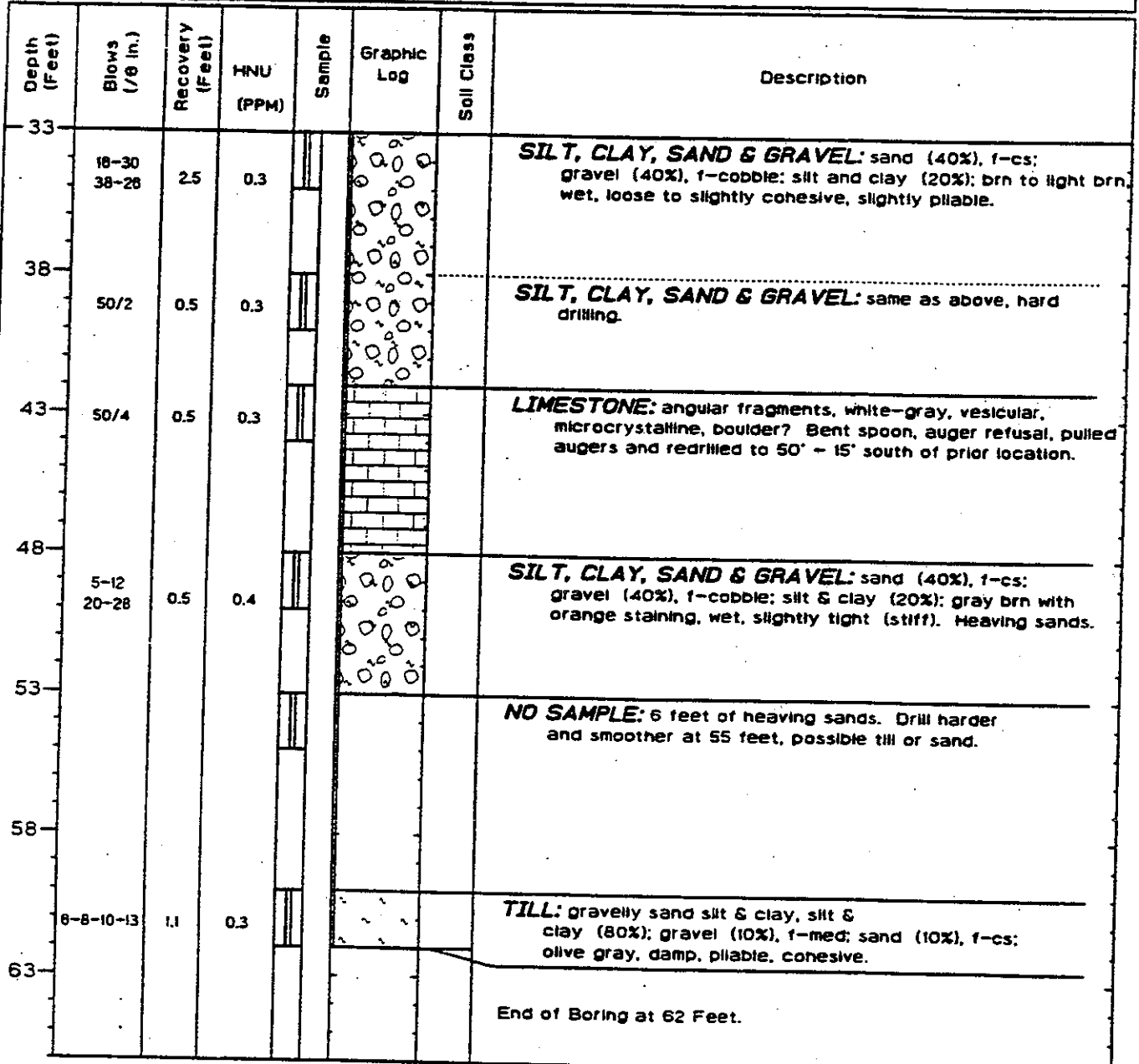
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Geraghty & Miller, Inc.
Environmental Services

Log of Boring: GM-21

MORAINE ENGINE PLANT — Moraine, Ohio



☒ Composite to Lab ■ VOC to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Burlington Environmental
Driller: Dan Fisher
Drilling Method: HSA 4 1/4"
Drilling Fluid: Plant Potable Water
Remarks:

Geologist: R. Astle
Total Depth: 62
Surface Elev.:
Datum: Feet, MSL
West Coor.: 6051

Begin Drilling: 08/01/94
End Drilling: 08/03/94
Converted to Well: Yes
Well Name: GM-21
South Coor.: 1518

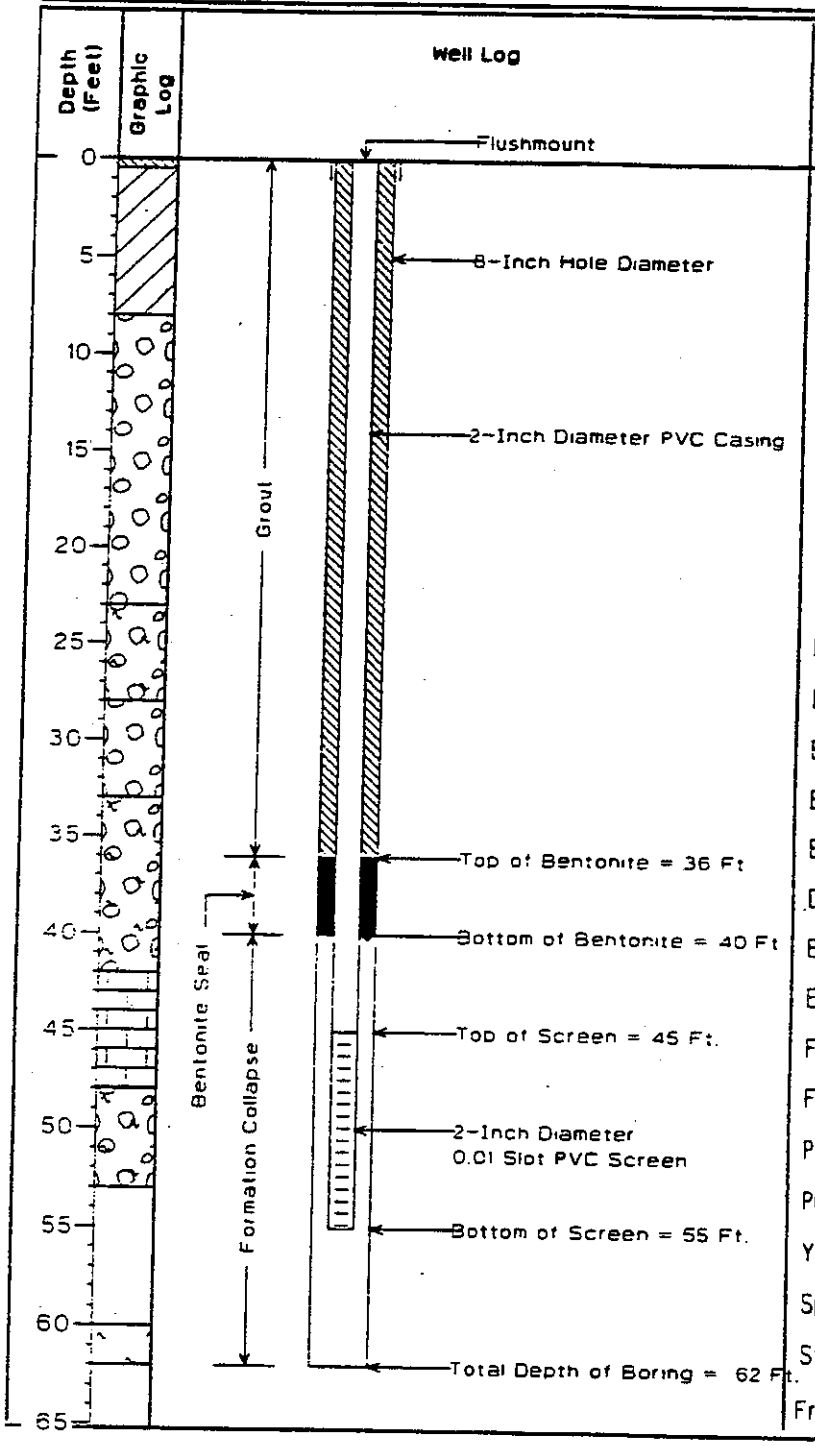
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Geraghty & Miller, Inc.
Environmental Services

Well Construction Log: GM-21

MORAINE ENGINE PLANT — Moraine, Ohio



Well Construction Details

Well Type: Monitor Well
Total Depth Drilled: 62
Surface Elev.:
Meas. Point Elev.: 723.79
Meas. Point Desc.: Mark on Casing
Datum: Feet, MSL
Drilling Co.: Burlington Environmental
Driller: Dan Fisher
Drilling Method: HSA 4 1/4"
Drilling Fluid: Plant Potable Water
Begin Drilling: 08/01/94
End Drilling: 08/03/94
Begin Well Instal.: 08/03/94
End Well Instal.: 08/03/94
Development Tech.: Submersible Pump
Begin Development: 08/09/94
End Development: 08/09/94
Fluid Loss: 1000 Gallons
Fluid Developed: 620 Gallons
Pumping DTW:
Pumping Duration:
Yield:
Specific Capacity:
Static Water Level: 26'
Fracture Zones:

For Lithologic Descriptions See Log of Boring: *GM-21*

West Coor.: 6051 South Coor.: 1518

Remarks:

Geologist: R. Astle

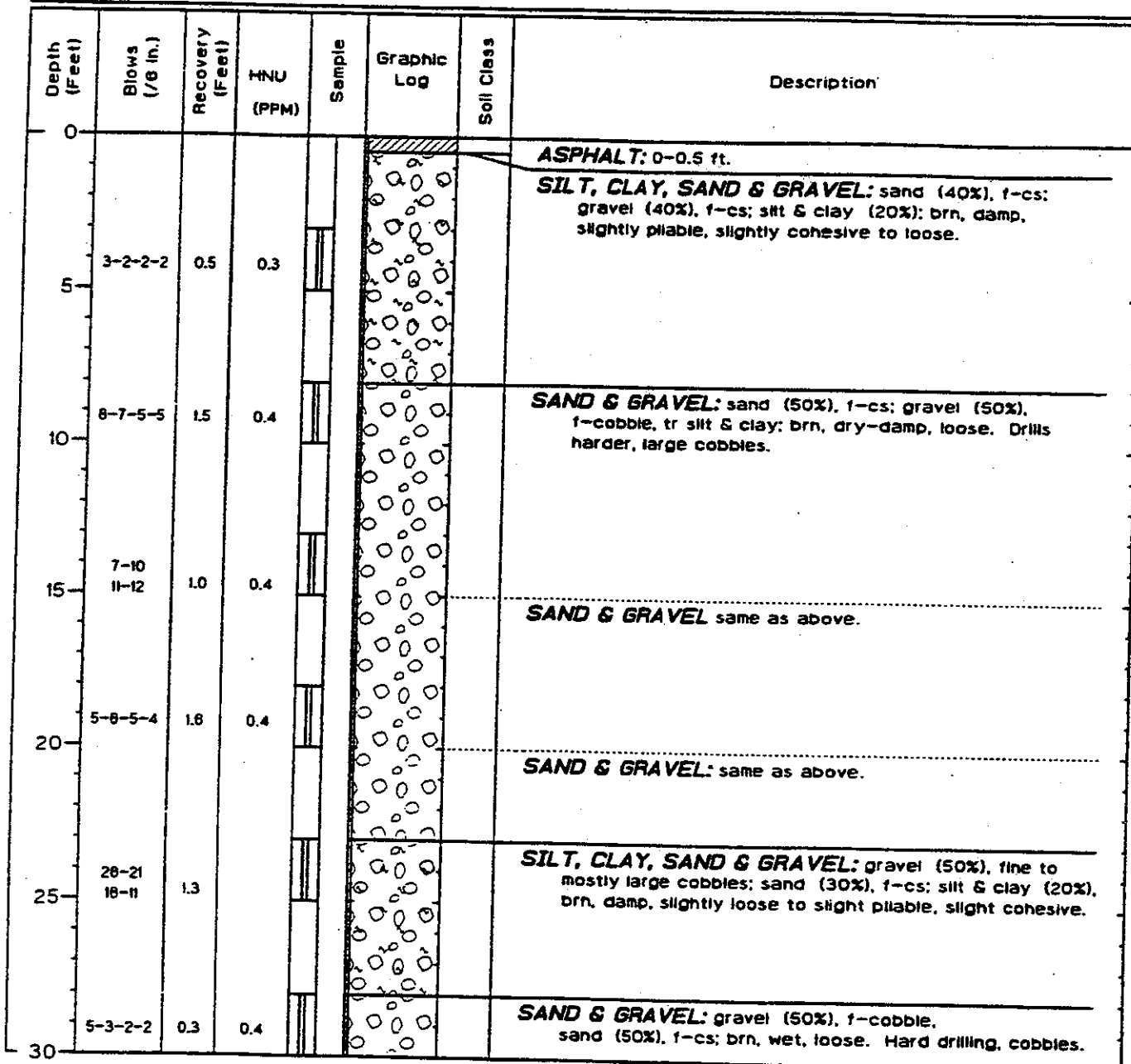
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Geraghty & Miller, Inc.
Environmental Services

Log of Boring: GM-22

MORAINE ENGINE PLANT — Moraine, Ohio



☒ Composite to Lab ■ VOC to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Burlington Environmental
Driller: Dan Fisher
Drilling Method: HSA 4 1/4"
Drilling Fluid: Plant Potable Water
Remarks:

Geologist: R. Astle
Total Depth: 57
Surface Elev.:
Datum: Feet, MSL
West Coor.: 6284

Begin Drilling: 08/03/94
End Drilling: 08/04/94
Converted to Well: Yes
Well Name: GM-22
South Coor.: 2530

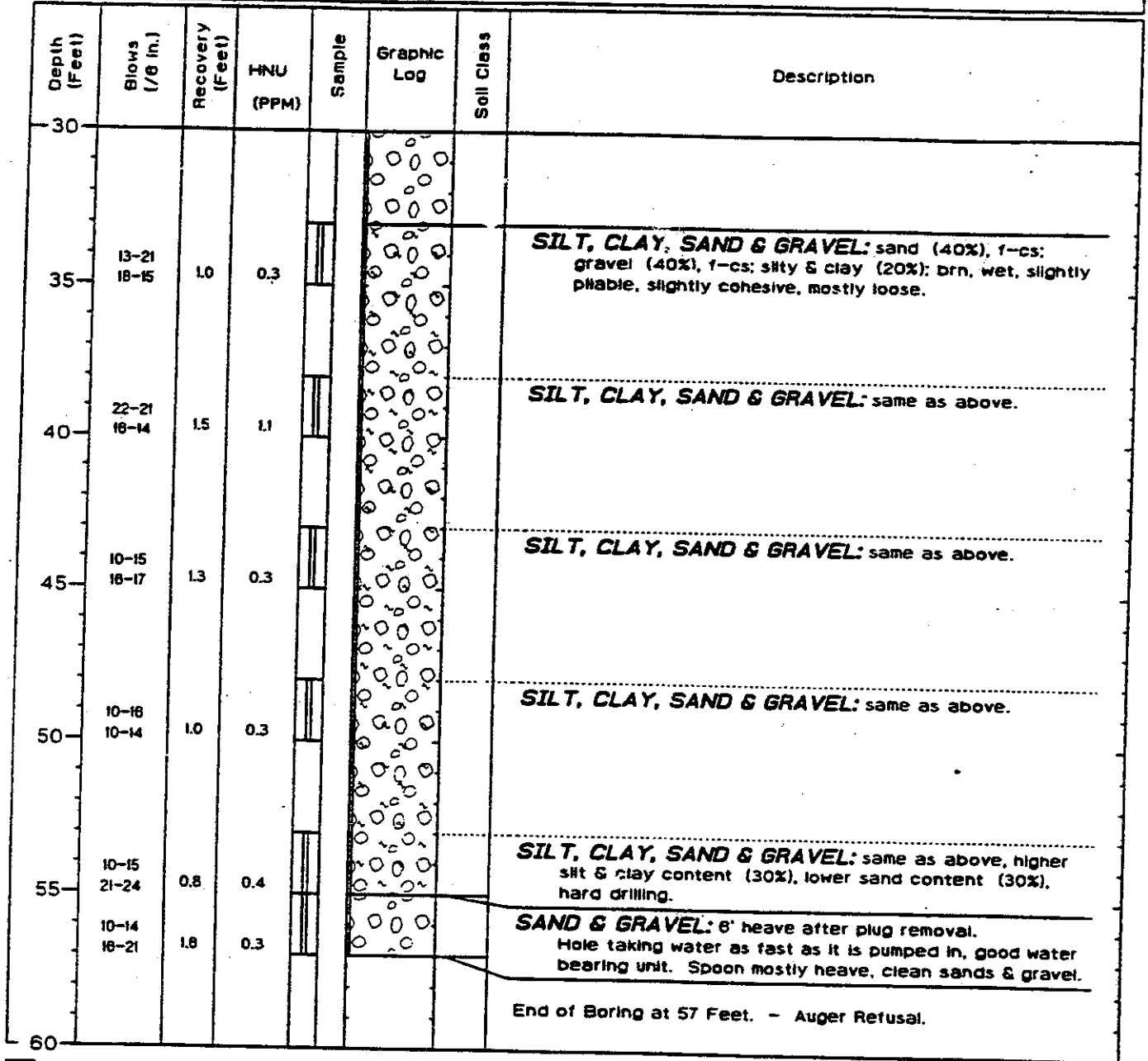
OH0258.001

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Geraghty & Miller, Inc.
Environmental Services

Log of Boring: GM-22

MORAINE ENGINE PLANT — Moraine, Ohio



☒ Composite to Lab ■ VOC to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Burlington Environmental
Driller: Dan Fisher
Drilling Method: HSA 4 1/4"
Drilling Fluid: Plant Potable Water
Remarks:

Geologist: R. Astle
Total Depth: 57
Surface Elev.:
Datum: Feet, MSL
West Coor.: 6284

Begin Drilling: 08/03/94
End Drilling: 08/04/94
Converted to Well: Yes
Well Name: GM-22
South Coor.: 2530

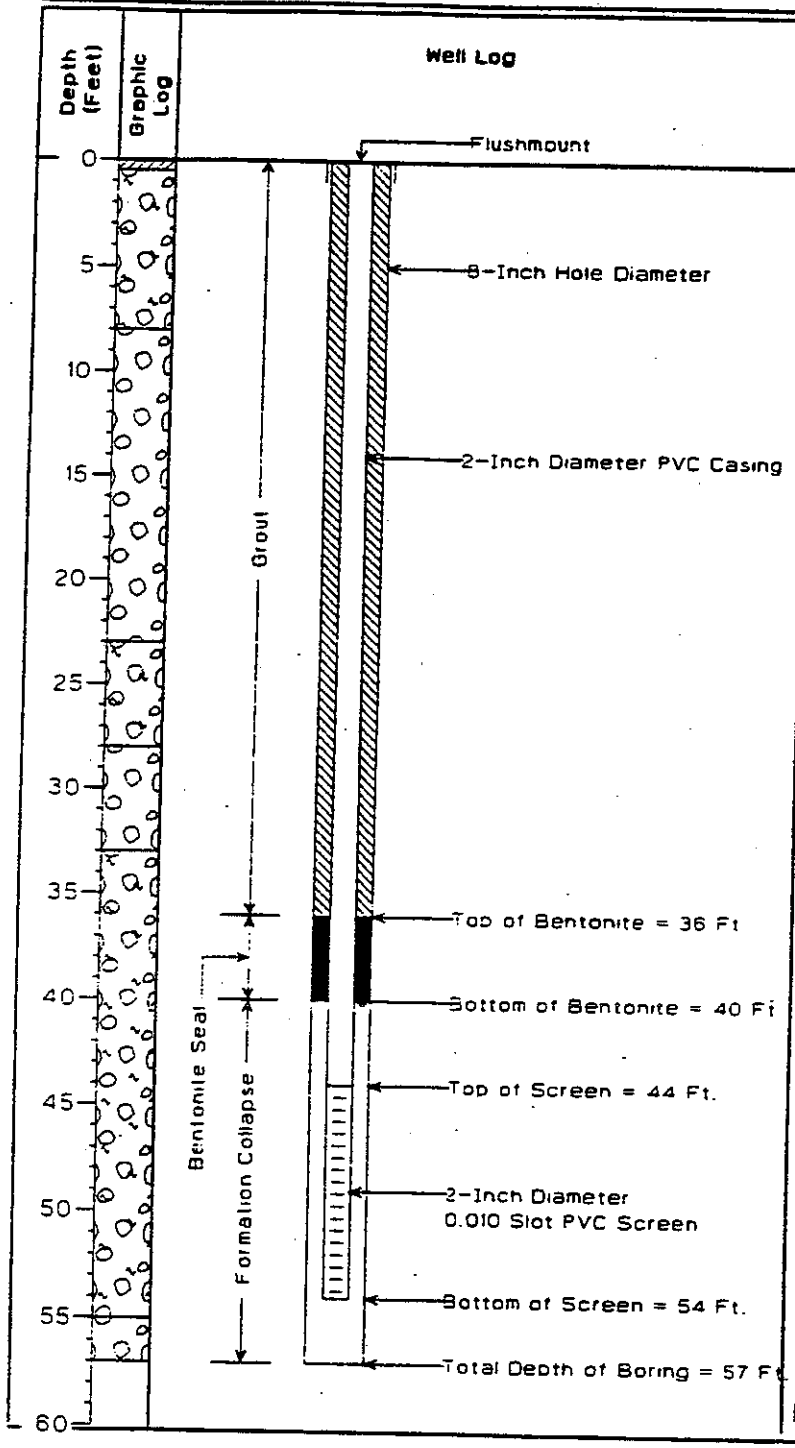
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Geraghty & Miller, Inc.
Environmental Services

Well Construction Log: GM-22

MORAINE ENGINE PLANT — Moraine, Ohio



Well Construction Details

Well Type:	Monitor Well
Total Depth Drilled:	57
Surface Elev.:	
Meas. Point Elev.:	728.67
Meas. Point Desc.:	Mark on Casing
Datum:	Feet, MSL
Drilling Co.:	Burlington Environmental
Driller:	Dan Fisher
Drilling Method:	HSA 4 1/4"
Drilling Fluid:	Plant Potable Water
Begin Drilling:	08/03/94
End Drilling:	08/04/94
Begin Well Instal.:	08/04/94
End Well Instal.:	08/04/94
Development Tech.:	Submersible Pump
Begin Development:	08/09/94
End Development:	08/09/94
Fluid Loss:	1000 Gallons
Fluid Developed:	260 Gallons
Pumping DTW:	
Pumping Duration:	
Yield:	
Specific Capacity:	
Static Water Level:	~ 26'
Fracture Zones:	

For Lithologic Descriptions See Log of Boring: *GM-22*

West Coor.: 6284 South Coor.: 2530

Remarks:

OH0258.001

Geologist: R. Astle

moraine

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: GM-23

MORAINE ENGINE PLANT — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (PPM)	Sample	Graphic Log	Soil Class	Description
0							***CEMEMT:*** 0-1 ft.
5	3-11 14-22	1.8	150				***SAND, GRAVEL, SILT & CLAY:*** silt & clay (40%), gravel (30%), f-cobble; sand (30%), f-cs; brn, dry-damp, stiff to loose, crumbly.
10	12-12 15-21	1.7	10				***SAND & GRAVEL:*** sand (50%), f-cs; gravel (50%), f-cobble; brn, dry-damp, loose.
15	13-8-8-8	1.5	10				***SAND & GRAVEL:*** same as above.
20	10-11 18-24	1.5	30				***SAND & GRAVEL:*** same as above, tr oxidation - orange (rust).
25	9-9-18-18	1.8	40				***SILT, CLAY & SAND:*** sand (60%), vfine to med; silt & clay (20%); brn, damp, semi-pliable, slight cohesive.
30	14-21 20-21	1.8	20				***SILT, CLAY, SAND & GRAVEL:*** sand (40%), f-cs; gravel (40%), f-cobble; silt & clay (20%); brn, moist, semi-loose to slightly cohesive, slightly pliable.
35	24-28 42-45	1.8	70				***SILT, CLAY, SAND & GRAVEL:*** same as above to 34.5 ft. ***SILT, CLAY, SAND & GRAVEL:*** Bottom 5" of spoon sand gravelly silt & clay; silt & clay (70%), gravel (20%), fine; sand (10%), vfine; olive grey, dry-damp, very stiff, hard. End of Boring at 35 Feet.
40							

☒ Composite to Lab ■ VOC to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Burlington Environmental
Driller: Dan Fisher
Drilling Method: HSA 4 1/4"
Drilling Fluid: Plant Potable Water
Remarks:

Geologist: R. Astle
Total Depth: 35
Surface Elev.:
Datum: Feet, MSL
West Coor.: 8018

Begin Drilling: 08/04/94
End Drilling: 08/05/94
Converted to Well: Yes
Well Name: GM-23
South Coor.: 5392

OH0258.001

moraine

SOIL/SEDIMENT SAMPLING LOG

Project/No. Moraine Engine Plant / OH0258.001 Page _____ of _____

Site Location Moraine, Ohio

Sample No. GM-23 (3-5) Coded/ Replicate No. _____ Date 08/04/94

Weather _____ Time Sampling Began 9:00 a.m. Time Sampling Completed 9:30 a.m.

Sampling Method and Material 2" Stainless Steel Split Spoon

Grab ____ Composite ____

From	To	Soil/Sediment Description
3.0 Ft.	5.0 Ft.	Gravelly silt & clay; silt & clay (40%); gravel
		(30%), f-cobble; sand (30%), f-cs; brown,
		dry-damp, stiff to loose and crumbly.

Other (OVA; HNU; etc.) 150 ppm

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	12 oz. glass jar	Cool

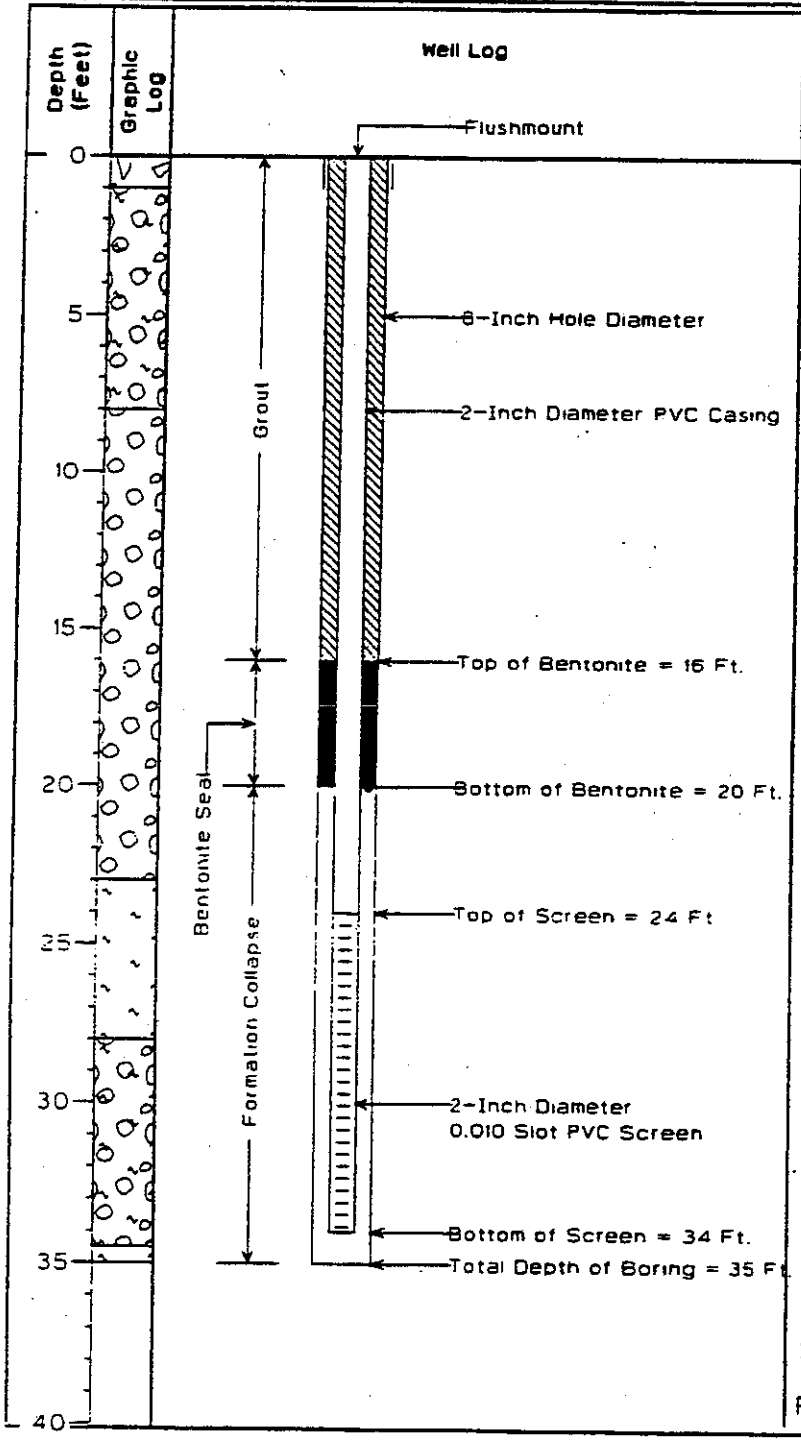
Remarks _____

Sampling Personnel R. Astle

Geraghty & Miller, Inc.
Environmental Services

Well Construction Log: GM-23

MORAINE ENGINE PLANT — Moraine, Ohio



Well Construction Details

Well Type: Monitor Well
Total Depth Drilled: 35
Surface Elev.:
Meas. Point Elev.: 731.22
Meas. Point Desc.: Mark on Casing
Datum: Feet, MSL
Drilling Co.: Burlington Environmental
Driller: Dan Fisher
Drilling Method: HSA 4 1/4"
Drilling Fluid: Plant Potable Water
Begin Drilling: 08/04/94
End Drilling: 08/05/94
Begin Well Instal.: 08/05/94
End Well Instal.: 08/05/94
Development Tech.: Submersible Pump
Begin Development: 08/10/94
End Development: 08/10/94
Fluid Loss: 200 Gallons
Fluid Developed: 130 Gallons
Pumping DTW:
Pumping Duration:
Yield:
Specific Capacity:
Static Water Level:
Fracture Zones:

For Lithologic Descriptions See Log of Boring: *GM-23*

Page 1 of 1

West Coor.: 6018 South Coor.: 5392

Remarks:
OH0258.001

Geologist: R. Astle

moraine

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: GM-23A

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
0						***CONCRETE:*** 0–0.5 ft;
	6-12-24	1.5	17.0			***SAND & GRAVEL:*** 0.5–2 ft; sand 60% (fine to medium), gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	28-50/5"	0.5	170.0			***SAND & GRAVEL:*** 2–4 ft; sand 50% (fine to coarse); gravel 40% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
5	12-17-19-14	1.5	15.0			***SAND & GRAVEL:*** 4–6 ft; sand 60% (fine to coarse); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	15-20-21-20	2.0	4.0			***SAND & GRAVEL:*** 6–8 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	10-21-27-18	1.5	5.0			***SAND & GRAVEL:*** 8–10 ft; sand 60% (fine to medium); gravel 30% (fine to very coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
10	5-8-13-29	0.5	1.5			***SAND & GRAVEL:*** 10–12 ft; sand 60% (fine to medium); gravel 30% (fine to very coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	8-11-13-13	1.5	5.0			***SAND & GRAVEL:*** 12–14 ft; sand 70% (fine to medium); gravel 20% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.
15	17-22-19-16	1.3	10.0			***SAND & GRAVEL:*** 14–16 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 26.0
Surface Elev.: 731.0646
Datum: Mean Sea Level
North Coor.: 5395.92437

Begin Drilling: 11/05/98
End Drilling: 11/05/98
Converted to Well: No
Well Name:
East Coor.: 6018.98651

OH000294.0001.0002

I:/GMOTORS/GMCRI/GTGS/GM-23A (12/18/98)

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: GM-23A

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
16						
	9-16-40-12	1.4	3.5			***SAND & GRAVEL:*** 16-18 ft: sand 50% (fine to medium); gravel 40% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	12-31-22-23	1.2	19.0			***SAND & GRAVEL:*** 18-20 ft: sand 60% (fine to coarse); gravel 30% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.
21	4-18-17-21	1.7	14.0			***SAND:*** 20-22 ft: sand 80% (fine); gravel 10% (fine); silt and clay 10%; moderate yellowish brown, moist, loose.
	11-14-15-18	2.0	6.0			***SAND:*** 22-24 ft: sand 85% (fine); silt and clay 15%; moderate yellowish brown, very moist, loose.
	2-11-15-17	1.8	3.0			***SAND:*** 24-26 ft: SAME AS ABOVE, except wet.
26						***TOTAL DEPTH:*** 26 feet.
31						

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 26.0
Surface Elev.: 731.0646
Datum: Mean Sea Level
North Coor.: 5395.92437

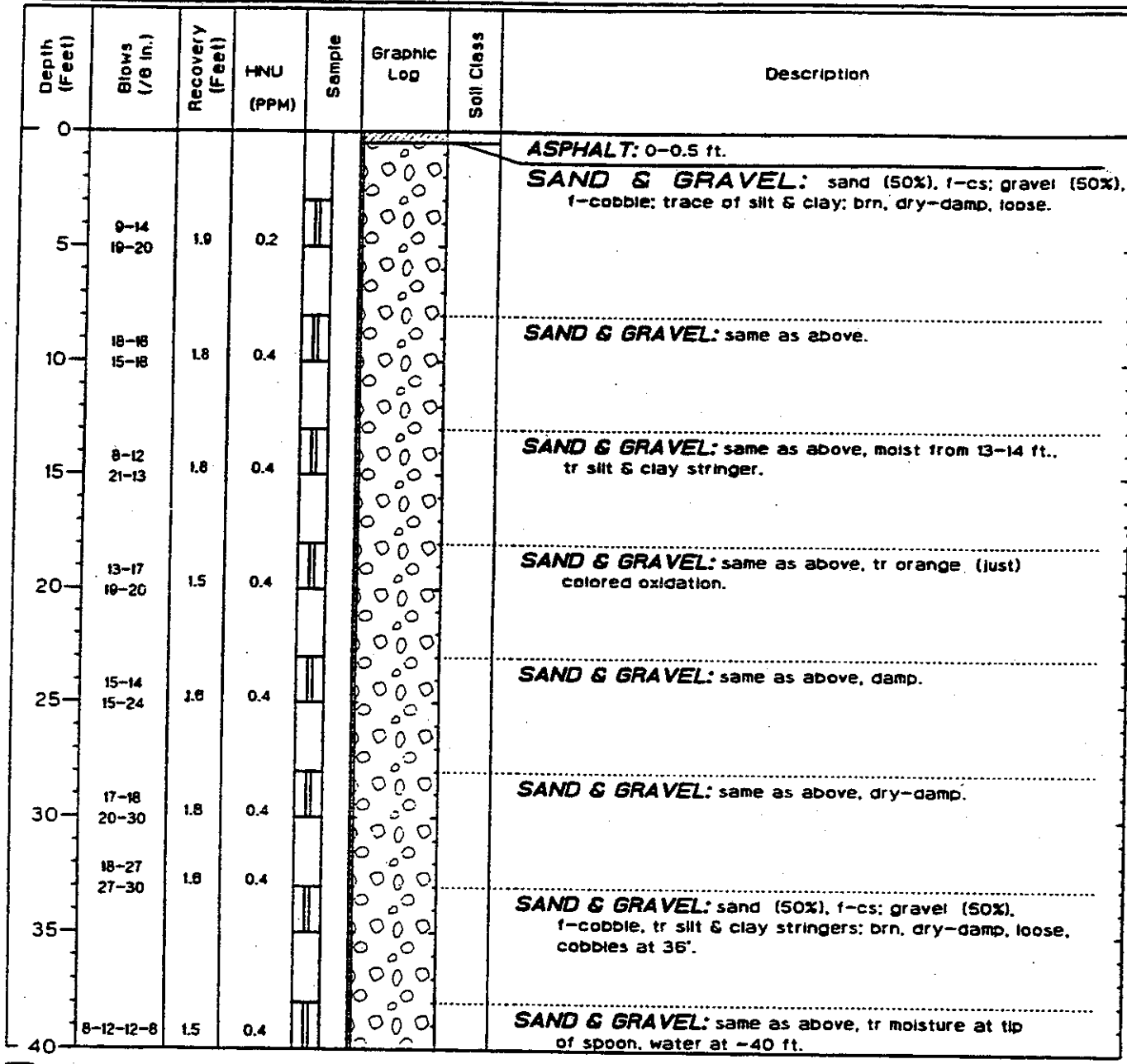
Begin Drilling: 11/05/98
End Drilling: 11/05/98
Converted to Well: No
Well Name:
East Coor.: 6018.98651

OH000294.0001.0002

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: GM-24

MORAINE ENGINE PLANT — Moraine, Ohio



☒ Composite to Lab ■ VOC to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Burlington Environmental
Driller: Dan Fisher
Drilling Method: HSA 4 1/4"
Drilling Fluid: Plant Potable Water
Remarks:

Geologist: R. Astle
Total Depth: 70
Surface Elev.:
Datum: Feet, MSL
West Coor.: 7812

Begin Drilling: 08/05/94
End Drilling: 08/08/94
Converted to Well: Yes
Well Name: GM-24
South Coor.: 8122

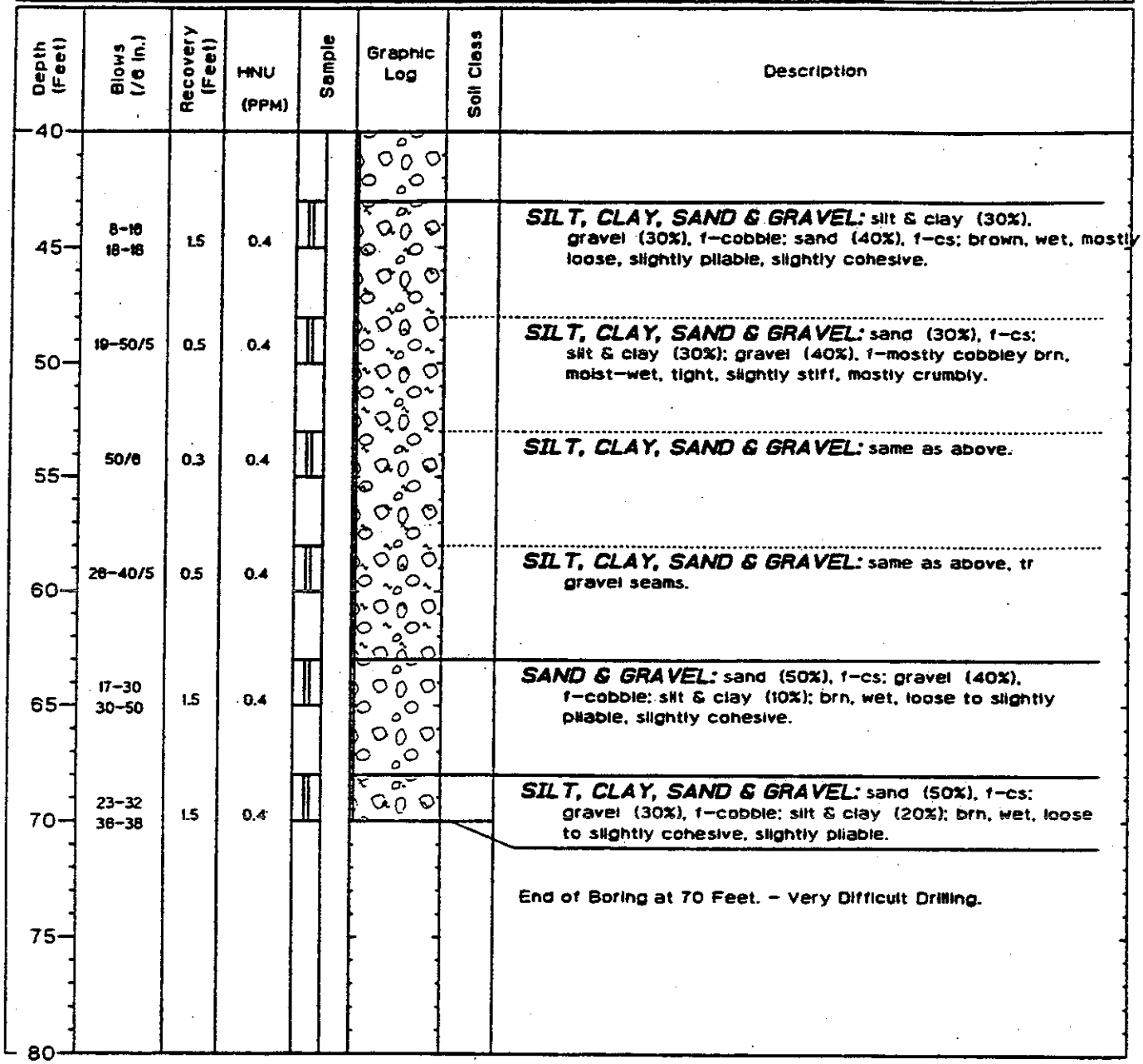
OH0258.001

moraine

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: GM-24

MORAINE ENGINE PLANT — Moraine, Ohio



☒ Composite to Lab ■ VOC to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Burlington Environmental
Driller: Dan Fisher
Drilling Method: HSA 4 1/4"
Drilling Fluid: Plant Potable Water
Remarks:

Geologist: R. Astle
Total Depth: 70
Surface Elev.:
Datum: Feet, MSL
West Coor.: 7812

Begin Drilling: 08/05/94
End Drilling: 08/08/94
Converted to Well: Yes
Well Name: GM-24
South Coor.: 8122

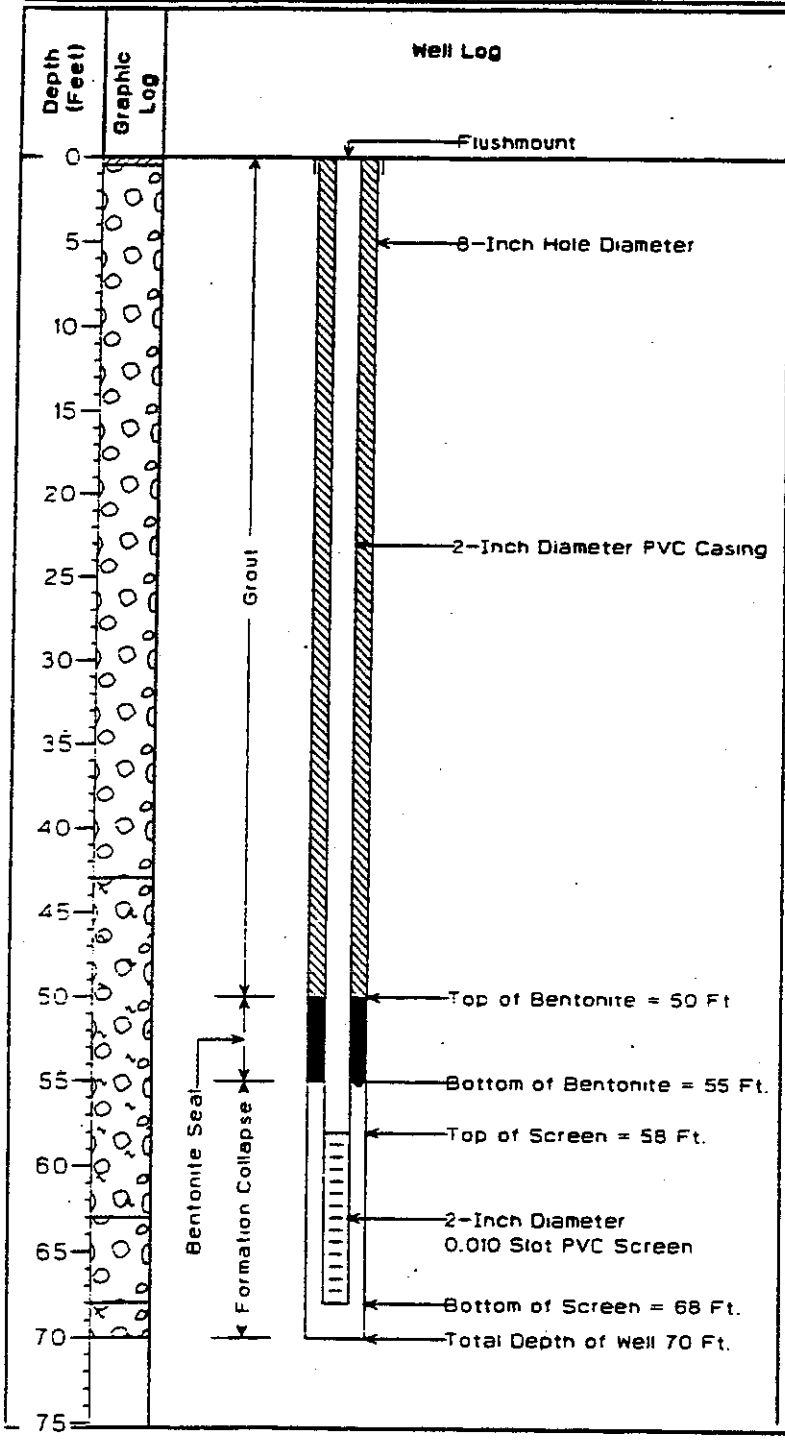
OH0258.001

moraine

Geraghty & Miller, Inc.
Environmental Services

Well Construction Log: GM-24

MORAINE ENGINE PLANT — Moraine, Ohio



Well Construction Details

Well Type: Monitor Well
Total Depth Drilled: 70
Surface Elev.:
Meas. Point Elev.: 747.61
Meas. Point Desc.: Mark on Casing
Datum: Feet, MSL
Drilling Co.: Burlington Environmental
Driller: Dan Fisher
Drilling Method: HSA 4 1/4"
Drilling Fluid: Plant Potable Water
Begin Drilling: 08/05/94
End Drilling: 08/08/94
Begin Well Instal.: 08/08/94
End Well Instal.: 08/08/94
Development Tech.: Submersible Pump
Begin Development: 08/10/94
End Development: 08/10/94
Fluid Loss: 250 Gallons
Fluid Developed: 305 Gallons
Pumping DTW:
Pumping Duration:
Yield:
Specific Capacity:
Static Water Level:
Fracture Zones:

For Lithologic Descriptions See Log of Boring: *GM-24*

West Coor.: 7812 South Coor.: 8122

Remarks:

OH0258.001

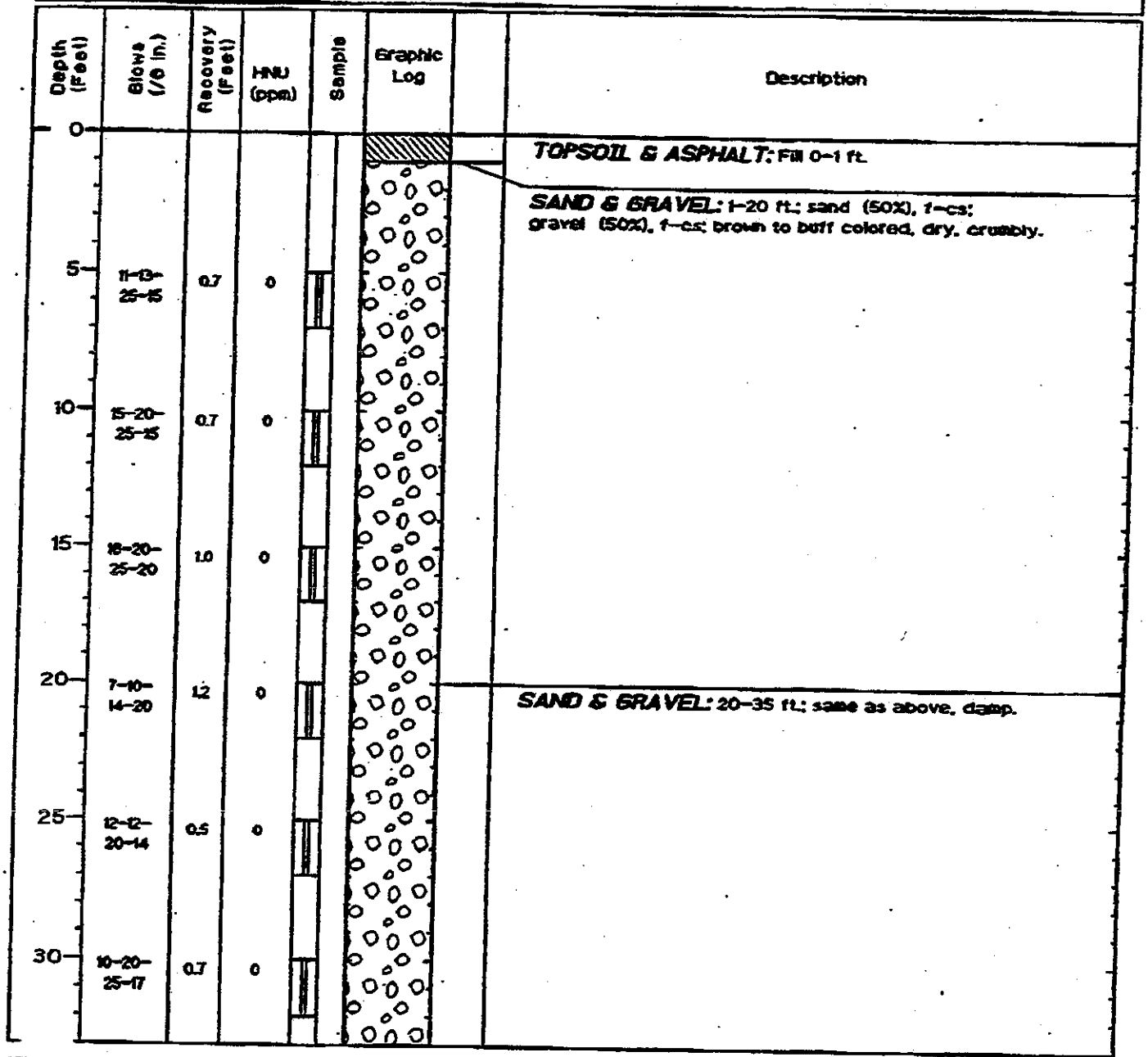
Geologist: R. Astle

moraine

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: GM-25

GENERAL MOTORS CORP. – OH0288.001 Moraine, Ohio



Sample to Lab Sample Not Analyzed

Drilling Co.: Philips Environmental
Driller: Steve Snyder
Drilling Method: HSA 4 1/4
Drilling Fluid: Potable Water
Remarks:

Geologist: R. Astle
Total Depth: 58.0
Surface Elev.:
Datum: Feet, MSL
West Coor.:

Begin Drilling: 12/12/95
End Drilling: 12/14/95
Converted to Well: Yes
Well Name: GM-25
South Coor.:

OH0288.001

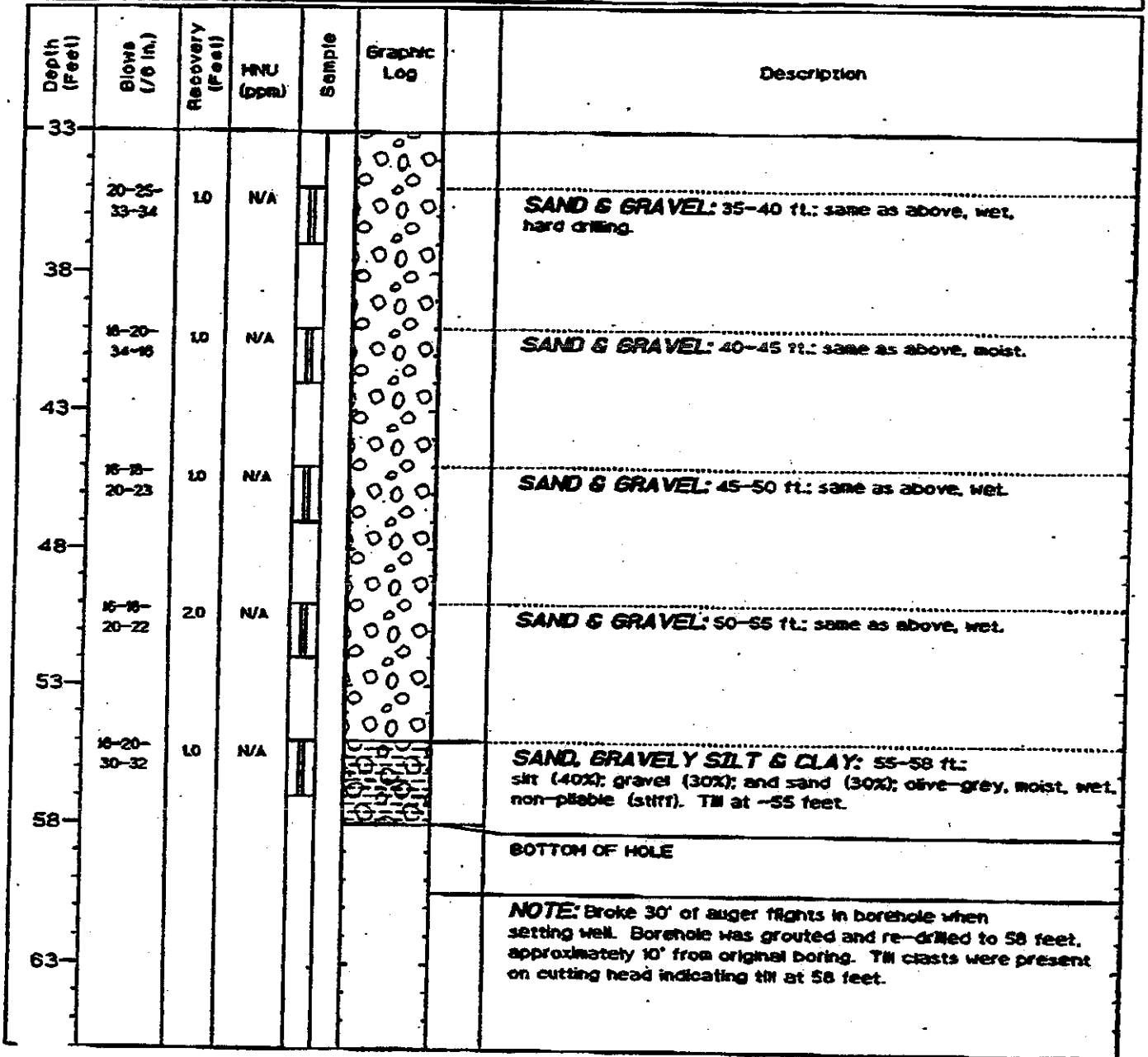
General Motors disk "GM-25" (rev 01/08/98)

MAR-18-99 09:43 FROM:ARCADIS GERAGHTY & MILLER ID:6147641270 PAGE 2/7

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: GM-25

GENERAL MOTORS CORP. – OH0288.001 Moraine, Ohio



■ Sample to Lab ◧ Sample Not Analyzed

Drilling Co.: Philips Environmental
Driller: Steve Snyder
Drilling Method: HSA 4 1/4
Drilling Fluid: Potable Water
Remarks:

Geologist: R. Astle
Total Depth: 58.0
Surface Elev.:
Datum: Feet, MSL
West Coor.:

Begin Drilling: 12/12/95
End Drilling: 12/14/95
Converted to Well: Yes
Well Name: GM-25
South Coor.:

OH0288.001

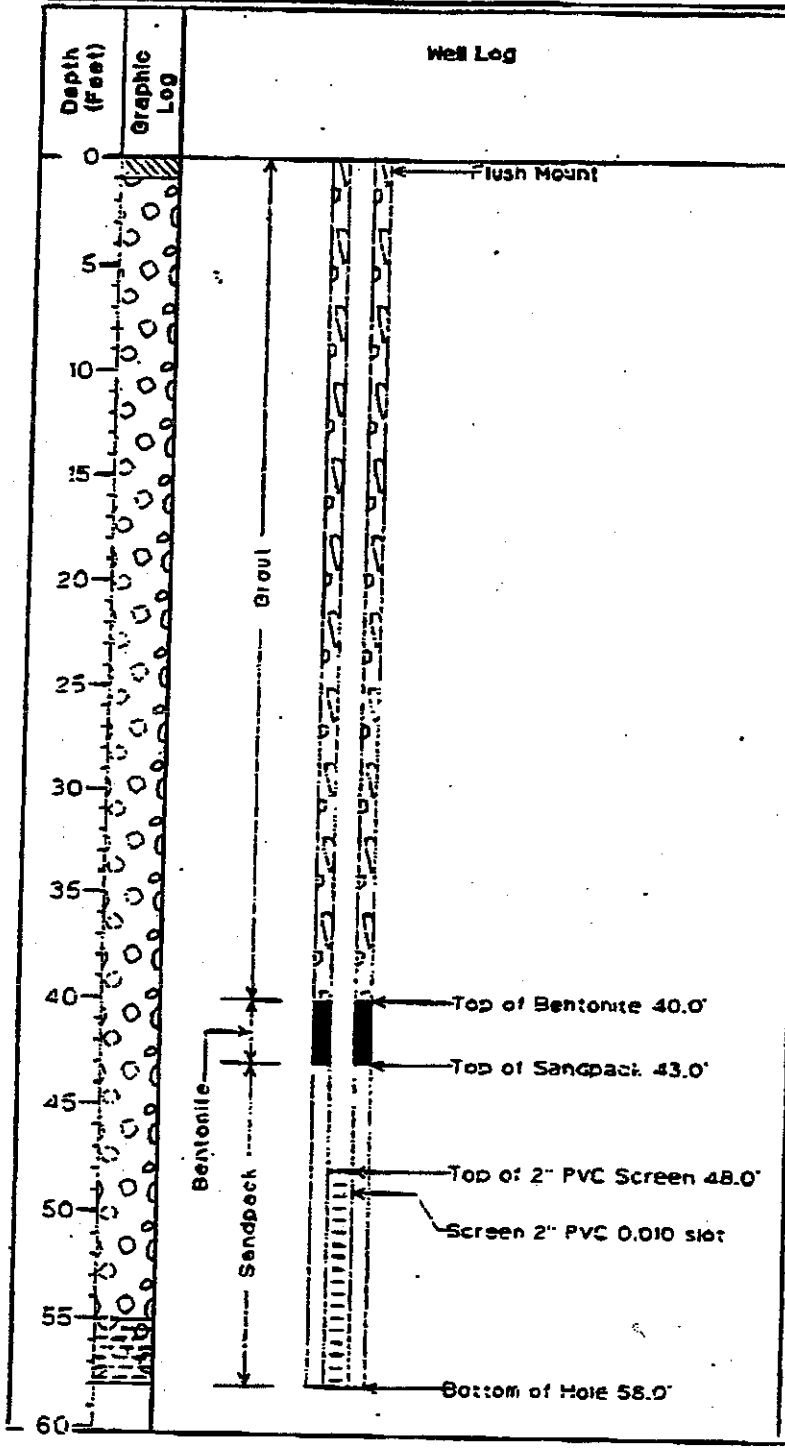
General Motors disk "GM-25" (rev 01/08/96)

MAR-18-99 09:43 FROM:ARCADIS GERAGHTY & MILLER ID:8147541270 PAGE 3/7

Geraghty & Miller, Inc.
Environmental Services

Well Construction Log: GM-25

GENERAL MOTORS CORP. – OH0288.001 Moraine, Ohio



Well Construction Details

Well Type: Monitor Well
Total Depth Drilled: 58.0
Surface Elev.:
Meas. Point Elev.:
Meas. Point Desc.: Top of PVC
Datum: Feet, MSL
Drilling Co.: Philips Environmental
Driller: Steve Snyder
Drilling Method: HSA 4 1/4
Drilling Fluid: Potable Water
Begin Drilling: 12/12/95
End Drilling: 12/14/95
Begin Well Instal.: 12/14/95
End Well Instal.: 12/14/95
Development Tech.: bail and pump
Begin Development: 12/18/95
End Development: 12/18/95
Fluid Loss: 50
Fluid Developed: 80
Pumping DTW: 39.35
Pumping Duration: 50 minutes
Yield: 15 gpm
Specific Capacity:
Static Water Level: 39.35
Fracture Zones: NA

For Lithologic Descriptions See Log of Boring: *GM-25*

West Coor.: South Coor.:
Remarks:
OH0288.001

Geologist: R. Astle

General Motors disk "GM-25" (rev 01/08/98)

MAR-18-99 09:44 FROM:ARCADIS GERAGHTY & MILLER ID:8147641270 PAGE 4/7

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: GM-26

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
0	3-8-15-25	1.2	0			***CLAY & SILT:*** 0-2 ft; silt and clay 80% (fine to medium); sand 20% (fine to medium); dark yellowish brown, moist, very cohesive.
	20-14-14-15	1.8	0			***CLAY & SILT:*** 2-4 ft; SAME AS ABOVE, except light brown.
5	9-14-15-21	1.2	0			***CLAY & SILT:*** 4-6 ft; silt and clay 60%; sand 20% (fine to coarse), gravel, 20% (fine to medium); moderate yellowinsh brown, moist, loose-cohesive.
	10-10-18-20	1.2	0			***GRAVEL & SAND:*** 6-8 ft; sand 50% (fine to medium); gravel 40% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.
	30-40-33-30	1.2	0			***GRAVEL & SAND:*** 8-10 ft; sand 40% (fine to coarse); gravel 50% (fine to coarse); silt and clay 10%; moderate-pale yellowish brown, moist, loose
10	50	0	N/A			***NO RECOVERY:*** 10-12 ft.
	32-33-45-35	1.0	0			***GRAVEL & SAND:*** 12-14 ft; sand 50% (fine to coarse); gravel 40% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
15	10-25-17-41	1.0	0			***GRAVEL & SAND:*** 14-16 ft; SAME AS ABOVE.

■ Sample to Lab ▯▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Dave/Russ
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 60.0
Surface Elev.: 722.2903
Datum: Mean Sea Level
North Coor.: -988.45

ng: 02/24/98
: 02/24/98
to Well: Yes
GM-26
961.65526

MG 7-3-07
MP Elevation not surface elevation

OH000294.0001.0002

'GMCRI/GM-26 (Rev:5/16/98)

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: GM-26

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
16						**NO RECOVERY:** 16–18 ft.
	50/4"	0	N/A			
	6-8-10-12	1.0	0			**GRAVEL:** 18–20 ft; gravel 70% (fine to medium); sand 20% (fine to medium); silt and clay 10%; moderate yellowish brown, wet, loose.
						GRAVEL: 20–22 ft; SAME AS ABOVE.
21	9-9-12-18	1.0	0			
	4-11-15-32	1.0	0			**GRAVEL & SAND:** 22–24 ft; sand 40% (fine to medium); gravel 50% (fine to medium); silt and clay 10%; moderate yellowish brown, wet, loose.
	10-17-28-27	1.2	0			**SAND:** 24–26 ft; sand 70% (fine to coarse); gravel 20% (fine to medium); silt and clay 10%; moderate yellowish brown, wet, loose.
26	4-9-13-22	1.0	0			**GRAVEL & SAND:** 26–28 ft; sand 60% (fine to coarse); gravel 30% (fine to medium); silt and clay 10%; moderate yellowish brown, wet, loose.
						GRAVEL & SAND: 28–30 ft; sand 50% (fine to coarse); gravel 40% (fine to medium); silt and clay 10%; moderate yellowish brown, wet, loose.
	12-18-26-38	0.7	0			
31	7-11-24-26	1.2	0			**GRAVEL & SAND:** 30–32 ft; sand 40% (fine to coarse); gravel 50% (fine to medium); silt and clay 10%; moderate yellowish brown, wet, loose.

■ Sample to Lab ◫ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Dave/Russ
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 60.0
Surface Elev.: 722.2903
Datum: Mean Sea Level
North Coor.: -988.45579

Begin Drilling: 02/24/98
End Drilling: 02/24/98
Converted to Well: Yes
Well Name: GM-26
East Coor.: 4981.65528

OH000294.0001.0002

F:/APPS/GT3/GMCRI/GM-26 (Rev:6/18/98)

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: GM-26

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
32						
	9-15-22-28	1.0	0			***GRAVEL & SAND:*** 32-34 ft; SAME AS ABOVE.
	8-17-18-19	0.75	0			***GRAVEL:*** 34-36 ft; gravel 70%; sand 20% (fine to medium); silt and clay 10%; moderate yellowish brown, wet, loose.
37	10-12-31-35	1.3	0			***GRAVEL:*** 36-38 ft; SAME AS ABOVE.
	14-30-34-30	1.0	0			***GRAVEL & SAND:*** 38-40 ft; gravel 50% (fine to coarse); sand 40% (fine to medium); silt and clay 10%; moderate yellowish brown, wet, loose.
	12-14-24-33	1.5	0			***GRAVEL & SAND:*** 40-42 ft; SAME AS ABOVE.
42	44-50/2"	1.0	0			***GRAVEL & SAND:*** 42-44 ft; gravel 50% (fine to medium); sand 40% (fine to medium); silt and clay 10%; moderate yellowish brown, wet, loose.
	28-30-35-46	1.5	0			***GRAVEL & SAND:*** 44-46 ft; sand 60% (fine to coarse); gravel 30% (fine to medium); silt and clay 10%; moderate yellowish brown, wet, loose.
47	22-35-45-30	2.0	0			***GRAVEL & SAND:*** 46-48 ft; SAME AS ABOVE.

■ Sample to Lab ◧ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Dave/Russ
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 60.0
Surface Elev.: 722.2803
Datum: Mean Sea Level
North Coor.: -988.45579

Begin Drilling: 02/24/98
End Drilling: 02/24/98
Converted to Well: Yes
Well Name: GM-26
East Coor.: 4981.65526

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: GM-26

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
48	12-22-28-31	1.5	0			***GRAVEL & SAND:*** 48-50 ft; sand 60% (fine to coarse); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, wet, loose.
	25-30-48-44	1.5	0			***GRAVEL & SAND:*** 50-52 ft; SAME AS ABOVE.
53	20-30-38-47	1.2	0			***GRAVEL & SAND:*** 52-54 ft; sand 60% (fine to coarse); gravel 20% (fine to medium); silt and clay 20%; moderate yellowish brown, wet, cohesive.
	32-31-35-44	1.5	0			***GRAVEL & SAND:*** 54-56 ft; sand 50% (fine to coarse); gravel 30% (fine to medium); silt and clay 20%; moderate yellowish brown, wet, cohesive.
	21-32-50/5"	1.0	0			***GRAVEL & SAND:*** 56-58 ft; SAME AS ABOVE.
58	12-14-24-40	1.3	0			***SAND:*** 58-59 ft; sand 70% (fine to medium); gravel 10% (fine to medium); silt and clay 20%; moderate yellowish brown, wet, cohesive.
						CLAY & SILT: 59-60 ft; silt and clay 80%; sand 20% (fine); moderate yellowish brown, wet, very cohesive.
						BOTTOM OF HOLE 60.0 ft.
63						

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Dave/Russ
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: W.J. Ferguson
Total Depth: 60.0
Surface Elev.: 722.2903
Datum: Mean Sea Level

Begin Drilling: 02/24/98
End Drilling: 02/24/98
Converted to Well: Yes
Well Name: GM-26

Remarks:
North Coor.: -988.45579
East Coor.: 4981.65526

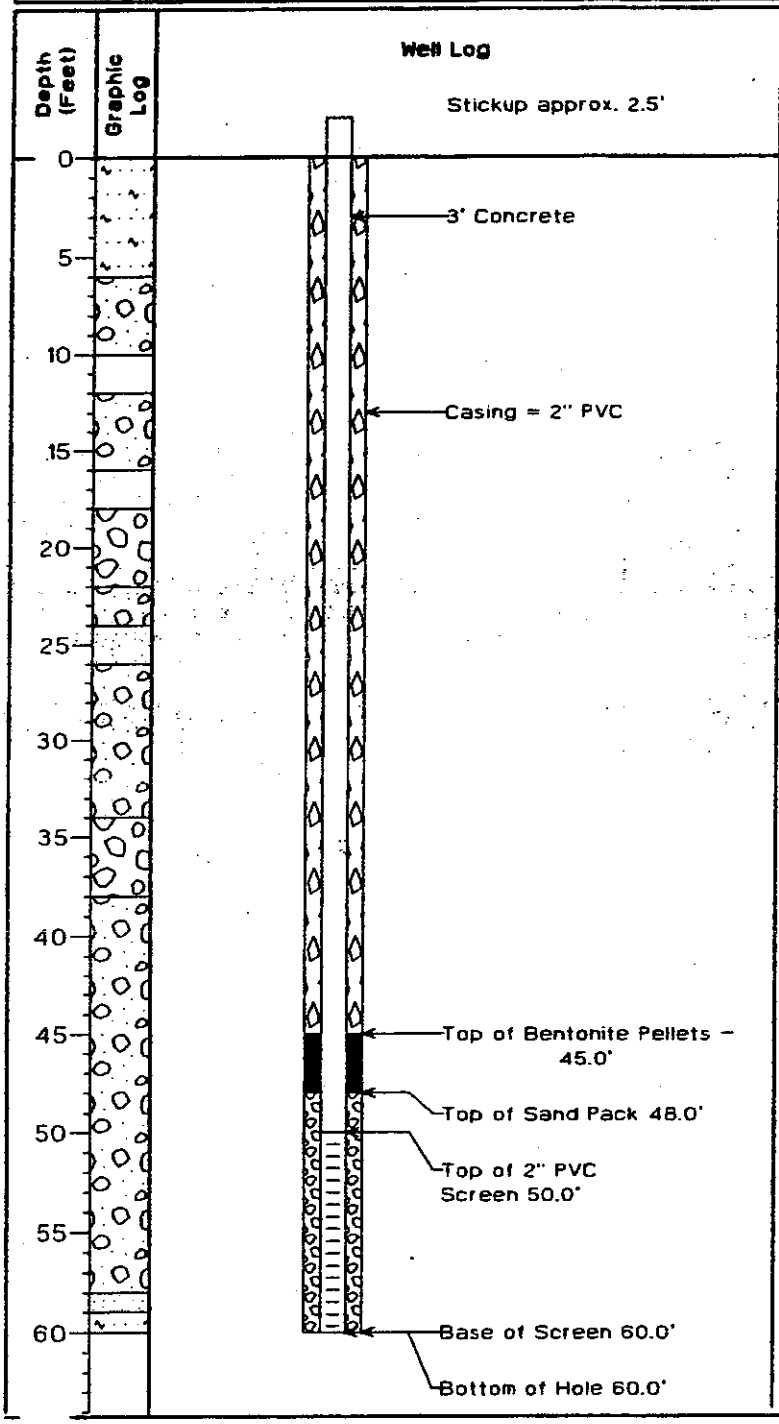
OH000294.0001.0002

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Geraghty & Miller, Inc.
Environmental Services

Well Construction Log: GM-26

GENERAL MOTORS — Moraine, Ohio



Well Construction Details

Well Type: Monitoring
Total Depth Drilled: 60.0
Surface Elev.: 722.2903
Meas. Point Elev.:
Meas. Point Desc.:
Datum: Mean Sea Level
Drilling Co.: Belasco Drilling
Driller: Dave/Russ
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Begin Drilling: 02/24/98
End Drilling: 02/24/98
Begin Well Instal.: 02/24/98
End Well Instal.: 02/24/98
Development Tech.:
Begin Development: 03/02/98
End Development: 03/02/98
Fluid Loss:
Fluid Developed:
Pumping DTW:
Pumping Duration:
Yield:
Specific Capacity:
Static Water Level:
Fracture Zones:

For Lithologic Descriptions See Log of Boring: *GM-26*

Page 1 of 1

West Coor.: 988.45579 South Coor.: 4961.65526

Remarks:

Geologist: W.J. Ferguson

OH000284.0001.0002

F:/APPS/GT3/GMCRI/GM-26 (Rev:6/18/98)

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: GM-27

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
0						**CONCRETE:** 0–0.5 ft; sand 60% (fine to
	11–10 14–17	1.5	1.0	■		**SAND & GRAVEL:** 0.5–2 ft; sand 60% (fine to coarse); gravel 30% (fine to medium); silt and clay 10%; dark yellowish brown, slightly moist, loose–cohesive.
	11–9– 14–11	1.5	3.0			**SAND & GRAVEL:** 2–4 ft; sand 70% (fine to coarse); gravel 20% (fine to medium); silt and clay 30%; dark yellowish brown to light gray, slight moist, loose.
5	7–5–7–7	1.5	2.0			**SAND & GRAVEL:** 4–6 ft; sand 40% (fine to medium); gravel 30% (fine); silt and clay 30%; dark brown, moist, loose–cohesive.
	7–5–3–1	0.25	2.0			**SAND & GRAVEL:** 6–8 ft; sand 50% (fine to medium); gravel 25% (fine); silt and clay 25%; moderate yellowish brown, moist, loose–cohesive.
	2–1–2–2	0.5	2.0			**SAND & GRAVEL:** 8–10 ft; sand 60% (fine to medium); gravel 20% (fine); silt and clay 20%; moderate yellowish brown, moist, loose–slightly cohesive.
10	5–6–10–7	0.5	17.0			**SAND & GRAVEL:** 10–12 ft; same as above.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Geologist: W.J. Ferguson
Begin Drilling: 08/04/98
Driller: Mike/Ray
Total Depth: 58.0
End Drilling: 08/13/98
Drilling Method: Hollow Stem Auger
Surface Elev.: 731.0336
Converted to Well: Yes
Drilling Fluid: None
Datum: Mean Sea Level
Well Name: GM-27
Remarks:
North Coor.: 5392.70451
East Coor.: 6029.36758

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: GM-27

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
12						***NO RECOVERY:*** 12–14 ft.
	21-23-21-9	0				
	12-15 41-20	0.25	3.5			***SAND & GRAVEL:*** 14–16 ft; sand 60% (fine to medium); gravel 20% (fine); silt and clay 20%; moderate yellowish brown, moist, loose–slightly cohesive.
17	8-15-13-31	0.5	9.0			***SAND & GRAVEL:*** 16–18 ft; sand 50% (fine to medium); gravel 40% (fine to coarse); silt and clay 10%; light gray to light yellowish brown, slightly moist, loose.
	7-11-15-17	1.0	19.0			***SAND & GRAVEL:*** 18–20 ft; sand 60% (fine to medium); gravel 30% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.
	5-6-12-14	1.0	15.5			***SAND & GRAVEL:*** 20–22 ft; sand 70% (fine to medium); gravel 15% (fine to medium); silt and clay 15%; moderate yellowish brown, moist, loose.
22	8-15-10-23	1.0	6.5			***SAND:*** 22–24 ft; sand 70% (fine to medium); gravel 10% (fine); silt and clay 20%; moderate yellowish brown, very moist, loose–cohesive.

■ Sample to Lab ◧ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Mike/Ray
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Geologist: W.J. Ferguson
Total Depth: 58.0
Surface Elev.: 731.0336
Datum: Mean Sea Level
Begin Drilling: 08/04/98
End Drilling: 08/13/98
Converted to Well: Yes
Well Name: GM-27
Remarks:
North Coor.: 5392.70451
East Coor.: 6029.36758

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: GM-27

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
36	48-38-50/3"	1.5	0			***TILL:*** 36-38ft; sand 5% (fine to medium); gravel 15% (fine to coarse); silt and clay 80%; dark gray; wet, very cohesive but slightly softer than above.
	10-28-50	1.0	<0.5			***SAND & GRAVEL:*** 38-40 ft; sand 80% (fine to coarse); gravel 10% (fine); silt and clay 10%; dark yellowish brown, wet, loose.
41	20-61-50	1.0	0			***SAND & GRAVEL:*** 40-42 ft; sand 75% (fine to coarse); gravel 15% (fine to coarse); silt and clay 10%; dark yellowish brown, wet, loose-cohesive.
	38-57-50	1.2	0			***SAND & GRAVEL:*** 42-44 ft; sand 70% (fine to coarse); gravel 20% (fine to coarse); silt and clay 10%; dark yellowish brown, wet, loose-cohesive.
	15-45-50	1.0	0			***SAND & GRAVEL:*** 44-46 ft; sand 70% (fine to coarse); gravel 20% (fine to medium); silt and clay 10%; dark yellowish brown, wet, loose.
46	100-94	0.8	0			***SAND & GRAVEL:*** 46-48 ft; sand 70% (fine to coarse); gravel 20% (fine to medium); silt and clay 10%; dark yellowish brown, wet, loose.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Geologist: W.J. Ferguson
Begin Drilling: 08/04/98
Driller: Mike/Ray
Total Depth: 58.0
End Drilling: 08/13/98
Drilling Method: Hollow Stem Auger
Surface Elev.: 731.0336
Converted to Well: Yes
Drilling Fluid: None
Datum: Mean Sea Level
Well Name: GM-27
Remarks:
North Coor.: 5392.70451
East Coor.: 6029.36758

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: GM-27

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
24	2-7-7-8	2.0	12.0			***SAND:*** 24–26 ft; sand 90% (fine); trace gravel (fine); trace silt and clay; moderate yellowish brown, very moist/wet, slightly cohesive.
	5-7-21-22	1.5	9.0			***SAND & GRAVEL:*** 26–28 ft; sand 60% (fine to medium); gravel 15% (fine); silt and clay 25%; moderate yellowish brown, wet, slightly cohesive.
29	8-15-48-41	2.0	12.5			***SAND & GRAVEL:*** 28–30 ft; sand 50% (fine to medium); gravel 30% (fine to medium); silt and clay 20%; moderate to dark yellowish brown, wet, loose–cohesive, slight odor.
		1.5	9.0/2.0			***SAND & GRAVEL:*** 30–31.5ft; sand 70% (fine to medium); gravel 20% (fine to medium); silt and clay 10%; dark yellowish brown, wet, cohesive.
						TILL: 31.5–32 ft; sand 10% (fine); gravel 10% (fine); silt and clay 80%; dark gray, moist, very cohesive.
						NO SOIL SAMPLE COLLECTED: 32–34 ft; The following log describes the lithology from the second attempted hole.
34	48-50/4"	1.0	0			***TILL:*** 34–36ft; sand 5% (fine); gravel 10% (fine to medium); silt and clay 85%; dark gray; dry, very cohesive.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Geologist: W.J. Ferguson
Begin Drilling: 08/04/98
Driller: Mike/Ray
Total Depth: 58.0
End Drilling: 08/13/98
Drilling Method: Hollow Stem Auger
Surface Elev.: 731.0336
Converted to Well: Yes
Drilling Fluid: None
Datum: Mean Sea Level
Well Name: GM-27
Remarks:
North Coor.: 5392.70451
East Coor.: 6029.36758

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: GM-27

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
48	52-47-32-48	0.8	<0.5			***SAND & GRAVEL:*** 48-50 ft; sand 75% (fine to coarse); gravel 15% (fine); silt and clay 10%; dark yellowish brown, wet, loose.
	135/4"	0.3	0			***SAND & GRAVEL:*** 50-52 ft; sand 90% (fine to coarse); silt and clay 10%; dark yellowish brown, wet, loose.
53	135/4"	0.3	0			***SAND & GRAVEL:*** 52-54 ft; same as above.
	150/4"	0.3	0			***SAND & GRAVEL:*** 54-55 ft; sand 80% (fine to coarse); gravel 10% (fine); silt and clay 10%; dark yellowish brown, wet, loose.
	39-48-57	1.5	0			***TILL:*** 55-56ft; silt and clay 80%; gravel 15% (fine to medium); sand 5% (fine); dark gray to dark yellowish brown, slightly moist, very cohesive.
58						***TILL:*** 56-58ft; same as above.
						TOTAL DEPTH: 58 ft.

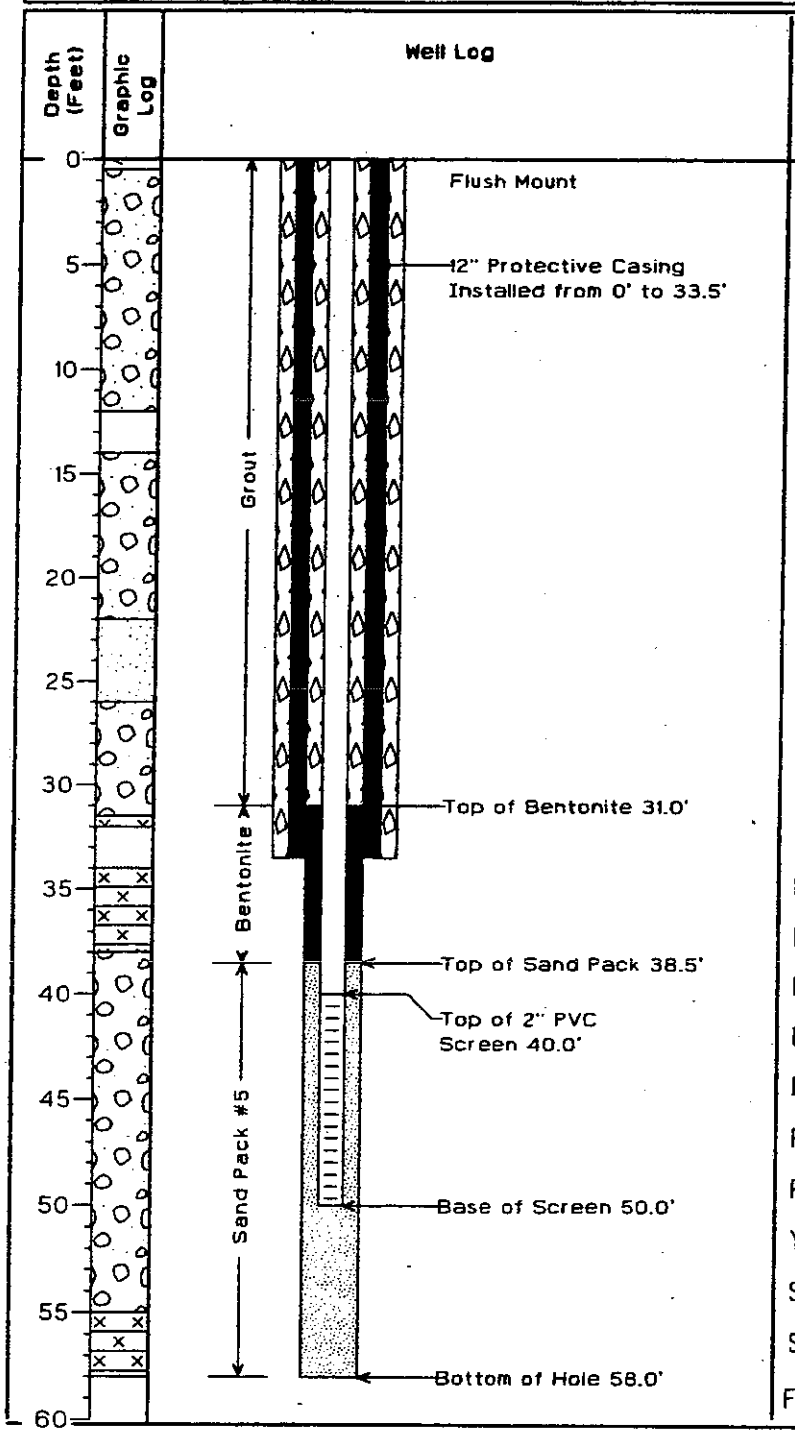
■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Mike/Ray
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Geologist: W.J. Ferguson
Total Depth: 58.0
Surface Elev.: 731.0336
Datum: Mean Sea Level
Begin Drilling: 08/04/98
End Drilling: 08/13/98
Converted to Well: Yes
Well Name: GM-27
Remarks:
North Coor.: 5382.70451
East Coor.: 6029.36758

Geraghty & Miller, Inc.
Environmental Services

Well Construction Log: GM-27

GENERAL MOTORS — Moraine, Ohio



Well Construction Details

Well Type: Groundwater Monitoring
Total Depth Drilled: 58.0
Surface Elev.: 731.0336
Meas. Point Elev.: 730.59
Meas. Point Desc.: Top Of Casing
Datum: Mean Sea Level
Drilling Co.: Belasco Drilling
Driller: Mike/Ray
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Begin Drilling: 08/04/98
End Drilling: 08/13/98
Begin Well Instal.: 08/04/98
End Well Instal.: 08/20/98
Development Tech.: Pump
Begin Development: 8/24/98
End Development: 8/24/98
Fluid Loss:
Fluid Developed: 40
Pumping DTW:
Pumping Duration: ~2 Hours
Yield:
Specific Capacity:
Static Water Level: 718.18
Fracture Zones:

For Lithologic Descriptions See Log of Boring: *GM-27*

West Coor.: 5392.70451 South Coor.: 6029.36758

Remarks:
OH000294.0001.0002

Geologist: W.J. Ferguson

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: GM-28

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
0						***ASPHALT:*** 0–0.25 ft;
	9–15–21–20	1.0	0			***SAND & GRAVEL:*** 0.25–2 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; multicolored including black, gray, and light brown, slightly moist, loose.
	50	<.25	0			***SAND & GRAVEL:*** 2–4 ft; sand 50% (fine to medium); gravel 40% (fine to coarse); silt and clay 10%; dark yellowish brown, moist, loose.
5	10–10 20–21	1.0	0			***SAND & GRAVEL:*** 4–6 ft; sand 60% (fine to medium), gravel 30% (fine to medium), silt and clay 10%, medium yellowish brown, slightly moist, loose.
	18–37–35–41	1.5	0			***SAND & GRAVEL:*** 6–8 ft; sand 40% (fine to medium); gravel 50% (fine to coarse); silt and clay 10%; light yellowish brown to light gray, slightly moist, loose. (STOPPED DRILLING THIS HOLE. Started new hole ~2.5 feet east. Continue split-spoon sampling at 8 feet.)
	18–50–33–33	1.5	0			***SAND & GRAVEL:*** 8–10 ft; sand 60% (fine to medium); gravel 30% (fine); silt and clay 10%; light to moderate yellowish brown, slightly moist, loose.
10	18–50–53–50	1.5	0			***SAND & GRAVEL:*** 10–12 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; light yellowish brown, slightly moist, loose.
	12–26–31–35	1.5	0			***SAND & GRAVEL:*** 12–14 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, slightly moist, loose.

■ Sample to Lab ◫ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 32.0
Surface Elev.: 729.8862
Datum: Mean Sea Level
North Coor.: 5041.36994

Begin Drilling: 08/05/98
End Drilling: 08/05/98
Converted to Well: Yes
Well Name: GM-28
East Coor.: 5916.17795

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: GM-28

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
14	4-24-50/5"	1.0	0			***SAND & GRAVEL:*** 14-16 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; light yellowish brown, slightly moist, loose.
	9-16-25-27	1.0	0			***SAND & GRAVEL:*** 16-18 ft; sand 70% (fine to coarse); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
19	8-17-20-22	1.0	0			***SAND & GRAVEL:*** 18-20 ft; sand 70% (fine to coarse); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	5-15-16-30	1.0	0.5			***SAND & GRAVEL:*** 20-22 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	11-15-13-20	1.0	<0.5			***SAND & GRAVEL:*** 22-24 ft; sand 70% (fine to coarse); gravel 20% (fine); silt and clay 10%; moderate yellowish brown, very moist to wet, loose-cohesive.
24	8-16-20-15	1.0	0			***SAND & GRAVEL:*** 24-26 ft; sand 60% (fine to coarse); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, wet, loose-cohesive.
	15-19-21-36	1.0	0			***SAND & GRAVEL:*** 26-28 ft; sand 70% (fine to coarse); gravel 20% (fine to medium); silt and clay 10%; moderate yellowish brown, wet, loose-cohesive.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 32.0
Surface Elev.: 729.8962
Datum: Mean Sea Level
North Coor.: 5041.36994

Begin Drilling: 08/05/98
End Drilling: 08/05/98
Converted to Well: Yes
Well Name: GM-28
East Coor.: 5916.17795

OH000294.0001.0002

I:/GMOTORS/GMCRI/GTGS/GM-28 (12/18/98)

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: GM-28

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
28	18-34 36-37	2.0	-0.5			***SAND & GRAVEL:*** 28-30 ft; sand 80% (fine to coarse); gravel 10% (fine to medium); silt and clay 10%; moderate yellowish brown, wet, loose-cohesive.
	44-64- 50/3"	1.5	1.0/ 0			***SAND & GRAVEL:*** 30-31.5 ft; sand 80% (fine to coarse); gravel 10% (fine to medium), silt and clay 10%; moderate yellowish brown, wet, loose-cohesive.
						TILL: 31.5-32 ft; silt and clay 90%; gravel 5% (fine) and sand 5%, dark gray; moist, very cohesive.
						TOTAL DEPTH: 32 ft;
33						
38						

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 32.0
Surface Elev.: 729.8962
Datum: Mean Sea Level
North Coor.: 5041.36984

Begin Drilling: 08/05/98
End Drilling: 08/05/98
Converted to Well: Yes
Well Name: GM-28
East Coor.: 5916.17795

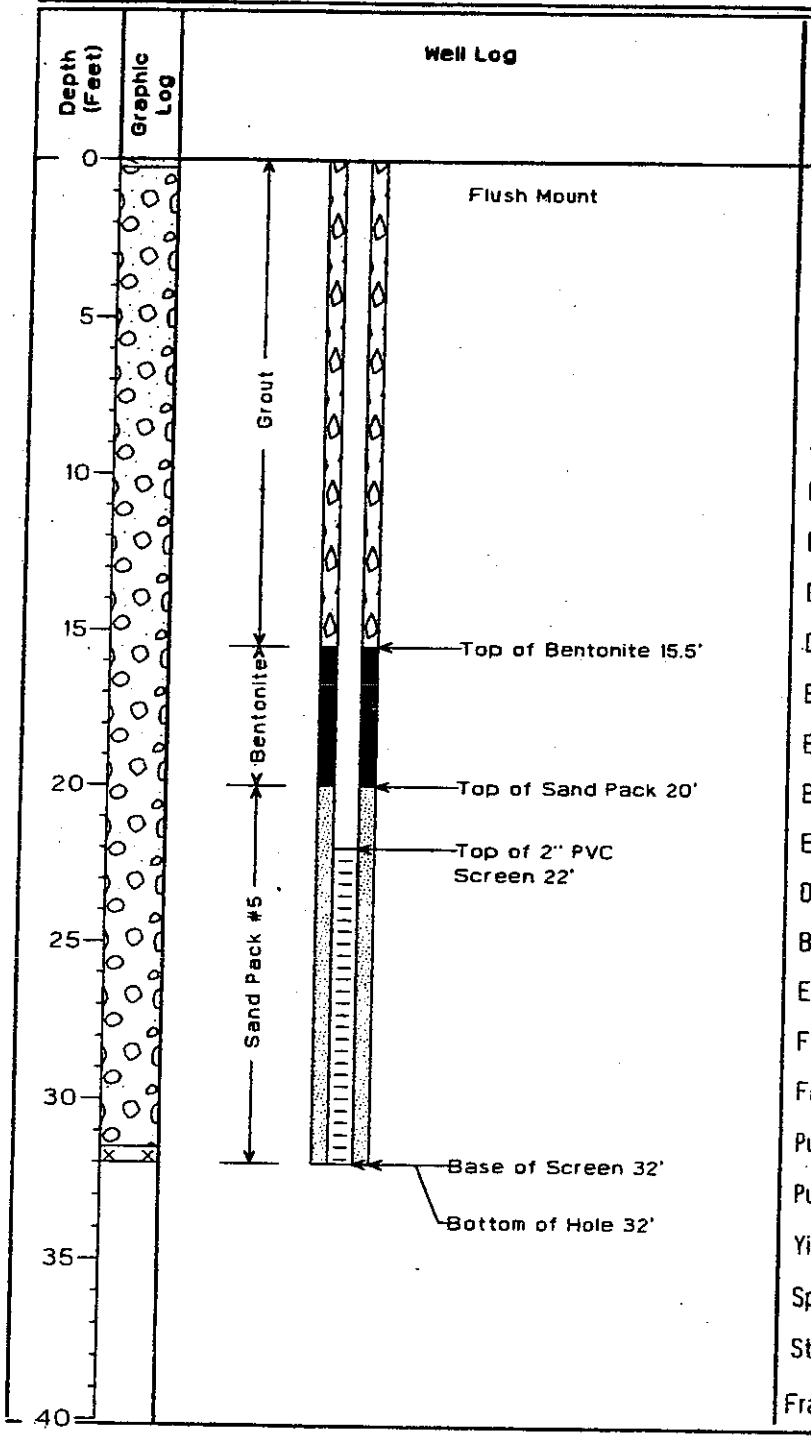
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I:/GMOTORS/GMCRI/GTGS/GM-28 (12/18/98)

Geraghty & Miller, Inc.
Environmental Services

Well Construction Log: GM-28

GENERAL MOTORS — Moraine, Ohio



Well Construction Details

Well Type: Groundwater Monitoring
Total Depth Drilled: 32.0
Surface Elev.: 729.8962
Meas. Point Elev.: 729.19
Meas. Point Desc.: Top of Casing
Datum: Mean Sea Level
Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Begin Drilling: 08/05/98
End Drilling: 08/05/98
Begin Well Instal.: 08/05/98
End Well Instal.: 08/05/98
Development Tech.: Pump/Bailer
Begin Development: 8/17/98
End Development: 8/17/98
Fluid Loss:
Fluid Developed: >210
Pumping DTW:
Pumping Duration:
Yield:
Specific Capacity:
Static Water Level: 727.65
Fracture Zones:

For Lithologic Descriptions See Log of Boring: *GM-28*

West Coor.: 5041.36994 South Coor.: 5916.17795

Remarks:
OH000294.0001.0002

Geologist: W.J. Ferguson

I:/GMOTORS/GMCRI/GTGS/GM-28 (12/18/98)

Borehole Number: GM-29

ARCADIS GERAGHTY&MILLER

Client: General Motors

Site Location: Moraine, Ohio

Project: Interim Measures

Project No: OH000294.0002.00007

SUBSURFACE PROFILE				SAMPLE				
Depth (feet)	Symbol	Description	Estimated Water Level	Sample Sent To Lab?	Sample Interval	Blows/ft	Recovery (feet)	HNU (ppm)
0		Ground Surface						
1		***FILL***						
2		***SAND AND GRAVEL*** sand (fine-medium) 60%; gravel (fine-coarse) 30%; silt/clay 10%; light yellowish brown; slightly moist; loose			2-4		1.1	1.0
4		***SAND*** sand (fine-medium) 80%; gravel (fine) 10%; silt/clay 10%;. light yellowish brown; moist; loose			4-6		1.2	0.5
6		***SAND AND GRAVEL*** sand (fine-medium) 70%; gravel (fine-medium) 20%; silt/clay 10%; light yellowish brown except for 4" segment with much dark gray staining and odor, moist, loose		yes	6-8		1.5	12.0
8		***SAND AND GRAVEL*** sand (fine-medium) 50%; gravel (fine-medium) 40%; silt/clay 10%; moderate yellowish brown; moist; loose			8-10		1.2	0.5
10		***SAND AND GRAVEL*** sand (fine-medium) 40%; gravel (fine-coarse) 50%; silt/clay 10%; moderate yellowish brown; moist; loose			10-12		2.0	1.5
12		***SAND AND GRAVEL*** sand (fine-medium) 60%; gravel (fine-coarse) 30%; silt/clay 10%; light yellowish brown; moist; loose			12-14		1.5	1.0
14								
15					14-16		1.1	2.0
16								

Scientist: Bill Ferguson
Project Manager: Nancy Gillotti
Drilling Co.: Belasco Drilling Services
Driller: Greg/Rick
Drilling Method: Hollow Stem Auger
Drilling Fluid: NA

Begin Drilling: 8/25/99
End Drilling: 8/25/99
Hole Size: 8"
Total Depth: 38'
Datum: Ground Level
File Name: gmotors\gmcrfi\winlogs\gm29.log

Surface Elev.: 731.27
North Coor.: 5208.67777
East Coor.: 5974.28514
Converted to Well: Yes
Well Name: GM-29
Revised: 3/1/00

Borehole Number: GM-29

ARCADIS GERAGHTY & MILLER

Client: General Motors

Site Location: Moraine, Ohio

Project: Interim Measures

Project No: OH000294.0002.00007

SUBSURFACE PROFILE				SAMPLE				
Depth (feet)	Symbol	Description	Estimated Water Level	Sample Sent To Lab?	Sample Interval	Blows/ft	Recovery (feet)	HNU (ppm)
17		***SAND AND GRAVEL*** sand (fine-medium) 60%; gravel (fine-coarse) 30%; silt/clay 10%; light yellowish brown; moist; loose			16-18		1.0	1.0
18								
19					18-20		0.8	0.3
20								
21					20-22		0.8	1.0
22								
23					22-24		1.0	1.5
24								
25		***SILTY SAND AND GRAVEL*** sand (fine-medium) 50%; gravel (fine-medium) 25%; silt/clay 25%; light yellowish brown; moist; cohesive-loose	▼		24-26		0.8	0.3
26								
27		***SAND*** sand (fine) 80%; gravel (fine) 10%; silt/clay 10%; moderate yellowish brown; very moist-wet; loose			26-28		1.5	0.8
28								
29		***SAND AND GRAVEL*** sand (fine-medium) 70%; gravel (fine) 20%; silt/clay 10%; dark yellowish brown; very moist-wet; loose			28-30		1.2	0.3
30								
31		***SAND AND GRAVEL*** sand (fine-medium) 60%; gravel (fine-medium) 30%; silt/clay 10%; dark yellowish brown; wet; loose			30-32		2.0	0.3
32								

Scientist: Bill Ferguson
Project Manager: Nancy Gillotti
Drilling Co.: Belasco Drilling Services
Driller: Greg/Rick
Drilling Method: Hollow Stem Auger
Drilling Fluid: NA

Begin Drilling: 8/25/99
End Drilling: 8/25/99
Hole Size: 8"
Total Depth: 38'
Datum: Ground Level
File Name: gmotors\gmcrfi\winlogs\gm29.log

Surface Elev.: 731.27
North Coor.: 5208.67777
East Coor.: 5974.28514
Converted to Well: Yes
Well Name: GM-29
Revised: 3/1/00

Borehole Number: GM-29

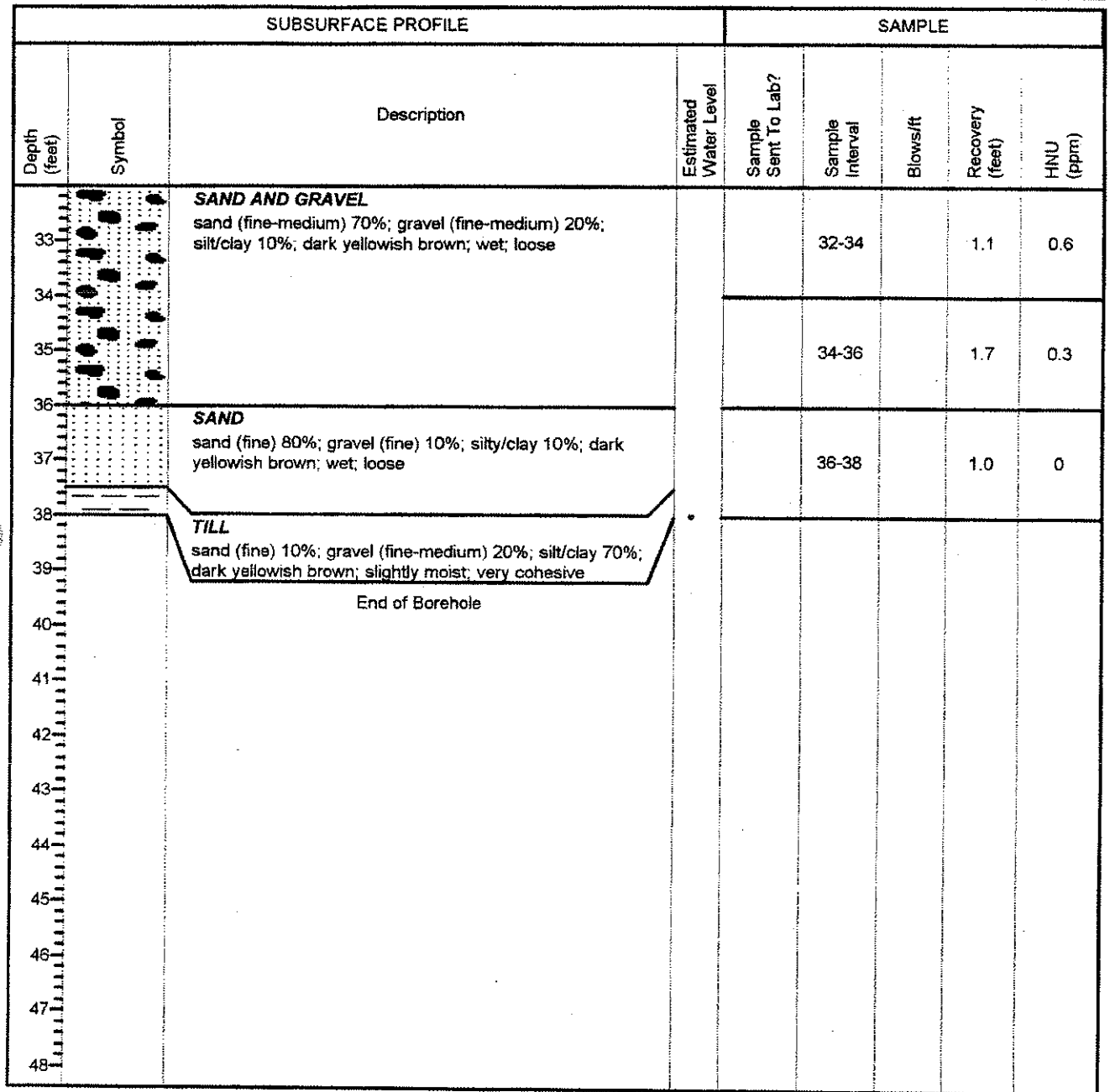
ARCADIS GERAGHTY & MILLER

Client: General Motors

Site Location: Moraine, Ohio

Project: Interim Measures

Project No: OH000294.0002.00007



SUBSURFACE PROFILE				SAMPLE				
Depth (feet)	Symbol	Description	Estimated Water Level	Sample Sent To Lab?	Sample Interval	Blows/ft	Recovery (feet)	HNU (ppm)
33		***SAND AND GRAVEL*** sand (fine-medium) 70%; gravel (fine-medium) 20%; silt/clay 10%; dark yellowish brown; wet; loose			32-34		1.1	0.6
34								
35					34-36		1.7	0.3
36		***SAND*** sand (fine) 80%; gravel (fine) 10%; silty/clay 10%; dark yellowish brown; wet; loose						
37					36-38		1.0	0
38		***TILL*** sand (fine) 10%; gravel (fine-medium) 20%; silt/clay 70%; dark yellowish brown; slightly moist; very cohesive						
39		End of Borehole						
40								
41								
42								
43								
44								
45								
46								
47								
48								

Scientist: Bill Ferguson
Project Manager: Nancy Gillotti
Drilling Co.: Belasco Drilling Services
Driller: Greg/Rick
Drilling Method: Hollow Stem Auger
Drilling Fluid: NA

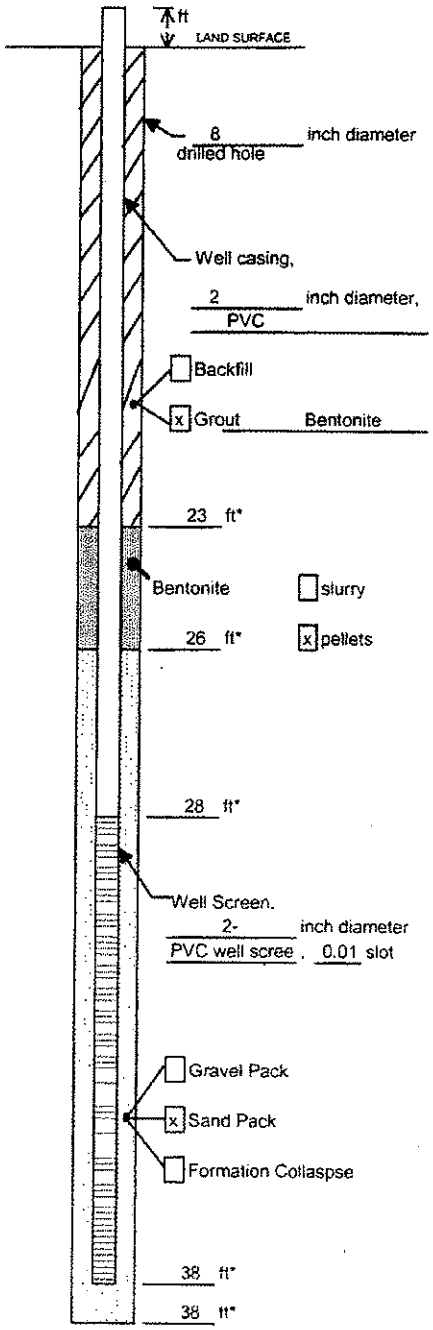
Begin Drilling: 8/25/99
End Drilling: 8/25/99
Hole Size: 8"
Total Depth: 38'
Datum: Ground Level
File Name: gmotors\gmcrfi\winlogs\gm29.log

Surface Elev.: 731.27
North Coor.: 5208.67777
East Coor.: 5974.28514
Converted to Well: Yes
Well Name: GM-29
Revised: 3/1/00

ARCADIS GERAGHTY & MILLER

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project OH000294.0002.00007 Well GM-29

Town/City Moraine, Ohio

County Montgomery State Ohio

Permit No.

Land-Surface Elevation and Datum:

731.27 feet [x] Surveyed [ ] Estimated

Installation Date(s) 8/25/99

Drilling Method Hollow stem auger

Drilling Contractor Belasco Drilling

Drilling Fluid

Development Technique(s) and Date(s)

Bailer and rope - 8/30/99

Fluid Loss During Drilling gallons

Water Removed During Development 9.5 gallons

Static Depth to Water 25.73 feet below M.P.

Pumping Depth to Water feet below M.P.

Pumping Duration hours

Yield gpm Date

Specific Capacity gpm/ft

Well Purpose Groundwater monitoring well

Remarks

Prepared by W. Ferguson

Borehole Number: GM-30

ARCADIS GERAGHTY & MILLER

Client: General Motors

Site Location: Moraine, Ohio

Project: Interim Measures

Project No: OH000294.0002.00007

SUBSURFACE PROFILE				SAMPLE				
Depth (feet)	Symbol	Description	Estimated Water Level	Sample Sent To Lab?	Sample Interval	Blows/ft	Recovery (feet)	HNU (ppm)
0		Ground Surface						
1					0-2			
2		***SAND/GRAVEL*** sand (fine-medium) 60%; gravel (fine) 30%; silt/clay 10%; moderate yellowish-brown; slightly moist; loose			2-4		1.0	0.0
3								
4								
5					4-6		1.0	0.5
6		***SAND/GRAVEL*** sand (fine-medium) 50%; gravel (fine-medium) 40%; silt/clay 10%; dark yellowish-brown; moist; loose			6-8		1.0	0.4
7								
8								
9					8-10		1.0	0.6
10		***SAND/GRAVEL*** sand (fine-medium) 60%; gravel (fine) 30%; silt/clay 10%; moderate yellowish-brown; slightly moist; loose			10-12		1.0	0.5
11								
12								
13					12-14		1.0	0.4
14								
15					14-16		1.0	0.3
16								
17					16-18		1.0	0.1
18								
19					18-20		1.0	0.0
20								

Scientist: Bill Ferguson
Project Manager: Nancy Gillotti
Drilling Co.: Belasco Drilling
Driller: Greg/Rick
Drilling Method: Hollow Stem Auger
Drilling Fluid: NA

Begin Drilling: 8/24/99
End Drilling: 8/25/99
Hole Size: 8"
Total Depth: 38'
Datum:
File Name: gmotors\gmcrfi\winlogs\gm30.log

Surface Elev.: 733.13
North Coor.: 5558.63946
East Coor.: 5970.02726
Converted to Well: Yes
Well Name: GM-30
Revised: 3/1/00

Borehole Number: GM-30

ARCADIS GERAGHTY & MILLER

Client: General Motors

Site Location: Moraine, Ohio

Project: Interim Measures

Project No: OH000294.0002.00007

SUBSURFACE PROFILE				SAMPLE				
Depth (feet)	Symbol	Description	Estimated Water Level	Sample Sent To Lab?	Sample Interval	Blows/ft	Recovery (feet)	HNU (ppm)
21					20-22		2.0	2.0
22		***SAND/GRAVEL*** sand (fine-medium) 50%; gravel (fine-medium) 40%; silt/clay 10%; dark yellowish-brown; moist; loose			22-24		1.2	0.3
24								
25					24-26		0.1	0.3
26		***SAND/GRAVEL*** sand (fine-medium) 60%; gravel (fine) 30%; silt/clay 10%; moderate yellowish-brown; very moist; loose			26-28		1.0	0.0
28		***SAND/GRAVEL*** sand (fine-medium) 60%; gravel (fine) 30%; silt/clay 10%; wet; loose; extreme black staining; strong odor and possible free-product (black liquid)	▼		28-30		1.0	40.0
30		***SAND/GRAVEL*** sand (fine-medium) 60%; gravel (fine) 30%; silt/clay 10%; wet; loose; extreme black staining; strong odor		Yes	30-32		1.5	200.0
32								
33					32-34		1.5	105.0
34		***SAND/GRAVEL*** sand (fine-coarse) 50%; gravel (fine-coarse) 40%; silt/clay 10%; dark gray; wet; loose			34-36		1.0	14.0
36		***SAND/GRAVEL*** sand (fine-medium) 70%; gravel (fine) 20%; silt/clay 10%; gray; wet; loose; some odor			36-38			14.0
38		***TILL*** sand and gravel 20%; silt clay 80%; dark brown; slightly moist						
39								
40		End of Borehole						

Scientist: Bill Ferguson
Project Manager: Nancy Gillotti
Drilling Co.: Belasco Drilling
Driller: Greg/Rick
Drilling Method: Hollow Stem Auger
Drilling Fluid: NA

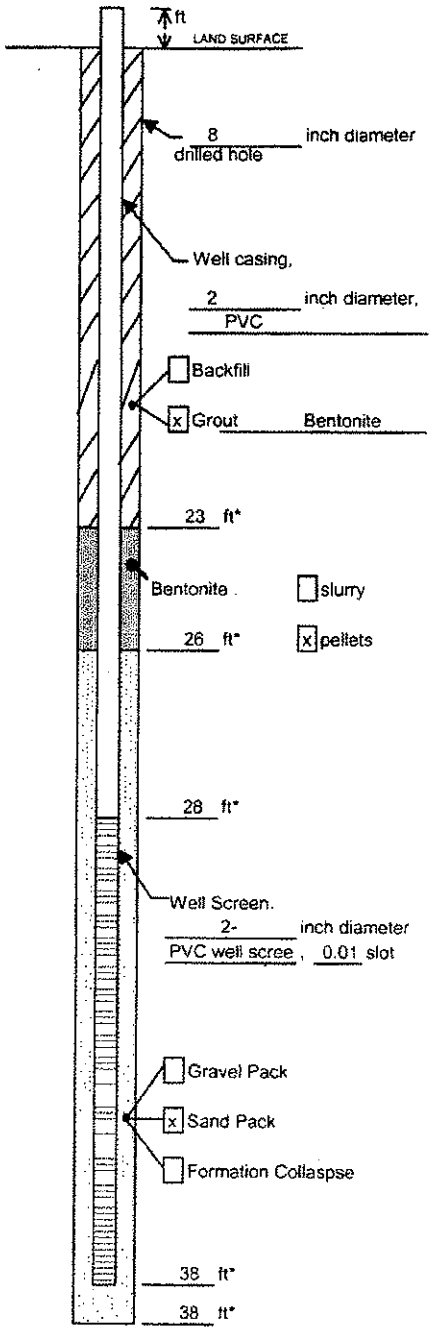
Begin Drilling: 8/24/99
End Drilling: 8/25/99
Hole Size: 8"
Total Depth: 38'
Datum:
File Name: gmotors\gmcrfi\winlogs\gm30.log

Surface Elev.: 733.13
North Coor.: 5558.63946
East Coor.: 5970.02726
Converted to Well: Yes
Well Name: GM-30
Revised: 3/1/00

ARCADIS GERAGHTY & MILLER

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project OH000294.0002.00007 Well GM-30

Town/City Moraine, Ohio

County Montgomery State Ohio

Permit No.

Land-Surface Elevation and Datum:

733.13 feet [x] Surveyed

[ ] Estimated

Installation Date(s) 8/24-25/1999

Drilling Method Hollow stem auger

Drilling Contractor Belasco Drilling

Drilling Fluid

Development Technique(s) and Date(s)

Bailer and rope - 8/30/99

Fluid Loss During Drilling gallons

Water Removed During Development 10 gallons

Static Depth to Water 27.3 feet below M.P.

Pumping Depth to Water feet below M.P.

Pumping Duration hours

Yield gpm Date

Specific Capacity gpm/ft

Well Purpose Groundwater monitoring well

Remarks

Prepared by W. Ferguson

Borehole Number: GM-31

ARCADIS GERAGHTY & MILLER

Client: General Motors

Site Location: Moraine, Ohio

Project: Interim Measures

Project No: OH000294.0002.00007

SUBSURFACE PROFILE				SAMPLE				
Depth (feet)	Symbol	Description	Estimated Water Level	Sample Sent To Lab?	Sample Interval	Blows/ft	Recovery (feet)	HNU (ppm)
0		Ground Surface						
		ASPHALT						
1		***SAND/GRAVEL*** sand (fine-medium) 70%; gravel (fine) 20%; silt/clay 10%; very dark brown; slightly moist; loose-pliable			0-2			
2								
3					2-4		1.1	0
4								
5					4-6		2.0	0
6		***SAND/GRAVEL*** sand (fine-medium) 70%; gravel (fine) 20%; silt/clay 10%; moderately yellowish-brown; slightly moist; loose						
7					6-8		1.6	0
8		***SAND/GRAVEL*** sand (fine-medium) 70%; gravel (fine) 20%; silt/clay 10%; moderately yellowish-brown; slightly moist; loose; slight black staining						
9					8-10		1.2	0.5
10		***SAND/GRAVEL*** sand (fine-medium) 60%; gravel (fine-medium) 30%; silt/clay 10%; light yellowish-brown; slightly moist; loose						
11					10-12		1.1	0
12								
13					12-14		1.2	0.2
14								
15					14-16		1.2	0.2
16								

Scientist: Bill Ferguson
Project Manager: Nancy Gillotti
Drilling Co.: Belasco Drilling
Driller: Greg/Rick
Drilling Method: Hollow Stem Auger
Drilling Fluid: NA

Begin Drilling: 8/26/99
End Drilling: 8/27/99
Hole Size: 8"
Total Depth: 62'
Datum:
File Name: gmotors\gmcrfi\winlog\gm-31.log

Surface Elev.: 728.62
North Coor.: 2939.25305
East Coor.: 5913.33502
Converted to Well: Yes
Well Name: GM-31
Revised: 3/1/00

Borehole Number: GM-31

ARCADIS GERAGHTY&MILLER

Client: General Motors

Site Location: Moraine, Ohio

Project: Interim Measures

Project No: OH000294.0002.00007

SUBSURFACE PROFILE				SAMPLE				
Depth (feet)	Symbol	Description	Estimated Water Level	Sample Sent To Lab?	Sample Interval	Blows/ft	Recovery (feet)	HNU (ppm)
17		***SAND/GRAVEL*** sand (fine-medium) 70%; gravel (fine) 20%; silt/clay 10%; moderately yellowish-brown; moist; loose			16-18		1.3	0
18								
19		***SAND/GRAVEL*** sand (fine-coarse) 60%; gravel (fine-medium) 30%; silt/clay 10%; moderate yellowish-brown; moist; loose			18-20		1.0	0
20								
21		***SAND/GRAVEL*** sand (fine-medium) 70%; gravel (fine-medium) 20%; silt/clay 10%; dark yellowish-brown; moist; loose			20-22		1.2	0
22								
23		***SAND/GRAVEL*** sand (fine-medium) 60%; gravel (fine-coarse) 30%; silt/clay 10%; moderately yellowish-brown; moist; loose			22-24		1.1	0
24								
25		***SAND/GRAVEL*** sand (fine-medium) 60%; gravel (fine-medium) 30%; silt/clay 10%; dark yellowish-brown; moist; loose	▼		24-26		0.2	0
26								
27		***SILTY SAND/GRAVEL*** sand (fine-medium) 20%; gravel (fine-medium) 40%; silt/clay 40%; (3" till-like material); moderately yellowish-brown, wet; loose-cohesive			26-28		0.8	0
28								
29		***SAND/GRAVEL*** sand (fine-medium) 60%; gravel (fine-medium) 30%; silty/clay 10%; dark yellowish brown; wet; loose			28-30		1.1	0
30								
31					30-32		1.5	0
32								

Scientist: Bill Ferguson
Project Manager: Nancy Gillotti
Drilling Co.: Belasco Drilling
Driller: Greg/Rick
Drilling Method: Hollow Stem Auger
Drilling Fluid: NA

Begin Drilling: 8/26/99
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ARCADIS GERAGHTY&MILLER

Client: General Motors

Site Location: Moraine, Ohio

Project: Interim Measures

Project No: OH000294.0002.00007

SUBSURFACE PROFILE				SAMPLE				
Depth (feet)	Symbol	Description	Estimated Water Level	Sample Sent To Lab?	Sample Interval	Blows/ft	Recovery (feet)	HNU (ppm)
33					32-34		1.2	0
34								
35					34-36		1.0	0
36								
37					36-38		1.4	0
38								
39					38-40		1.1	0
40								
41		***SAND*** sand (fine-medium) 80%; gravel (fine) 10%; silt/clay 10%; moderate yellowish-brown; wet; loose			40-42		2.0	0
42								
43		***SAND/GRAVEL*** sand (fine-medium) 70%; gravel (fine) 20%; silt/clay 10%; dark yellowish-brown; wet; loose			42-44		2.0	0.2
44								
45					44-46		0.8	0
46								
47					46-48		0.7	0
48								

Scientist: Bill Ferguson
Project Manager: Nancy Gillotti
Drilling Co.: Belasco Drilling
Driller: Greg/Rick
Drilling Method: Hollow Stem Auger
Drilling Fluid: NA

Begin Drilling: 8/26/99
End Drilling: 8/27/99
Hole Size: 8"
Total Depth: 62'
Datum:
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Surface Elev.: 728.62
North Coor.: 2939.25305
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Revised: 3/1/00

Borehole Number: GM-31

ARCADIS GERAGHTY&MILLER

Client: General Motors

Site Location: Moraine, Ohio

Project: Interim Measures

Project No: OH000294.0002.00007

SUBSURFACE PROFILE				SAMPLE				
Depth (feet)	Symbol	Description	Estimated Water Level	Sample Sent To Lab?	Sample Interval	Blows/ft	Recovery (feet)	HNU (ppm)
49		***SAND/GRAVEL*** hitting boulder at or near 48' abandon hole and drill again near 12' south; drill down to 48' and recommence split spooning. Hit metal conduit at 3' with post hole digger; try 3rd hole 1ft south and east of 2nd hole.			48-50		2.0	0
50								
51		sand (fine-medium) 70%; gravel (fine) 20%; silt/clay 10%; dark yellowish-brown; wet; loose			50-52		2.0	0
52								
53					52-54		2.0	0
54								
55					54-56		2.0	0
56		***SAND/GRAVEL*** sand (fine-medium) 70%; gravel (fine) 20%; silt/clay 10%; dark yellowish-brown; wet; loose; some gray color			56-58		2.0	0
57								
58								
59					58-60		2.0	0
60		***TILL*** silt/clay 70%; gravel (fine) 20%; sand (fine) 10%; dark yellowish-brown to dark olive brown; slightly moist; very cohesive						
61					60-62			
62		End of Borehole						
63								
64								

Scientist: Bill Ferguson
Project Manager: Nancy Gillotti
Drilling Co.: Belasco Drilling
Driller: Greg/Rick
Drilling Method: Hollow Stem Auger
Drilling Fluid: NA

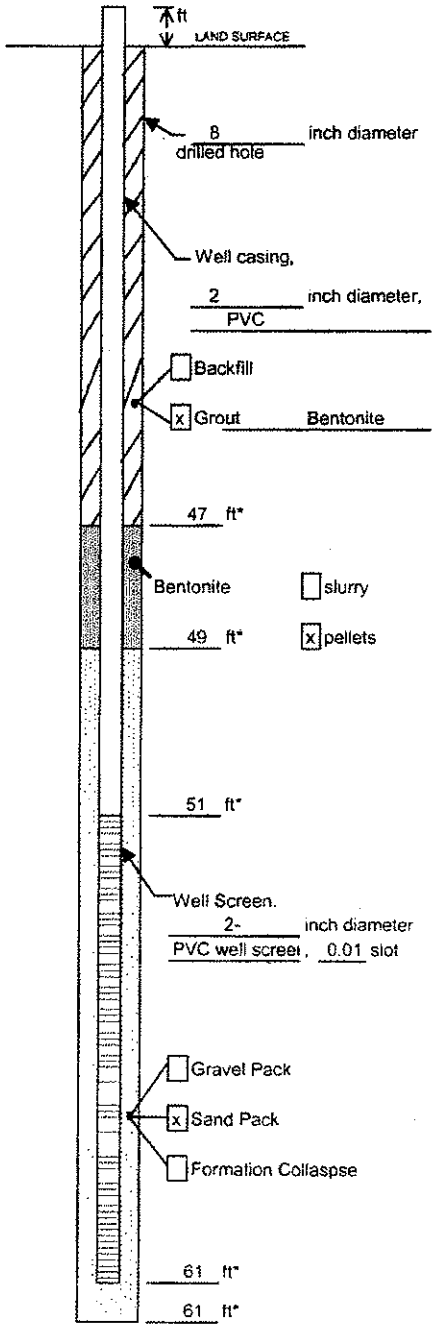
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Hole Size: 8"
Total Depth: 62'
Datum:
File Name: gmotors\gmcrfi\winlog\gm-31.log

Surface Elev.: 728.62
North Coor.: 2939.25305
East Coor.: 5913.33502
Converted to Well: Yes
Well Name: GM-31
Revised: 3/1/00

ARCADIS GERAGHTY & MILLER

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project OH000294.0002.00007 Well GM-31

Town/City Moraine, Ohio

County Montgomery State Ohio

Permit No.

Land-Surface Elevation and Datum:

728.62 feet [x] Surveyed [ ] Estimated

Installation Date(s) 8/26-27/1999

Drilling Method Hollow stem auger

Drilling Contractor Belasco Drilling

Drilling Fluid

Development Technique(s) and Date(s)

Bailer and rope - 9/1/99

Fluid Loss During Drilling gallons

Water Removed During Development gallons

Static Depth to Water feet below M.P.

Pumping Depth to Water feet below M.P.

Pumping Duration hours

Yield gpm Date

Specific Capacity gpm/ft

Well Purpose Groundwater monitoring well

Remarks

Prepared by W. Ferguson

Borehole Number: GM-32

ARCADIS GERAGHTY & MILLER

Client: General Motors

Site Location: Moraine, Ohio

Project: Interim Measures

Project No: OH000294.0002.00007

SUBSURFACE PROFILE				SAMPLE				
Depth (feet)	Symbol	Description	Estimated Water Level	Sample Sent To Lab?	Sample Interval	Blows/ft	Recovery (feet)	HNU (ppm)
0		Ground Surface						
1		***TOP SOIL*** top soil; silt and sand; dark brown; no odor; white soft sand and silt near 2'			0-2		1.7	0
3		***SILTY SAND*** white soft sand and silt; black; clayey sand with traces of gravel; possible small fragments of sludge; a couple of broken glass fragments			2-4		1.7	7.0
5		***SILTY SAND*** little recovery; organic material; soft brownish black; silt and sand; one piece of metal		Yes	4-6		0.2	12.5
7		***CLAYEY SAND*** clayey sand; trace gravel; dark brown-black; moist			6-8		1.7	1.5
9		***CLAY*** clay; dark brown-black; moist; black gravel			8-10		0.5	0.5
11		***CLAYEY SAND*** clayey sand; more sand and gravel			10-12		0.5	2.5
13		***SAND/GRAVEL*** sand and gravel; loose; medium to light brown			12-14		1.17	0.5
15		***SAND/GRAVEL*** sand and gravel; hard; course			14-16		1.3	0
17					16-18		1.7	0
19					18-20		1.9	0

Scientist: Eric Gray
Project Manager: Nancy Gillotti
Drilling Co.: Belasco Drilling
Driller: Greg/Rick
Drilling Method: Hollow Stem Auger
Drilling Fluid: NA

Begin Drilling: 8/31/99 10:00
End Drilling: 9/1/99 16:42
Hole Size: 8"
Total Depth: 60'
Datum:
File Name: gmotors\gmcrfi\winlogs\gm32.log

Surface Elev.: 732.47
North Coor.: 3485.66736
East Coor.: 6070.27614
Converted to Well: Yes
Well Name: GM-32
Revised: 3/1/00

Borehole Number: GM-32

ARCADIS GERAGHTY&MILLER

Client: General Motors

Site Location: Moraine, Ohio

Project: Interim Measures

Project No: OH000294.0002.00007

SUBSURFACE PROFILE				SAMPLE				
Depth (feet)	Symbol	Description	Estimated Water Level	Sample Sent To Lab?	Sample Interval	Blows/ft	Recovery (feet)	HNU (ppm)
21		***SAND/GRAVEL*** sand and gravel; hard; course; few large cobbles			20-22		1.25	0
22		***SAND/GRAVEL*** sand and gravel; hard; course; less cobbles			22-24		1.0	0
23								
24					24-26		0.75	0.5
25								
26					26-28		1.17	0
27								
28					28-30		1.3	0
29								
30		no recovery - a single rock - moist			30-32		0	
31			▼					
32		***SAND/GRAVEL*** water; coarse gravel and sand			32-34		0.67	0
33								
34		***SAND/GRAVEL*** wet; coarse-grained gravel and sand			34-36		1.0	0
35								
36					36-38		1.17	0
37								
38					38-40		1.17	0
39								
40								

Scientist: Eric Gray
Project Manager: Nancy Gillotti
Drilling Co.: Belasco Drilling
Driller: Greg/Rick
Drilling Method: Hollow Stem Auger
Drilling Fluid: NA

Begin Drilling: 8/31/99 10:00
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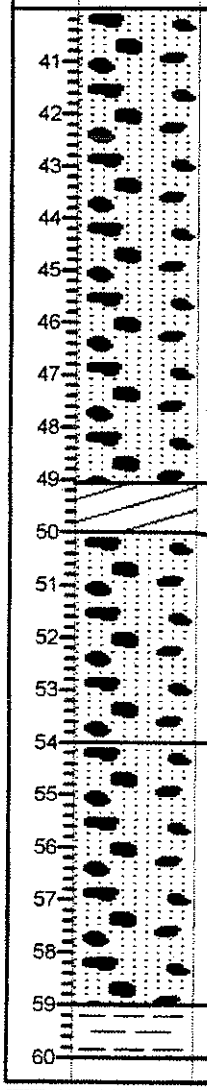
ARCADIS GERAGHTY & MILLER

Client: General Motors

Site Location: Moraine, Ohio

Project: Interim Measures

Project No: OH000294.0002.00007



SUBSURFACE PROFILE				SAMPLE				
Depth (feet)	Symbol	Description	Estimated Water Level	Sample Sent To Lab?	Sample Interval	Blows/ft	Recovery (feet)	HNU (ppm)
41					40-42		1.0	0
42								
43					42-44		0.75	0
44								
45					44-46		0.75	0
46								
47					46-48		0.25	0
48								
49					48-50		0.5	0
50		***CLAY*** clay; grayish-brown; soft; moist						
		SAND/GRAVEL sand and gravel; gray; moist; no clay			50-52		1.0	0
51								
52					52-54		1.3	0
53								
54		***SAND/GRAVEL*** sand and gravel; very wet			54-56		2.0	0
55								
56					56-58		2.0	0
57								
58					58-60		2.0	0
59		***TILL***						
60								

Scientist: Eric Gray
Project Manager: Nancy Gillotti
Drilling Co.: Belasco Drilling
Driller: Greg/Rick
Drilling Method: Hollow Stem Auger
Drilling Fluid: NA

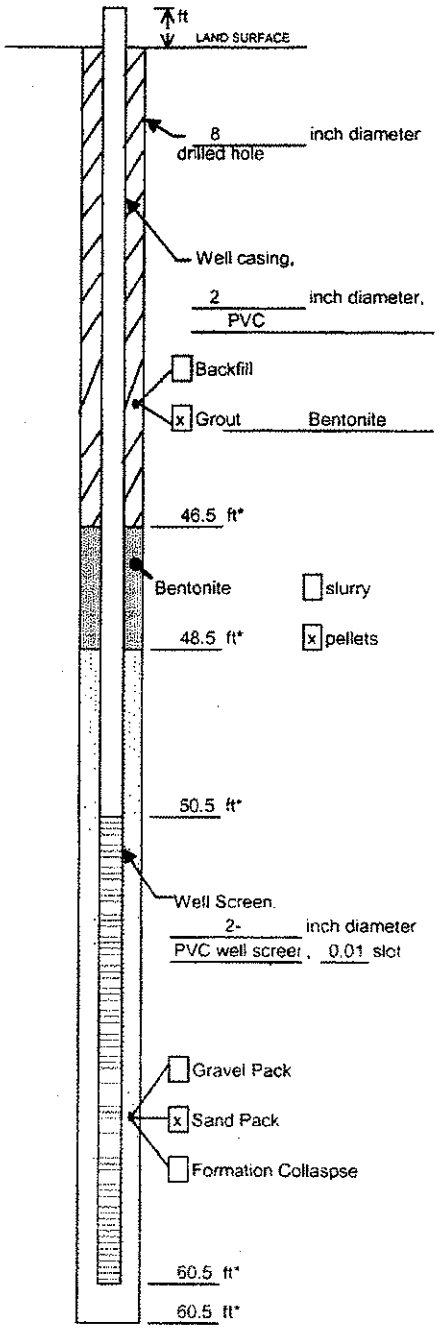
Begin Drilling: 8/31/99 10:00
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Hole Size: 8"
Total Depth: 60'
Datum:
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Surface Elev.: 732.47
North Coor.: 3485.66736
East Coor.: 6070.27614
Converted to Well: Yes
Well Name: GM-32
Revised: 3/1/00

ARCADIS GERAGHTY & MILLER

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project OH000294.0002.00007 Well GM-32

Town/City Moraine, Ohio

County Montgomery State Ohio

Permit No.

Land-Surface Elevation and Datum:

732.47 feet [x] Surveyed [ ] Estimated

Installation Date(s) 8/31/99

Drilling Method Hollow stem auger

Drilling Contractor Belasco Drilling

Drilling Fluid

Development Technique(s) and Date(s)

Bailer and rope - 9/22/99

Fluid Loss During Drilling gallons

Water Removed During Development gallons

Static Depth to Water feet below M.P.

Pumping Depth to Water feet below M.P.

Pumping Duration hours

Yield gpm Date

Specific Capacity gpm/ft

Well Purpose Groundwater monitoring well

Remarks

Prepared by W. Ferguson

KEY TO SYMBOLS

Symbol **Description**

Strata symbols


High plasticity clay (CH -- C)


Inorganic silts and clays (CH-MH -- MC)


Low plasticity clay (CL -- O)


Low-high plasticity clays (CL-CH -- CO)


Silty low plasticity clay (CL-ML -- CZ)


Fill (FILL -- F)


Clayey gravel (GC -- O8)


Clayey sand and gravel (GC-SC -- DO8)


Silty gravel (GM -- Z8)


Silty clayey gravel (GM-GC -- ZO8)


Silty sand and gravel (GM-SM -- 08)


Poorly graded gravel (GP -- G)


Poorly graded gravel with clay (GP-GC -- DGO3)


Poorly graded gravel with silt (GP-GM -- DGZ3)


Poorly graded gravel and sand (GP-SP -- :G)


Well graded gravel (GW -- 83)

Symbol **Description**


Well graded gravel with clay (GW-GC -- 83O)


Well graded gravel with silt (GW-GM -- 83Z)


Well graded gravel/ clayey gravel (GW-GP -- 83G)


Well graded gravel and sand (GW-SW -- 83D)


Elastic silt (MH -- M)


Silt (ML -- Z)


High plasticity organic clays (OH -- 5)


Low plasticity organic silts (OL -- 4)


Basalt (or generic rock) (ROCK --])


Clayey sand (SC -- DO)


Silty sand (SM -- 0)


Poorly graded clayey silty sand (SM-SC -- :ZO)


Poorly graded silty fine sand (SM-ML -- :Z)


Poorly graded sand (SP -- :)


Poorly graded sand with clay (SP-SC -- :R)


Poorly graded sand with silt (SP-SM -- :=)

KEY TO SYMBOLS

Symbol	Description
Strata symbols	
	Well graded sand (SW -- D)
	Well graded sand with clay (SW-SC -- DR)
	Well graded sand with silt (SW-SM -- D=)
	Interlayered well/poorly graded sand (SW-SP -- D:)
	Silty sandy clay (VC -- 0C)
	Variable gravel and silty sand mix (VG -- 0G)
	Variable sand and silt mix (VS -- 0Y)
	Agglomerate (\)
	Blank (E)
	CH fraction (U)
	CL fraction (R)
	Claystone (H)
	Cobble frac (A)
	Cobbles (B)
	Competent (K)
	Dolomite (()

Symbol	Description
	Extra fine gravel (3)
	Fine gravel (Y)
	Frac rock (X)
	Granite (/)
	Gravel (8)
	Gravel frac (9)
	Intrusive (V)
	Limestone (L)
	Metamorphic rocks ())
	MH fraction (?)
	ML fraction (=)
	Mudstone (7)
	Organics (J)
	Paving (P)
	Peat (Q)
	Sand (S)
	Sandstone (N)
	Schist ($)

KEY TO SYMBOLS

Symbol	Description
Strata symbols	
	Sediment (2)
	Shale (>)
	Shell fragments (&)
	Siltstone (I)
	Topsoil (T)
	Weathered (W)
	EXTRA: alternating dot-dash pattern (|)
	EXTRA: dashed horizontal lines (%)
	EXTRA: medium closely-spaced dots (6)
	EXTRA: narrow-spaced horizontal dashed lines (-)
	EXTRA: random dot pattern (1)
	EXTRA: regularly spaced "V"'s (<)

Symbol	Description
	EXTRA: very narrow cross-hatching (!)
	EXTRA: dashed lines with 3 dots above each dash (.)
	EXTRA: large widely-spaced dots (*)
	EXTRA: small filled triangles ([)
	EXTRA: semi-random dot pattern (:)
	EXTRA: semi-random triangle pattern (')
	EXTRA: zigzag lines (#)
	EXTRA: grass pattern ({)
	EXTRA: tilde sign (})
	EXTRA: randomly arranged square boxes (;)
Misc. Symbols	
	Drill rejection (BOTTOM)
	Boring continues (CONTINUE)
	Water table during drilling (LWATERNF)
	Water table at boring completion (LWATER)

KEY TO SYMBOLS

Symbol	Description
Misc. Symbols	
	Water table during drilling (WATER)
	Water table at boring completion (FWATER)
	Water table during drilling (RWATERNF)
	Water table at boring completion (RWATER)
	(RTARROW)
	Depth to caving (CAVED)
	(CIRCLE)
	(FCIRCLE)
	(HATCHED)
	(XHATCHED)
	(FILLED)
	(BARGRAPH)
	(NOMARKER)
Soil Samplers	
	Auger (A)
	Bulk sample taken from 6 in. auger (B)
	California sampler (C)

Symbol	Description
	Direct Push (D)
	Corps of Engineers sampler (E)
	Bulk/Grab sample (F)
	Piston (I)
	Pitcher (L)
	Denison (O)
	Standard penetration test (P)
	Rock core (R)
	Undisturbed thin wall Shelby tube (S)
	No recovery (X)
	EXTRA: (downward pointing white triangle on black background) (G)
	EXTRA: (double vertical lines) (H)
	EXTRA: (downward pointing outline arrow) (J)
	EXTRA: (downward pointing filled arrow) (K)
	EXTRA: (split diagonally left to right, white on left, black on right) (N)
	EXTRA: (diagonal line from right to left) (T)

KEY TO SYMBOLS

Symbol Description

Soil Samplers



EXTRA: (generic sampling interval)
(U)



EXTRA: (generic sampling interval)
(V)

Monitor Well Details

flush-mount cover
(COVER -- FLUSH,)



riser with cover and protective casing
(CASED RISER -- PROTECT,)



pipe riser
(RISER -- BLANKPVC,)



covered riser
(COVERED RISER -- CAPPED,)



recessed cover set in concrete
(RECESSED -- RECESSED, 13)



top of well, recessed pipe
(SUNKEN -- SUNKEN, 13)



protective casing set in concrete
(CASED -- CASED, 13)



concrete seal
(CONCRETE -- BLANKPVC, 13)



gravel backfill
(GRAVEL -- BLANKPVC, *1)



pipe set in cement grout w/ protective casing
(CEMENT CASED -- CASED, E)



unknown backfill type, blank PVC
(INDETERMINATE -- BLANKPVC, E)



assorted cuttings
(CUTTINGS -- BLANKPVC, O)



bentonite slurry
(BENTONITE -- BLANKPVC, P)

Symbol Description



bentonite pellets
(PELLETS -- BLANKPVC, I)



silica sand, blank PVC
(SAND -- BLANKPVC, 6)



slotted pipe w/ sand
(SLOTTED -- SLOTDPVC, 6)



slotted pipe, unknown backfill
(SLOT/NO FILL -- SLOTDPVC, E)



stylized slotted pipe with no back-fill
(STYLIZED SLOT -- ALTSLOT, E)



endcap on pipe packed in sand
(ENDCAP -- ENDCAP, 6)



no pipe, filler material
(END -- ,])



no pipe, sealed
(SEALED -- , P)



silica sand, no pipe (end plug)
(SAND PLUG -- , 6)



end of well installation
(BLANK -- , E)

Sample Destinations



Composite Sample to Lab
(C)



Grab Sample to Lab
(G)



Split-Spoon not Analyzed
(S)

ARCADIS

Log of Boring: GM-33

Waste Pile/Staging Area Investigation

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	4,5,7,7	16	1.3				FILL	FILL topsoil; very soft; sandy silt; dry; brown	
2	5,4,3,4	20	1.7				SW	SAND very loose; moist; dark brown/black; sand 80%; gravel 15%; silt 5%; well graded	
4	3,3,4,2	19	12.3				CL	CLAY soft; moist; dark brown-black; clay 80%; sand 15%; gravel 5%; high plasticity	
6	2,3,4,4	20	18.2				CL	CLAY medium stiff; moist; olive gray; clay 80%; sand 15%; silt 5%; oily; stained; medium plasticity	
8	8,12,8,9	19	15.2				SW	SAND medium dense; moist; black; sand 80%; gravel 10%; silt 10%; oily; stained; well graded	
10	10,8,12, 30	19	15.0				SW	SAND medium dense; moist; black; sand 80%; gravel 15%; silt 5%; oily; stained; well graded	
12									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Denzel Wright
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: Cindy Capell
Total Depth: 58'
Surface Elev.: 730.30
North Coor.: 2277.98

Begin Drilling: 4/2/01
End Drilling: 4/2/01
Converted to Well: Y Well I.D.:
East Coor.: 5761.66

Remarks: Analyzed for TCL VOCs, SVOCs, PCBs, TAL metals

Project No.: OH000294.0002.00006 Datum: Filename: April Logs

ARCADIS

Log of Boring: GM-33

Waste Pile/Staging Area Investigation

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
12	18,21,30, 18	17	19.2				SW	SAND medium dense; moist; light gray; sand 85%; gravel 10%; silt 5%; well graded	
14	10,13,19, 35	19	14.2				SW	SAND medium dense; moist; light gray; sand 90%; gravel 10%; well graded	
16	10,30,30, 40	19.5	7.5				SW	SAND dense; moist; light gray; sand 85%; gravel 15%; well graded	
18	46,48,50	16	8.1				SW	SAND refusal; dense; moist; light gray; sand 85%; gravel 10%; silt 5%; well graded	
20	12,34,35, 50	22	15.0				SW	SAND dense; moist; light gray; sand 85%; gravel 10%; silt 5%; well graded	
22	16,30,30	20	1.8				SW	SAND spoon refusal; dense; moist; yellowish-orange; sand 90%; gravel 10%	
24									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Denzel Wright
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: Cindy Capell
Total Depth: 58'
Surface Elev.: 730.30
North Coor.: 2277.98

Begin Drilling: 4/2/01
End Drilling: 4/2/01
Converted to Well: Y Well I.D.:
East Coor.: 5761.66

Remarks: Analyzed for TCL VOCs, SVOCs, PCBs, TAL metals

Project No.: OH000294.0002.00006 Datum: Filename: April Logs

ARCADIS

Log of Boring: GM-33

Waste Pile/Staging Area Investigation

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
24	17,9,9,9	20	0.3				GW	GRAVEL medium dense; moist; yellowish-orange; gravel 60%; sand 30%; silt 10%; well graded	
26	9,10,24, 30	20	7.8				SW	SAND medium dense; moist; light brown-black; sand 80%; gravel 15%; silt 5%; oily stained; well graded	
28	35,22,24, 24	20	7.3				SW	SAND medium dense; moist; light brown-gray; sand 60%; gravel 35%; silt 5%; oily stained; well graded	▼
30	18,15,38, 38	7	1.7				SW	SAND dense; wet; light brown; sand 85%; gravel 10%; silt 5%; well graded	
32	21,28,35, 40	22	2.3				GW	GRAVEL dense; wet; light brown; gravel 60%; sand 35%; silt 5%; well graded	
34	20,24,24, 28	24	0.3				GW	GRAVEL dense; wet; light brown; gravel 80%; sand 20%; well graded	
36									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Denzel Wright
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: Cindy Capell
Total Depth: 58'
Surface Elev.: 730.30
North Coor.: 2277.98

Begin Drilling: 4/2/01
End Drilling: 4/2/01
Converted to Well: Y Well I.D.: _____
East Coor.: 5761.66

Remarks: Analyzed for TCL VOCs, SVOCs, PCBs, TAL metals

Project No.: OH000294.0002.00006 Datum: _____ Filename: April Logs

ARCADIS

Log of Boring: GM-33

Waste Pile/Staging Area Investigation

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
36	17,13,20, 23	22	3.1				GW	GRAVEL dense; wet; light brown; gravel 60%; sand 40%; well graded	
38	17,23,28, 30	24	6.1				SW	SAND dense; wet; light brown; sand 80%; gravel >15%; silt <5%; well graded	
40	21,21,25, 25	22	5.7				GW	GRAVEL dense; wet; light brown; sand 85%; gravel 10%; silt 5%; well graded	
42	31,21,17, 14	18	0.1				SW	SAND dense; wet; light brown; well graded; sand 85%; silt 10%; gravel 5%	
44	13,17,25, 30	24	0.3				SW	SAND dense; wet; light brown; well graded; sand 80%; gravel 15%; silt 5%	
46	25,17,25, 28	22	0.9				GW	GRAVEL dense; wet; light brown; well graded; gravel 70%; sand 25%; silt <5%	
48									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Denzel Wright
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: Cindy Capell
Total Depth: 58'
Surface Elev.: 730.30
North Coor.: 2277.98

Begin Drilling: 4/2/01
End Drilling: 4/2/01
Converted to Well: Y Well I.D.: ____
East Coor.: 5761.66

Remarks: Analyzed for TCL VOCs, SVOCs, PCBs, TAL metals

Project No.: OH000294.0002.00006 Datum: ____ Filename: April Logs

ARCADIS

Log of Boring: GM-33

Waste Pile/Staging Area Investigation

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
48	30,32,40, 50	22	0.9				GW	GRAVEL dense; wet; light brown; well graded; gravel 60%; sand 40%; silt <3%	
50	16,21,30, 35	24	0.0				SW	SAND dense; wet; light brown; well graded; sand 80%; gravel 15%; silt <5%	
52	12,24,30, 37	24	0.0				SP	SAND dense; wet; light brown; poorly graded; sand 90%; gravel 10%; silt <3%	
54	23,28,33, 33	24	0.0				SW	SAND dense; wet; light brown; well graded; sand 80%; gravel 15%; silt 5%	
							SP	SAND dense; wet; gray; poorly graded; well sorted; sand 95%; silt 5%	
56	16,22,50	24	0.0				SW	SAND refusal; dense; wet; light brown; well graded; sand 80%; gravel 15%; silt 5%	
							ML	SILT hard; wet; gray; poorly graded; greenish gray; silt 60%; clay 30%; sand <10%	
58								Bottom of boring	
60									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Denzel Wright
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: Cindy Capell
Total Depth: 58'
Surface Elev.: 730.30
North Coor.: 2277.98

Begin Drilling: 4/2/01
End Drilling: 4/2/01
Converted to Well: Y Well I.D.: ____
East Coor.: 5761.66

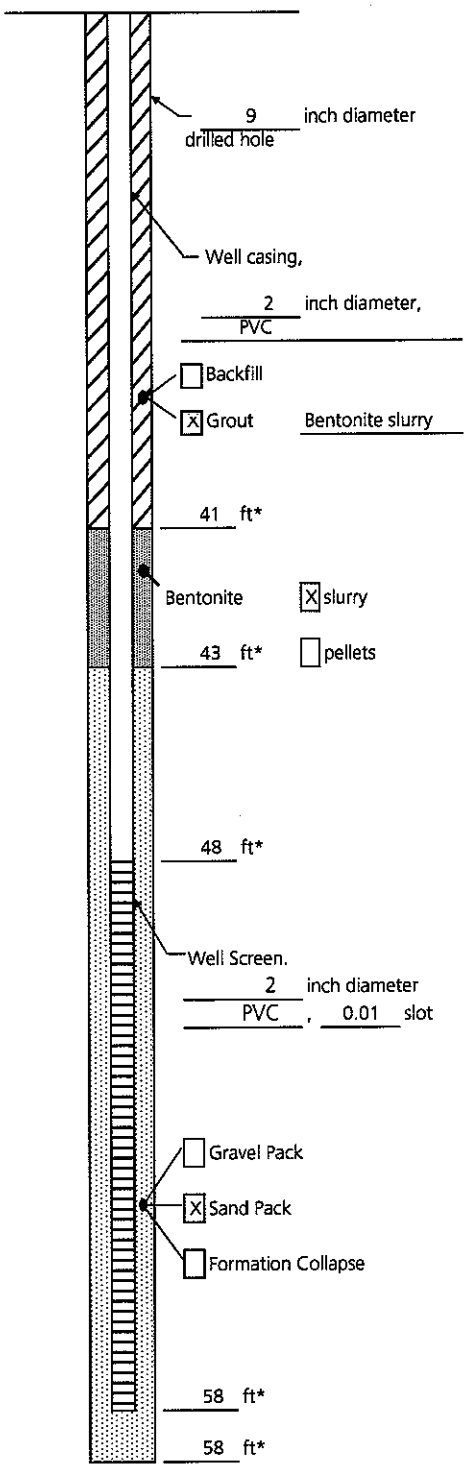
Remarks: Analyzed for TCL VOCs, SVOCs, PCBs, TAL metals

Project No.: OH000294.0002.00006 Datum: ____ Filename: April Logs

ARCADIS G&M

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project OH000294.0004.00004 Well GM-33

Town/City Moraine

County Montgomery State Ohio

Permit No.

Land-Surface (LS) Elevation and Datum:

730.30 LS/729.77 TOC feet [X] Surveyed [ ] Estimated

Installation Date(s) 4/2/2001

Drilling Method Hollow stem auger

Drilling Contractor Wright Drilling

Drilling Fluid N/A

Development Technique(s) and Date(s)

Pumping and surge block 4/10/01 - 4/16/01

Fluid Loss During Drilling N/A gallons

Water Removed During Development 255 gallons

Static Depth to Water 28.04 feet below M.P.

Pumping Depth to Water 50.80 feet below M.P.

Pumping Duration 2 hours

Yield 1.3 gpm Date 4/11/2001

Specific Capacity NA gpm/ft

Well Purpose Groundwater sampling and water level measurements.

Remarks Flush mount.

Prepared by C. Capell

ARCADIS

Log of Boring: GM-34

Waste Pile/Staging Area Investigation

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	6,9,11	11	1.3				CL	CLAY asphalt 5"; fill dense; moist; light brown; well graded; clay 30%; silt 40%; gravel 15%; sand 10%	
2	6,9,7,6	22	0.9				GW	GRAVEL fill; dense; moist; light brown; well graded; gravel 60%; sand 20%; clay 10%; silt 10%	
4	0,1,3,4	0						No recovery	
6	2,3,6,4	13.5	1.7				ML	SILT dense; moist; light brown; well graded; clay 35%; silt 35%; sand 15%; gravel 15%	
8	2,3,3,6	22.5	0.9				CH	CLAY medium stiff; moist; light brown; clay 80%; silt 10%; sand <5%; gravel <5%; medium plasticity	
10	3,12,12, 11	24	0.7				SW	SAND loose; moist; light brown; well graded; sand 70%; gravel 20%; silt 10%	
12									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Denzel Wright
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: Cindy Capell
Total Depth: 36'
Surface Elev.: 731.06
North Coor.: 2278.47

Begin Drilling: 4/3/01
End Drilling: 4/3/01
Converted to Well: Y Well I.D.:
East Coor.: 5769.74

Remarks: Analyzed for TCL VOCs, SVOCs, PCBs, TAL metals

Project No.: OH000294.0002.00006 Datum: Filename: April Logs

ARCADIS

Log of Boring: GM-34

Waste Pile/Staging Area Investigation

Depth (feet)	Blows (/6 in.)	Recovery (inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
12	16,16,34, 22	24	2.5				SW	SAND medium dense; moist; yellowish orange; well graded; sand 75%; gravel 25%; silt <3%	
14	14,45,45, 40	24	6.6				SW	SAND medium dense; moist; light gray; well graded; sand 75%; gravel 25%; silt <3%	
16	25,27,30, 32	24	9.9				SW	SAND medium dense; moist; light gray; well graded; sand 75%; gravel 25%; silt <3%	
18	9,45,50	18	10.2				SW	SAND medium dense; moist; light gray; well graded; sand 75%; gravel 25%; silt <3%; spoon refusal	
20	23,50,-,-,	12	7.2				SW	SAND medium dense; moist; light gray; well graded; sand 75%; gravel 25%; silt <3%; spoon refusal	
22	21,50/5,-,-	12	8.6				SW	SAND medium dense; moist; light gray; well graded; sand 75%; gravel 25%; silt <3%; spoon refusal	
24									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Denzel Wright
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: Cindy Capell
Total Depth: 36'
Surface Elev.: 731.06
North Coor.: 2278.47

Begin Drilling: 4/3/01
End Drilling: 4/3/01
Converted to Well: Y Well I.D.:
East Coor.: 5769.74

Remarks: Analyzed for TCL VOCs, SVOCs, PCBs, TAL metals

Project No.: OH000294.0002.00006 Datum: Filename: April Logs

ARCADIS

Log of Boring: GM-34

Waste Pile/Staging Area Investigation

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
24	31,50/5,-,-	12	4.0				SW	SAND dense; moist; light brown; well graded; sand 80%; gravel 15%; silt <5%; spoon refusal	
26	45,34,34, 16	20	1.7				SW	SAND dense; moist; light gray-light brown; well graded; sand 80%; gravel 15%; silt <5%	
28	16,21,28, 45	22	2.1				SW	SAND dense; moist; light gray-light brown; well graded; sand 80%; gravel 15%; silt <5%	
30	21,40,50,-	18	3.1				SW	SAND dense; moist; light gray-light brown; well graded; sand 80%; gravel 15%; silt <5%; spoon refusal	▼
32	40,50	8	1.7				SW	SAND dense; wet; olive gray; well graded; poorly sorted; sand 80%; gravel; 15%; silt <5%; spoon refusal	
34	10,50/5	12	3.5				SW	SAND dense; wet; olive gray; well graded; sand 80%; gravel; 15%; silt <5%; spoon refusal	
36									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Denzel Wright
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: Cindy Capell
Total Depth: 36'
Surface Elev.: 731.06
North Coor.: 2278.47

Begin Drilling: 4/3/01
End Drilling: 4/3/01
Converted to Well: Y Well I.D.: ____
East Coor.: 5769.74

Remarks: Analyzed for TCL VOCs, SVOCs, PCBs, TAL metals

Project No.: OH000294.0002.00006 Datum: ____ Filename: April Logs

ARCADIS

Log of Boring: GM-34

Waste Pile/Staging Area Investigation

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
36								Bottom of boring	
38									
40									
42									
44									
46									
48									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Denzel Wright
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: Cindy Capell
Total Depth: 36'
Surface Elev.: 731.06
North Coor.: 2278.47

Begin Drilling: 4/3/01
End Drilling: 4/3/01
Converted to Well: Y Well I.D.:
East Coor.: 5769.74

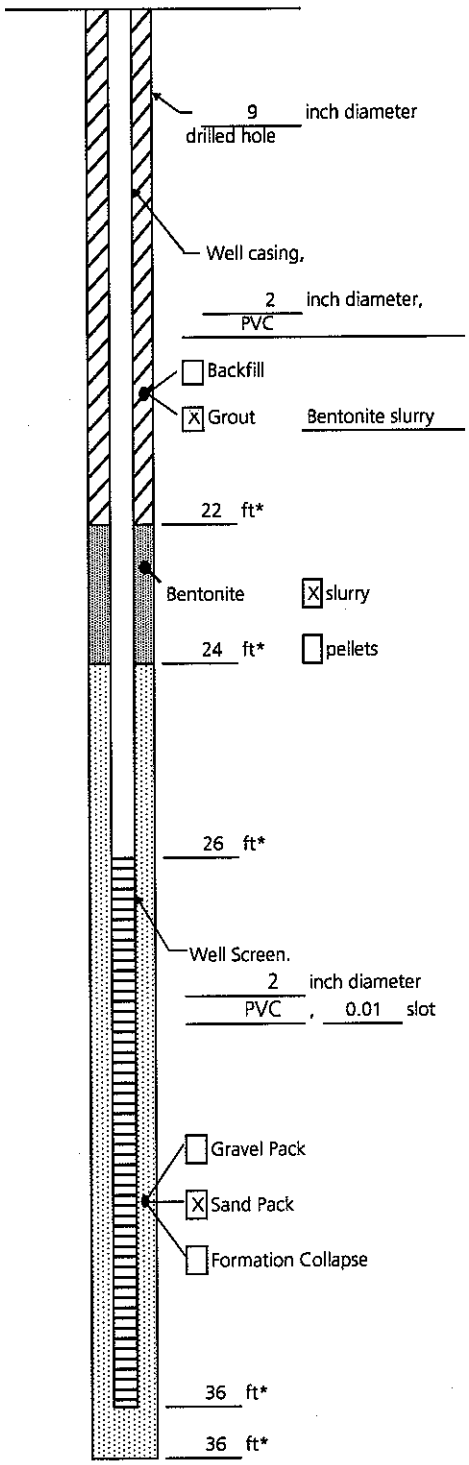
Remarks: Analyzed for TCL VOCs, SVOCs, PCBs, TAL metals

Project No.: OH000294.0002.00006 Datum: Filename: April Logs

ARCADIS G&M

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project OH000294.0004.00004 Well GM-34

Town/City Moraine

County Montgomery State Ohio

Permit No.

Land-Surface (LS) Elevation and Datum:

731.06 LS/730.56 TOC feet [X] Surveyed [ ] Estimated

Installation Date(s) 4/3/2001

Drilling Method Hollow stem auger

Drilling Contractor Wright Drilling

Drilling Fluid N/A

Development Technique(s) and Date(s)

Pumping 4/9/01

Fluid Loss During Drilling N/A gallons

Water Removed During Development 36 gallons

Static Depth to Water 28.84 feet below M.P.

Pumping Depth to Water 28.85 feet below M.P.

Pumping Duration 1.05 hours

Yield 1.41* gpm Date 4/10/2001

Specific Capacity NA gpm/ft

Well Purpose Groundwater sampling and water level measurements.

Remarks Flush mount.

*1.26 gpm on 4/10/01

1.41 gpm on 4/9/01

Prepared by C. Capell

ARCADIS

Log of Boring: GM-35

Waste Pile/Staging Area Investigation

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	-,8,12,15	18	1.5				SW	SAND 7" of concrete; fill; medium dense; dry; yellowish orange; well graded; sand 80%; gravel 15%; silt <5%	
2	16,13,8,7	20	1.7				SW	SAND fill; medium dense; dry; yellowish orange; well graded; sand 80%; gravel 15%; silt <5%	
4	9,6,5,4	22	1.7				SW	SAND fill; medium dense; dry; yellowish orange; well graded; sand 80%; gravel 15%; silt <5%	
6	4,9,9,6	20	3.4				SW	SAND loose; moist; white-black-dark brown; well graded; sand 85%; gravel 15%; silt <5%; pieces of wood present	
8	3,6,3,4	22	109.9				CL	CLAY medium stiff; low-medium plasticity; moist; dark gray-black; clay 65%; silt 25%; sand <5%; gravel <5%	
10	3,3,6,10	22	3.0				CL	CLAY medium stiff; low-medium plasticity; moist; dark gray-black; clay 60%; silt 20%; sand 10%; gravel 10%	
12									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Brian Wright
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: Cindy Capell
Total Depth: 70'
Surface Elev.: 731.56
North Coor.: 1750.11

Begin Drilling: 4/4/01
End Drilling: 4/6/01
Converted to Well: Y Well I.D.: _____
East Coor.: 5509.95

Remarks: Analyzed for TCL VOCs, SVOCs, PCBs, TAL metals

Project No.: OH000294.0002.00006 Datum: _____ Filename: April Logs

ARCADIS

Log of Boring: GM-35

Waste Pile/Staging Area Investigation

Depth (feet)	Blows (/6 in.)	Recovery (inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
12	10,11,8, 12	18	2.5				SW	SAND loose; moist; light brown; well graded; sand 80%; gravel 15%; silt <5%	
14	11,19,19, 20	24	1.9				SW	SAND loose; moist; light brown; well graded; sand 80%; gravel 15%; silt <5%	
16	12,20,17, 17	24	2.5				SW	SAND loose; moist; light brown; well graded; sand 80%; gravel 15%; silt <5%	
18	12,14,16, 26	24	2.5				GW	GRAVEL/SAND loose; moist; light brown; well graded; gravel 60%; sand 35-40%; silt <5%	
20	50,26,50	18	2.3				SW	SAND medium dense; moist; light brown; well graded; sand 80%; gravel 15%; silt <5%	
22	50/5	0	-					No recovery; spoon refusal	
24									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Brian Wright
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: Cindy Capell
Total Depth: 70'
Surface Elev.: 731.56
North Coor.: 1750.11

Begin Drilling: 4/4/01
End Drilling: 4/6/01
Converted to Well: Y Well I.D.: _____
East Coor.: 5509.95

Remarks: Analyzed for TCL VOCs, SVOCs, PCBs, TAL metals

Project No.: OH000294.0002.00006 Datum: _____ Filename: April Logs

ARCADIS

Log of Boring: GM-35

Waste Pile/Staging Area Investigation

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
24	20,30,30, 50	22	2.1				SW	SAND medium dense; moist; light brown; well graded; sand 80%; gravel 15%; silt <5%	
26	30,35,50,-	18	2.0				SW	SAND refusal; medium dense; moist; light brown; well graded; sand 80%; gravel 15%; silt <5%	
28	25,50/5	12	2.1				SW	SAND refusal; medium dense; moist; light brown; well graded; sand 80%; gravel 15%; silt <5%	
30	30,26,30, 30	24	3.4				SW	SAND medium dense; wet; yellowish orange; well graded; sand 80%; gravel 15%; silt <5%	▼
32	12,15,24, 24	13	2.3				GW	GRAVEL/SAND medium dense; wet; yellowish orange; well graded; gravel 75%; sand 20%; silt <5%	
34	21,21,30, 50	21	2.8				GW	GRAVEL/SAND medium dense; wet; yellowish orange; well graded; gravel 75%; sand 20%; silt <5%	
36									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Brian Wright
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: Cindy Capell
Total Depth: 70'
Surface Elev.: 731.56
North Coor.: 1750.11

Begin Drilling: 4/4/01
End Drilling: 4/6/01
Converted to Well: Y Well I.D.: _____
East Coor.: 5509.95

Remarks: Analyzed for TCL VOCs, SVOCs, PCBs, TAL metals

Project No.: OH000294.0002.00006 Datum: _____ Filename: April Logs

ARCADIS

Log of Boring: GM-35

Waste Pile/Staging Area Investigation

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
36	6,6,8,8	15	1.7				GW	GRAVEL/SAND medium dense; wet; yellowish orange; well graded; gravel 75%; sand 20%; silt <5%	
38	39,50/5	14	3.6				SW	SAND/GRAVEL refusal; dense; wet; light brown-yellowish orange; well graded; sand 80%; gravel 15%; silt <5%	
40	6,9,9,15	12	1.5				SW	SAND/GRAVEL loose; wet; yellow orange; well graded; sand 80%; gravel 10%; silt <5%	
42	10,26,30, 35	16.5	1.9				SW	SAND/GRAVEL medium dense; wet; yellowish orange; well graded; sand 75%; gravel 15%; silt <5%	
44	8,15,41, 30	21	3.8				SP	SAND/GRAVEL medium dense; wet; light brown; poorly graded; sand 75%; gravel 20%; silt <5%	
46	7,10,10, 20	22	4.1				SP	SAND/GRAVEL medium dense; wet; light brown; poorly graded; sand 75%; gravel 20%; silt <5%	
48									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Brian Wright
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: Cindy Capell
Total Depth: 70'
Surface Elev.: 731.56
North Coor.: 1750.11

Begin Drilling: 4/4/01
End Drilling: 4/6/01
Converted to Well: Y Well I.D.: _____
East Coor.: 5509.95

Remarks: Analyzed for TCL VOCs, SVOCs, PCBs, TAL metals

Project No.: OH000294.0002.00006 Datum: _____ Filename: April Logs

ARCADIS

Log of Boring: GM-35

Waste Pile/Staging Area Investigation

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
48	30,50/6	9	2.8				SP	SAND/GRAVEL medium dense; wet; light brown; poorly graded; sand 75%; gravel 20%; silt <5%; spoon refusal	
50	8,20,30, 50/6	24	6.9				SP	SAND loose; wet; brown; poorly graded; sand 95%; silt <5%	
52	13,20,25, 30	24	6.2				SW	SAND/GRAVEL dense; wet; brown; well graded; sand 80%; gravel 15%; silt <5%	
54	16,35,50/ 3	18	7.3				SW	SAND/GRAVEL very dense; wet; brown; well graded; sand 75%; gravel 20%; silt <5%	
56	7,14,24, 38	24	5.4				SP	SAND dense; wet; brown; poorly graded; sand 90%; gravel 5%; silt <5%	
58	10,16,28, 32	24	5.1				SP	SAND dense; wet; brown; poorly graded; sand 90%; gravel 5%; silt <5%	
60									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Brian Wright
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: Cindy Capell
Total Depth: 70'
Surface Elev.: 731.56
North Coor.: 1750.11

Begin Drilling: 4/4/01
End Drilling: 4/6/01
Converted to Well: Y Well I.D.:
East Coor.: 5509.95

Remarks: Analyzed for TCL VOCs, SVOCs, PCBs, TAL metals

Project No.: OH000294.0002.00006 Datum: Filename: April Logs

ARCADIS

Log of Boring: GM-35

Waste Pile/Staging Area Investigation

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
60	10,18,20, 22	24	2.3				SP	SAND dense; wet; brown; poorly graded; sand 90%; gravel 10%; silt <5%	
62	46,50/6	12	0.0				CL	SAND/CLAY very soft; wet; low plasticity; gray; clay 70%; silt 20%; sand 10%	
64	44,50/6	20	0.0				SP	SAND/GRAVEL refusal; dense; wet; olive gray; poorly graded; sand 75%; gravel; 20%; silt <5%	
66	48,50/5	0						No recovery	
68	38,50/6	18	0.0				CL	SILT/CLAY hard; moist; low plasticity; olive gray; clay 55%; silt 40%; sand <5%	
70								Bottom of boring	
72									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Brian Wright
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: Cindy Capell
Total Depth: 70'
Surface Elev.: 731.56
North Coor.: 1750.11

Begin Drilling: 4/4/01
End Drilling: 4/6/01
Converted to Well: Y Well I.D.: _____
East Coor.: 5509.95

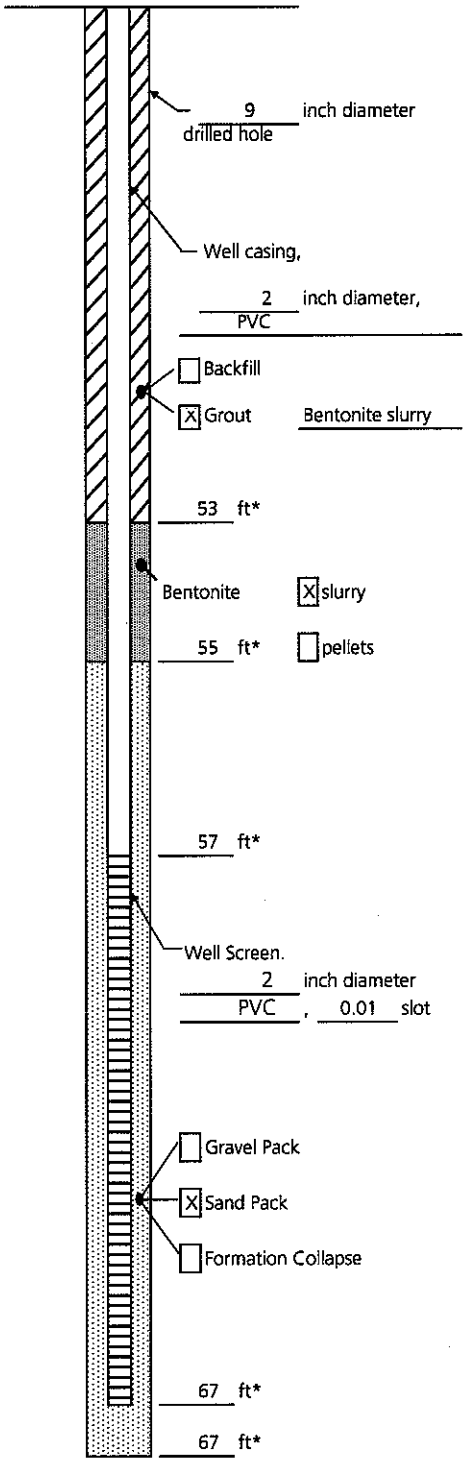
Remarks: Analyzed for TCL VOCs, SVOCs, PCBs, TAL metals

Project No.: OH000294.0002.00006 Datum: _____ Filename: April Logs

ARCADIS G&M

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project OH000294.0004.00004 Well GM-35

Town/City Moraine

County Montgomery State Ohio

Permit No.

Land-Surface (LS) Elevation and Datum:

731.56 LS/731.27 TOC feet [X] Surveyed [ ] Estimated

Installation Date(s) 4/6/2001

Drilling Method Hollow stem auger

Drilling Contractor Wright Drilling

Drilling Fluid N/A

Development Technique(s) and Date(s)

Pumping and surging 4/11/01 - 4/16/01

Fluid Loss During Drilling N/A gallons

Water Removed During Development 340 gallons

Static Depth to Water 30.02 feet below M.P.

Pumping Depth to Water NR feet below M.P.

Pumping Duration 3.92 hours

Yield 3.91* gpm Date 4/11/2001

Specific Capacity NA gpm/ft

Well Purpose Groundwater sampling and water level measurements.

Remarks Unknown amount of water added during well installation to control heaving sands. Flush mount.

*Started at 1.03 gpm; final 36 minutes at 3.91 gpm

Prepared by C. Capell

ARCADIS

Log of Boring: GM-36

Waste Pile/Staging Area Investigation

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	-,8,11,16	15	0.0				SW	SAND 7" of concrete; loose; dry; light gray white; sand 90%; gravel 5%; silt <5%	
2	25,23,12, 15	24	1.3				SP	SAND medium dense; dry-moist; white-purple-light brown; poorly graded; sand 100%	
4	7,7,8,5	22	5.4				SP	SAND medium dense; dry-moist; white-purple-light brown; poorly graded; sand 100%	
6	3,3,2,1	22	6.8				SP	SAND loose; moist; white-light gray-brown; poorly graded; sand 100% wet at 7' and light gray-white	
8	2,7,7,8	18	1.1				CH	CLAY medium stiff; moist; brown; clay 80%; silt 20%; medium plasticity	
10	1,3,5,4	20	1.3				CL	CLAY medium stiff; moist; olive gray; clay 70%; silt 20%; gravel 10%; medium plasticity	
12									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Geologist: Cindy Capell
Begin Drilling: 4/3/01
Driller: Denzel Wright
Total Depth: 34'
End Drilling: 4/3/01
Drilling Method: Hollow Stem Auger
Surface Elev.: 731.44
Converted to Well: Y Well I.D.:
Drilling Fluid: None
North Coor.: 1754.76
East Coor.: 5551.00
Remarks: Analyzed for TCL VOCs, SVOCs, PCBs, TAL metals
Project No.: OH000294.0002.00006
Datum:
Filename: April Logs

ARCADIS

Log of Boring: GM-36

Waste Pile/Staging Area Investigation

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
12	2,4,10,7	20	0.5				SP	SAND loose; moist; light brown; poorly graded; sand 90%; gravel 10%	
14	3,4,10,10	20	1.5				SP	SAND loose; moist; light brown; poorly graded; sand 90%; gravel 10%	
16	4,8,8,8	20	0.9				SP	SAND loose; moist; light brown; poorly graded; sand 90%; gravel 10%	
18	10,16,17, 17	20	0.5				SP	SAND loose; moist; light brown; poorly graded; sand 90%; gravel 10%	
20	5,7,11,12	22	0.9				SP	SAND loose; moist; olive gray; poorly graded; sand 95%; gravel <5%	
22	19,25,30, 30	22	0.7				SW	SAND medium dense; moist; light brown; well graded; sand 70%; gravel 35%; silt <5%	
24									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Denzel Wright
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: Cindy Capell
Total Depth: 34'
Surface Elev.: 731.44
North Coor.: 1754.76

Begin Drilling: 4/3/01
End Drilling: 4/3/01
Converted to Well: Y Well I.D.: _____
East Coor.: 5551.00

Remarks: Analyzed for TCL VOCs, SVOCs, PCBs, TAL metals

Project No.: OH000294.0002.00006 Datum: _____ Filename: April Logs

ARCADIS

Log of Boring: GM-36

Waste Pile/Staging Area Investigation

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
24	12,21,44, 44	20	0.3				SW	SAND medium dense; moist; light brown; well graded; sand 70%; gravel 35%; silt <5%	
26	10,15,23, 25	20	0.9				SW	SAND medium dense; moist; light brown; well graded; sand 70%; gravel 35%; silt <5%	
28	13,31,50	18	0.5				SW	SAND medium dense; moist; light brown; well graded; sand 70%; gravel 35%; silt <5%	
30	10,26,30, 30	22	4.2				SW	SAND medium dense; wet; yellowish orange; well graded; sand 75%; gravel 25%; silt <3%	
32	17,29,40, 45	24	2.3				SW	SAND medium dense; wet; yellowish orange; well graded; sand 75%; gravel 25%; silt <3%	
34								Bottom of boring	
36									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Denzel Wright
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: Cindy Capell
Total Depth: 34'
Surface Elev.: 731.44
North Coor.: 1754.76

Begin Drilling: 4/3/01
End Drilling: 4/3/01
Converted to Well: Y Well I.D.:
East Coor.: 5551.00

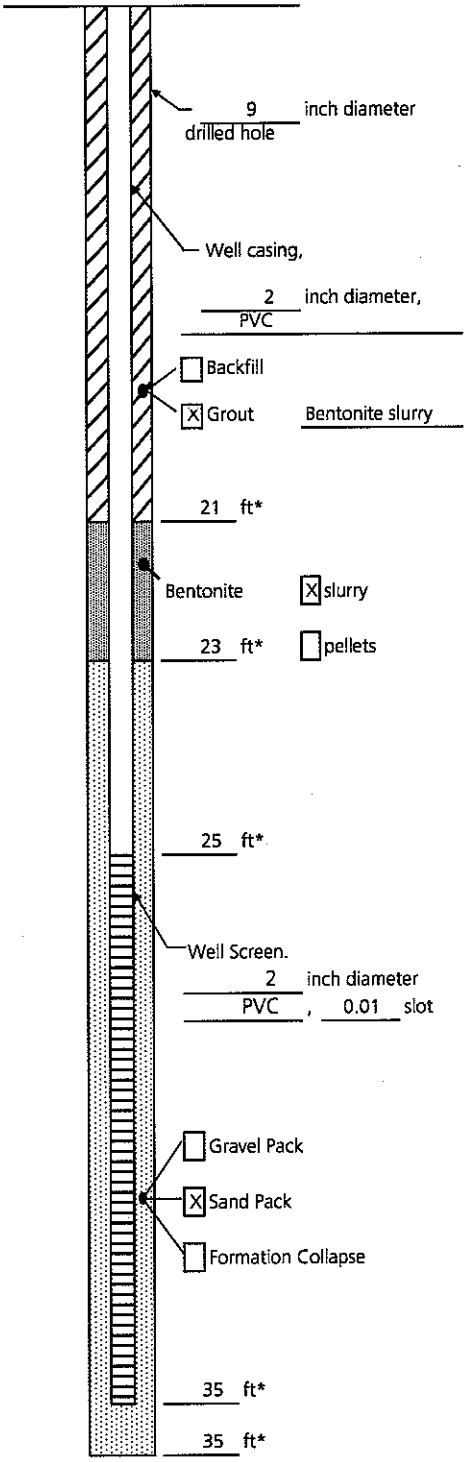
Remarks: Analyzed for TCL VOCs, SVOCs, PCBs, TAL metals

Project No.: OH000294.0002.00006 Datum: Filename: April Logs

ARCADIS G&M

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project OH000294.0004.00004 Well GM-36

Town/City Moraine

County Montgomery State Ohio

Permit No.

Land-Surface (LS) Elevation and Datum:

731.44 LS/731.11 TOC feet [X] Surveyed [ ] Estimated

Installation Date(s) 4/3/2001

Drilling Method Hollow stem auger

Drilling Contractor Wright Drilling

Drilling Fluid N/A

Development Technique(s) and Date(s)

Pumping 4/9/01

Fluid Loss During Drilling N/A gallons

Water Removed During Development 55 gallons

Static Depth to Water 29.92 feet below M.P.

Pumping Depth to Water NR feet below M.P.

Pumping Duration 0.66 hours

Yield 1.34 gpm Date 4/9/2001

Specific Capacity NA gpm/ft

Well Purpose Groundwater sampling and water level measurements.

Remarks Flush mount.

Prepared by C. Capell

gmotors\gmcrf\logsWELLCSTR.xls\GM-36
6/1/2005

ARCADIS

Log of Boring: GM-37

Waste Pile/Staging Area Investigation

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	7,18,22, 17	19	2.0				ML	SILT asphalt; fill; loose; dry; stained; dark brown-red-blue-orange; silt 70%; sand 25%; gravel <5%; pieces of glass present	
2	4,3,5,2	16	0.0				ML	SILT fill; loose; dry; stained; dark brown-red-blue-orange; silt 70%; sand 25%; gravel <5%; pieces of glass present	
4	2,3,2,2	11	0.2				ML	SILT fill; loose; dry; stained; dark brown-red-blue-orange; silt 70%; sand 25%; gravel <5%; pieces of glass present	
6	0,1,2,3	20	0.0				CL	SILT/CLAY soft; medium plasticity; moist; light brown-olive gray; clay 75%; silt 20%; sand <5%	
8	3,8,7,8	24	0.0				CL	SILT/CLAY medium stiff; medium plasticity; moist; light brown-yellowish orange; clay 75%; silt 20%; sand <5%	
10	8,11,11, 13	18	0.0				SW	SAND/GRAVEL loose; moist; light brown-yellowish orange; well graded; sand 75%; gravel 20%; silt <5%	
12									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Brian Wright
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: Cindy Capell
Total Depth: 56'
Surface Elev.: 730.36
North Coor.: 1857.31

Begin Drilling: 4/9/01
End Drilling: 4/9/01
Converted to Well: Y Well I.D.:
East Coor.: 5696.09

Remarks: Analyzed for TCL VOCs, SVOCs, PCBs, TAL metals

Project No.: OH000294.0002.00006 Datum: Filename: April Logs

ARCADIS

Log of Boring: GM-37

Waste Pile/Staging Area Investigation

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
12	8,12,14, 18	20	0.0				SW	SAND/GRAVEL loose; moist; yellowish orange; well graded; sand 75%; gravel 20%; silt <5%	
14	20,22,22, 24	20	0.0				SW	SAND/GRAVEL medium dense; moist; yellowish orange; well graded; sand 80%; gravel 20%	
16	14,18,26, 20	22	0.0				SW	SAND/GRAVEL medium dense; moist; light brown-yellowish orange; well graded; sand 80%; gravel 20%	
18	18,22,19, 28	22	0.0				SW	SAND/GRAVEL medium dense; moist; light brown-yellowish orange; well graded; sand 80%; gravel 20%;	
20	16,17,34, 50/6	18	0.0				SW	SAND/GRAVEL medium dense; moist; yellowish orange; well graded; sand 60%; gravel 35%; silt <5%	
22	44,46,50/ 6	14	0.0				SW	SAND/GRAVEL medium dense; moist; light brown; well graded; sand 60%; gravel 35%; silt <5%	
24									

☒ Composite Sample to Lab ■ Grab Sample to Lab ☐ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Brian Wright
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: Cindy Capell
Total Depth: 56'
Surface Elev.: 730.36
North Coor.: 1857.31

Begin Drilling: 4/9/01
End Drilling: 4/9/01
Converted to Well: Y Well I.D.:
East Coor.: 5696.09

Remarks: Analyzed for TCL VOCs, SVOCs, PCBs, TAL metals

Project No.: OH000294.0002.00006 Datum: Filename: April Logs

ARCADIS

Log of Boring: GM-37

Waste Pile/Staging Area Investigation

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
24	35,26,50/6	20	0.0				SW	SAND/GRAVEL medium dense; moist; light brown; well graded; sand 60%; gravel 35%; silt <5%	
26	100/3	0	-					No recovery	
28	35,46,50	22	0.0				SW	SAND/GRAVEL medium dense; wet; light brown; well graded; sand 60%; gravel 35%; silt <5%	▼
30	9,9,19,50/6	18	0.4				SW	SAND/GRAVEL medium dense; wet; light brown; well graded; sand 75%; gravel 20%; silt <5%	
32	4,20,50/6	24	0.0				SW	SAND/GRAVEL medium dense; wet; light brown; well graded; sand 75%; gravel 20%; silt <5%	
34	4,16,50/6	20	0.6				SW	SAND/GRAVEL medium dense; wet; light brown; well graded; sand 75%; gravel 20%; silt <5%	
36									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Brian Wright
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: Cindy Capell
Total Depth: 56'
Surface Elev.: 730.36
North Coor.: 1857.31

Begin Drilling: 4/9/01
End Drilling: 4/9/01
Converted to Well: Y Well I.D.:
East Coor.: 5696.09

Remarks: Analyzed for TCL VOCs, SVOCs, PCBs, TAL metals

Project No.: OH000294.0002.00006 Datum: Filename: April Logs

ARCADIS

Log of Boring: GM-37

Waste Pile/Staging Area Investigation

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
36	6,10,22, 24	24	1.3				SW	SAND/GRAVEL medium dense; wet; light brown; well graded; sand 75%; gravel 20%; silt <5%	
38	12,11,50/ 6	24	0.0				SW	SAND/GRAVEL medium dense; wet; light brown; well graded; sand 75%; gravel 20%; silt <5%	
40	21,10,6,4	24	1.6				SW	SAND/GRAVEL medium dense; wet; light brown; well graded; sand 75%; gravel 20%; silt <5%	
42	40,43,50/ 6	24	1.6				SW	SAND/GRAVEL medium dense; wet; light brown; well graded; sand 75%; gravel 20%; silt <5%	
44	33,38,50/ 6	24	2.3				SW	SAND/GRAVEL medium dense; wet; light brown; well graded; sand 75%; gravel 20%; silt <5%	
46	12,23,29, 23	24	3.0				SW	SAND/GRAVEL medium dense; wet; light brown; well graded; sand 75%; gravel 20%; silt <5%	
48									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Brian Wright
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: Cindy Capell
Total Depth: 56'
Surface Elev.: 730.36
North Coor.: 1857.31

Begin Drilling: 4/9/01
End Drilling: 4/9/01
Converted to Well: Y Well I.D.: _____
East Coor.: 5696.09

Remarks: Analyzed for TCL VOCs, SVOCs, PCBs, TAL metals

Project No.: OH000294.0002.00006 Datum: _____ Filename: April Logs

ARCADIS

Log of Boring: GM-37

Waste Pile/Staging Area Investigation

Depth (feet)	Blows (/6 in.)	Recovery (inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
48	21,21,36, 34	24	1.6				SW	SAND/GRAVEL medium dense; wet; light brown; well graded; sand 80%; gravel 15%; silt <5%	
50	28,38,50/ 6	22	8.5				SW	SAND/GRAVEL medium dense; wet; light brown; well graded; sand 80%; gravel 15%; silt <5%	
52	48,50/1	22	15.7				SW	SAND/GRAVEL medium dense; wet; light brown; well graded; sand 80%; gravel 15%; silt <5%	
54	44,50/3	24	0.0				SW	SAND/GRAVEL medium dense; wet; light brown; well graded; sand 80%; gravel 15%; silt <5%	
							CL	SILT/CLAY medium stiff; low plasticity; gray; poorly graded; clay 60%; silt 40%	
56								Bottom of boring	
58									
60									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Brian Wright
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: Cindy Capell
Total Depth: 56'
Surface Elev.: 730.36
North Coor.: 1857.31

Begin Drilling: 4/9/01
End Drilling: 4/9/01
Converted to Well: Y Well I.D.: _____
East Coor.: 5696.09

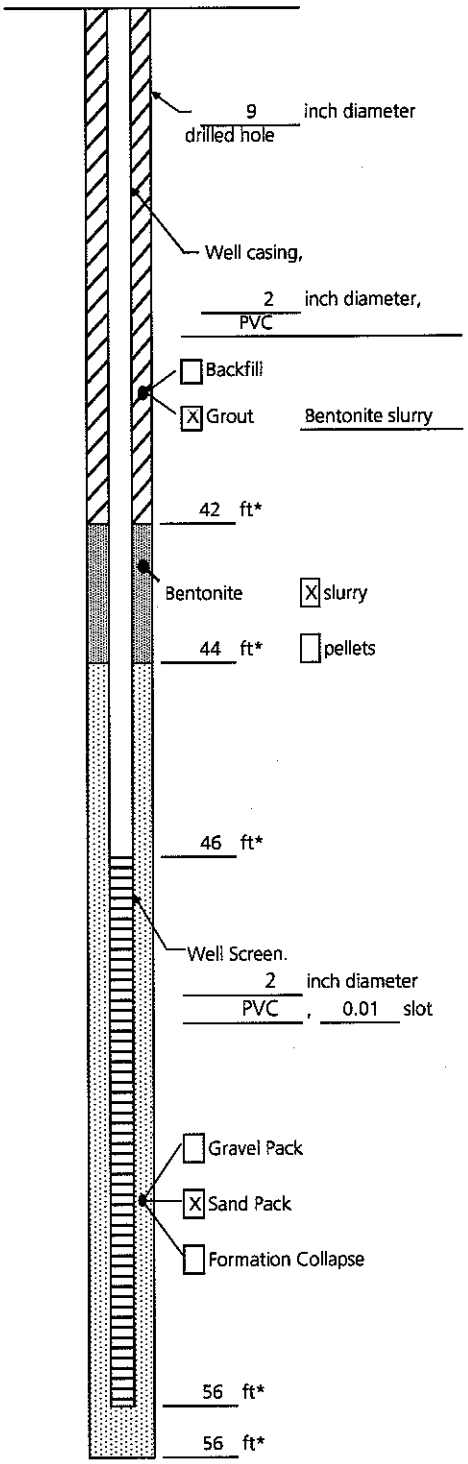
Remarks: Analyzed for TCL VOCs, SVOCs, PCBs, TAL metals

Project No.: OH000294.0002.00006 Datum: _____ Filename: April Logs

ARCADIS G&M

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project OH000294.0004.00004 Well GM-37

Town/City Moraine

County Montgomery State Ohio

Permit No.

Land-Surface (LS) Elevation and Datum:

730.36 LS/730.05 TOC feet [X] Surveyed [ ] Estimated

Installation Date(s) 4/3/2001

Drilling Method Hollow stem auger

Drilling Contractor Wright Drilling

Drilling Fluid N/A

Development Technique(s) and Date(s)

Surging 4/16/01

Fluid Loss During Drilling N/A gallons

Water Removed During Development 100 gallons

Static Depth to Water 27.85 feet below M.P.

Pumping Depth to Water NR feet below M.P.

Pumping Duration 1.43 hours

Yield 1.16 gpm Date 4/16/2001

Specific Capacity NA gpm/ft

Well Purpose Groundwater sampling and water level measurements.

Remarks Flush mount.

Prepared by C. Capell

gmotors\gmcrf\logsWELLCSTR.xls\GM-37
6/1/2005

ARCADIS

Log of Boring: GM-38

Waste Pile/Staging Area Investigation

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	-,-,15,24	12	3.3				ML	SILT 10" of asphalt; fill; loose; dry; stained; dark brown-red-blue-orange; silt 70%; sand 25%; gravel <5%	
2	7,18,18,5	22	0.0				ML	SILT fill; loose; dry; stained; dark brown-red-blue-orange; silt 70%; sand 25%; gravel <5%	
4	10,3,5,5	14	0.7				ML	SILT fill; loose; dry; stained; dark brown-red-blue-orange; silt 70%; sand 25%; gravel <5%	
6	4,4,10,10	6	0.9				ML	SILT fill; loose; dry; stained; dark brown-red-blue-orange; silt 70%; sand 25%; gravel <5%	
8	1,2,3,6	24	0.4				CL	CLAY/SILT stained; medium stiff; medium plasticity; moist; light brown-yellowish orange; clay 75%; silt 20%; sand <5%	
10	3,4,6,7	22	0.0				CL	CLAY/SILT stained; medium stiff; medium plasticity; moist; light brown-yellowish orange; clay 75%; silt 20%; sand <5%	
12									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Brian Wright
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: Cindy Capell
Total Depth: 34'
Surface Elev.: 730.31
North Coor.: 1857.56

Begin Drilling: 4/10/01
End Drilling: 4/10/01
Converted to Well: Y Well I.D.:
East Coor.: 5686.00

Remarks: Analyzed for TCL VOCs, SVOCs, PCBs, TAL metals

Project No.: OH000294.0002.00006 Datum: Filename: April Logs

ARCADIS

Log of Boring: GM-38

Waste Pile/Staging Area Investigation

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
12	3,6,6,7	14	0.0				SP	SILT/SAND loose; moist; light brown-yellowish orange; poorly graded; sand 90%; silt 10%; gravel <3%	
14	5,10,10, 12	18.5	0.0				SP	SILT/SAND loose; moist; light brown-yellowish orange; poorly graded; sand 90%; silt 10%; gravel <3%	
16	9,11,17, 17	24	0.0				SW	SAND/GRAVEL loose; moist; light brown-yellowish orange; well graded; sand 80%; gravel 15%; silt <5%	
18	16,19,25, 35	22	0.0				SW	SAND/GRAVEL loose; moist; light brown-yellowish orange; well graded; sand 80%; gravel 15%; silt <5%	
20	28,28,26, 27	22	0.0				GW	GRAVEL/SAND medium dense; moist; light brown; well graded; gravel 70%; sand 25%; silt <5%	
22	9,10,20, 28	20	0.0				GW	GRAVEL/SAND medium dense; moist; light brown; well graded; gravel 70%; sand 25%; silt <5%	
24									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Brian Wright
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: Cindy Capell
Total Depth: 34'
Surface Elev.: 730.31
North Coor.: 1857.56

Begin Drilling: 4/10/01
End Drilling: 4/10/01
Converted to Well: Y Well I.D.: _____
East Coor.: 5686.00

Remarks: Analyzed for TCL VOCs, SVOCs, PCBs, TAL metals

Project No.: OH000294.0002.00006 Datum: _____ Filename: April Logs

ARCADIS

Log of Boring: GM-38

Waste Pile/Staging Area Investigation

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
24	21,28,28, 30	18	0.0				SW	SAND/GRAVEL medium dense; moist; light brown; well graded; sand 60%; gravel 40%; silt <3%	
26	50/6	11.5	0.0				SW	SAND/GRAVEL medium dense; moist; light brown; well graded; sand 60%; gravel 40%; silt <3%	
28	35,50/6	11	0.2				SW	SAND/GRAVEL medium dense; wet; light brown; well graded; sand 60%; gravel 40%; silt <3%	▼
30	16,18,20, 30	23	1.0				SW	SAND/GRAVEL medium dense; wet; light brown; well graded; sand 80%; gravel 15%; silt <5%	
32		20	0.3				SW	SAND/GRAVEL medium dense; wet; light brown; well graded; sand 80%; gravel 15%; silt <5%	
34								Bottom of boring	
36									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Brian Wright
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: Cindy Capell
Total Depth: 34'
Surface Elev.: 730.31
North Coor.: 1857.56

Begin Drilling: 4/10/01
End Drilling: 4/10/01
Converted to Well: Y Well I.D.: ____
East Coor.: 5686.00

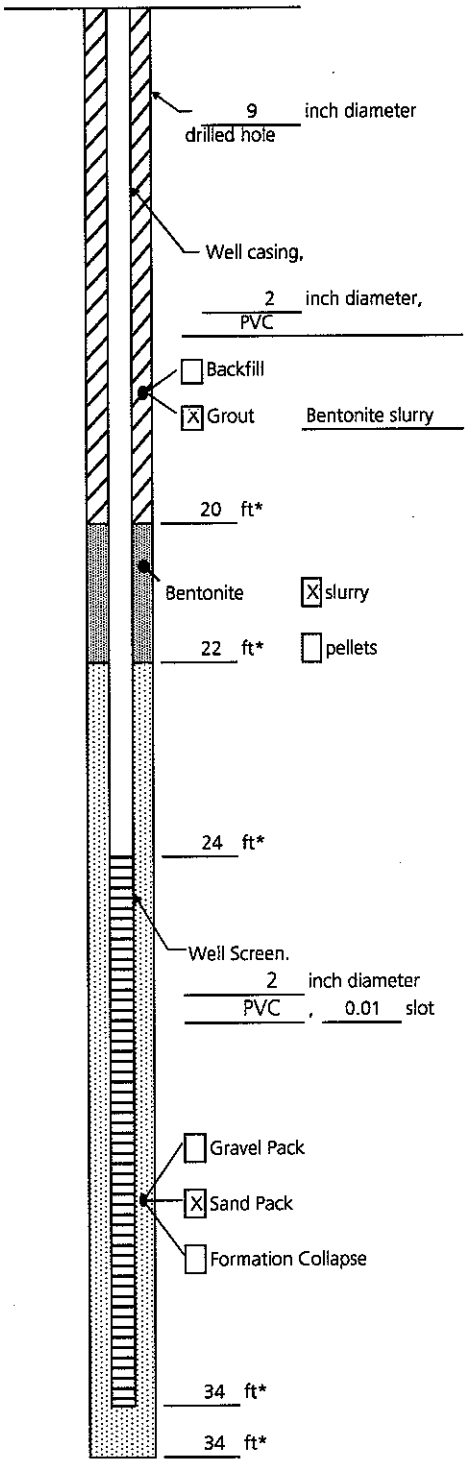
Remarks: Analyzed for TCL VOCs, SVOCs, PCBs, TAL metals

Project No.: OH000294.0002.00006 Datum: ____ Filename: April Logs

ARCADIS G&M

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project OH000294.0004.00004 Well GM-38

Town/City Moraine

County Montgomery State Ohio

Permit No.

Land-Surface (LS) Elevation and Datum:

730.31 LS/729.88 TOC feet [X] Surveyed [ ] Estimated

Installation Date(s) 4/10/2001

Drilling Method Hollow stem auger

Drilling Contractor Wright Drilling

Drilling Fluid N/A

Development Technique(s) and Date(s)

Pumping 4/12/01

Fluid Loss During Drilling N/A gallons

Water Removed During Development 86 gallons

Static Depth to Water 28.16 feet below M.P.

Pumping Depth to Water NR feet below M.P.

Pumping Duration 1.43 hours

Yield 1 gpm Date 4/12/2001

Specific Capacity NA gpm/ft

Well Purpose Groundwater sampling and water level measurements.

Remarks Flush mount.

Prepared by C. Capell

ARCADIS

Log of Boring: GM-39

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	N/A	96	0.9					CONCRETE first 1' concrete	
							GW	GRAVEL sandy gravel, damp with fines (25%), gravel (35%), sand (40%), well graded, fill	
2	N/A		2.9				SW	SAND light brown, dry, gravely-sand with fines (10%), gravel (20%), sand (70%), well graded, fill, pieces of limestone aggregate visible	
4	N/A		6.3				SW	SAND light brown, dry, gravely-sand with fines (10%), gravel (20%), sand (70%), well graded, fill	
6	N/A		3.4				SW	SAND light brown, dry, gravely-sand with fines (10%), gravel (20%), sand (70% well graded, fill	
								Second layer of concrete is visible at 7'	
8	N/A	132	2.9				SW	SAND light brown, dry, gravely-sand with fines (10%), gravel (20%), sand (70%), well graded	
10	N/A		3.4				SW	SAND light brown, dry, gravely-sand with fines (10%), gravel (20%), sand (70%), well graded	
12									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 118 feet
Surface Elev.: 731.15
North Coor.: 5396.416

Begin Drilling: 11/12/03 @ 1140
End Drilling: 11/12/03 @ 1612
Converted to Well: Y Well I.D.: GM-39
East Coor.: 6006.197

Remarks: 4 inch core barrel.

Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-39

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
12	N/A		2.9				SW	SAND light brown, dry, gravely-sand with fines (10%), gravel (20%), sand (70%), well graded	
14	N/A		3.4				SW	SAND light brown, dry, gravely-sand with fines (10%), gravel (20%), sand (70%), well graded	
16	N/A		3.8				SW	SAND light brown, dry, gravely-sand with fines (10%), gravel (20%), sand (70%), well graded	
18	N/A	144	12.6				SW	SAND sand (60%), gravel (40%), wet, cobbles, visible, well graded	▼
20	N/A		12.6				SW	SAND sand (60%), gravel (40%), wet, cobbles, visible, well graded	
22	N/A		36.9				SP	SAND fine to medium grained sand, gravel (10%), poorly graded, wet, cobbles visible	
24									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 118 feet
Surface Elev.: 731.15
North Coor.: 5396.416

Begin Drilling: 11/12/03 @ 1140
End Drilling: 11/12/03 @ 1612
Converted to Well: Y Well I.D.: GM-39
East Coor.: 6006.197

Remarks: 4 inch core barrel.

Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-39

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
24	N/A		36.9				SP	SAND fine to medium grained sand, gravel (10%), poorly graded, wet, cobbles visible	
26	N/A		36.9				SP	SAND fine to medium grained sand, gravel (10%), poorly graded, wet, cobbles visible	
28	N/A	144	18.4				SP	SAND fine to medium grained sand, gravel (10%), poorly graded, wet, cobbles visible	
30	N/A		18.4				SP	SAND fine to medium grained sand, gravel (10%), poorly graded, wet, cobbles visible	
32	N/A		18.4				SP	SAND fine to medium grained sand, gravel (10%), poorly graded, wet, cobbles visible	
34	N/A		1.9				CL	CLAY silty clay with gravel (10%), low plasticity, hard, dry, light gray	
36									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: D. Manzo
Total Depth: 118 feet
Surface Elev.: 731.15
North Coor.: 5396.416
Begin Drilling: 11/12/03 @ 1140
End Drilling: 11/12/03 @ 1612
Converted to Well: Y Well I.D.: GM-39
East Coor.: 6006.197
Remarks: 4 inch core barrel.
Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-39

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
36	N/A		0.9				CL	CLAY silty clay with gravel (10%), low plasticity, hard, dry, light gray	
38	N/A	150	0.9				CL	CLAY silty clay with gravel (10%), low plasticity, hard, dry, light gray	
40	N/A		1.4				SW	SAND coarse grained sand (70%) and gravel (30%), well graded, wet, cobbles visible	
42	N/A		1.4				SW	SAND coarse grained sand (70%) and gravel (30%), well graded, wet, cobbles visible	
44	N/A		0.9				SW	SAND coarse grained sand (70%) and gravel (30%), well graded, wet, cobbles visible	
							GW	GRAVEL gravel (75%) mostly cobbles, and coarse grained sand (25%), well graded, wet	
46	N/A		0.9				GW	GRAVEL gravel (75%) mostly cobbles, and coarse grained sand (25%), well graded, wet	
48									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 118 feet
Surface Elev.: 731.15
North Coor.: 5396.416

Begin Drilling: 11/12/03 @ 1140
End Drilling: 11/12/03 @ 1612
Converted to Well: Y Well I.D.: GM-39
East Coor.: 6006.197

Remarks: 4 inch core barrel.

Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-39

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
48	N/A	132	0.9				GW	GRAVEL gravel (60%) and coarse grained sand (40%), cobbles visible, well graded, wet	
50	N/A		0.9				GW	GRAVEL gravel (60%) and coarse grained sand (40%), cobbles visible, well graded, wet	
52	N/A		0.9				GW	GRAVEL gravel (60%) and coarse grained sand (40%), cobbles visible, well graded, wet	
54	N/A		0.9				CL	CLAY light gray, silty clay, with gravel (10-25%), low plasticity, hard, dry	
56	N/A		0.9				CL	CLAY light gray, silty clay, with gravel (10-25%), low plasticity, hard, dry	
58	N/A	132	0.9				SW	SAND coarse-grained sand (60%), gravel (40%), wet, cobbles visible, well graded	
60									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: D. Manzo
Total Depth: 118 feet
Surface Elev.: 731.15
North Coor.: 5396.416
Begin Drilling: 11/12/03 @ 1140
End Drilling: 11/12/03 @ 1612
Converted to Well: Y Well I.D.: GM-39
East Coor.: 6006.197
Remarks: 4 inch core barrel.
Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-39

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
60	N/A		0.9				SW	SAND coarse-grained sand (60%), gravel (40%), wet, cobbles visible, well graded	
62	N/A		0.9				SW	SAND coarse-grained sand (60%), gravel (40%), wet, cobbles visible, well graded	
64	N/A		0.9				SW	SAND coarse-grained sand (60%), gravel (40%), wet, cobbles visible, well graded	
66	N/A		1.4				SW	SAND medium grained to coarse grained sand (80%) and gravel (20%), well graded, damp	
68	N/A	144	1.4				SW	SAND medium grained to coarse grained sand (80%) and gravel (20%), well graded, damp	
70	N/A		0.0				SP	SAND fine to medium grained sand, damp, fines (10%), gravel (<10%), damp, well graded	
72									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: D. Manzo
Total Depth: 118 feet
Surface Elev.: 731.15
North Coor.: 5396.416
Begin Drilling: 11/12/03 @ 1140
End Drilling: 11/12/03 @ 1612
Converted to Well: Y Well I.D.: GM-39
East Coor.: 6006.197
Remarks: 4 inch core barrel.
Project No.: OH000294.0005.00008
Datum: N/A
Filename: November 2003

ARCADIS

Log of Boring: GM-39

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
72	N/A		0.0				SP	SAND fine to medium grained sand, damp, fines (10%), gravel (<10%), damp, well graded	
74	N/A		0.0				SM	SILTY SAND fine grained sand, silts and clays (25%), wet, poorly graded	
76	N/A		1.4				SW	SAND medium to coarse grained sand (75%) and gravel (25%), well graded, wet	
78	N/A	108	0.9				SW	SAND medium to coarse grained sand (75%) and gravel (25%), well graded, wet	
80	N/A		0.9				SW	SAND medium to coarse grained sand (75%) and gravel (25%), well graded, wet	
82	N/A		0.9				SW	SAND coarse grained sand (60%) and gravel (40%), wet, well graded	
84									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: D. Manzo
Total Depth: 118 feet
Surface Elev.: 731.15
North Coor.: 5396.416
Begin Drilling: 11/12/03 @ 1140
End Drilling: 11/12/03 @ 1612
Converted to Well: Y Well I.D.: GM-39
East Coor.: 6006.197
Remarks: 4 inch core barrel.
Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-39

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
84	N/A		0.9				GP	GRAVEL gravel (90%) cobble sized, with coarse grained sand (10%), poorly graded, wet	
86	N/A		0.4				SW	SAND coarse grained sand (60%) and gravel (40%), wet, well graded, cobbles visible	
88	N/A	96	0.4				SW	SAND coarse grained sand (60%) and gravel (40%), wet, well graded, cobbles visible	
90	N/A		0.4				SW	SAND coarse grained sand (60%) and gravel (40%), wet, well graded, cobbles visible	
92	N/A		0.4				SW	SAND coarse grained sand (60%) and gravel (40%), wet, well graded, cobbles visible	
94	N/A		0.4				SW	SAND coarse grained sand (60%) and gravel (40%), wet, well graded, cobbles visible	
96									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: D. Manzo
Total Depth: 118 feet
Surface Elev.: 731.15
North Coor.: 5396.416
Begin Drilling: 11/12/03 @ 1140
End Drilling: 11/12/03 @ 1612
Converted to Well: Y Well I.D.: GM-39
East Coor.: 6006.197
Remarks: 4 inch core barrel.
Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-39

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
96	N/A		0.4				SW	SAND coarse grained sand (60%) and gravel (40%), wet, well graded, cobbles visible	
98	N/A	96	0.4				SW	SAND coarse grained sand (60%) and gravel (40%), wet, well graded, cobbles visible	
100	N/A		0.4				GW	GRAVEL gravel (60%) and coarse grained sand (40%), well graded, wet	
102	N/A		0.9				GW	GRAVEL gravel (60%) and coarse grained sand (40%), well graded, wet	
104	N/A		0.9				GW	GRAVEL gravel (60%) and coarse grained sand (40%), well graded, wet	
106	N/A		0.9				SW	SAND medium to coarse grained sand (80%) and gravel (20%), well graded, wet	
108									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 118 feet
Surface Elev.: 731.15
North Coor.: 5396.416

Begin Drilling: 11/12/03 @ 1140
End Drilling: 11/12/03 @ 1612
Converted to Well: Y Well I.D.: GM-39
East Coor.: 6006.197

Remarks: 4 inch core barrel.

Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-39

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
108	N/A	120	1.4				SW	SAND medium to coarse grained sand (80%) and gravel (20%), well graded, wet	
110	N/A		1.4				SW	SAND medium to coarse grained sand (80%) and gravel (20%), well graded, wet	
112	N/A		1.4				SW	SAND medium to coarse grained sand (80%) and gravel (20%), well graded, wet	
114	N/A		1.4				SW	SAND medium to coarse grained sand (80%) and gravel (20%), well graded, wet	
116	N/A		0.0				CL	CLAY dark gray, silty clay, gravel (10-25%), low plasticity, hard, dry	
118								End of Boring	
120									

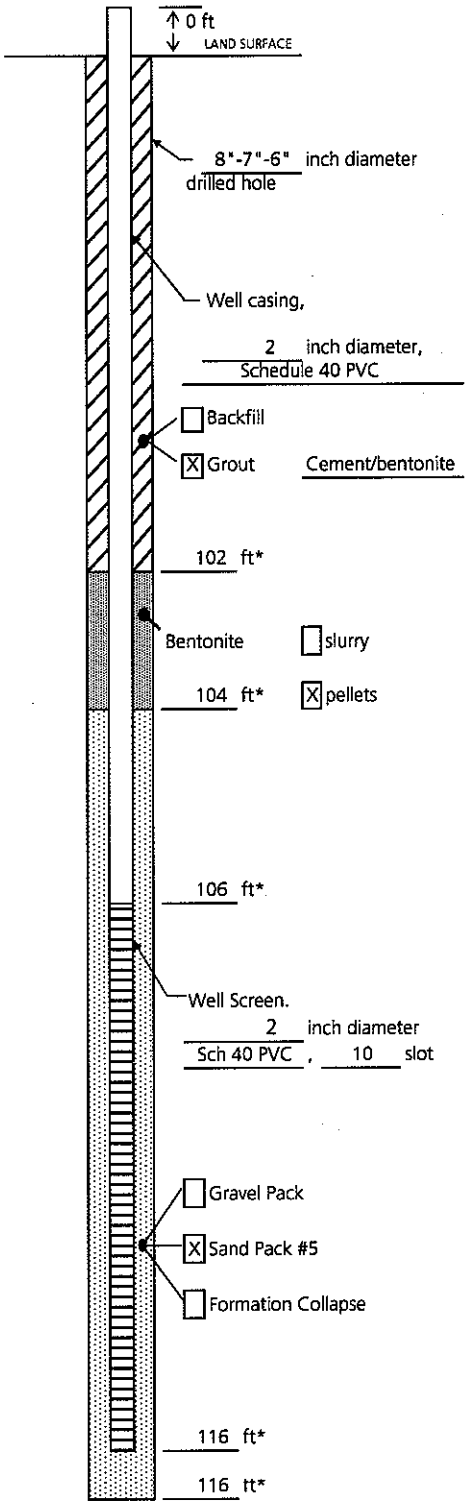
☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: D. Manzo
Total Depth: 118 feet
Surface Elev.: 731.15
North Coor.: 5396.416
Begin Drilling: 11/12/03 @ 1140
End Drilling: 11/12/03 @ 1612
Converted to Well: Y Well I.D.: GM-39
East Coor.: 6006.197
Remarks: 4 inch core barrel.
Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well GM-39

Town/City Moraine

County Montgomery State Ohio

Permit No. N/A

Land-Surface (LS) Elevation and Datum:

731.15 feet [X] Surveyed

[ ] Estimated

Installation Date(s) 11/17/03 - 11/18/03

Drilling Method Rotosonic

Drilling Contractor Prosonic

Drilling Fluid Water (800 gallons)

Development Technique(s) and Date(s)

Submersible 4" pump 11/17-11/18/03. 800 gallons

Fluid Loss During Drilling N/A gallons

Water Removed During Development 900 gallons

Static Depth to Water N/A feet below M.P.

Pumping Depth to Water N/A feet below M.P.

Pumping Duration 3 hours

Yield N/A gpm Date 11/17/03
11/20/03

Specific Capacity N/A gpm/ft

Well Purpose Deep monitoring well for north portion of property replaces production wells 31/39.

Remarks 8" casing driven to 38'
7" casing driven to 58'
6" casing driven to 116'

Prepared by D. Manzo

ARCADIS

Log of Boring: GM-40

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	N/A	96	1.4					ASPHALT	
							CL	CLAY light brown silty clay, dry, hard, low plasticity, sand and gravel (25%)	
2	N/A		1.4				CL	CLAY light brown silty clay, dry, hard, low plasticity, sand and gravel (25%)	
4	N/A		1.4				CL	CLAY light brown silty clay, medium hardness, medium plasticity, sand and gravel (10%)	
6	N/A		0.9				CL	CLAY light brown silty clay, medium hardness, medium plasticity, sand and gravel (10%)	
8	N/A	72	0.9				CL	CLAY light brown silty clay, medium hardness, medium plasticity, sand and gravel (10%)	
10	N/A		0.9				CL	CLAY light brown silty clay, medium hardness, medium plasticity, sand and gravel (10%)	
12									

☒ Composite Sample to Lab ■ Grab Sample to Lab ☐ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: D. Manzo
Total Depth: 150 feet
Surface Elev.: 727.28
North Coor.: 3088.907
Begin Drilling: 11/12/03 @ 1641
End Drilling: 11/13/03 @ 1342
Converted to Well: Y Well I.D.: GM-40
East Coor.: 4983.552

Remarks: 4 inch core barrel.

Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-40

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
12	N/A		0.9				ML	SILT light brown clayey silt, low plasticity, hard, dry, sand and gravel (25%)	
14	N/A		0.9				ML	SILT light brown clayey silt, low plasticity, hard, dry, sand and gravel (25%)	
16	N/A		0.9				SW	SAND gravely sand with fines (25%), sand (50%), gravel (25%), dry, well graded	
18	N/A	102	0.9				SW	SAND gravely sand with fines (25%), sand (50%), gravel (25%), dry, well graded	
20	N/A		0.9				GW	GRAVEL gravel (60%), sand (40%), cobbles visible, well graded	
22	N/A		0.9				SW	SAND sand (80%) and gravel (20%), damp, well graded	
24									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 150 feet
Surface Elev.: 727.28
North Coor.: 3088.907

Begin Drilling: 11/12/03 @ 1641
End Drilling: 11/13/03 @ 1342
Converted to Well: Y Well I.D.: GM-40
East Coor.: 4983.552

Remarks: 4 inch core barrel.

Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-40

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
24	N/A		0.9				SW	SAND sand (80%) and gravel (20%), damp, well graded	
26	N/A		0.9				GW	GRAVEL gravel (70%) and sand (30%), cobbles visible, wet, well graded	▼
28	N/A	120	0.9				GW	GRAVEL gravel (70%) and sand (30%), cobbles visible, wet, well graded	
30	N/A		0.9				GW	GRAVEL gravel (70%) and sand (30%), cobbles visible, wet, well graded	
32	N/A		1.4				GW	GRAVEL gravel (70%) and sand (30%), cobbles visible, wet, well graded	
							CL	CLAY silty clay with sand (25%) and gravel, damp, low plasticity, hard, cobbles visible	
34	N/A		2.9				CL	CLAY silty clay with sand (25%) and gravel, damp, low plasticity, hard, cobbles visible	
							GW	GRAVEL gravel (60%) and sand (30%), fines (10%) , well graded, wet (saturated)	
36									

☒ Composite Sample to Lab ■ Grab Sample to Lab ☐ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 150 feet
Surface Elev.: 727.28
North Coor.: 3088.907

Begin Drilling: 11/12/03 @ 1641
End Drilling: 11/13/03 @ 1342
Converted to Well: Y Well I.D.: GM-40
East Coor.: 4983.552

Remarks: 4 inch core barrel.

Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-40

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
36	N/A		1.4				GW	GRAVEL gravel (60%) and sand (30%), fines (10%) , well graded, wet (saturated)	
38	N/A	84	1.4				GW	GRAVEL gravel (60%), coarse grained sand (40%), wet (saturated), well graded, cobbles visible	
40	N/A		0.9				GW	GRAVEL gravel (60%), coarse grained sand (40%), wet (saturated), well graded, cobbles visible	
42	N/A		1.4				GW	GRAVEL gravel (60%), coarse grained sand (40%), wet (saturated), well graded, cobbles visible	
44	N/A		0.9				GW	GRAVEL gravel (60%), coarse grained sand (40%), wet (saturated), well graded, cobbles visible	
46	N/A		0.9				GW	GRAVEL gravel (60%), coarse grained sand (40%), wet (saturated), well graded, cobbles visible	
48									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 150 feet
Surface Elev.: 727.28
North Coor.: 3088.907

Begin Drilling: 11/12/03 @ 1641
End Drilling: 11/13/03 @ 1342
Converted to Well: Y Well I.D.: GM-40
East Coor.: 4983.552

Remarks: 4 inch core barrel.

Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-40

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
48	N/A	84	0.9				GW	GRAVEL gravel (60%), coarse grained sand (40%), wet (saturated), well graded, cobbles visible	
50	N/A		0.9				GW	GRAVEL gravel (60%), coarse grained sand (40%), wet (saturated), well graded, cobbles visible	
52	N/A		1.4				CL	CLAY light gray, silty clay, gravel (10-25%), low plasticity, hard, dry	
54	N/A		1.4				CL	CLAY light gray, silty clay, gravel (10-25%), low plasticity, hard, dry	
56	N/A		1.4				CL	CLAY light gray, silty clay, gravel (10-25%), low plasticity, hard, dry	
58	N/A	96	1.4				CL	CLAY light gray, silty clay, gravel (10-25%), low plasticity, hard, dry	
60									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: D. Manzo
Total Depth: 150 feet
Surface Elev.: 727.28
North Coor.: 3088.907
Begin Drilling: 11/12/03 @ 1641
End Drilling: 11/13/03 @ 1342
Converted to Well: Y Well I.D.: GM-40
East Coor.: 4983.552
Remarks: 4 inch core barrel.
Project No.: OH000294.0005.00008
Datum: N/A
Filename: November 2003

ARCADIS

Log of Boring: GM-40

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
60	N/A		1.4				CL	CLAY light gray, silty clay, gravel (10-25%), low plasticity, hard, dry	
62	N/A		1.4				CL	CLAY light gray, silty clay, gravel (10-25%), low plasticity, hard, dry	
64	N/A		0.9				SW	SAND sand (75%) and gravel (25%), wet, well graded, cobbles visible	
66	N/A		0.9				SW	SAND sand (75%) and gravel (25%), wet, well graded, cobbles visible	
68	N/A	96	0.9				SW	SAND sand (75%) and gravel (25%), wet, well graded, cobbles visible	
70	N/A		0.9				SW	SAND sand (75%) and gravel (25%), wet, well graded, cobbles visible	
							SP	SAND fine grained sand (80%) with silts and clays (20%), wet (saturated), poorly graded	
72									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 150 feet
Surface Elev.: 727.28
North Coor.: 3088.907

Begin Drilling: 11/12/03 @ 1641
End Drilling: 11/13/03 @ 1342
Converted to Well: Y Well I.D.: GM-40
East Coor.: 4983.552

Remarks: 4 inch core barrel.

Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-40

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
72	N/A		0.9				SP	SAND fine grained sand (80%) with silts and clays (20%), wet (saturated), poorly graded	
							CL	CLAY silty clay, damp, low plasticity, hard, light gray, no sand or gravel	
74	N/A		1.4				CL	CLAY silty clay, damp, low plasticity, hard, light gray, no sand or gravel	
76	N/A		1.4				CL	CLAY silty clay, damp, low plasticity, hard, light gray, no sand or gravel	
78	N/A	90	0.9				SW	SAND sand (75%) and gravel (25%), well graded, cobbles visible	
80	N/A		0.9				SW	SAND sand (75%) and gravel (25%), well graded, cobbles visible	
82	N/A		0.9				SW	SAND coarse grained sand (70%) and gravel (30%), wet (saturated), well graded, large cobbles visible	
84									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: D. Manzo
Total Depth: 150 feet
Surface Elev.: 727.28
North Coor.: 3088.907
Begin Drilling: 11/12/03 @ 1641
End Drilling: 11/13/03 @ 1342
Converted to Well: Y Well I.D.: GM-40
East Coor.: 4983.552
Remarks: 4 inch core barrel.
Project No.: OH000294.0005.00008
Datum: N/A
Filename: November 2003

ARCADIS

Log of Boring: GM-40

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
84	N/A		0.9				SP	SAND fine grained to medium grained sand, gravel (10%), poorly graded, wet (saturated)	
86	N/A		0.9				SP	SAND fine grained to medium grained sand, gravel (10%), poorly graded, wet (saturated)	
88	N/A	84	0.9				SW	SAND sand (60%), gravel (40%), sand is fine to coarse-grained, well graded, cobbles visible	
90	N/A		0.9				SW	SAND sand (60%), gravel (40%), sand is fine to coarse-grained, well graded, cobbles visible	
92	N/A		0.9				SW	SAND sand (60%), gravel (40%), sand is fine to coarse-grained, well graded, cobbles visible	
94	N/A		0.9				SW	SAND sand (60%), gravel (40%), sand is fine to coarse-grained, well graded, cobbles visible	
96									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: D. Manzo
Total Depth: 150 feet
Surface Elev.: 727.28
North Coor.: 3088.907
Begin Drilling: 11/12/03 @ 1641
End Drilling: 11/13/03 @ 1342
Converted to Well: Y Well I.D.: GM-40
East Coor.: 4983.552
Remarks: 4 inch core barrel.
Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-40

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
96	N/A		0.9				SW	SAND sand (60%), gravel (40%), sand is fine to coarse-grained, well graded, cobbles visible	
98	N/A	90	0.9				SW	SAND sand (60%), gravel (40%), sand is fine to coarse-grained, well graded, cobbles visible	
100	N/A		0.9				SW	SAND sand (60%), gravel (40%), sand is fine to coarse-grained, well graded, cobbles visible	
102	N/A		0.9				GP	GRAVEL gravel (80%), coarse grained sand (20%), wet, poorly graded	
104	N/A		0.9				SW	SAND sand (70%), gravel (30%), medium to coarse grained sand, wet, cobbles visible, well graded	
106	N/A		0.9				SW	SAND sand (70%), gravel (30%), medium to coarse grained sand, wet, cobbles visible, well graded	
108									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 150 feet
Surface Elev.: 727.28
North Coor.: 3088.907

Begin Drilling: 11/12/03 @ 1641
End Drilling: 11/13/03 @ 1342
Converted to Well: Y Well I.D.: GM-40
East Coor.: 4983.552

Remarks: 4 inch core barrel.

Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-40

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
108	N/A	72	0.9				SW	SAND sand (70%), gravel (30%), medium to coarse grained sand, wet, cobbles visible, well graded	
110	N/A		0.9				SW	SAND sand (70%), gravel (30%), medium to coarse grained sand, wet, cobbles visible, well graded	
112	N/A		0.9				SW	SAND sand (70%), gravel (30%), medium to coarse grained sand, wet, cobbles visible, well graded	
114	N/A		0.9				SW	SAND sand (70%), gravel (30%), medium to coarse grained sand, wet, cobbles visible, well graded	
116	N/A		0.9				SW	SAND sand (70%), gravel (30%), medium to coarse grained sand, wet, cobbles visible, well graded	
118	N/A	78	0.9				SW	SAND medium to coarse grained sand, wet, well graded, gravel (10%)	
120									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: D. Manzo
Total Depth: 150 feet
Surface Elev.: 727.28
North Coor.: 3088.907
Begin Drilling: 11/12/03 @ 1641
End Drilling: 11/13/03 @ 1342
Converted to Well: Y Well I.D.: GM-40
East Coor.: 4983.552
Remarks: 4 inch core barrel.
Project No.: OH000294.0005.00008
Datum: N/A
Filename: November 2003

ARCADIS

Log of Boring: GM-40

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
120	N/A		0.9				SW	SAND medium to coarse grained sand, wet, well graded, gravel (10%)	
122	N/A		0.9				SW	SAND medium to coarse grained sand, wet, well graded, gravel (10%)	
124	N/A		0.9				SW	SAND medium to coarse grained sand, wet, well graded, gravel (10%)	
126	N/A		0.9				SW	SAND medium to coarse grained sand, wet, well graded, gravel (10%)	
128	N/A	102	0.9				SW	SAND medium to coarse grained sand, wet, well graded, gravel (10%)	
130	N/A		0.9				SW	SAND medium to coarse grained sand, wet, well graded, gravel (10%)	
132									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 150 feet
Surface Elev.: 727.28
North Coor.: 3088.907

Begin Drilling: 11/12/03 @ 1641
End Drilling: 11/13/03 @ 1342
Converted to Well: Y Well I.D.: GM-40
East Coor.: 4983.552

Remarks: 4 inch core barrel.

Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-40

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
132	N/A		1.4				SC	CLAYEY SAND fine to coarse grained sand (50%), gravel (25%), silts and clays (25%), wet, well graded	
134	N/A		1.4				SC	CLAYEY SAND fine to coarse grained sand (50%), gravel (25%), silts and clays (25%), wet, well graded	
136	N/A		0.9				SW	SAND medium to coarse grained sand (75%), gravel (25%), wet, well graded	
138	N/A	90	0.9				SW	SAND medium to coarse grained sand (75%), gravel (25%), wet, well graded	
140	N/A		0.9				SW	SAND medium to coarse grained sand (75%), gravel (25%), wet, well graded	
142	N/A		1.4				GW	GRAVEL gravel (75%), medium to coarse grained sand (25%), wet, well graded, predominately large cobbles	
144									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: D. Manzo
Total Depth: 150 feet
Surface Elev.: 727.28
North Coor.: 3088.907
Begin Drilling: 11/12/03 @ 1641
End Drilling: 11/13/03 @ 1342
Converted to Well: Y Well I.D.: GM-40
East Coor.: 4983.552

Remarks: 4 inch core barrel.

Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-40

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
144	N/A		0.9				GW	GRAVEL gravel (75%), medium to coarse grained sand (25%), wet, well graded, predominately large cobbles	
146	N/A		0.9				GW	GRAVEL gravel (60%), medium to coarse grained sand, wet, well graded	
148								Not sampled	
150								End of Boring	
152									
154									
156									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 150 feet
Surface Elev.: 727.28
North Coor.: 3088.907

Begin Drilling: 11/12/03 @ 1641
End Drilling: 11/13/03 @ 1342
Converted to Well: Y Well I.D.: GM-40
East Coor.: 4983.552

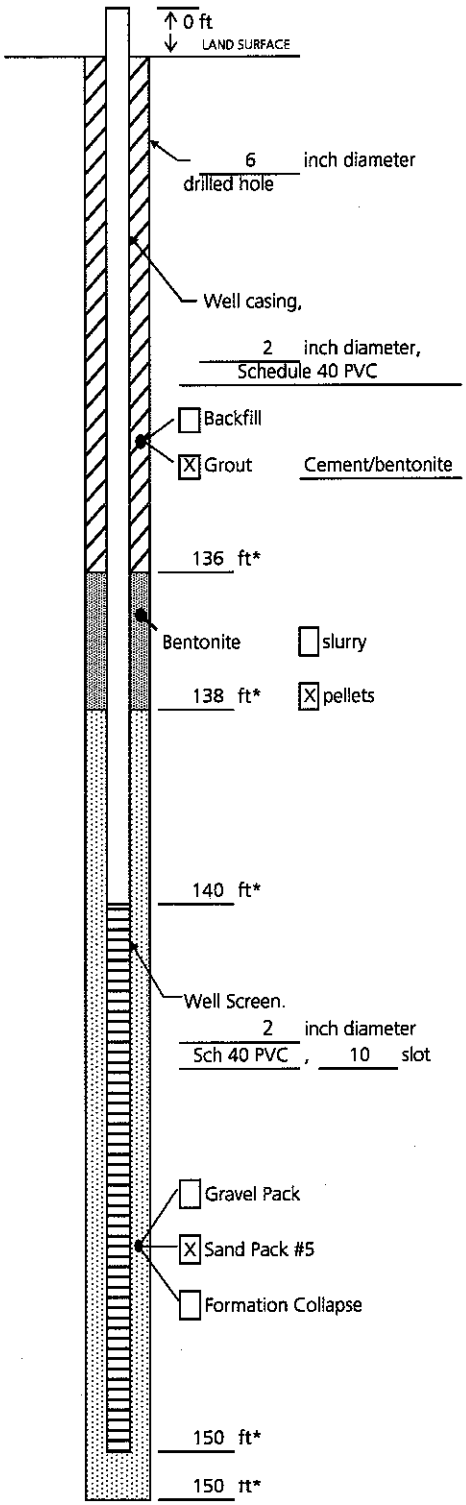
Remarks: 4 inch core barrel.

Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well GM-40

Town/City Moraine

County Montgomery State Ohio

Permit No. N/A

Land-Surface (LS) Elevation and Datum:

727.28 feet [X] Surveyed

[ ] Estimated

Installation Date(s) 11/12/03 - 11/14/03

Drilling Method Rotosonic

Drilling Contractor Prosonic

Drilling Fluid Water (765 gallons)

Development Technique(s) and Date(s)

Submersible 4" pump 11/13/03

Fluid Loss During Drilling N/A gallons

Water Removed During Development 900 gallons

Static Depth to Water N/A feet below M.P.

Pumping Depth to Water N/A feet below M.P.

Pumping Duration 3.5 hours

Yield N/A gpm Date 11/13/03
11/20/03

Specific Capacity N/A gpm/ft

Well Purpose Deep monitoring well for west side of property replaces production well 42.

Remarks

Prepared by D. Manzo

ARCADIS

Log of Boring: GM-41

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	N/A	72	0.4				CL	CLAY dark brown, silty clay, low plasticity, hard, gravel (10%), dry, roots visible, fill	
2	N/A		0.4				CL	CLAY dark brown, silty clay, low plasticity, hard, gravel (10%), dry, fill	
4	N/A		0.4				CL	CLAY dark brown, silty clay, low plasticity, hard, gravel (10%), fill	
6	N/A		0.4				CL	CLAY dark brown, silty clay, low plasticity, hard, gravel (10%), fill	
8	N/A	54	0.4				CL	CLAY dark brown, silty clay, low plasticity, hard, gravel (10%), fill	
10	N/A		0.4				GC	CLAYEY GRAVEL clayey gravel, clay (40%), gravel (50%), sand and silt (10%), low plasticity, hard, dry	
12									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: D. Manzo
Total Depth: 118 feet
Surface Elev.: 733.78
North Coor.: 3429.721
Begin Drilling: 11/19/03 @ 0809
End Drilling: 11/19/03 @ 1033
Converted to Well: Y Well I.D.: GM-41
East Coor.: 6684.301
Remarks: 4 inch core barrel.
Project No.: OH000294.0005.00008
Datum: N/A
Filename: November 2003

ARCADIS

Log of Boring: GM-41

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
12	N/A		0.4				SP	SAND fine to medium grained sand, dry, poorly graded	
14	N/A		0.4				SP	SAND fine to medium grained sand, dry, poorly graded	
16	N/A		0.4				SP	SAND fine to medium grained sand, dry, poorly graded	
18	N/A	54	0.4				SP	SAND fine to medium grained sand, dry, poorly graded	
20	N/A		0.4				SP	SAND fine to medium grained sand, dry, poorly graded	
22	N/A		0.4				GP	GRAVEL gravel, poorly graded, sand (<10%), damp	
24									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: D. Manzo
Total Depth: 118 feet
Surface Elev.: 733.78
North Coor.: 3429.721
Begin Drilling: 11/19/03 @ 0809
End Drilling: 11/19/03 @ 1033
Converted to Well: Y Well I.D.: GM-41
East Coor.: 6684.301
Remarks: 4 inch core barrel.
Project No.: OH000294.0005.00008
Datum: N/A
Filename: November 2003

ARCADIS

Log of Boring: GM-41

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
24	N/A		0.4				SW	SAND gravely sand, gravel (30%), sand (50%), silts and clays (20%), well graded, damp	
26	N/A		0.4				SW	SAND gravely sand, gravel (30%), sand (50%), silts and clays (20%), well graded, damp	
28	N/A	54	0.4				SP	SAND fine to medium grained sand, wet (saturated), poorly graded	
30	N/A		0.4				SP	SAND fine to medium grained sand, wet (saturated), poorly graded	
32	N/A		0.4				SP	SAND fine to medium grained sand, wet (saturated), poorly graded	
34	N/A		0.9				SW	SAND gravely sand, gravel (30%), sand (60%), fines (10%), wet, well graded	▼
36									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: D. Manzo
Total Depth: 118 feet
Surface Elev.: 733.78
North Coor.: 3429.721
Begin Drilling: 11/19/03 @ 0809
End Drilling: 11/19/03 @ 1033
Converted to Well: Y Well I.D.: GM-41
East Coor.: 6684.301
Remarks: 4 inch core barrel.
Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-41

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
36	N/A		0.4				CL	CLAY light gray silty clay, gravel (10-25%), low plasticity, hard, large cobbles visible	
38	N/A	90	0.4				SM	SILTY SAND silt and fine grained sand (60%), clay (40%), wet, poorly graded	
40	N/A		0.4				SM	SILTY SAND silt and fine grained sand (60%), clay (40%), wet, poorly graded	
42	N/A		0.4				SM	SILTY SAND silt and fine grained sand (60%), clay (40%), wet, poorly graded	
44	N/A		0.4				CL	CLAY light gray silty clay with gravel (10-25%), low plasticity, dry to damp, hard	
46	N/A		0.4				CL	CLAY light gray silty clay with gravel (10-25%), low plasticity, dry to damp, hard	
48									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: D. Manzo
Total Depth: 118 feet
Surface Elev.: 733.78
North Coor.: 3429.721
Begin Drilling: 11/19/03 @ 0809
End Drilling: 11/19/03 @ 1033
Converted to Well: Y Well I.D.: GM-41
East Coor.: 6684.301
Remarks: 4 inch core barrel.
Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-41

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
48	N/A	120	0.4				CL	CLAY light gray silty clay with gravel (10-25%), low plasticity, dry to damp, hard	
50	N/A		0.4				CL	CLAY light gray silty clay with gravel (10-25%), low plasticity, dry to damp, hard	
52	N/A		0.4				SP	SAND fine to medium grained sand, damp, poorly graded	
54	N/A		0.4				SP	SAND fine to medium grained sand, damp, poorly graded	
56	N/A		0.4				SP	SAND fine to medium grained sand, damp, poorly graded	
58	N/A	96	0.4				SP	SAND fine to medium grained sand, damp, poorly graded	
60									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 118 feet
Surface Elev.: 733.78
North Coor.: 3429.721

Begin Drilling: 11/19/03 @ 0809
End Drilling: 11/19/03 @ 1033
Converted to Well: Y Well I.D.: GM-41
East Coor.: 6684.301

Remarks: 4 inch core barrel.

Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-41

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
60	N/A		0.4				SP	SAND fine to medium grained sand, damp, poorly graded	
62	N/A		0.4				SP	SAND fine to medium grained sand, damp, poorly graded	
							CL	CLAY silty clay, dry, light gray, low plasticity, hard, gravel (10%)	
64	N/A		0.4				SW	SAND medium to coarse grained sand (75%), pea sized gravel (25%), wet (saturated), well graded	
66	N/A		0.4				SW	SAND medium to coarse grained sand (75%), pea sized gravel (25%), wet (saturated), well graded	
68	N/A	96	0.4				SW	SAND medium to coarse grained sand (75%), pea sized gravel (25%), wet (saturated), well graded	
70	N/A		0.4				SP	SAND fine grained sand, wet, poorly graded	
72									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 118 feet
Surface Elev.: 733.78
North Coor.: 3429.721

Begin Drilling: 11/19/03 @ 0809
End Drilling: 11/19/03 @ 1033
Converted to Well: Y Well I.D.: GM-41
East Coor.: 6684.301

Remarks: 4 inch core barrel.

Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-41

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
72	N/A		0.9				SM	SILTY SAND silt, fine grained sand (25%), wet, poorly graded	
74	N/A		0.9				SM	SILTY SAND silt, fine grained sand (25%), wet, poorly graded	
76	N/A		0.9				SM	SILTY SAND silt and fine grained sand (25%), wet, poorly graded	
78	N/A	204	0.4				SP	SAND fine to medium grained sand, wet, poorly graded	
80	N/A		0.4				SP	SAND fine to medium grained sand, wet, poorly graded	
82	N/A		0.4				SP	SAND fine to medium grained sand, wet, poorly graded	
84									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 118 feet
Surface Elev.: 733.78
North Coor.: 3429.721

Begin Drilling: 11/19/03 @ 0809
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Converted to Well: Y Well I.D.: GM-41
East Coor.: 6684.301

Remarks: 4 inch core barrel.

Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-41

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
84	N/A		0.4				SP	SAND fine to medium grained sand, wet, poorly graded	
86	N/A		0.4				SP	SAND fine to medium grained sand, wet, poorly graded	
88	N/A		0.4				SP	SAND fine to medium grained sand, wet, poorly graded	
90	N/A		0.4				GW	GRAVEL gravel (75%) and coarse grained sand (25%), well graded, wet (saturated), very large cobbles visible (10%)	
92	N/A		0.4				GW	GRAVEL gravel (75%) and coarse grained sand (25%), well graded, wet (saturated), very large cobbles visible (10%)	
94	N/A		0.4				GW	GRAVEL gravel (75%) and coarse grained sand (25%), well graded, wet (saturated), very large cobbles visible (10%)	
96									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 118 feet
Surface Elev.: 733.78
North Coor.: 3429.721

Begin Drilling: 11/19/03 @ 0809
End Drilling: 11/19/03 @ 1033
Converted to Well: Y Well I.D.: GM-41
East Coor.: 6684.301

Remarks: 4 inch core barrel.

Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-41

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
96	N/A		0.4				GW	GRAVEL gravel (75%) and coarse grained sand (25%), well graded, wet (saturated), very large cobbles visible (10%)	
98	N/A	108	0.4				GW	GRAVEL gravel (75%) and coarse grained sand (25%), well graded, wet (saturated), very large cobbles visible (10%)	
100	N/A		0.4				SW	SAND medium to coarse grained sand (75%) and gravel, well graded, wet	
102	N/A		0.4				SW	SAND medium to coarse grained sand (75%) and gravel, well graded, wet	
104	N/A		0.4				SW	SAND medium to coarse grained sand (75%) and gravel, well graded, wet	
106	N/A		0.4				SW	SAND medium to coarse grained sand (75%) and gravel, well graded, wet	
108									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 118 feet
Surface Elev.: 733.78
North Coor.: 3429.721

Begin Drilling: 11/19/03 @ 0809
End Drilling: 11/19/03 @ 1033
Converted to Well: Y Well I.D.: GM-41
East Coor.: 6684.301

Remarks: 4 inch core barrel.

Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-41

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
108	N/A	108	0.4				SW	SAND medium to coarse grained sand (75%) and gravel, well graded, wet	
110	N/A		0.4				SW	SAND medium to coarse grained sand (75%) and gravel, well graded, wet	
112	N/A		0.4				SW	SAND medium to coarse grained sand (75%) and gravel, well graded, wet	
114	N/A		0.4				CL	CLAY blue-gray clay with gravel (10%), hard, high plasticity, dry	
116	N/A		0.4				CL	CLAY blue-gray clay with gravel (10%), hard, high plasticity, dry	
118								End of Boring	
120									

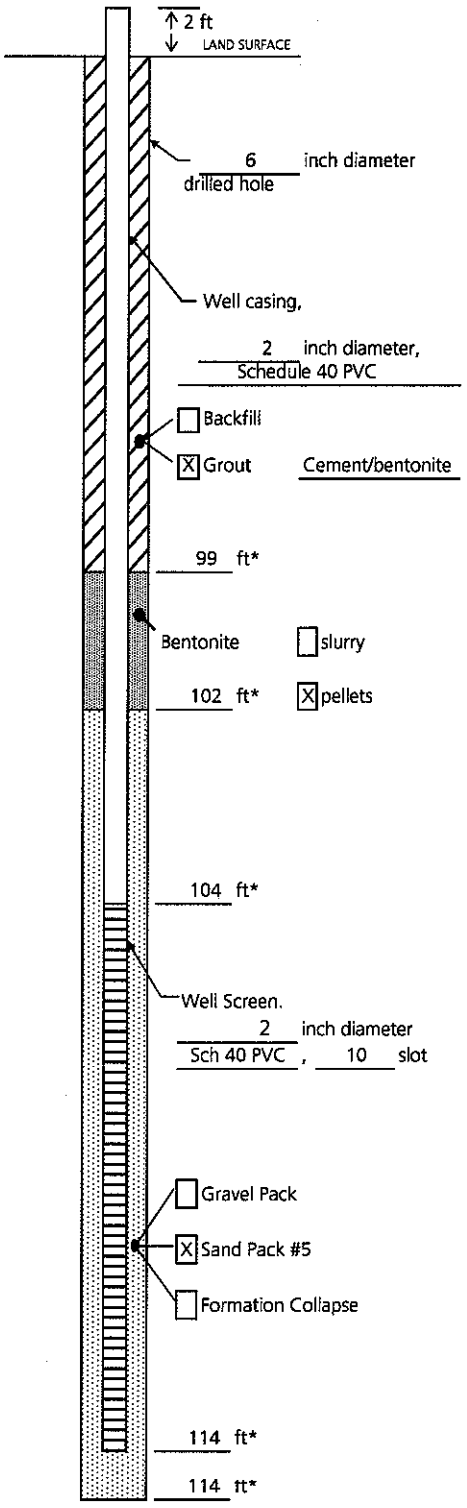
☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: D. Manzo
Total Depth: 118 feet
Surface Elev.: 733.78
North Coor.: 3429.721
Begin Drilling: 11/19/03 @ 0809
End Drilling: 11/19/03 @ 1033
Converted to Well: Y Well I.D.: GM-41
East Coor.: 6684.301
Remarks: 4 inch core barrel.
Project No.: OH000294.0005.00008
Datum: N/A
Filename: November 2003

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well GM-41

Town/City Moraine

County Montgomery State Ohio

Permit No. N/A

Land-Surface (LS) Elevation and Datum:

733.78 feet [X] Surveyed

[ ] Estimated

Installation Date(s) 11/19/2003

Drilling Method Rotosonic

Drilling Contractor Prosonic

Drilling Fluid Water (600 gallons)

Development Technique(s) and Date(s)

Submersible 4" pump 11/19/03 (600 gallons)

Fluid Loss During Drilling 150 gallons

Water Removed During Development 700 gallons

Static Depth to Water N/A feet below M.P.

Pumping Depth to Water N/A feet below M.P.

Pumping Duration 3 hours

Yield N/A gpm Date 11/19/03
11/20/03

Specific Capacity N/A gpm/ft

Well Purpose Deep monitoring well for east portion of property replaces production well 28.

Remarks Set well at 114' due to the clay from from 114-118'.

Prepared by D. Manzo

ARCADIS

Log of Boring: GM-42

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	N/A	96	1.4					ASPHALT	
							CL	CLAY brown silty clay, gravel (10-20%), dry, low plasticity, medium hardness	
2	N/A		0.9				CL	CLAY brown silty clay, gravel (10-20%), dry, low plasticity, medium hardness	
4	N/A		0.9				CL	CLAY brown silty clay, gravel (10-20%), dry, low plasticity, medium hardness	
6	N/A		0.9				CL	CLAY brown silty clay, gravel (10-20%), dry, low plasticity, medium hardness	
8	N/A	150	1.4				SP	SAND medium grained sand (80%), gravel (20%), dry, light brown, poorly graded	
10	N/A		1.4				SP	SAND medium grained sand (80%), gravel (20%), dry, light brown, poorly graded	
							SW	SAND fine to coarse grained sand (60%), gravel (40%), dry, light brown, well graded	
12									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 158 feet
Surface Elev.: 729.48
North Coor.: 2338.296

Begin Drilling: 11/11/03 @ 0915
End Drilling: 11/12/03 @ 1614
Converted to Well: Y Well I.D.: GM-42
East Coor.: 5651.056

Remarks: 4 inch core barrel.

Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-42

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
12	N/A		0.9				SW	SAND fine to coarse grained sand (60%), gravel (40%), dry, light brown, well graded	
14	N/A		1.4				SW	SAND fine to coarse grained sand (60%), gravel (40%), dry, light brown, well graded	
16	N/A		0.9				SW	SAND fine to coarse grained sand (60%), gravel (40%), dry, light brown, well graded	
18	N/A	132	1.4				SP	SAND fine grained sand (90%), gravel (10%), damp, light brown, poorly graded	
20	N/A		0.9				SP	SAND fine grained sand (90%), gravel (10%), damp, light brown, poorly graded	
22	N/A		1.4				GW	GRAVEL coarse grained sand (25%), gravel (75%), wet (saturated), well graded	▼
24									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 158 feet
Surface Elev.: 729.48
North Coor.: 2338.296

Begin Drilling: 11/11/03 @ 0915
End Drilling: 11/12/03 @ 1614
Converted to Well: Y Well I.D.: GM-42
East Coor.: 5651.056

Remarks: 4 inch core barrel.

Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-42

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
24	N/A		0.9				GW	GRAVEL coarse grained sand (25%), gravel (75%), wet (saturated), well graded	
26	N/A		0.9				GW	GRAVEL coarse grained sand (25%), gravel (75%), wet (saturated), well graded	
28	N/A	96	0.9				GW	GRAVEL coarse grained sand (25%), gravel (75%), wet (saturated), well graded	
30	N/A		0.9				GW	GRAVEL coarse grained sand (25%), gravel (75%), wet (saturated), well graded	
32	N/A		0.9				GW	GRAVEL coarse grained sand (25%), gravel (75%), wet (saturated), well graded	
34	N/A		0.9				GW	GRAVEL coarse grained sand (25%), gravel (75%), wet (saturated), well graded	
36									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: D. Manzo
Total Depth: 158 feet
Surface Elev.: 729.48
North Coor.: 2338.296
Begin Drilling: 11/11/03 @ 0915
End Drilling: 11/12/03 @ 1614
Converted to Well: Y Well I.D.: GM-42
East Coor.: 5651.056
Remarks: 4 inch core barrel.
Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-42

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
36	N/A		1.4				GW	GRAVEL coarse grained sand (25%), gravel (75%), wet (saturated), well graded	
							SW	SAND fine to coarse grained sand (60%), gravel (40%), well graded, wet (saturated)	
38	N/A	156	0.9				SW	SAND coarse grained sand (50%), gravel (50%), saturated (wet), well graded	
40	N/A		1.4				SW	SAND coarse grained sand (50%), gravel (50%), saturated (wet), well graded	
42	N/A		1.9				SW	SAND coarse grained sand (50%), gravel (50%), saturated (wet), well graded	
44	N/A		1.4				SW	SAND coarse grained sand (50%), gravel (50%), saturated (wet), well graded	
46	N/A		2.4				SW	SAND fine grained sand, coarse grained sand (50%), gravel (50%), saturated (wet), well graded	
							SP	SAND fine grained sand, damp to wet with 10% coarse sand and gravel, light brown, poorly graded	
48									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: D. Manzo
Total Depth: 158 feet
Surface Elev.: 729.48
North Coor.: 2338.296
Begin Drilling: 11/11/03 @ 0915
End Drilling: 11/12/03 @ 1614
Converted to Well: Y Well I.D.: GM-42
East Coor.: 5651.056
Remarks: 4 inch core barrel.
Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-42

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
48	N/A		2.4				SP	SAND fine grained sand, damp to wet with 10% coarse sand and gravel, light brown, poorly graded	
50	N/A	126	2.4				SP	SAND fine grained sand, damp to wet with 10% coarse sand and gravel, light brown, poorly graded	
52	N/A		2.4				SP	SAND fine grained sand, damp to wet with 10% coarse sand and gravel, light brown, poorly graded	
54	N/A		0.9				CL	CLAY light gray, damp, silty clay, low plasticity, medium hardness, gravel (10%)	
56	N/A		0.4				CL	CLAY light gray, damp, silty clay, low plasticity, medium hardness, gravel (10%)	
58	N/A	144	0.9				CL	CLAY light gray, damp, silty clay, low plasticity, medium hardness, gravel (10%)	
60									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 158 feet
Surface Elev.: 729.48
North Coor.: 2338.296

Begin Drilling: 11/11/03 @ 0915
End Drilling: 11/12/03 @ 1614
Converted to Well: Y Well I.D.: GM-42
East Coor.: 5651.056

Remarks: 4 inch core barrel.

Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-42

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
60	N/A		0.4				SW	SAND fine grained sand, light gray, wet (saturated), poorly graded, coarse grained sand and gravel (10%)	
62	N/A		0.4				CL	CLAY light gray silty clay, damp, coarse grained sand and gravel (10%), low plasticity, hard, 1-3" stringers of fine grained, wet sand	
64	N/A		0.4				CL	CLAY light gray silty clay, damp, coarse grained sand and gravel (10%), low plasticity, hard, 1-3" stringers of fine grained, wet sand	
66	N/A		3.4				SW	SAND light brown sand (75%), gravel (25%), well graded, damp	
68	N/A	138	0.4				SW	SAND damp, coarse grained sand (50%), gravel (50%), well graded, no fines	
70	N/A		0.4				SW	SAND damp, coarse grained sand (50%), gravel (50%), well graded, no fines	
72									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 158 feet
Surface Elev.: 729.48
North Coor.: 2338.296

Begin Drilling: 11/11/03 @ 0915
End Drilling: 11/12/03 @ 1614
Converted to Well: Y Well I.D.: GM-42
East Coor.: 5651.056

Remarks: 4 inch core barrel.

Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-42

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
72	N/A		0.4				SW	SAND damp, coarse grained sand (50%), gravel (50%), well graded, no fines	
74	N/A		0.0				SM	SILTY SAND fine grained sand (60%), silts and clay (40%), low plasticity, hard, light gray, damp	
76	N/A		0.0				SM	SILTY SAND fine grained sand (60%), silts and clay (40%), low plasticity, hard, light gray, damp	
78	N/A	90	0.4				SP	SAND fine to medium grained sand (90%), gravel (10%), poorly graded, damp	
80	N/A		0.4				SP	SAND fine to medium grained sand (90%), gravel (10%), poorly graded, damp	
82	N/A		0.4				SP	SAND fine to medium grained sand (90%), gravel (10%), poorly graded, damp	
84									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: D. Manzo
Total Depth: 158 feet
Surface Elev.: 729.48
North Coor.: 2338.296
Begin Drilling: 11/11/03 @ 0915
End Drilling: 11/12/03 @ 1614
Converted to Well: Y Well I.D.: GM-42
East Coor.: 5651.056
Remarks: 4 inch core barrel.
Project No.: OH000294.0005.00008
Datum: N/A
Filename: November 2003

ARCADIS

Log of Boring: GM-42

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
84	N/A		0.4				SP	SAND fine to medium grained sand (90%), gravel (10%), poorly graded, damp	
86	N/A		0.4				SP	SAND fine to medium grained sand (90%), gravel (10%), poorly graded, damp	
88	N/A	120	0.9				SP	SAND fine to medium grained sand (90%), gravel (10%), poorly graded, damp	
90	N/A		0.9				SP	SAND fine to medium grained sand (90%), gravel (10%), poorly graded, damp	
92	N/A		0.9				SP	SAND fine to medium grained sand (90%), gravel (10%), poorly graded, damp	
94	N/A		0.9				SP	SAND fine to medium grained sand (90%), gravel (10%), poorly graded, damp	
96									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: D. Manzo
Total Depth: 158 feet
Surface Elev.: 729.48
North Coor.: 2338.296
Begin Drilling: 11/11/03 @ 0915
End Drilling: 11/12/03 @ 1614
Converted to Well: Y Well I.D.: GM-42
East Coor.: 5651.056
Remarks: 4 inch core barrel.
Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-42

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
96	N/A		0.9				SP	SAND fine to medium grained sand (90%), gravel (10%), poorly graded, damp	
98	N/A	120	0.0				SP	SAND fine to medium grained sand (90%), gravel (10%), poorly graded, damp	
100	N/A		0.0				GW	GRAVEL gravel (75%), coarse grained sand (25%), wet, well graded, no fines	
102	N/A		0.0				GW	GRAVEL gravel (75%), coarse grained sand (25%), wet, well graded, no fines	
104	N/A		0.0				GW	GRAVEL gravel (75%), coarse grained sand (25%), wet, well graded, no fines	
106	N/A		0.0				GW	GRAVEL gravel (75%), coarse grained sand (25%), wet, well graded, no fines	
							CL	CLAY silty clay with coarse grained sand and gravel (25%), low plasticity, hard, light gray, damp	
108									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 158 feet
Surface Elev.: 729.48
North Coor.: 2338.296

Begin Drilling: 11/11/03 @ 0915
End Drilling: 11/12/03 @ 1614
Converted to Well: Y Well I.D.: GM-42
East Coor.: 5651.056

Remarks: 4 inch core barrel.

Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-42

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
108	N/A	162	0.0				SW	SAND sand (75%), gravel (25%), well graded, wet	
110	N/A		0.0				SP	SAND fine grained sand (80%), coarse grained sand and gravel (20%), poorly graded, wet	
112	N/A		0.0				GW	GRAVEL gravel (60%), coarse grained sand (40%), wet, well graded, no fines	
114	N/A		0.0				GW	GRAVEL gravel (60%), coarse grained sand (40%), wet, well graded, no fines	
							CL	CLAY light gray silty clay, gravel (25%), low plasticity, hard, damp	
116	N/A		0.0				CL	CLAY light gray silty clay, gravel (25%), low plasticity, hard, damp	
118	N/A	120	0.0				SW	SAND sand, wet, gravel (10%), well graded	
120									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 158 feet
Surface Elev.: 729.48
North Coor.: 2338.296

Begin Drilling: 11/11/03 @ 0915
End Drilling: 11/12/03 @ 1614
Converted to Well: Y Well I.D.: GM-42
East Coor.: 5651.056

Remarks: 4 inch core barrel.

Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-42

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
120	N/A		0.0				SW	SAND sand, wet, gravel (10%), well graded	
122	N/A		0.0				SW	SAND sand, wet, gravel (10%), well graded	
124	N/A		0.0				CL	CLAY light gray silty clay, damp, very hard, high plasticity	
126	N/A		0.0				CL	CLAY light gray silty clay, damp, very hard, high plasticity	
128	N/A	120	0.0				CL	CLAY light gray silty clay, damp, very hard, high plasticity	
130	N/A		0.0				GW	GRAVEL gravel (60%), fine to coarse grained sand (40%), wet, well graded	
132									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 158 feet
Surface Elev.: 729.48
North Coor.: 2338.296

Begin Drilling: 11/11/03 @ 0915
End Drilling: 11/12/03 @ 1614
Converted to Well: Y Well I.D.: GM-42
East Coor.: 5651.056

Remarks: 4 inch core barrel.

Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-42

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
132	N/A		0.0				GW	GRAVEL gravel (60%), fine to coarse grained sand (40%), wet, well graded	
134	N/A		0.0				GW	GRAVEL gravel (60%), fine to coarse grained sand (40%), wet, well graded	
136	N/A		0.0				GW	GRAVEL gravel (60%), fine to coarse grained sand (40%), wet, well graded	
138	N/A	96	0.0				GW	GRAVEL gravel (60%), fine to coarse grained sand (40%), wet, well graded	
140	N/A		0.0				GW	GRAVEL gravel (80%), sand (20%), cobbles visible, wet, well graded	
142	N/A		0.0				GW	GRAVEL gravel (80%), sand (20%), cobbles visible, wet, well graded	
144									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: D. Manzo
Total Depth: 158 feet
Surface Elev.: 729.48
North Coor.: 2338.296
Begin Drilling: 11/11/03 @ 0915
End Drilling: 11/12/03 @ 1614
Converted to Well: Y Well I.D.: GM-42
East Coor.: 5651.056
Remarks: 4 inch core barrel.
Project No.: OH000294.0005.00008
Datum: N/A
Filename: November 2003

ARCADIS

Log of Boring: GM-42

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
144	N/A		0.0				GW	GRAVEL gravel (80%), sand (20%), cobbles visible, wet, well graded	
146	N/A		0.0				GW	GRAVEL gravel (80%), sand (20%), cobbles visible, wet, well graded	
148	N/A	120	0.0				GW	GRAVEL gravel (80%), sand (20%), cobbles visible, wet, well graded	
150	N/A		0.0				SW	SAND sand (75%), gravel (25%), wet, well graded, some cobbles visible	
152	N/A		0.0				SW	SAND sand (75%), gravel (25%), wet, well graded, some cobbles visible	
154	N/A		0.0				SW	SAND sand (75%), gravel (25%), wet, well graded, some cobbles visible	
156									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: D. Manzo
Total Depth: 158 feet
Surface Elev.: 729.48
North Coor.: 2338.296
Begin Drilling: 11/11/03 @ 0915
End Drilling: 11/12/03 @ 1614
Converted to Well: Y Well I.D.: GM-42
East Coor.: 5651.056
Remarks: 4 inch core barrel.
Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Log of Boring: GM-42

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
156	N/A		0.0				SW	SAND sand (75%), gravel (25%), wet, well graded, some cobbles visible	
158								End of Boring	
160									
162									
164									
166									
168									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: J. Sigler
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 158 feet
Surface Elev.: 729.48
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Begin Drilling: 11/11/03 @ 0915
End Drilling: 11/12/03 @ 1614
Converted to Well: Y Well I.D.: GM-42
East Coor.: 5651.056

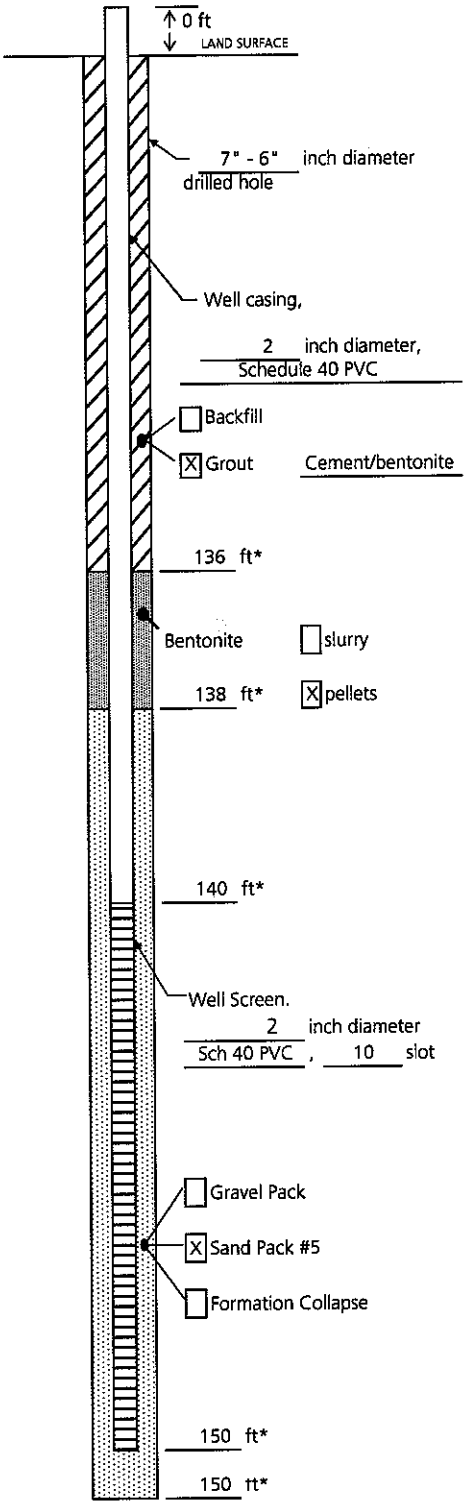
Remarks: 4 inch core barrel.

Project No.: OH000294.0005.00008 Datum: N/A Filename: November 2003

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well GM-42

Town/City Moraine

County Montgomery State Ohio

Permit No. N/A

Land-Surface (LS) Elevation and Datum:

729.48 feet [X] Surveyed

[ ] Estimated

Installation Date(s) 11/11/03 - 11/12/03

Drilling Method Rotosonic

Drilling Contractor Prosonic

Drilling Fluid Water (765 gallons)

Development Technique(s) and Date(s)

Submersible pump 11/19/03

Fluid Loss During Drilling N/A gallons

Water Removed During Development 1100 gallons

Static Depth to Water N/A feet below M.P.

Pumping Depth to Water N/A feet below M.P.

Pumping Duration 7.5 hours

Yield N/A gpm Date 11/19/03
11/20/03

Specific Capacity N/A gpm/ft

Well Purpose Deep monitoring well for south portion of property replaces production well 32.

Remarks 7" casing driven to 58'.
6" casing driven to 150'.

Prepared by D. Manzo

ARCADIS

Log of Boring: GM-43

General Motors Corporation

Building 14 Investigation, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	7,14,12,8	20	0				GW	SANDY GRAVEL First 10" concrete then sandy gravel with 25% silt and clay, dry, fill	
2	8,12,11,7	4	0				GW	SANDY GRAVEL Sandy gravel with 25% silt and clay, dry, fill	
4	7,11,12, 14	21	0				SM	SILTY SAND Silty sand with 25% gravel, well graded, dry	
6	12,10,7,9	12	0				SM	SILTY SAND Silty sand with 25% gravel, well graded, dry	
8	7,13,11, 11	19	0				SW	SAND Medium to coarse grained sand (75%) and gravel (25%), well graded, dry	
10	7,5,4,6	15	0				SW	SAND Medium to coarse grained sand (75%) and gravel (25%), well graded, dry	
12									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Frontz Drilling
Driller: A.Mackey
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: J. Manzo
Total Depth: 54
Surface Elev.: 729.00
North Coor.: 3654.83199

Begin Drilling: 8/9/04 @ 9:02
End Drilling: 8/9/04 @ 1310
Converted to Well: Y Well I.D.: GM-43
East Coor.: 5210.57176

Remarks: Samples submitted for laboratory analysis of VOCs.

Project No.: OH000294.0006.00009 Datum: Filename: August 2004

ARCADIS

Log of Boring: GM-43

General Motors Corporation

Building 14 Investigation, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Soil Class.	Description	Depth to Water
12	5,4,3,4	20	0	SW	SAND Fine to medium grained sand with 10% gravel, well graded, dry	
14	4,22,22, 16	18	0	SW	SAND Sand (70%) and gravel (30%), well graded, damp	
16	13,19,21, 20	20	0	SW	SAND Sand (70%) and gravel (30%), well graded, damp	
18	5,17,24, 21	19	0	SM	SILTY SAND Silty sand with 25% gravel, damp, well graded	
20	14,24,21, 10	12	0	SM	SILTY SAND Silty sand with 25% gravel, damp, well graded	
22	14,24,12, 11	20	0	GW	GRAVEL Wet (saturated), sand (50%) and gravel (50%), well graded	▼
24						

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Frontz Drilling
Driller: A.Mackey
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: J. Manzo
Total Depth: 54
Surface Elev.: 729.00
North Coor.: 3654.83199

Begin Drilling: 8/9/04 @ 9:02
End Drilling: 8/9/04 @ 1310
Converted to Well: Y Well I.D.: GM-43
East Coor.: 5210.57176

Remarks: Samples submitted for laboratory analysis of VOCs.

Project No.: OH000294.0006.00009 Datum: Filename: August 2004

ARCADIS

Log of Boring: GM-43

General Motors Corporation

Building 14 Investigation, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
24	8,17,15, 14	20	0				GW	GRAVEL Wet (saturated), sand (50%) and gravel (50%), well graded	
26	10,14,7, 11	17	0				SW	SAND Medium to coarse grained sand, wet (saturated), well graded	
28	7,5,9,11	11	0				SW	SAND Medium to coarse grained sand, wet (saturated), well graded	
30	11,14,12, 12	19	0				SW	SAND Medium to coarse grained sand, wet (saturated), well graded	
32	7,11,14, 19	21	0				SW	SAND Medium to coarse grained sand, wet (saturated), well graded	
								Gray silty clay with 10% gravel, hard, low plasticity, damp	
34	21,50/4	0	0					No recovery, pushing cobble	
36									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Frontz Drilling
Driller: A.Mackey
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: J. Manzo
Total Depth: 54
Surface Elev.: 729.00
North Coor.: 3654.83199

Begin Drilling: 8/9/04 @ 9:02
End Drilling: 8/9/04 @ 1310
Converted to Well: Y Well I.D.: GM-43
East Coor.: 5210.57176

Remarks: Samples submitted for laboratory analysis of VOCs.

Project No.: OH000294.0006.00009 Datum: Filename: August 2004

ARCADIS

Log of Boring: GM-43

General Motors Corporation

Building 14 Investigation, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
36	12,19,17, 23	20	0				SW	SAND Medium to coarse grained sand and fine grained gravel, well graded	
38	4,17,20, 16	13	0				SW	SAND Medium to coarse grained sand and fine grained gravel, well graded	
40	3,6,50/3	13	0				SW	SAND Medium to coarse grained sand and fine grained gravel, well graded	
42	14,17,19, 22	13	0				SW	SAND Medium to coarse grained sand and fine grained gravel, well graded	
44	12,29,50/ 2	15	0				GW	GRAVEL Fine to medium grained gravel (75%) and coarse grained sand (25%)	
46	7,26,50/2	5	0				SW	SAND Fine to medium grained sand (75%) and gravel, well graded	
48									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Frontz Drilling
Driller: A.Mackey
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: J. Manzo
Total Depth: 54
Surface Elev.: 729.00
North Coor.: 3654.83199

Begin Drilling: 8/9/04 @ 9:02
End Drilling: 8/9/04 @ 1310
Converted to Well: Y Well I.D.: GM-43
East Coor.: 5210.57176

Remarks: Samples submitted for laboratory analysis of VOCs.

Project No.: OH000294.0006.00009 Datum: Filename: August 2004

ARCADIS

Log of Boring: GM-43

General Motors Corporation

Building 14 Investigation, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
48	29,19,22, 32	24	0				SW	SAND Fine to medium grained sand (75%) and gravel, well graded	
							CL	CLAY Gray, silty clay with 10% gravel hard, low plasticity	
50	21,25,27, 31	11	0				CL	CLAY Gray, silty clay with 10% gravel hard, low plasticity	
							CL	CLAY Gray, silty clay with 25% gravel and sand, low plasticity, hard	
52	22,50/3	9	0				CL	CLAY Gray, silty clay with 10% gravel, hard, low plasticity	
54								End of boring	
56									
58									
60									

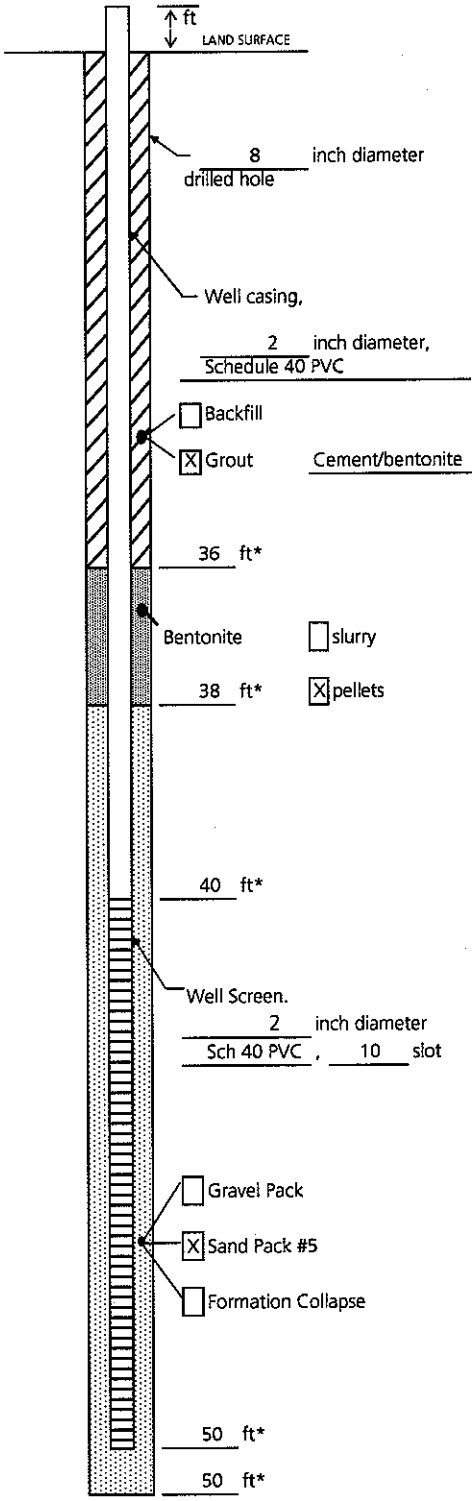
☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Frontz Drilling
Geologist: J. Manzo
Begin Drilling: 8/9/04 @ 9:02
Driller: A.Mackey
Total Depth: 54
End Drilling: 8/9/04 @ 1310
Drilling Method: Hollow Stem Auger
Surface Elev.: 729.00
Converted to Well: Y Well I.D.: GM-43
Drilling Fluid: None
North Coor.: 3654.83199
East Coor.: 5210.57176
Remarks: Samples submitted for laboratory analysis of VOCs.
Project No.: OH000294.0006.00009
Datum:
Filename: August 2004

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project OH000294.0006.0009 Well GM-43

Town/City Moraine, Ohio

County Montgomery State Ohio

Permit No.

Land-Surface (LS) Elevation and Datum:

729.00 feet [X] Surveyed

[ ] Estimated

Installation Date(s) 8/9/2004

Drilling Method Hollow stem auger

Drilling Contractor Frontz Drilling

Drilling Fluid None

Development Technique(s) and Date(s)

Submersible pump (proactive mini-typhoon) 8/16/04

Fluid Loss During Drilling N/A gallons

Water Removed During Development 250 gallons

Static Depth to Water 21.69 feet below M.P..

Pumping Depth to Water 21.97 feet below M.P.

Pumping Duration 2 hours

Yield 2 gpm Date 8/16/04

Specific Capacity NM gpm/ft

Well Purpose Monitoring well

Remarks

Prepared by J. Manzo

ARCADIS

Log of Boring: GM-44

General Motors Corporation

Building 14 Investigation, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	5,5,1,1	8	0				ML	SILT 8" of asphalt, brown, clayey-silt with 25% sand and gravel, dry, fill	
2	5,4,6,6	2	0				ML	SILT Brown, clayey-silt with 25% sand and gravel, dry, fill	
4	10,18,23, 11	12	0				GM	GRAVEL Gravel (50%), sand (50%), aggregate, fill, dry (poor recovery)	
6	7,9,9,7	4	0				GM	GRAVEL Gravel (50%), sand (50%), aggregate, fill, dry (poor recovery)	
8	11,27,26, 29	13	0				GW	GRAVEL Sandy gravel, no clay or silt, aggregate visible, fill, dry	
10	16,24,29, 27	15	0				GW	GRAVEL Sandy gravel, no clay or silt, aggregate visible, fill, dry	
12									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Frontz Drilling
Driller: A.Mackey
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: J. Manzo
Total Depth: 62
Surface Elev.: 728.77
North Coor.: 3137.22419

Begin Drilling: 8/3/04 @ 1528
End Drilling: 8/4/04 @ 8:58
Converted to Well: Y Well I.D.: GM-44
East Coor.: 5217.32129

Remarks: Samples submitted for laboratory analysis of VOCs.

Project No.: OH000294.0006.00009 Datum: Filename: August 2004

ARCADIS

Log of Boring: GM-44

General Motors Corporation

Building 14 Investigation, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
12	12,18,21, 27	19	0				GM	GRAVEL Gravel (25%), sand (75%) with 10% silt and clay, dry	
14	11,12,17, 16	12	0				SP	SAND Silt (30%), sand (60%), 10% gravel, dry, poorly graded	
16	14,17,21, 25	2	0				SP	SAND Silt (30%), sand (60%), 10% gravel, dry, poorly graded (poor recovery)	
18	19,29,33, 35	18	0				SP	SAND Silt (30%), sand (60%), 10% gravel, dry, poorly graded	
20	18,50/5	3	0				SW	SAND Silty sand with 25% gravel, dry, well graded, poor recovery	
22	7,10,14, 12	12	0				GW	GRAVEL Saturated, coarse grained sand (40%), gravel (60%), well graded	▼
24									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Frontz Drilling
Driller: A.Mackey
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: J. Manzo
Total Depth: 62
Surface Elev.: 728.77
North Coor.: 3137.22419

Begin Drilling: 8/3/04 @ 1528
End Drilling: 8/4/04 @ 8:58
Converted to Well: Y Well I.D.: GM-44
East Coor.: 5217.32129

Remarks: Samples submitted for laboratory analysis of VOCs.

Project No.: OH000294.0006.00009 Datum: Filename: August 2004

ARCADIS

Log of Boring: GM-44

General Motors Corporation

Building 14 Investigation, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
24	9,12,11,7	18	0				GW	GRAVEL Saturated, coarse grained sand (40%), gravel (60%), well graded	
26	10,14,13,16	18	0				GW	GRAVEL Saturated, coarse grained sand (40%), gravel (60%), well graded	
28	12,14,16,14	21	0				GW	GRAVEL Saturated, coarse grained sand (40%), gravel (60%), well graded	
30	11,14,17,15	2	0				GW	GRAVEL Saturated, coarse grained sand (40%), gravel (60%), well graded, poor recovery	
32	12,16,14,19	20	0				SW	SAND Fine to medium grained sand (75%), gravel (25%), well graded	
34	10,19,20,17	21	0				SW	SAND Coarse grained sand (75%), gravel (25%), well graded	
36									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Frontz Drilling
Driller: A.Mackey
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: J. Manzo
Total Depth: 62
Surface Elev.: 728.77
North Coor.: 3137.22419

Begin Drilling: 8/3/04 @ 1528
End Drilling: 8/4/04 @ 8:58
Converted to Well: Y Well I.D.: GM-44
East Coor.: 5217.32129

Remarks: Samples submitted for laboratory analysis of VOCs.

Project No.: OH000294.0006.00009 Datum: Filename: August 2004

ARCADIS

Log of Boring: GM-44

General Motors Corporation

Building 14 Investigation, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
36	12,19,21, 26	21	0				GW	GRAVEL Fine gravel (75%), sand (25%), well graded	
38	13,27,50/ 4	4	0				GW	GRAVEL Fine gravel (75%), sand (25%), well graded, poor recovery	
40	25,29,50/ 4	20	0				SP	SAND Fine grained sand, poorly graded	
							CL	CLAY Gray clay, very hard, low plasticity, 25% gravel, dry	
42	16,50/5	17	0				CL	CLAY Gray clay, very hard, low plasticity, 25% gravel, dry	
44	7,14,21, 36	24	0				GW	GRAVEL Sand (20%), fine gravel (80%), well graded	
46	7,9,12,14	13	0				GW	GRAVEL Coarse grained sand (20%), gravel (80%), well graded	
48									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Frontz Drilling
Driller: A.Mackey
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: J. Manzo
Total Depth: 62
Surface Elev.: 728.77
North Coor.: 3137.22419

Begin Drilling: 8/3/04 @ 1528
End Drilling: 8/4/04 @ 8:58
Converted to Well: Y Well I.D.: GM-44
East Coor.: 5217.32129

Remarks: Samples submitted for laboratory analysis of VOCs.

Project No.: OH000294.0006.00009 Datum: Filename: August 2004

ARCADIS

Log of Boring: GM-44

General Motors Corporation

Building 14 Investigation, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
48	9,11,14, 21	17	0				GW	GRAVEL Coarse grained sand (20%), gravel (80%), well graded	
50	15,17,19, 23	14	0				GW	GRAVEL Coarse grained sand (20%), gravel (80%), well graded	
52	5,9,17,23	13	0				GW	GRAVEL Coarse grained sand (20%), gravel (80%), well graded	
54	14,15,34, 41	4	0				GW	GRAVEL Coarse grained sand (20%), gravel (80%), well graded	
56	5,17,50/3	5	0				GW	GRAVEL Coarse grained sand (20%), gravel (80%), well graded, pushing cobble	
58	9,50/3	2	0				GW	GRAVEL Coarse grained sand (20%), gravel (80%), well graded, pushing cobble	
60									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Frontz Drilling
Driller: A.Mackey
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: J. Manzo
Total Depth: 62
Surface Elev.: 728.77
North Coor.: 3137.22419

Begin Drilling: 8/3/04 @ 1528
End Drilling: 8/4/04 @ 8:58
Converted to Well: Y Well I.D.: GM-44
East Coor.: 5217.32129

Remarks: Samples submitted for laboratory analysis of VOCs.

Project No.: OH000294.0006.00009 Datum: Filename: August 2004

ARCADIS

Log of Boring: GM-44

General Motors Corporation

Building 14 Investigation, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
60	23,27,30, 50/3	13	0				CL	CLAY Gray clay with 10% gravel, hard, low plasticity, dry	
62								End of boring	
64									
66									
68									
70									
72									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Frontz Drilling
Driller: A.Mackey
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: J. Manzo
Total Depth: 62
Surface Elev.: 728.77
North Coor.: 3137.22419

Begin Drilling: 8/3/04 @ 1528
End Drilling: 8/4/04 @ 8:58
Converted to Well: Y Well I.D.: GM-44
East Coor.: 5217.32129

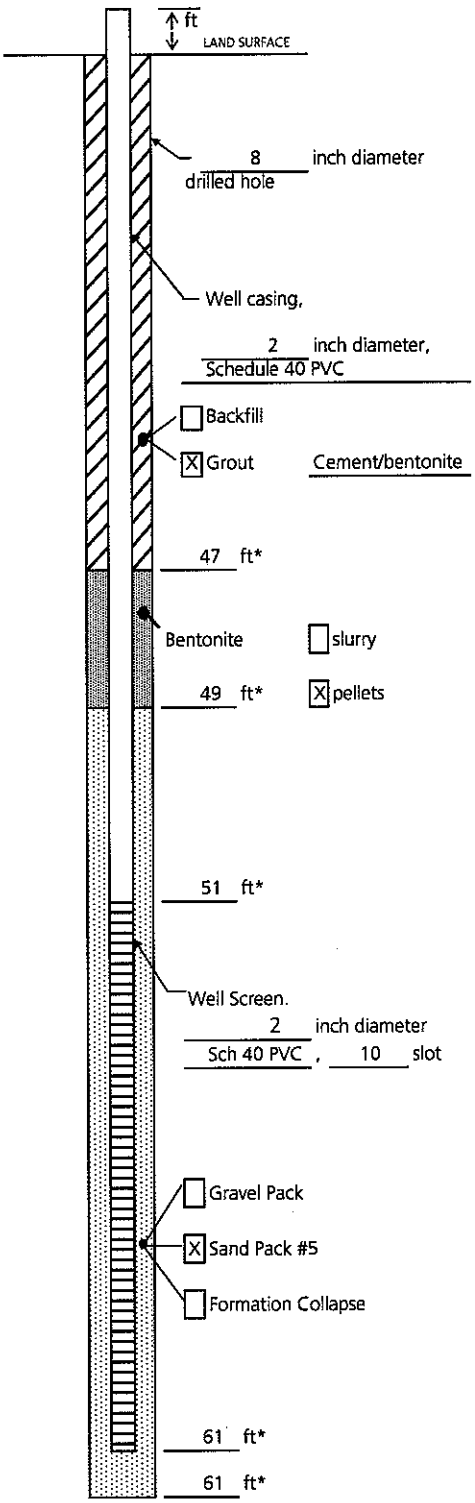
Remarks: Samples submitted for laboratory analysis of VOCs.

Project No.: OH000294.0006.00009 Datum: Filename: August 2004

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project OH000294.0006.0009 Well GM-44

Town/City Moraine, Ohio

County Montgomery State Ohio

Permit No.

Land-Surface (LS) Elevation and Datum:

728.77 feet [X] Surveyed

[ ] Estimated

Installation Date(s) 8/4/2004

Drilling Method Hollow stem auger

Drilling Contractor Frontz Drilling

Drilling Fluid None

Development Technique(s) and Date(s)

Submersible pump (proactive mini-typhoon) 8/16/04

Fluid Loss During Drilling N/A gallons

Water Removed During Development 250 gallons

Static Depth to Water 21.79 feet below M.P..

Pumping Depth to Water 21.87 feet below M.P.

Pumping Duration 2 hours

Yield 2 gpm Date 8/16/04

Specific Capacity NM gpm/ft

Well Purpose Monitoring well

Remarks

Prepared by J. Manzo

ARCADIS

Log of Boring: GM-45

General Motors Corporation

Building 14 Investigation, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	12,10,11, 12	24	0				CL	CLAY 3" of asphalt then dark brown, silty clay with 10% gravel, hard, low plasticity, dry	
2	8,4,3,4	20	0				CL	CLAY Dark brown, silty clay with 10% gravel, hard, low plasticity, dry	
4	4,6,7,3	17	0				CL	CLAY Brown, silty clay, medium plasticity, medium hardness, dry	
6	6,5,7,8	16	0				SW	SAND Fine to medium grained sand, well graded, 10% gravel	
8	3,5,11,16	17	0				SW	SAND Fine to medium grained sand, well graded, 10% gravel	
10	11,16,21, 34	19	0				SW	SAND Fine to medium grained sand, well graded, 10% gravel	
12									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯▯ Split-Spoon Not Analyzed

Drilling Co.: Frontz Drilling
Driller: A.Mackey
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: J. Manzo
Total Depth: 60
Surface Elev.: 729.75
North Coor.: 2852.62955

Begin Drilling: 8/5/04 @ 7:18
End Drilling: 8/5/04 @ 1358
Converted to Well: Y Well I.D.: GM-45
East Coor.: 5216.73965

Remarks: Samples submitted for laboratory analysis of VOCs.

Project No.: OH000294.0006.00009 Datum: Filename: August 2004

ARCADIS

Log of Boring: GM-45

General Motors Corporation — Building 14 Investigation, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Soil Class.	Description
12	36,50/3	3	0	SW	SAND Fine to medium grained sand, well graded, 10% gravel, poor recovery, pushing rock
14	13,20,19, 43	11	0	SW	SAND Fine to medium grained sand, well graded, 10% gravel, poor recovery
16	31,24,33, 37	12	0	SW	SAND Fine to medium grained sand, well graded, 10% gravel, poor recovery
18	11,10,15, 14	10	0	GW	GRAVEL Sand (40%) and cobble size gravel (60%), well graded
20	9,14,15,4	9	0	GW	GRAVEL Sand (40%) and cobble size gravel (60%), well graded
22	11,12,10, 9	7	0	GW	GRAVEL Saturated, sand (30%), gravel (70%), well graded, sand is coarse grained
24					

Depth to Water

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Frontz Drilling
Driller: A.Mackey
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: J. Manzo
Total Depth: 60
Surface Elev.: 729.75
North Coor.: 2852.62955

Begin Drilling: 8/5/04 @ 7:18
End Drilling: 8/5/04 @ 1358
Converted to Well: Y Well I.D.: GM-45
East Coor.: 5216.73965

Remarks: Samples submitted for laboratory analysis of VOCs.

Project No.: OH000294.0006.00009 Datum:

Filename: August 2004

ARCADIS

Log of Boring: GM-45

General Motors Corporation

Building 14 Investigation, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
24	9,12,23, 22	15	0				GW	GRAVEL Saturated, sand (30%), gravel (70%), well graded, sand is coarse grained	
26	12,16,19, 23	24	0				GW	GRAVEL Saturated, sand (30%), gravel (70%), well graded, sand is coarse grained	
28	15,16,32, 35	24	0				GW	GRAVEL Saturated, sand (30%), gravel (70%), well graded, sand is coarse grained	
30	5,30,24, 10	4	0				GW	GRAVEL Saturated, sand (30%), gravel (70%), well graded, sand is coarse grained	
32	5,12,8,11	13	0				GW	GRAVEL Saturated, sand (30%), gravel (70%), well graded, sand is coarse grained	
34	12,20,14, 8	17	0				GW	GRAVEL Saturated, sand (30%), gravel (70%), well graded, sand is coarse grained	
36									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Frontz Drilling
Driller: A.Mackey
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: J. Manzo
Total Depth: 60
Surface Elev.: 729.75
North Coor.: 2852.62955

Begin Drilling: 8/5/04 @ 7:18
End Drilling: 8/5/04 @ 1358
Converted to Well: Y Well I.D.: GM-45
East Coor.: 5216.73965

Remarks: Samples submitted for laboratory analysis of VOCs.

Project No.: OH000294.0006.00009 Datum: Filename: August 2004

ARCADIS

Log of Boring: GM-45

General Motors Corporation

Building 14 Investigation, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
36	7,50/3	11	0				GW	GRAVEL Saturated, sand (30%), gravel (70%), well graded, sand is coarse grained	
38	25,40,7/50	16	0				CL	CLAY Gray, clay with 10% gravel, hard, low plasticity	
40	25,24,30,29	20	0				CL	CLAY Gray, clay with 10% gravel, hard, low plasticity	
42	34,50/3	24	0				CL	CLAY Gravel, clay with 25% sand, hard, low plasticity	
44	8,8,16,17	24	0				GW	GRAVEL Coarse grained sand (40%), fine grained gravel (60%), wet (saturated)	
46	8,12,16,11	24	0				GW	GRAVEL Coarse grained sand (40%), fine grained gravel (60%), wet (saturated)	
48									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Frontz Drilling
Driller: A.Mackey
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: J. Manzo
Total Depth: 60
Surface Elev.: 729.75
North Coor.: 2852.62955

Begin Drilling: 8/5/04 @ 7:18
End Drilling: 8/5/04 @ 1358
Converted to Well: Y Well I.D.: GM-45
East Coor.: 5216.73965

Remarks: Samples submitted for laboratory analysis of VOCs.

Project No.: OH000294.0006.00009 Datum: Filename: August 2004

ARCADIS

Log of Boring: GM-45

General Motors Corporation

Building 14 Investigation, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
48	12,50/3	9	0				GW	GRAVEL Coarse grained sand (40%), fine grained gravel (60%), wet (saturated)	
50	19,25,29, 27	24	0				GW	GRAVEL Coarse grained sand (40%), fine grained gravel (60%), wet (saturated)	
52	8,12,17, 15	24	0				GW	GRAVEL Coarse grained sand (40%), fine grained gravel (60%), wet (saturated)	
54	7,15,9,12	12	0				GW	GRAVEL Coarse grained sand (40%), fine grained gravel (60%), wet (saturated)	
56	13,17,50/ 3	12	0				GW	GRAVEL Coarse grained sand (40%), fine grained gravel (60%), wet (saturated)	
58	9,11,14, 12	3	0				GW	GRAVEL Coarse grained sand (40%), fine grained gravel (60%), wet (saturated), poor recovery	
							CL	CLAY Gray, clay with 10% gravel, hard, low plasticity	
60									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Frontz Drilling
Driller: A.Mackey
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: J. Manzo
Total Depth: 60
Surface Elev.: 729.75
North Coor.: 2852.62955

Begin Drilling: 8/5/04 @ 7:18
End Drilling: 8/5/04 @ 1358
Converted to Well: Y Well I.D.: GM-45
East Coor.: 5216.73965

Remarks: Samples submitted for laboratory analysis of VOCs.

Project No.: OH000294.0006.00009 Datum: Filename: August 2004

ARCADIS

Log of Boring: GM-45

General Motors Corporation

Building 14 Investigation, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
60								End of boring	
62									
64									
66									
68									
70									
72									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Frontz Drilling
Driller: A.Mackey
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: J. Manzo
Total Depth: 60
Surface Elev.: 729.75
North Coor.: 2852.62955

Begin Drilling: 8/5/04 @ 7:18
End Drilling: 8/5/04 @ 1358
Converted to Well: Y Well I.D.: GM-45
East Coor.: 5216.73965

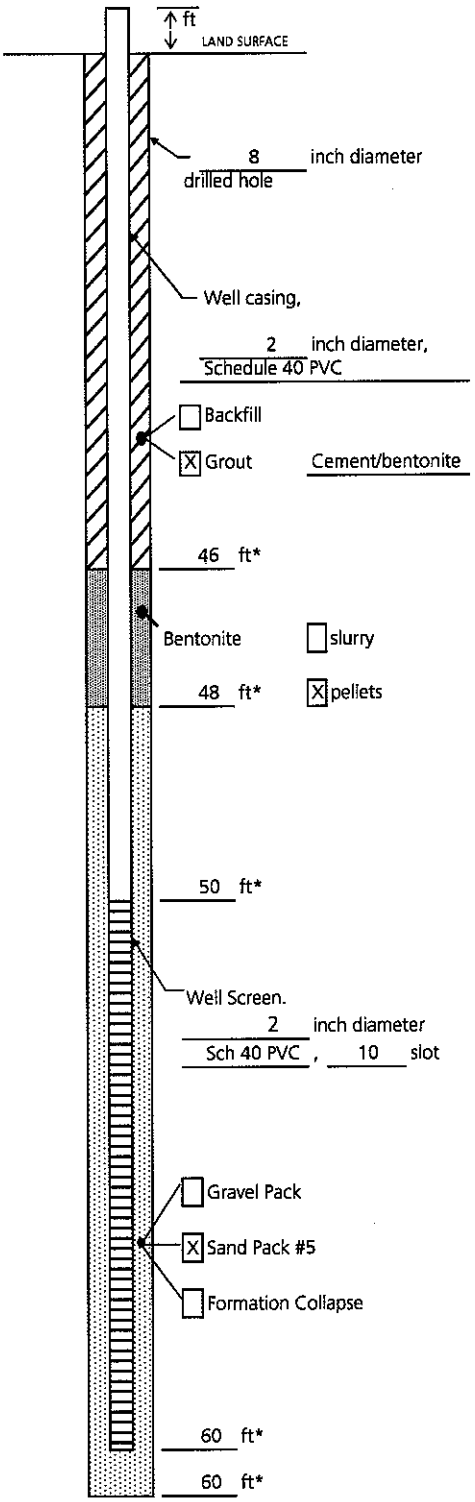
Remarks: Samples submitted for laboratory analysis of VOCs.

Project No.: OH000294.0006.00009 Datum: Filename: August 2004

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project OH000294.0006.0009 Well GM-45

Town/City Moraine, Ohio

County Montgomery State Ohio

Permit No.

Land-Surface (LS) Elevation and Datum:

729.75 feet [X] Surveyed

[ ] Estimated

Installation Date(s) 8/5/2004

Drilling Method Hollow stem auger

Drilling Contractor Frontz Drilling

Drilling Fluid None

Development Technique(s) and Date(s)

Submersible pump (proactive mini-typhoon) 8/16/04

Fluid Loss During Drilling N/A gallons

Water Removed During Development 300 gallons

Static Depth to Water 22.18 feet below M.P..

Pumping Depth to Water 22.31 feet below M.P.

Pumping Duration 2.50 hours

Yield 2 gpm Date 8/16/04

Specific Capacity NM gpm/ft

Well Purpose Monitoring well

Remarks

Prepared by J. Manzo

ARCADIS

Log of Boring: GM-46

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	N/A	N/A	N/A					CONCRETE	
2	N/A	24	0.0				ML	FILL Brown, clayey silt, gravel (25%), low plasticity, hard, dry Same as above	
4	N/A	24	0.0				ML	Same as above	
6	N/A	24	0.0				ML	FILL Gray, clayey silt, sand and gravel (25%), soft, low plasticity, moist	
8	N/A	24	0.0				SW	SAND & GRAVEL Brown, gravel (25%), some silt, trace cobbles, well graded, moist	
10	N/A	24	0.0				SW	Same as above	
12	N/A	24	0.0				SW	Same as above	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Prosonic Corporation
Geologist: J. Manzo
Begin Drilling: 2/24/06 @ 1705
Driller: J. Sigler
Total Depth: 32
End Drilling: 2/25/06 @ 1835
Drilling Method: Rotosonic
Surface Elev.: 728.13
Converted to Well: Y Well I.D.: GM-46
Drilling Fluid: Water
North Coor.: 5130.493
East Coor.: 6256.772
Remarks:

Project No.: OH000294.0008.00002
Datum: TOC Elev. 727.79
Filename: February 2006

ARCADIS

Log of Boring: GM-46

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
14	N/A	24	0.0				SW	Same as above	
16	N/A	24	0.0				SW	Same as above	
18	N/A	24	0.0				GW	SAND & GRAVEL Gray, sand (25%), well graded, moist-wet	
20	N/A	24	0.0				GW	Same as above	
22	N/A	24	0.0				ML	CLAYEY SILT Gray, gravel (25%), soft, medium plasticity, wet	▼
24	N/A	24	0.0				ML	Same as above	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic Corporation
Geologist: J. Manzo
Begin Drilling: 2/24/06 @ 1705
Driller: J. Sigler
Total Depth: 32
End Drilling: 2/25/06 @ 1835
Drilling Method: Rotosonic
Surface Elev.: 728.13
Converted to Well: Y Well I.D.: GM-46
Drilling Fluid: Water
North Coor.: 5130.493
East Coor.: 6256.772
Remarks:

Project No.: OH000294.0008.00002
Datum: TOC Elev. 727.79
Filename: February 2006

ARCADIS

Log of Boring: GM-46

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
								Water sample collected at 25' for analysis of site-specific VOCs.	
26	N/A	24	0.0				ML	Same as above	
28	N/A	24	0.0				CL	SILTY CLAY Gray, hard, gravel (25%), moist to dry	
30	N/A	24	0.0				CL	Same as above	
32								End of boring	
34									
36									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

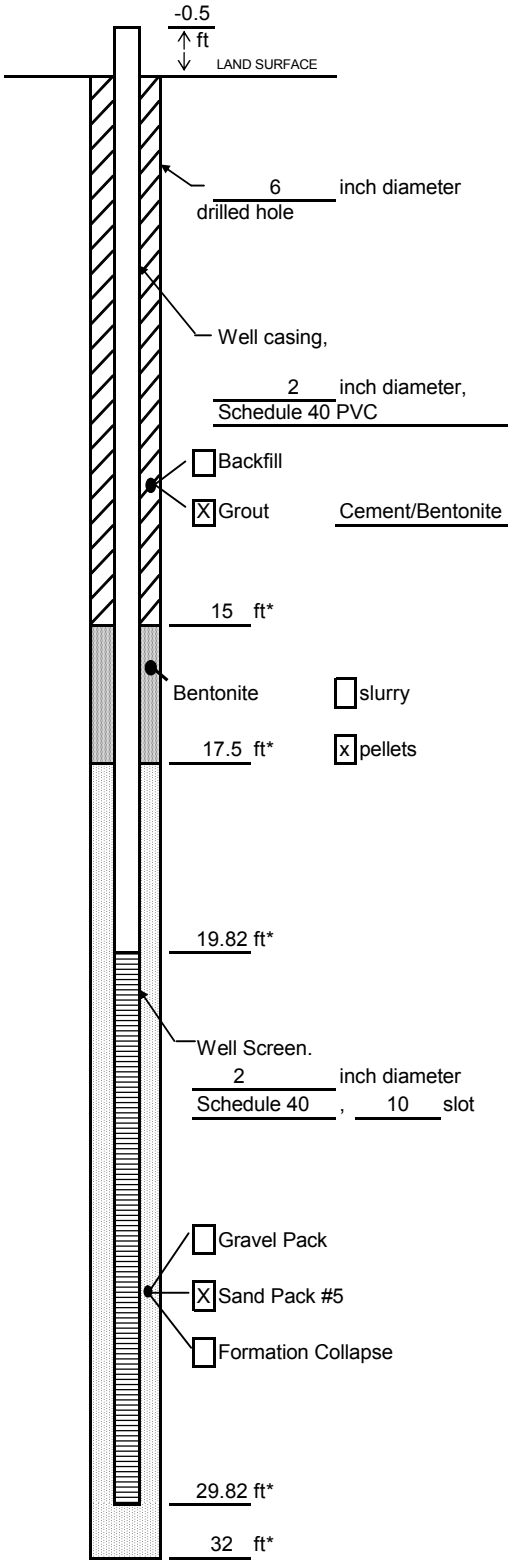
Drilling Co.: Prosonic Corporation
Geologist: J. Manzo
Begin Drilling: 2/24/06 @ 1705
Driller: J. Sigler
Total Depth: 32
End Drilling: 2/25/06 @ 1835
Drilling Method: Rotosonic
Surface Elev.: 728.13
Converted to Well: Y Well I.D.: GM-46
Drilling Fluid: Water
North Coor.: 5130.493
East Coor.: 6256.772
Remarks:

Project No.: OH000294.0008.00002
Datum: TOC Elev. 727.79
Filename: February 2006

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well GM-46

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

728.13 feet [x] Surveyed

[ ] Estimated

Installation Date(s) 2/24-2/25/06

Drilling Method Rotosonic

Drilling Contractor Prosonic Corporation

Drilling Fluid Water

Development Technique(s) and Date(s)

Submersible pump 2/25/06

Fluid Loss During Drilling NA gallons

Water Removed During Development 200 gallons

Static Depth to Water 20.27 feet below M.P.

Pumping Depth to Water 20.27 feet below M.P.

Pumping Duration 3.00 hours

Yield 3 gpm Date 2/25/06

Specific Capacity N/A gpm/ft

Well Purpose Monitoring Well

Remarks TOC Elevation = 727.79

Prepared by J. Manzo

ARCADIS

Log of Boring: GM-47

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	N/A	12	0.0				GP	GRAVEL Poorly graded, dry	
2	N/A	12	0.0				SW	SAND AND GRAVEL Brown, medium-fine, gravel (20%), little silt, dry	
4	N/A	12	0.0				SW	Same as above	
6	N/A	12	0.0				SW	Same as above	
8	N/A	24	0.0				SW	Same as above	
10	N/A	24	0.0				SW	Same as above	
12	N/A	24	0.0				SW	Same as above	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic Corporation
Geologist: T. Fortner
Begin Drilling: 2/23/06 @ 1650
Driller: J. Sigler
Total Depth: 67
End Drilling: 2/24/06 @ 1126
Drilling Method: Rotosonic
Surface Elev.: 727.03
Converted to Well: Y Well I.D.: GM-47
Drilling Fluid: Water
North Coor.: 1312.270
East Coor.: 4776.411
Remarks:

Project No.: OH000294.0008.00002
Datum: TOC Elev. 725.75
Filename: February 2006

ARCADIS

Log of Boring: GM-47

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
14	N/A	24	0.0				GP	GRAVEL Poorly graded, dry	
							SW	SAND & GRAVEL Brown, medium-fine sand, gravel (10%), little silt, dry	
16	N/A	24	0.0				SW	Same as above, gravel (30%)	
18	N/A	8	0.0				SW	Same as above	
20	N/A	8	0.0				SW	Same as above	
22	N/A	8	0.0				SW	Same as above	
24	N/A	8	0.0				SW	Same as above	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Prosonic Corporation
Geologist: T. Fortner
Begin Drilling: 2/23/06 @ 1650
Driller: J. Sigler
Total Depth: 67
End Drilling: 2/24/06 @ 1126
Drilling Method: Rotosonic
Surface Elev.: 727.03
Converted to Well: Y Well I.D.: GM-47
Drilling Fluid: Water
North Coor.: 1312.270
East Coor.: 4776.411
Remarks:

Project No.: OH000294.0008.00002
Datum: TOC Elev. 725.75
Filename: February 2006

ARCADIS

Log of Boring: GM-47

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
26	N/A	20	0.0				SW	Same as above, wet at 27'	
28	N/A	20	0.0				GP	GRAVEL Poorly graded, wet	
30	N/A	20	0.0				GW	GRAVEL Brown, coarse sand (40%), wet Water sample collected at 30' for site specific VOCs.	
32	N/A	20	0.0				GW	Same as above	
34	N/A	20	0.0				GW	Same as above, medium-coarse sand (30%)	
36	N/A	24	1.3				GW	Same as above	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic Corporation
Geologist: T. Fortner
Begin Drilling: 2/23/06 @ 1650
Driller: J. Sigler
Total Depth: 67
End Drilling: 2/24/06 @ 1126
Drilling Method: Rotosonic
Surface Elev.: 727.03
Converted to Well: Y Well I.D.: GM-47
Drilling Fluid: Water
North Coor.: 1312.270
East Coor.: 4776.411
Remarks:

Project No.: OH000294.0008.00002
Datum: TOC Elev. 725.75
Filename: February 2006

ARCADIS

Log of Boring: GM-47

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
38	N/A	24	1.3				SW	SAND & GRAVEL Brown, medium-coarse sand (50%), fine gravel, wet	
40	N/A	24	1.5				SW	Same as above	
42	N/A	24	1.4				SW	Same as above	
44	N/A	24	1.4				SW	Same as above	
								Water sample collected at 45' for site specific VOCs.	
46	N/A	20	1.4				SW	Same as above, gravel (20%)	
48	N/A	20	0.0				SW	Same as above	
50									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic Corporation
Geologist: T. Fortner
Begin Drilling: 2/23/06 @ 1650
Driller: J. Sigler
Total Depth: 67
End Drilling: 2/24/06 @ 1126
Drilling Method: Rotosonic
Surface Elev.: 727.03
Converted to Well: Y Well I.D.: GM-47
Drilling Fluid: Water
North Coor.: 1312.270
East Coor.: 4776.411
Remarks:

Project No.: OH000294.0008.00002
Datum: TOC Elev. 725.75
Filename: February 2006

ARCADIS

Log of Boring: GM-47

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
	N/A	20	0.0				SW	Same as above, fine gravel (50%)	
52	N/A	20	0.0				SW	Same as above, gravel (10%)	
54	N/A	20	0.0				SW	Same as above, gravel (20%)	
56	N/A	24	0.0				SW	SAND Brown, medium-coarse, wet	
58	N/A	24	0.0				SP	SAND Brown, medium, little silt, poorly graded, saturated	
60	N/A	24	0.0				CL	SILTY CLAY Gray, gravel (10-20%), stiff-very stiff, low plasticity, 4" gravel layer above silty clay Water sample collected at 60' for site specific VOCs.	
62	N/A	24	0.0				CL	Same as above, gravel (10%)	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic Corporation
Geologist: T. Fortner
Begin Drilling: 2/23/06 @ 1650
Driller: J. Sigler
Total Depth: 67
End Drilling: 2/24/06 @ 1126
Drilling Method: Rotosonic
Surface Elev.: 727.03
Converted to Well: Y Well I.D.: GM-47
Drilling Fluid: Water
North Coor.: 1312.270
East Coor.: 4776.411
Remarks:

Project No.: OH000294.0008.00002
Datum: TOC Elev. 725.75
Filename: February 2006

ARCADIS

Log of Boring: GM-47

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
64	N/A	24	0.0				CL	Same as above	
66	N/A	12	0.0				CL	Same as above, gravel (20%)	
								End of boring	
68									
70									
72									
74									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

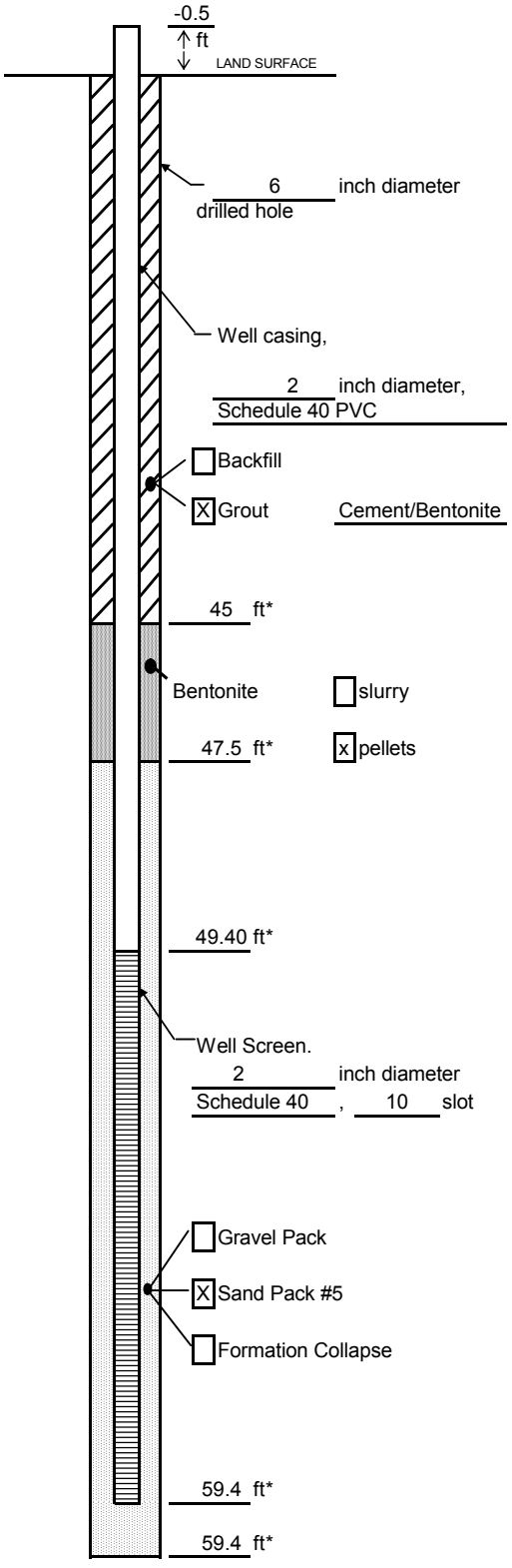
Drilling Co.: Prosonic Corporation
Geologist: T. Fortner
Begin Drilling: 2/23/06 @ 1650
Driller: J. Sigler
Total Depth: 67
End Drilling: 2/24/06 @ 1126
Drilling Method: Rotosonic
Surface Elev.: 727.03
Converted to Well: Y Well I.D.: GM-47
Drilling Fluid: Water
North Coor.: 1312.270
East Coor.: 4776.411
Remarks:

Project No.: OH000294.0008.00002
Datum: TOC Elev. 725.75
Filename: February 2006

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well GM-47

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

727.03 feet [x] Surveyed [ ] Estimated

Installation Date(s) 2/24/2006

Drilling Method Rotosonic

Drilling Contractor Prosonic Corporation

Drilling Fluid Water

Development Technique(s) and Date(s)

Submersible pump 2/25/06

Fluid Loss During Drilling NA gallons

Water Removed During Development 600 gallons

Static Depth to Water 21.91 feet below M.P.

Pumping Depth to Water 50-59.5 feet below M.P.

Pumping Duration 4.00 hours

Yield 3 gpm Date 2/25/06

Specific Capacity N/A gpm/ft

Well Purpose Monitoring Well

Remarks TOC Elevation = 726.75

Prepared by J. Manzo

ARCADIS

Log of Boring: GM-48

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	N/A	24	0.0				ML	CLAYEY SILT Brown, sand and gravel (25%), trace large cobbles, low plasticity, hard, dry	
2	N/A	24	0.0				ML	Same as above	
4	N/A	24	0.0				ML	Same as above, gray with brown mottling	
6	N/A	24	0.0				SM	SILTY SAND Brown, some clay, trace cobble, well graded, moist	
8	N/A	24	0.0				SM	Same as above	
10	N/A	24	0.0				GW	GRAVEL Sand (25%), trace cobbles, well graded, dry	
12	N/A	24	0.0				GW	Same as above	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic Corporation
Geologist: J. Manzo
Begin Drilling: 2/22/06 @ 1159
Driller: T. Bentz
Total Depth: 73
End Drilling: 2/23/06 @ 1143
Drilling Method: Rotosonic
Surface Elev.: 728.98
Converted to Well: Y Well I.D.: GM-48
Drilling Fluid: Water
North Coor.: 610.119
East Coor.: 4199.632
Remarks:

Project No.: OH000294.0008.00002
Datum: TOC Elev. 728.67
Filename: February 2006

ARCADIS

Log of Boring: GM-48

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
14	N/A	24	0.0				GW	Same as above	
16	N/A	24	0.0				GW	Same as above	
18	N/A	24	0.0				GW	Same as above	
20	N/A	24	0.0				GW	Same as above	
22	N/A	24	0.0				GW	Same as above	
24	N/A	24	0.0				GW	Same as above	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic Corporation
Geologist: J. Manzo
Begin Drilling: 2/22/06 @ 1159
Driller: T. Bentz
Total Depth: 73
End Drilling: 2/23/06 @ 1143
Drilling Method: Rotosonic
Surface Elev.: 728.98
Converted to Well: Y Well I.D.: GM-48
Drilling Fluid: Water
North Coor.: 610.119
East Coor.: 4199.632
Remarks:

Project No.: OH000294.0008.00002
Datum: TOC Elev. 728.67
Filename: February 2006

ARCADIS

Log of Boring: GM-48

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
26	N/A	24	0.0				GW	Same as above	
28	N/A	24	0.0				GW	Same as above	
30	N/A	24	0.0				GW	Same as above, coarse sand, wet	▼
32	N/A	24	0.0				GW	Same as above Water sample collected at 32' for analysis of site specific VOCs.	
34	N/A	24	0.0				GW	Same as above	
36	N/A	24	0.0				GW	Same as above	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic Corporation
Geologist: J. Manzo
Begin Drilling: 2/22/06 @ 1159
Driller: T. Bentz
Total Depth: 73
End Drilling: 2/23/06 @ 1143
Drilling Method: Rotosonic
Surface Elev.: 728.98
Converted to Well: Y Well I.D.: GM-48
Drilling Fluid: Water
North Coor.: 610.119
East Coor.: 4199.632
Remarks:

Project No.: OH000294.0008.00002
Datum: TOC Elev. 728.67
Filename: February 2006

ARCADIS

Log of Boring: GM-48

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
38	N/A	24	0.0				GW	Same as above	
40	N/A	24	0.0				GW	Same as above	
42	N/A	24	0.0				GW	Same as above	
44	N/A	0	0.0					No recovery	
46	N/A	0	0.0					No recovery	
								Water sample collected at 47' for analysis of site specific VOCs.	
48	N/A	24	0.0				SW	Same as above, gravel (20%)	
50									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic Corporation
Geologist: J. Manzo
Begin Drilling: 2/22/06 @ 1159
Driller: T. Bentz
Total Depth: 73
End Drilling: 2/23/06 @ 1143
Drilling Method: Rotosonic
Surface Elev.: 728.98
Converted to Well: Y Well I.D.: GM-48
Drilling Fluid: Water
North Coor.: 610.119
East Coor.: 4199.632
Remarks:

Project No.: OH000294.0008.00002
Datum: TOC Elev. 728.67
Filename: February 2006

ARCADIS

Log of Boring: GM-48

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
	N/A	24	0.0				SW	Same as above	
52	N/A	24	0.0				SW	Same as above	
54	N/A	24	0.0				SW	Same as above	
56	N/A	24	0.0				SW	Same as above	
58	N/A	16	0.0				GW	Same as above, gravel (75%)	
60	N/A	10	0.0				SW	Same as above, gravel (20%)	
62	N/A	10	0.0				SW	SAND Fine-medium, gravel (10%), little silt, well graded, wet	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic Corporation
Geologist: J. Manzo
Begin Drilling: 2/22/06 @ 1159
Driller: T. Bentz
Total Depth: 73
End Drilling: 2/23/06 @ 1143
Drilling Method: Rotosonic
Surface Elev.: 728.98
Converted to Well: Y Well I.D.: GM-48
Drilling Fluid: Water
North Coor.: 610.119
East Coor.: 4199.632
Remarks:

Project No.: OH000294.0008.00002
Datum: TOC Elev. 728.67
Filename: February 2006

ARCADIS

Log of Boring: GM-48

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
64	N/A	16	0.0				SW	Same as above	
66	N/A	16	0.0				SW	Same as above	
68	N/A	24	0.0				SW	Same as above	
70	N/A	24	0.0				SW	Same as above	
							CL	SILTY CLAY Gray, gravel (10%), dry to moist	
72	N/A	12	0.0				CL	Water sample collected at 71' for analysis of site specific VOCs. Same as above	
								End of boring	
74									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

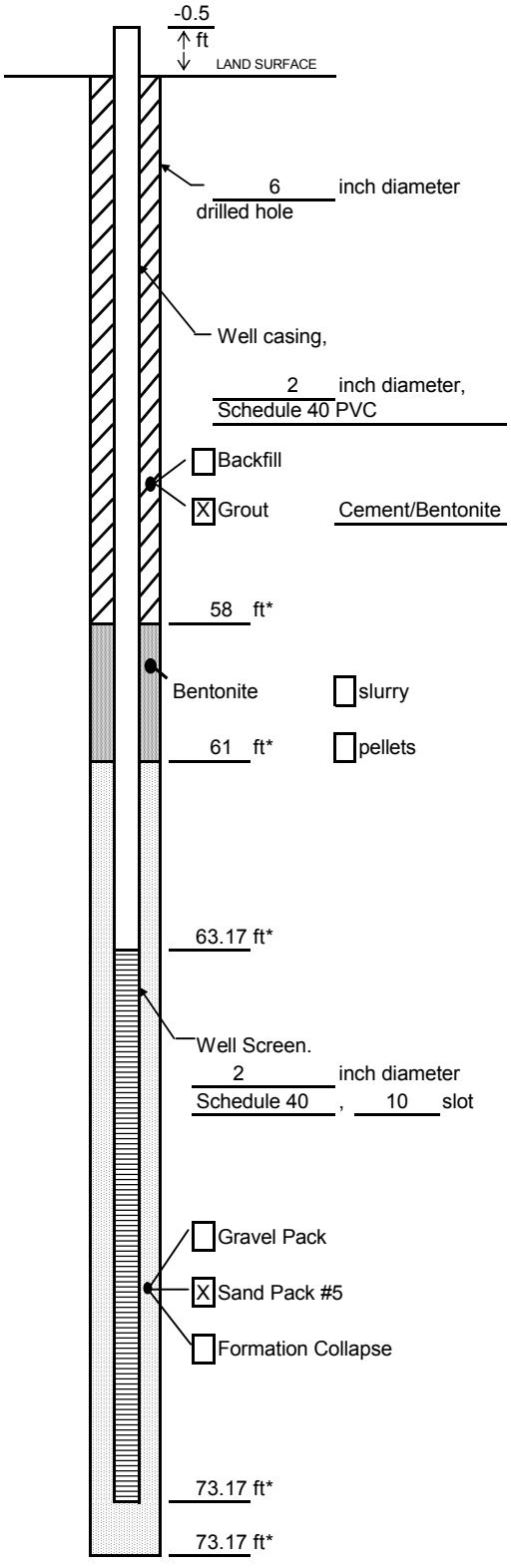
Drilling Co.: Prosonic Corporation
Geologist: J. Manzo
Begin Drilling: 2/22/06 @ 1159
Driller: T. Bentz
Total Depth: 73
End Drilling: 2/23/06 @ 1143
Drilling Method: Rotosonic
Surface Elev.: 728.98
Converted to Well: Y Well I.D.: GM-48
Drilling Fluid: Water
North Coor.: 610.119
East Coor.: 4199.632
Remarks:

Project No.: OH000294.0008.00002
Datum: TOC Elev. 728.67
Filename: February 2006

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well GM-48

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

728.98 feet [x] Surveyed

[ ] Estimated

Installation Date(s) 2/22-2/23/06

Drilling Method Rotosonic

Drilling Contractor Prosonic Corporation

Drilling Fluid Water

Development Technique(s) and Date(s)

Submersible pump 2/23-2/24/06

Fluid Loss During Drilling NA gallons

Water Removed During Development 500 gallons

Static Depth to Water 24.39 feet below M.P.

Pumping Depth to Water 24.39 feet below M.P.

Pumping Duration 6.00 hours

Yield 2 gpm Date 2/24/06

Specific Capacity NM gpm/ft

Well Purpose Monitoring Well

Remarks TOC Elevation = 728.67

Prepared by J. Manzo

ARCADIS

Log of Boring: GM-49

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	N/A	24	0.0				ML	CLAYEY SILT Brown, sand and gravel (25%), hard, low plasticity, dry	
2	N/A	24	0.0				ML	Same as above	
4	N/A	16	0.0				CL	SILTY CLAY Gray, sand and gravel (25%), hard, low plasticity, dry	
6	N/A	16	0.0				CL	Same as above	
8	N/A	24	0.0				CL	Same as above	
10	N/A	24	0.0				CL	Same as above	
12	N/A	12	0.0				GW	GRAVEL Sand (25%), well graded, trace cobbles, dry	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Prosonic Corporation
Geologist: J. Manzo/T. Fortner
Begin Drilling: 2/24/06 @ 10:35
Driller: T. Bentz
Total Depth: 79
End Drilling: 2/25/06 @ 1628
Drilling Method: Rotosonic
Surface Elev.: 728.98
Converted to Well: Y Well I.D.: GM-49
Drilling Fluid: Water
North Coor.: -222.235
East Coor.: 4383.157
Remarks: TOC elevation 727.88.
Project No.: OH000294.0008.00002
Datum:
Filename: February 2006

ARCADIS

Log of Boring: GM-49

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
14	N/A	24	0.0				GW	Same as above	
16	N/A	24	0.0				GW	Same as above	
18	N/A	24	0.0				CL	SILTY CLAY Gray, gravel (25%), hard, dry	
20	N/A	24	0.0				CL	Same as above	
22	N/A	16	0.0				SM	SILTY SAND Gravel (25%), well graded, moist	
24	N/A	16	0.0				SM	Same as above	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic Corporation
Geologist: J. Manzo/T. Fortner
Begin Drilling: 2/24/06 @ 10:35
Driller: T. Bentz
Total Depth: 79
End Drilling: 2/25/06 @ 1628
Drilling Method: Rotosonic
Surface Elev.: 728.98
Converted to Well: Y Well I.D.: GM-49
Drilling Fluid: Water
North Coor.: -222.235
East Coor.: 4383.157
Remarks: TOC elevation 727.88.
Project No.: OH000294.0008.00002
Datum:
Filename: February 2006

ARCADIS

Log of Boring: GM-49

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
26	N/A	16	0.0				SM	Same as above	
28	N/A	16	0.0				GW	GRAVEL Sand (25%), well graded, moist-wet	
								Water sample collected at 29' for analysis of site specific VOCs.	▼
30	N/A	16	0.0				GW	Same as above, wet	
32	N/A	20	0.0				GW	Same as above	
34	N/A	20	0.0				GW	Same as above	
36	N/A	20	0.0				GW	Same as above	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic Corporation
Geologist: J. Manzo/T. Fortner
Begin Drilling: 2/24/06 @ 10:35
Driller: T. Bentz
Total Depth: 79
End Drilling: 2/25/06 @ 1628
Drilling Method: Rotosonic
Surface Elev.: 728.98
Converted to Well: Y Well I.D.: GM-49
Drilling Fluid: Water
North Coor.: -222.235
East Coor.: 4383.157
Remarks: TOC elevation 727.88.
Project No.: OH000294.0008.00002
Datum:
Filename: February 2006

ARCADIS

Log of Boring: GM-49

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
38	N/A	20	0.0				GW	Same as above	
40	N/A	20	0.0				GW	Same as above	
42	N/A	20	0.0				SW	SAND Brown, medium-coarse gravel (5%), well graded, wet	
44	N/A	20	0.0				SW	Same as above	
46	N/A	20	0.0				SW	Same as above	
48	N/A	20	0.0				SW	Same as above	
								Water sample collected at 49' for analysis of site specific VOCs.	
50									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic Corporation
Geologist: J. Manzo/T. Fortner
Begin Drilling: 2/24/06 @ 10:35
Driller: T. Bentz
Total Depth: 79
End Drilling: 2/25/06 @ 1628
Drilling Method: Rotosonic
Surface Elev.: 728.98
Converted to Well: Y Well I.D.: GM-49
Drilling Fluid: Water
North Coor.: -222.235
East Coor.: 4383.157
Remarks: TOC elevation 727.88.
Project No.: OH000294.0008.00002
Datum:
Filename: February 2006

ARCADIS

Log of Boring: GM-49

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
	N/A	20	0.0				GW	GRAVEL Coarse sand (30%), well graded, wet	
52	N/A	22	0.0				SP	SAND Brown medium-coarse, poorly graded, wet	
54	N/A	22	0.0				SP	Same as above	
56	N/A	22	0.0				GW	GRAVEL Coarse sand (30%), well graded, wet	
58	N/A	22	0.0				GW	Same as above	
60	N/A	22	0.0				SW	SAND Brown, medium-coarse, gravel (10%), poorly graded, wet	
62	N/A	12	0.0				GW	GRAVEL Medium-coarse sand (25%), gravel (75%), well graded, wet	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Prosonic Corporation
Geologist: J. Manzo/T. Fortner
Begin Drilling: 2/24/06 @ 10:35
Driller: T. Bentz
Total Depth: 79
End Drilling: 2/25/06 @ 1628
Drilling Method: Rotosonic
Surface Elev.: 728.98
Converted to Well: Y Well I.D.: GM-49
Drilling Fluid: Water
North Coor.: -222.235
East Coor.: 4383.157
Remarks: TOC elevation 727.88.
Project No.: OH000294.0008.00002
Datum:
Filename: February 2006

ARCADIS

Log of Boring: GM-49

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
64	N/A	12	0.0				GW	Same as above	
66	N/A	12	0.0				GW	Same as above	
68	N/A	12	0.0				GW	Same as above	
70	N/A	12	0.0				GW	Same as above	
72	N/A	24	0.0				GW	Same as above	
74	N/A	24	0.0				SP	SAND Gravel (25%), poorly graded, wet Water sample collected at 75' for analysis of site specific VOCs.	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Prosonic Corporation
Geologist: J. Manzo/T. Fortner
Begin Drilling: 2/24/06 @ 10:35
Driller: T. Bentz
Total Depth: 79
End Drilling: 2/25/06 @ 1628
Drilling Method: Rotosonic
Surface Elev.: 728.98
Converted to Well: Y Well I.D.: GM-49
Drilling Fluid: Water
North Coor.: -222.235
East Coor.: 4383.157
Remarks: TOC elevation 727.88.
Project No.: OH000294.0008.00002
Datum:
Filename: February 2006

ARCADIS

Log of Boring: GM-49

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
76	N/A	24	0.0				CL	SILTY CLAY Gray, gravel (10%), hard, dry	
78	N/A	12	0.0				CL	Same as above	
								End of boring	
80									
82									
84									
86									

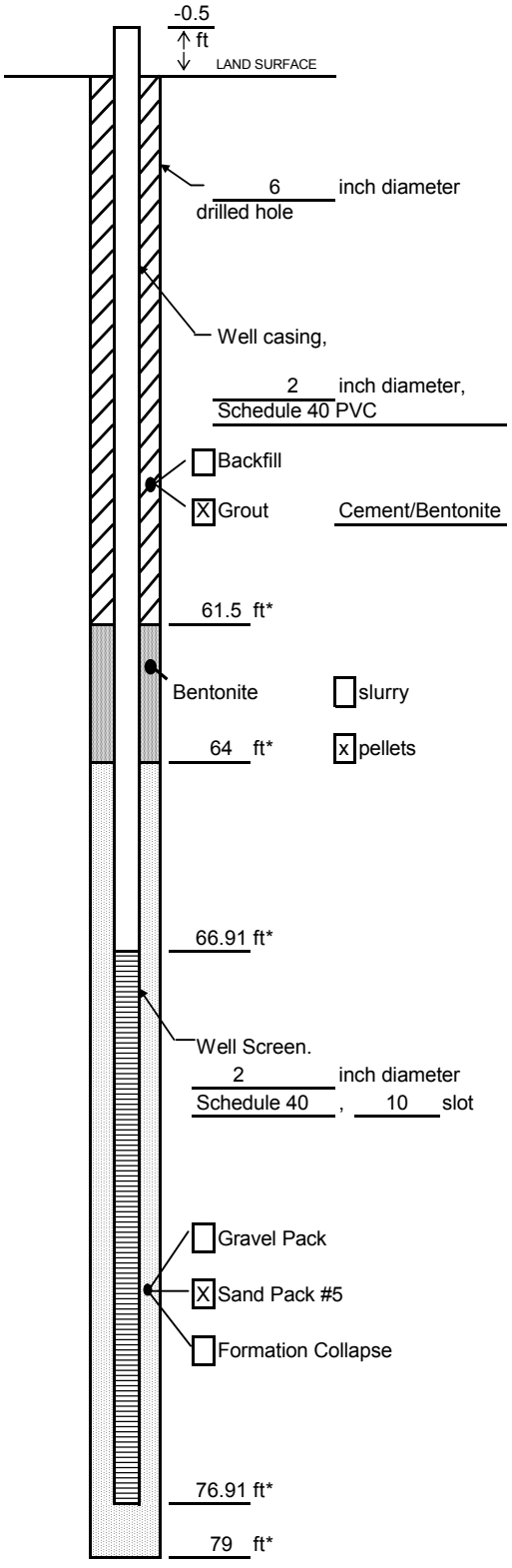
☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic Corporation
Geologist: J. Manzo/T. Fortner
Begin Drilling: 2/24/06 @ 10:35
Driller: T. Bentz
Total Depth: 79
End Drilling: 2/25/06 @ 1628
Drilling Method: Rotosonic
Surface Elev.: 728.98
Converted to Well: Y Well I.D.: GM-49
Drilling Fluid: Water
North Coor.: -222.235
East Coor.: 4383.157
Remarks: TOC elevation 727.88.
Project No.: OH000294.0008.00002
Datum:
Filename: February 2006

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well GM-49

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

728.28 feet [x] Surveyed

[ ] Estimated

Installation Date(s) 2/24-2/25/06

Drilling Method Rotosonic

Drilling Contractor Prosonic Corporation

Drilling Fluid Water

Development Technique(s) and Date(s)

Submersible pump 2/25/06

Fluid Loss During Drilling NA gallons

Water Removed During Development 500 gallons

Static Depth to Water 24.10 feet below M.P.

Pumping Depth to Water 24.10 feet below M.P.

Pumping Duration 6.00 hours

Yield 2 gpm Date 2/25/06

Specific Capacity 2 gpm/ft

Well Purpose Monitoring Well

Remarks TOC Elevation = 727.88

Prepared by J. Manzo

ARCADIS

Log of Boring: GM-50

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0								See GM-47 for lithologic description from 0-40'	
2									
4									
6									
8									
10									
12									

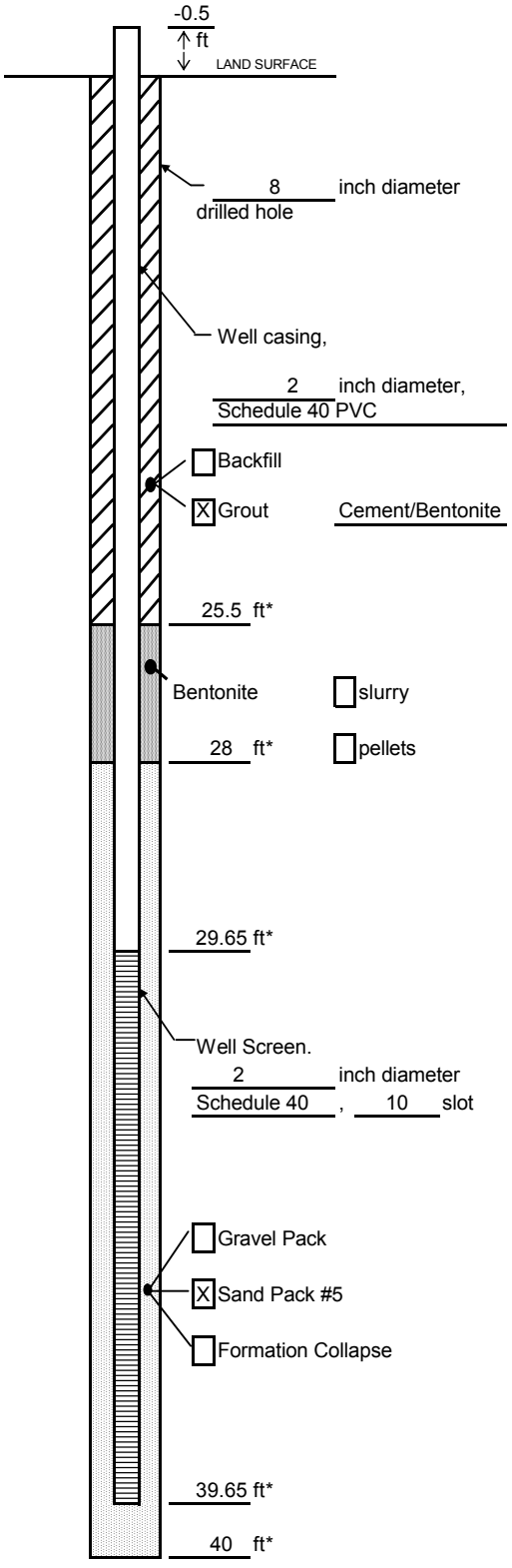
☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: T. Fortner
Begin Drilling: 4/24/06
Driller: B. Smith
Total Depth: 40
End Drilling: 4/24/06
Drilling Method: Rotosonic
Surface Elev.: 727.034
Converted to Well: Y Well I.D.: GM-50
Drilling Fluid: Water
North Coor.: 1311.64197
East Coor.: 4773.28499
Remarks: Shallow pair to GM-47.
Project No.: OH000294.0008.00002
Datum: TOC Elev = 722.109
Filename: July 2006

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well GM-50

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

727.034 feet [x] Surveyed

[ ] Estimated

Installation Date(s) 4/24/2006

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Pumping - surge with pump 4/26/06

Fluid Loss During Drilling NA gallons

Water Removed During Development 200 gallons

Static Depth to Water 20.39 feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration 1.50 hours

Yield NM gpm Date 4/26/06

Specific Capacity NM gpm/ft

Well Purpose Monitoring Well

Remarks TOC Elevation = 726.555

Prepared by J. Manzo

ARCADIS

Log of Boring: GM-51

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0								See GM-48 for lithologic description from 0-45'	
2									
4									
6									
8									
10									
12									

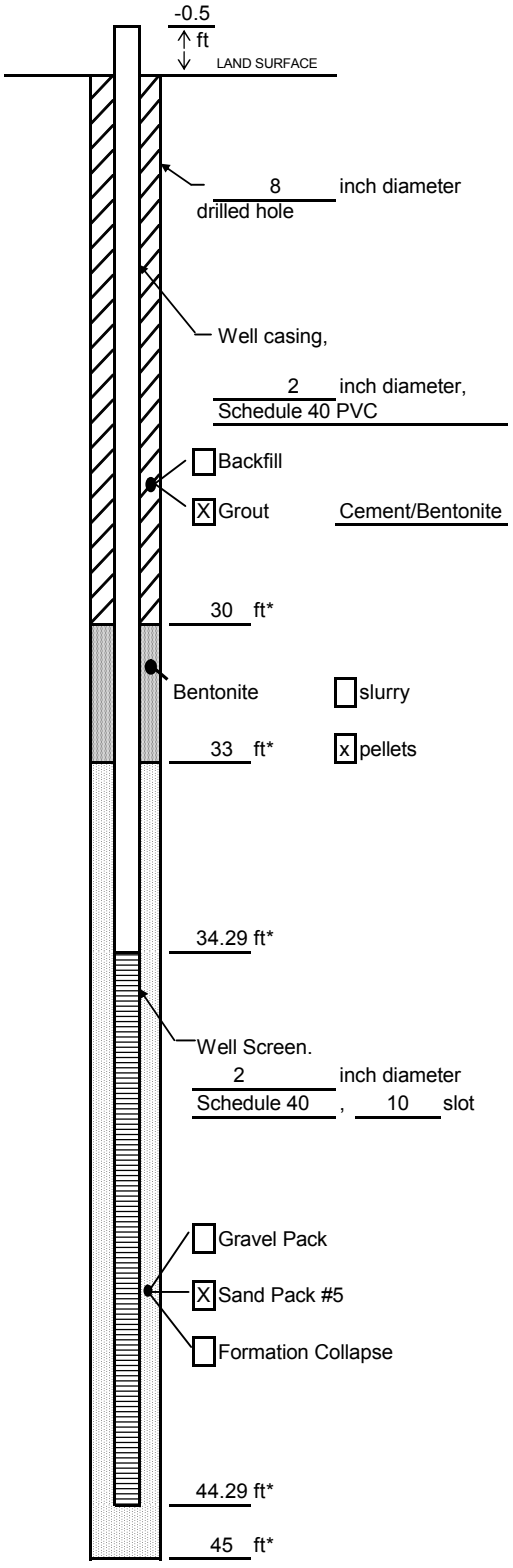
☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: T. Fortner
Begin Drilling: 4/25/06
Driller: B. Smith
Total Depth: 45
End Drilling: 4/25/06
Drilling Method: Rotosonic
Surface Elev.: 728.825
Converted to Well: Y Well I.D.: GM-51
Drilling Fluid: Water
North Coor.: 614.47441
East Coor.: 4198.06172
Remarks: Shallow pair to GM-48.
Project No.: OH000294.0008.00002
Datum: TOC elev 728.303
Filename: July 2006

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well GM-51

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

728.825 feet [x] Surveyed [ ] Estimated

Installation Date(s) 4/25/2006

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Pumping - surge with pump 4/26/06

Fluid Loss During Drilling NA gallons

Water Removed During Development 200 gallons

Static Depth to Water 22.68 feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration 1.50 hours

Yield NM gpm Date 4/25/06

Specific Capacity NM gpm/ft

Well Purpose Monitoring Well

Remarks TOC Elevation = 728.303

Prepared by J. Manzo

ARCADIS

Log of Boring: GM-52

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0								See GM-49 for lithologic description from 45'	
2									
4									
6									
8									
10									
12									

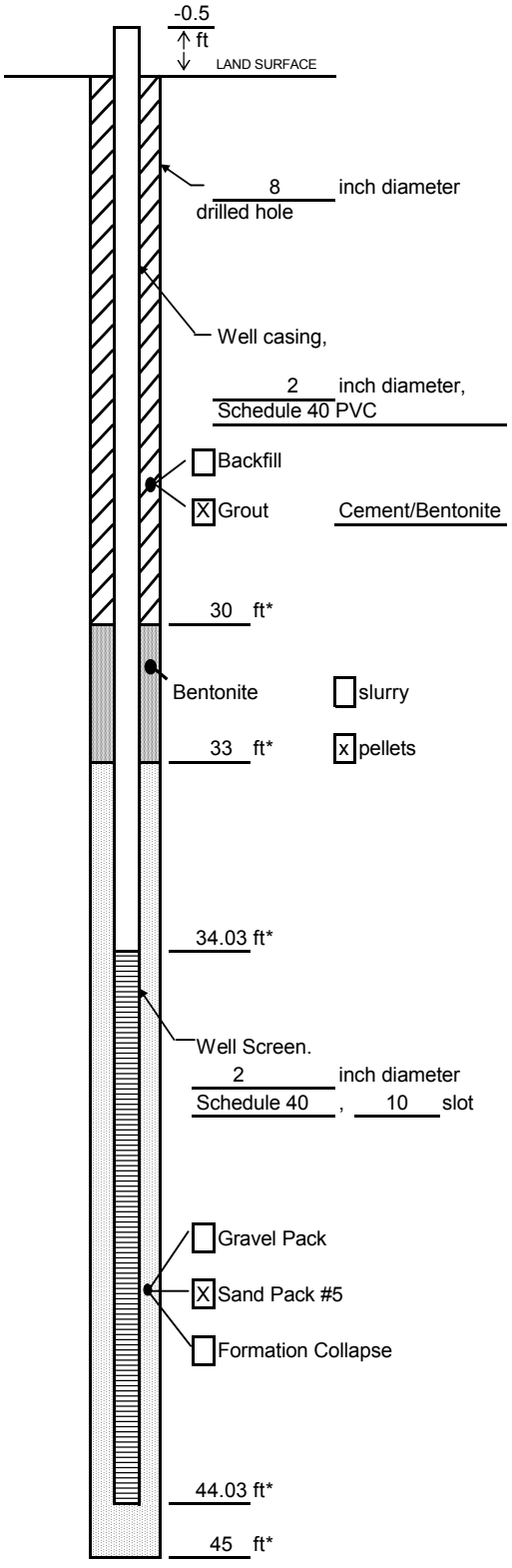
☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: T. Fortner
Begin Drilling: 4/25/06
Driller: B. Smith
Total Depth: 45
End Drilling: 4/25/06
Drilling Method: Rotosonic
Surface Elev.: 728.155
Converted to Well: Y Well I.D.: GM-52
Drilling Fluid: Water
North Coor.: -226.18252
East Coor.: 4383.22583
Remarks: Shallow pair to GM-49.
Project No.: OH000294.0008.00002
Datum: TOC Elev 727.615
Filename: July 2006

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well GM-52

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

728.155 feet [x] Surveyed

[ ] Estimated

Installation Date(s) 4/25/2006

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Pumping - surge with pump 4/25/06

Fluid Loss During Drilling NA gallons

Water Removed During Development 200 gallons

Static Depth to Water 22.34 feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration 1.50 hours

Yield NM gpm Date 4/26/06

Specific Capacity NM gpm/ft

Well Purpose Monitoring Well

Remarks TOC Elevation = 727.615

Prepared by J. Manzo

ARCADIS

Log of Boring: GM-53

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0								See GM-54 for lithologic description from 0-33'	
2									
4									
6									
8									
10									
12									

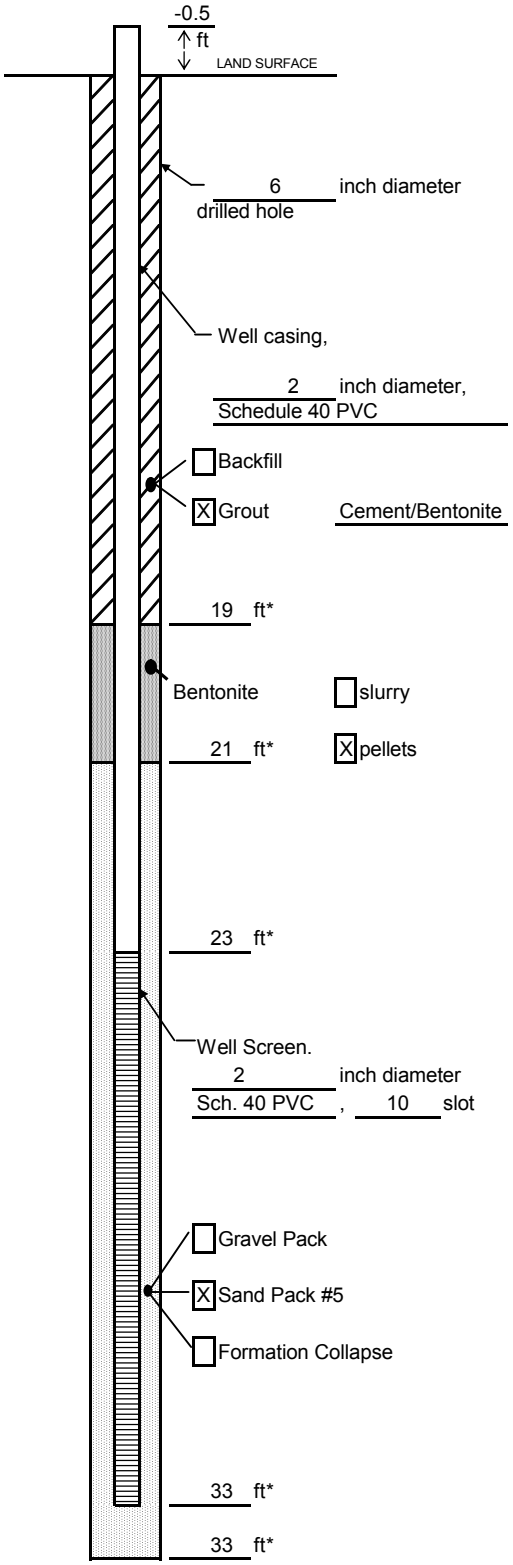
☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: T. Fortner
Begin Drilling: 7/25/06
Driller: M. Osterberg
Total Depth: 33
End Drilling: 7/25/06
Drilling Method: Rotosonic
Surface Elev.: 730.530
Converted to Well: Y Well I.D.: GM-53
Drilling Fluid: Water
North Coor.: 2999.31791
East Coor.: 6823.94469
Remarks: Shallow pair to GM-54.
Project No.: OH000294.0008.00002
Datum: TOC Elev 730.353
Filename: July 2006

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.
Unless Otherwise Noted.
* Depth Below Land Surface

Project General Motors Corporation Well GM-53

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

730.530 feet [x] Surveyed [ ] Estimated

Installation Date(s) 7/28/2006

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Pumping - surge with pump 7/30/06

Fluid Loss During Drilling ~100 gallons

Water Removed During Development 120 gallons

Static Depth to Water 22.87 feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration 0.70 hours

Yield 3 gpm Date 7/30/06

Specific Capacity NM gpm/ft

Well Purpose Monitoring well

Remarks TOC Elevation = 730.353

Time 1040, 1043, 1046, 1049, 1052

pH 6.39, 6.49, 6.50, 6.49, 6.50

Conductivity 1.74, 1.66, 1.66, 1.66, 1.66

Turbidity 0, 0, 0, 0, 0 (clear-nonturbid)

Temperature 19.3, 18.8, 17.8, 17.9, 17.8

Prepared by T. Fortner

ARCADIS

Log of Boring: GM-54

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	N/A	0	N/A					No recovery	
2									
4									
	N/A	24	3.3				SW	SAND Brown, medium-coarse, medium gravel (20-30%), well graded, dry	
6									
	N/A	24	8.3				SW	Same as above	
8									
	N/A	24	1.4				SW	Same as above	
10									
	N/A	24	0.7				GW	GRAVEL Brown, medium-coarse, medium-coarse sand (30%), well graded, dry	
12								GRAVEL Brown, medium-coarse, medium-coarse sand (30%), well graded, dry	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 7/11/06 @ 1550

Driller: M. Osterberg | Total Depth: 115 | End Drilling: 7/12/06 @ 1300

Drilling Method: Rotosonic | Surface Elev.: 730.513 | Converted to Well: Y | Well I.D.: GM-54

Drilling Fluid: Water | North Coor.: 2995.14271 | East Coor.: 6817.71652

Remarks: Water samples 70-75'; 80-85'; 95-100'; 110-115'

Project No.: OH000294.0008.00002 | Datum: TOC Elev = 730.287 | Filename: July 2006

ARCADIS

Log of Boring: GM-54

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
14	N/A	24	1.6				SW	SAND Brown, medium-coarse, fine-medium gravel (40%), well graded, dry	
16	N/A	24	1.0				GW	GRAVEL Brown, medium-coarse, medium-coarse sand (30%), well graded, dry	
18	N/A	24	2.7				GW	Same as above	
20	N/A	24	1.5				GW	Same as above	
22	N/A	24	1.1				GW	Same as above, wet at 22'	▼
24	N/A	24	1.2				GW	Same as above	
								Same as above	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: T. Fortner
Begin Drilling: 7/11/06 @ 1550
Driller: M. Osterberg
Total Depth: 115
End Drilling: 7/12/06 @ 1300
Drilling Method: Rotosonic
Surface Elev.: 730.513
Converted to Well: Y Well I.D.: GM-54
Drilling Fluid: Water
North Coor.: 2995.14271
East Coor.: 6817.71652
Remarks: Water samples 70-75'; 80-85'; 95-100'; 110-115'
Project No.: OH000294.0008.00002
Datum: TOC Elev = 730.287
Filename: July 2006

ARCADIS

Log of Boring: GM-54

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
26	N/A	24	1.5				SP	SAND Brown, medium grained, fine gravel (5-10%), poorly graded, wet	
28	N/A	24	0.8				SP	Same as above	
30	N/A	24	0.1				SP	Same as above	
32	N/A	24	0.4				GW	GRAVEL Brown, fine-medium, medium-coarse sand (30%), well graded, wet	
34	N/A	24	0.1				CL	SANDY CLAY Brown, stiff, low plasticity with trace gravel, moist	
36	N/A	24	0.5				CL	SILTY CLAY Gray, stiff, brittle, low plasticity with ~5% fine gravel, dry	
								Same as above	
	N/A	24	0.3				CL	Same as above	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 7/11/06 @ 1550

Driller: M. Osterberg | Total Depth: 115 | End Drilling: 7/12/06 @ 1300

Drilling Method: Rotosonic | Surface Elev.: 730.513 | Converted to Well: Y | Well I.D.: GM-54

Drilling Fluid: Water | North Coor.: 2995.14271 | East Coor.: 6817.71652

Remarks: Water samples 70-75'; 80-85'; 95-100'; 110-115'

Project No.: OH000294.0008.00002 | Datum: TOC Elev = 730.287 | Filename: July 2006

ARCADIS

Log of Boring: GM-54

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
38									
	N/A	24	0.5				CL	Same as above	
40									
	N/A	24	0.4				CL	Same as above	
42									
	N/A	24	0.4				CL	Same as above	
44									
	N/A	24	0.0				CL	Same as above	
46									
	N/A	24	0.0				CL	Same as above	
48							CL	Same as above	
	N/A	24	0.0				CL	Same as above	
50									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 7/11/06 @ 1550

Driller: M. Osterberg | Total Depth: 115 | End Drilling: 7/12/06 @ 1300

Drilling Method: Rotosonic | Surface Elev.: 730.513 | Converted to Well: Y | Well I.D.: GM-54

Drilling Fluid: Water | North Coor.: 2995.14271 | East Coor.: 6817.71652

Remarks: Water samples 70-75'; 80-85'; 95-100'; 110-115'

Project No.: OH000294.0008.00002 | Datum: TOC Elev = 730.287 | Filename: July 2006

ARCADIS

Log of Boring: GM-54

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
	N/A	24	0.0				CL	Same as above	
52									
	N/A	24	0.0				CH	SILTY CLAY Gray with some coarse sand, soft, high plasticity, moist-wet	
54									
	N/A	24	0.0				CL	SILTY CLAY Gray, stiff, brittle, low plasticity, medium gravel (5%), dry	
56									
	N/A	24	0.0				CL	Same as above	
58									
	N/A	24	0.0				CL	Same as above	
60								Same as above	
	N/A	24	0.0				CL	Same as above	
62									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 7/11/06 @ 1550

Driller: M. Osterberg | Total Depth: 115 | End Drilling: 7/12/06 @ 1300

Drilling Method: Rotosonic | Surface Elev.: 730.513 | Converted to Well: Y | Well I.D.: GM-54

Drilling Fluid: Water | North Coor.: 2995.14271 | East Coor.: 6817.71652

Remarks: Water samples 70-75'; 80-85'; 95-100'; 110-115'

Project No.: OH000294.0008.00002 | Datum: TOC Elev = 730.287 | Filename: July 2006

ARCADIS

Log of Boring: GM-54

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
	N/A	24	0.3				CL	Same as above	
64							SW	SAND Brown, medium-coarse, coarse gravel (5%), well graded, wet	
	N/A	24	0.4				SW	Same as above	
66									
	N/A	24	0.1				SW	Same as above	
68									
	N/A	24	0.2				GW	GRAVEL Brown, medium-coarse, medium coarse sand (40%), wet	
70									
	N/A	24	0.0				SM	SILTY SAND Brown, fine, wet	
72								Same as above	
	N/A	24	0.5				SM	Same as above	
74									
	N/A	24	0.0				SM	Same as above	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 7/11/06 @ 1550

Driller: M. Osterberg | Total Depth: 115 | End Drilling: 7/12/06 @ 1300

Drilling Method: Rotosonic | Surface Elev.: 730.513 | Converted to Well: Y | Well I.D.: GM-54

Drilling Fluid: Water | North Coor.: 2995.14271 | East Coor.: 6817.71652

Remarks: Water samples 70-75'; 80-85'; 95-100'; 110-115'

Project No.: OH000294.0008.00002 | Datum: TOC Elev = 730.287 | Filename: July 2006

ARCADIS

Log of Boring: GM-54

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
76									
	N/A	24	0.1				SP	SAND Brown, fine-medium, poorly graded, wet	
78									
	N/A	24	0.1				SP	Same as above	
80									
	N/A	24	0.5				SP	Same as above	
82									
	N/A	24	0.1				SP	Same as above	
84								Same as above	
	N/A	24	14.7				SP	Same as above (OVA readings from 85-103' were performed during intense rainfall; humidity levels may have produced instrument drift while screening.)	
86									
	N/A	24	16.8				SW	SAND Brown, fine-coarse, medium-coarse gravel (40%), well graded, wet	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 7/11/06 @ 1550

Driller: M. Osterberg | Total Depth: 115 | End Drilling: 7/12/06 @ 1300

Drilling Method: Rotosonic | Surface Elev.: 730.513 | Converted to Well: Y | Well I.D.: GM-54

Drilling Fluid: Water | North Coor.: 2995.14271 | East Coor.: 6817.71652

Remarks: Water samples 70-75'; 80-85'; 95-100'; 110-115'

Project No.: OH000294.0008.00002 | Datum: TOC Elev = 730.287 | Filename: July 2006

ARCADIS

Log of Boring: GM-54

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
88									
	N/A	24	8.6				SW	Same as above	
90									
	N/A	24	4.2				SW	Same as above	
92									
	N/A	24	10.7				SW	Same as above	
94									
	N/A	24	6.6				SW	Same as above	
96								Same as above	
	N/A	24	18.8				SW	SAND Brown, medium-coarse cobbles (20%), well graded, wet	
98									
	N/A	24	31.1				SW	SAND Brown, fine-medium, fine-medium gravel (40%), some silt, well graded, wet	
100									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 7/11/06 @ 1550

Driller: M. Osterberg | Total Depth: 115 | End Drilling: 7/12/06 @ 1300

Drilling Method: Rotosonic | Surface Elev.: 730.513 | Converted to Well: Y | Well I.D.: GM-54

Drilling Fluid: Water | North Coor.: 2995.14271 | East Coor.: 6817.71652

Remarks: Water samples 70-75'; 80-85'; 95-100'; 110-115'

Project No.: OH000294.0008.00002 | Datum: TOC Elev = 730.287 | Filename: July 2006

ARCADIS

Log of Boring: GM-54

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
	N/A	24	39.2				SW	Same as above	
102									
	N/A	24	0.0				SW	Same as above	
104									
	N/A	24	0.0				GM	SAND/GRAVEL/SILT Brown, fine-coarse sand (50%), fine-medium gravel (30%), silt (20%), well graded, wet	
106									
	N/A	24	0.0				SW	SAND Brown, medium-coarse, medium gravel (10%), well graded, wet	
108								Same as above	
	N/A	24	0.0				SW	Same as above	
110									
	N/A	24	0.0				SW	Same as above	
112									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 7/11/06 @ 1550

Driller: M. Osterberg | Total Depth: 115 | End Drilling: 7/12/06 @ 1300

Drilling Method: Rotosonic | Surface Elev.: 730.513 | Converted to Well: Y | Well I.D.: GM-54

Drilling Fluid: Water | North Coor.: 2995.14271 | East Coor.: 6817.71652

Remarks: Water samples 70-75'; 80-85'; 95-100'; 110-115'

Project No.: OH000294.0008.00002 | Datum: TOC Elev = 730.287 | Filename: July 2006

ARCADIS

Log of Boring: GM-54

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
114	N/A	24	0.0				SW	Same as above	
								End of boring	
116									
118									
120									
122									
124									

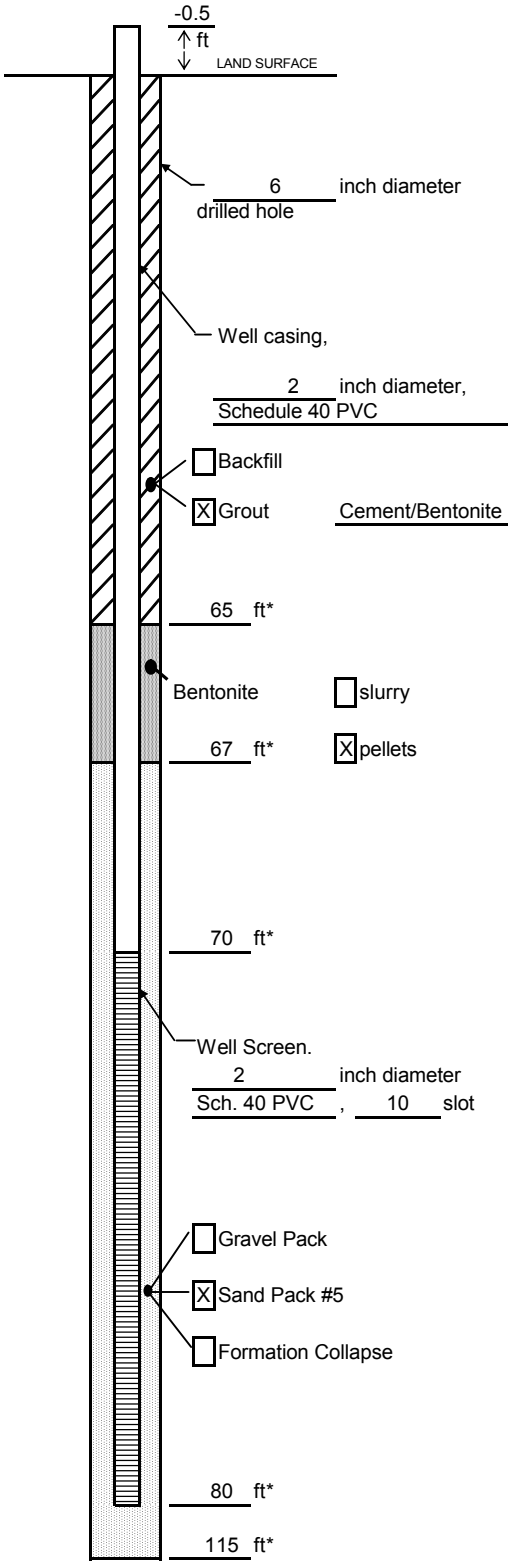
☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: T. Fortner
Begin Drilling: 7/11/06 @ 1550
Driller: M. Osterberg
Total Depth: 115
End Drilling: 7/12/06 @ 1300
Drilling Method: Rotosonic
Surface Elev.: 730.513
Converted to Well: Y Well I.D.: GM-54
Drilling Fluid: Water
North Coor.: 2995.14271
East Coor.: 6817.71652
Remarks: Water samples 70-75'; 80-85'; 95-100'; 110-115'
Project No.: OH000294.0008.00002
Datum: TOC Elev = 730.287
Filename: July 2006

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.
* Depth Below Land Surface

Project General Motors Corporation Well GM-54

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

730.513 feet [x] Surveyed [ ] Estimated

Installation Date(s) 7/25/2006

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Pumping - surge with pump 7/30/06

Fluid Loss During Drilling ~300 gallons

Water Removed During Development 320 gallons

Static Depth to Water 21.68 feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration 1.20 hours

Yield 4 gpm Date 7/30/06

Specific Capacity NM gpm/ft

Well Purpose Monitoring well - Well B

Remarks TOC Elevation = 730.287

Time 1110, 1113, 1116, 1119, 1122

pH 6.65, 6.44, 6.46, 6.45, 6.45

Conductivity 1.28, 1.27, 1.27, 1.27, 1.27

Turbidity 0, 0, 0, 0, 0 (clear-nonturbid)

Temperature 19.0, 18.8, 18.7, 18.7, 18.6

Prepared by T. Fortner

ARCADIS

Log of Boring: GM-55

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0								See GM-56 for lithologic description from 0-35'	
2									
4									
6									
8									
10									
12									

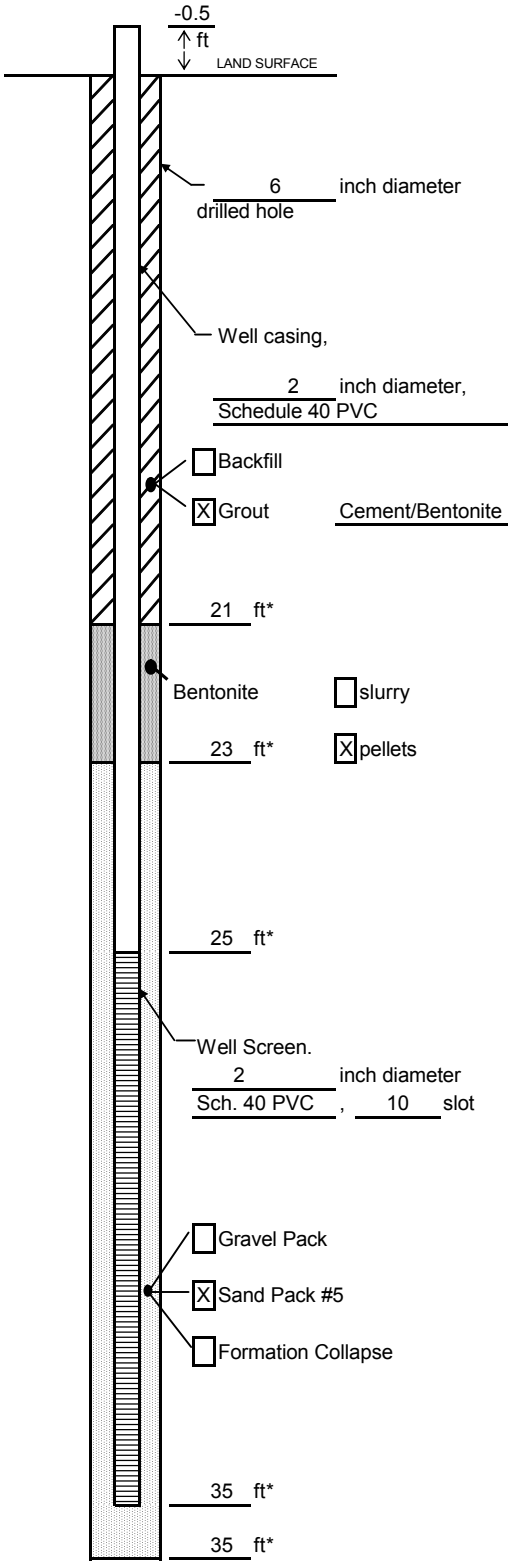
☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: T. Fortner
Begin Drilling: 7/26/06
Driller: M. Osterberg
Total Depth: 35
End Drilling: 7/26/06
Drilling Method: Rotosonic
Surface Elev.: 719.900
Converted to Well: Y Well I.D.: GM-55
Drilling Fluid: Water
North Coor.: -645.93943
East Coor.: 5202.05871
Remarks: Shallow well pair to GM-56. Boring previously "Well-D"
Project No.: OH000294.0008.00002
Datum: TOC Elev. 719.857
Filename: July 2006

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.
* Depth Below Land Surface

Project General Motors Corporation Well GM-55

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

719.900 feet [x] Surveyed [ ] Estimated

Installation Date(s) 7/27/2006

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Pumping - surge with pump 7/28/06

Fluid Loss During Drilling ~80 gallons

Water Removed During Development 100 gallons

Static Depth to Water 15.1 feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration 0.70 hours

Yield 3 gpm Date 7/28/06

Specific Capacity NM gpm/ft

Well Purpose Monitoring well - Well D

Remarks TOC Elevation = 719.857

Time 1311, 1314, 1317, 1320, 1323

pH 6.29, 6.30, 6.27, 6.28, 6.29

Conductivity 1.18, 1.10, 1.10, 1.10, 1.10

Turbidity 18.0, 17, 0, 0, 0 (clear-nonturbid)

Temperature 18.6, 18.1, 18.0, 18.1, 18.2

Prepared by T. Fortner

ARCADIS

Log of Boring: GM-56

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0								No recovery	
2	N/A	24	1.6				CL	SILTY CLAY Brown to dark gray, medium gravel to cobble (10%), soft, medium plasticity, moist	
4	N/A	24	3.4				SP	SILTY SAND/GRAVEL Brown, fine-medium sand, fine gravel, poorly graded, wet	
6	N/A	24	5.3				SP	Same as above	
8	N/A	24	5.7				CL	SILTY CLAY Brown, soft, medium plasticity, moist-dry	
10	N/A	24	1.2				SM	SILTY SAND Brown, fine-medium, wet	
12	N/A	24	4.9				SM	SILTY SAND Brown, fine-medium, fine gravel (5%), moist	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 7/12/06 @ 1518

Driller: M. Osterberg | Total Depth: 85 | End Drilling: 7/13/06 @ 0830

Drilling Method: Rotosonic | Surface Elev.: 719.745 | Converted to Well: Y | Well I.D.: GM-56

Drilling Fluid: Water | North Coor.: -646.38569 | East Coor.: 5209.35261

Remarks: Water samples 25-30'; 35-40'; 55-66'

Project No.: OH000294.0008.00002 | Datum: TOC Elev. 719.516 | Filename: July 2006

ARCADIS

Log of Boring: GM-56

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
14	N/A	24	4.7				SW	Same as above, fine gravel (10%)	
16	N/A	24	6.7				GW	GRAVEL Brown, fine-medium, fine sand (20-30%), well graded, moist	
18	N/A	24	2.9				SW	SAND Brown, medium-coarse, fine-medium gravel (10-20%), well graded, moist	
20	N/A	24	7.0				GW	GRAVEL Fine-medium, medium-coarse sand (20%), well graded, moist	
22	N/A	24	5.5				GW	Same as above, wet	▼
24	N/A	24	3.4				SW	SAND Brown, medium-coarse, medium-coarse gravel (20%), wet	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 7/12/06 @ 1518

Driller: M. Osterberg | Total Depth: 85 | End Drilling: 7/13/06 @ 0830

Drilling Method: Rotosonic | Surface Elev.: 719.745 | Converted to Well: Y | Well I.D.: GM-56

Drilling Fluid: Water | North Coor.: -646.38569 | East Coor.: 5209.35261

Remarks: Water samples 25-30'; 35-40'; 55-66'

Project No.: OH000294.0008.00002 | Datum: TOC Elev. 719.516 | Filename: July 2006

ARCADIS

Log of Boring: GM-56

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
26	N/A	24	7.5				SW	Same as above	
28	N/A	24	6.1				SW	Same as above	
30	N/A	24	7.2				GW	GRAVEL Brown, medium-coarse, medium-coarse sand (30%), wet	
32	N/A	24	4.5				GW	Same as above	
34	N/A	24	1.6				SW	SAND Brown, medium-coarse,medium coarse gravel (10%), well graded, wet	
36	N/A	24	2.2				SW	Same as above	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 7/12/06 @ 1518

Driller: M. Osterberg | Total Depth: 85 | End Drilling: 7/13/06 @ 0830

Drilling Method: Rotosonic | Surface Elev.: 719.745 | Converted to Well: Y | Well I.D.: GM-56

Drilling Fluid: Water | North Coor.: -646.38569 | East Coor.: 5209.35261

Remarks: Water samples 25-30'; 35-40'; 55-66'

Project No.: OH000294.0008.00002 | Datum: TOC Elev. 719.516 | Filename: July 2006

ARCADIS

Log of Boring: GM-56

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
38	N/A	24	3.9				SW	Same as above	
40	N/A	24	4.1				SW	Same as above	
42	N/A	24	3.6				SW	SAND Brown, medium-coarse, medium coarse gravel (5%), wet	
44	N/A	24	3.4				SW	Same as above, fine gravel (10%)	
46	N/A	24	0.0				SW	Same as above	
48	N/A	24	1.0				SW	Same as above	
50									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 7/12/06 @ 1518

Driller: M. Osterberg | Total Depth: 85 | End Drilling: 7/13/06 @ 0830

Drilling Method: Rotosonic | Surface Elev.: 719.745 | Converted to Well: Y | Well I.D.: GM-56

Drilling Fluid: Water | North Coor.: -646.38569 | East Coor.: 5209.35261

Remarks: Water samples 25-30'; 35-40'; 55-66'

Project No.: OH000294.0008.00002 | Datum: TOC Elev. 719.516 | Filename: July 2006

ARCADIS

Log of Boring: GM-56

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
	N/A	24	5.2				SW	Same as above	
52	N/A	24	3.2				SW	Same as above	
54	N/A	24	6.2				SW	Same as above	
56	N/A	24	5.7				SW	SAND Brown, fine-medium, medium gravel (20%), well graded, wet	
58	N/A	24	4.9				SW	Same as above	
60	N/A	24	5.7				SW	SAND Brown, fine-coarse, fine gravel (5%), well graded, wet	
62	N/A	24	6.2				SW	Same as above	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 7/12/06 @ 1518

Driller: M. Osterberg | Total Depth: 85 | End Drilling: 7/13/06 @ 0830

Drilling Method: Rotosonic | Surface Elev.: 719.745 | Converted to Well: Y | Well I.D.: GM-56

Drilling Fluid: Water | North Coor.: -646.38569 | East Coor.: 5209.35261

Remarks: Water samples 25-30'; 35-40'; 55-66'

Project No.: OH000294.0008.00002 | Datum: TOC Elev. 719.516 | Filename: July 2006

ARCADIS

Log of Boring: GM-56

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
64	N/A	24	5.4				SW	Same as above	
66	N/A	24	3.7				SW	Same as above	
68	N/A	24	2.2				SW	Same as above	
70	N/A	24	0.5				SW	Same as above	
72	N/A	24	1.0				SW	Same as above	
74	N/A	24	0.9				CL	SILTY CLAY Brown, fine gravel (5%), high plasticity, moist-wet	
							SP	SAND	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 7/12/06 @ 1518

Driller: M. Osterberg | Total Depth: 85 | End Drilling: 7/13/06 @ 0830

Drilling Method: Rotosonic | Surface Elev.: 719.745 | Converted to Well: Y | Well I.D.: GM-56

Drilling Fluid: Water | North Coor.: -646.38569 | East Coor.: 5209.35261

Remarks: Water samples 25-30'; 35-40'; 55-66'

Project No.: OH000294.0008.00002 | Datum: TOC Elev. 719.516 | Filename: July 2006

ARCADIS

Log of Boring: GM-56

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
								Brown, medium-coarse, poorly graded, trace fine gravel, wet	
76	N/A	24	2.7				SP	Same as above	
78	N/A	24	3.2				SP	Same as above	
80	N/A	24	4.2				SP	Same as above	
82	N/A	24	4.7				GP	GRAVEL Brown, medium-coarse, medium-coarse sand (20%), some silt, poorly graded, wet	
84	N/A	12	1.3				SP	SAND Brown, medium-coarse, trace fine gravel, poorly graded, wet	
								End of boring	
86									

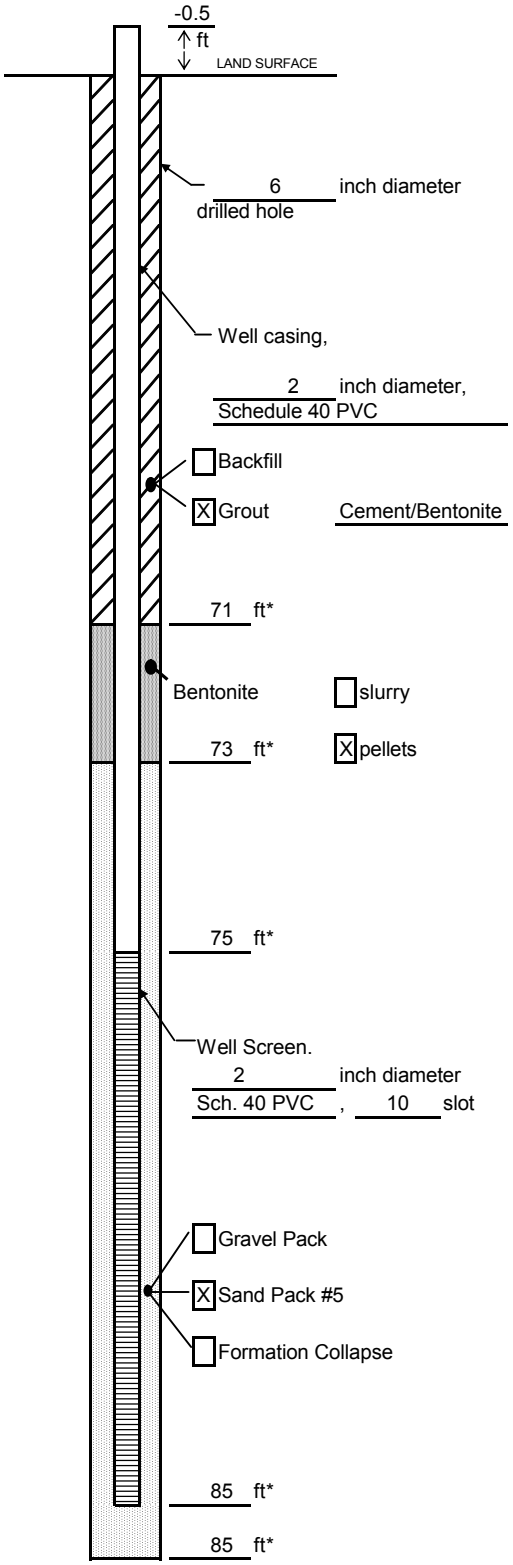
☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: T. Fortner
Begin Drilling: 7/12/06 @ 1518
Driller: M. Osterberg
Total Depth: 85
End Drilling: 7/13/06 @ 0830
Drilling Method: Rotosonic
Surface Elev.: 719.745
Converted to Well: Y Well I.D.: GM-56
Drilling Fluid: Water
North Coor.: -646.38569
East Coor.: 5209.35261
Remarks: Water samples 25-30'; 35-40'; 55-66'
Project No.: OH000294.0008.00002
Datum: TOC Elev. 719.516
Filename: July 2006

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.
* Depth Below Land Surface

Project General Motors Corporation Well GM-56

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

719.745 feet [x] Surveyed [ ] Estimated

Installation Date(s) 7/27/2006

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Pumping - surge with pump 7/28/06

Fluid Loss During Drilling ~150 gallons

Water Removed During Development 170 gallons

Static Depth to Water 14.5 feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration 0.20 hours

Yield 4 gpm Date 7/30/06

Specific Capacity NM gpm/ft

Well Purpose Monitoring well - Well E

Remarks TOC Elevation = 719.516

Time 1425, 1428, 1431, 1434, 1437

pH 6.67, 6.56, 6.35, 6.33, 6.33

Conductivity 1.02, 1.01, 1.01, 1.01, 1.01

Turbidity 19, 14, 6, 1, 0 (clear-nonturbid)

Temperature 19.1, 19.0, 19.2, 19.0, 19.0

Prepared by T. Fortner

ARCADIS

Log of Boring: GM-57

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	N/A	0	N/A					No recovery	
6	N/A	24	3.5				GW	GRAVEL Brown, fine-medium, medium-coarse sand (15%), some silt, well graded, moist	
8	N/A	24	0.4				GW	Same as above	
10	N/A	24	0.0				GW	Same as above	
12	N/A	24	2.8				SW	SAND Brown, medium-coarse, fine-medium gravel (30%), well graded, moist	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: T. Fortner
Begin Drilling: 7/13/06 @ 1022
Driller: M. Osterberg
Total Depth: 45
End Drilling: 7/13/06 @ 1138
Drilling Method: Rotosonic
Surface Elev.: 719.406
Converted to Well: Y Well I.D.: GM-57
Drilling Fluid: Water
North Coor.: -993.49389
East Coor.: 4965.98684
Remarks: Water sample 25-30'; 40-45'
Project No.: OH000294.0008.00002
Datum: TOC Elev. 721.740
Filename: July 2006

ARCADIS

Log of Boring: GM-57

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
14	N/A	24	1.2				SW	Same as above	
16	N/A	24	2.7				SW	Same as above	
18	N/A	24	3.0				SW	Same as above, fine-medium gravel (40%)	
20	N/A	24	1.5				SW	Same as above	
22	N/A	24	3.3				SW	Same as above, wet	▼
24	N/A	24	4.2				SW	Same as above	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: T. Fortner
Begin Drilling: 7/13/06 @ 1022
Driller: M. Osterberg
Total Depth: 45
End Drilling: 7/13/06 @ 1138
Drilling Method: Rotosonic
Surface Elev.: 719.406
Converted to Well: Y Well I.D.: GM-57
Drilling Fluid: Water
North Coor.: -993.49389
East Coor.: 4965.98684
Remarks: Water sample 25-30'; 40-45'
Project No.: OH000294.0008.00002
Datum: TOC Elev. 721.740
Filename: July 2006

ARCADIS

Log of Boring: GM-57

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
26	N/A	24	3.1				GW	GRAVEL Brown, fine-medium, coarse sand (5%), well graded, wet	
28	N/A	24	4.0				GW	Same as above	
30	N/A	24	4.2				SW	SAND Brown, medium-coarse, fine-medium gravel (10%), wet	
32	N/A	24	2.0				SW	Same as above	
34	N/A	24	0.7				SW	Same as above	
36	N/A	24	0.0				GW	GRAVEL Brown, fine-medium, medium-coarse sand (30%), well graded, wet	
	N/A	24	0.1				GW	Same as above	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: T. Fortner
Begin Drilling: 7/13/06 @ 1022
Driller: M. Osterberg
Total Depth: 45
End Drilling: 7/13/06 @ 1138
Drilling Method: Rotosonic
Surface Elev.: 719.406
Converted to Well: Y Well I.D.: GM-57
Drilling Fluid: Water
North Coor.: -993.49389
East Coor.: 4965.98684
Remarks: Water sample 25-30'; 40-45'
Project No.: OH000294.0008.00002
Datum: TOC Elev. 721.740
Filename: July 2006

ARCADIS

Log of Boring: GM-57

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
38									
	N/A	24	0.3				SW	SAND Brown, medium-coarse, fine gravel (20-30%), little fine sand and silt, well graded, wet	
40									
	N/A	24	0.0				SW	Same as above	
42									
	N/A	24	0.5				SW	Same as above	
44									
								End of boring	
46									
48									
50									

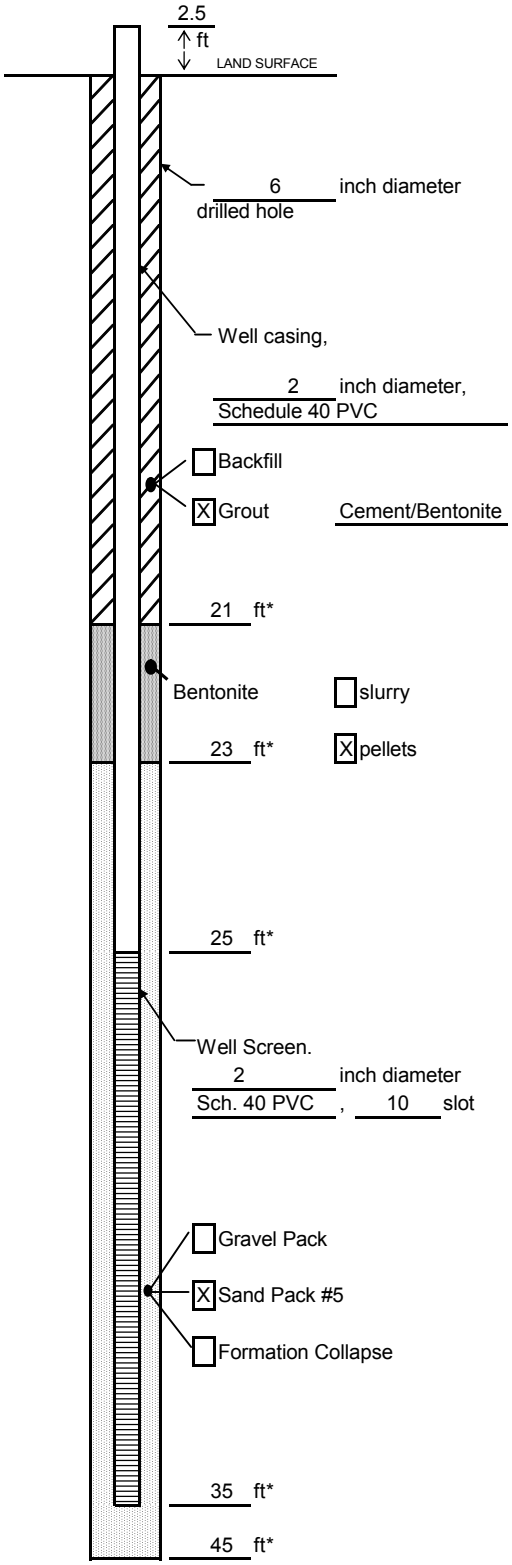
☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: T. Fortner
Begin Drilling: 7/13/06 @ 1022
Driller: M. Osterberg
Total Depth: 45
End Drilling: 7/13/06 @ 1138
Drilling Method: Rotosonic
Surface Elev.: 719.406
Converted to Well: Y Well I.D.: GM-57
Drilling Fluid: Water
North Coor.: -993.49389
East Coor.: 4965.98684
Remarks: Water sample 25-30'; 40-45'
Project No.: OH000294.0008.00002
Datum: TOC Elev. 721.740
Filename: July 2006

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.
* Depth Below Land Surface

Project General Motors Corporation Well GM-57

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

719.406 feet [x] Surveyed [ ] Estimated

Installation Date(s) 7/27/2006

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Pumping - surge with pump 7/30/06

Fluid Loss During Drilling ~80 gallons

Water Removed During Development 90 gallons

Static Depth to Water 17.16 feet below M.P.

Pumping Depth to Water 17.16 feet below M.P.

Pumping Duration 0.50 hours

Yield 3 gpm Date 7/30/06

Specific Capacity NM gpm/ft

Well Purpose Monitoring well - Well F

Remarks TOC Elevation = 721.740

Time 820, 823, 826, 829, 832

pH 5.79, 5.81, 5.94, 5.95, 5.96

Conductivity 1.10, 1.18, 1.12, 1.10, 1.12

Turbidity 0, 0, 0, 0, 0 (clear-nonturbid)

Temperature 18.0, 17.6, 16.4, 16.3, 16.2

Prepared by T. Fortner

ARCADIS

Log of Boring: GM-58

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	N/A	0	N/A					No recovery	
8	N/A	24	0.0				SW	SAND Brown, medium-coarse, fine-medium gravel (30%), moist	
10	N/A	24	0.0				SW	Same as above, dry	
12	N/A	24	0.0				SW	Same as above	
							SW	Same as above	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: T. Fortner
Begin Drilling: 8/21/06 @ 1648
Driller: K. Gobell
Total Depth: 115
End Drilling: 8/22/06 @ 1630
Drilling Method: Rotosonic
Surface Elev.: 735.588
Converted to Well: Y Well I.D.: GM-58
Drilling Fluid: Water
North Coor.: 3450.80045
East Coor.: 7183.08786
Remarks: Water samples 25-30'; 75-80'; 95-100'
Project No.: OH000294.0009
Datum: TOC Elev=735.462
Filename: August 2006

ARCADIS

Log of Boring: GM-58

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
	N/A	24	0.0				SW	Same as above	
14									
	N/A	24	0.0				SW	Same as above	
16									
	N/A	24	0.0				SW	Same as above	
18									
	N/A	24	0.0				SW	Same as above	
20									
	N/A	24	0.0				SW	Same as above	
22									
	N/A	24	0.0				SW	Same as above, wet	▼
24							SW	Same as above	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 8/21/06 @ 1648

Driller: K. Gobell | Total Depth: 115 | End Drilling: 8/22/06 @ 1630

Drilling Method: Rotosonic | Surface Elev.: 735.588 | Converted to Well: Y | Well I.D.: GM-58

Drilling Fluid: Water | North Coor.: 3450.80045 | East Coor.: 7183.08786

Remarks: Water samples 25-30'; 75-80'; 95-100'

Project No.: OH000294.0009 | Datum: TOC Elev=735.462 | Filename: August 2006

ARCADIS

Log of Boring: GM-58

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
	N/A	24	0.0				SW	Same as above	
26									
	N/A	24	0.0				GW	GRAVEL Brown, fine-medium, medium-coarse sand (30%), well graded, wet	
28									
	N/A	24	0.0				GW	Same as above	
30							CL	SANDY CLAY Brown, stiff, moist, medium plasticity, moist	
	N/A	24	0.0				CL	SILTY CLAY Gray, fine gravel (10%), stiff, dry, low-medium plasticity, moist	
32									
	N/A	24	0.0				CL	Same as above	
34									
	N/A	24	1.8				CL	Same as above, fine-medium gravel (40-50%)	
36							CL	Same as above	
	N/A	24	2.9				CL	Same as above, very stiff, fine gravel (10%)	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 8/21/06 @ 1648

Driller: K. Gobell | Total Depth: 115 | End Drilling: 8/22/06 @ 1630

Drilling Method: Rotosonic | Surface Elev.: 735.588 | Converted to Well: Y | Well I.D.: GM-58

Drilling Fluid: Water | North Coor.: 3450.80045 | East Coor.: 7183.08786

Remarks: Water samples 25-30'; 75-80'; 95-100'

Project No.: OH000294.0009 | Datum: TOC Elev=735.462 | Filename: August 2006

ARCADIS

Log of Boring: GM-58

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
38									
	N/A	24	10.4				CL	Same as above	
40									
	N/A	24	16.1				CL	Same as above, fine-medium gravel (10%)	
42									
	N/A	24	17.3				CL	Same as above	
44									
	N/A	24	15.2				CL	SANDY CLAY Gray, fine sand, medium plasticity, soft, moist, 6 inches fine sand stringer, fine gravel (5%)	
46									
	N/A	24	14.6				CL	Same as above, 6 inches fine sand stringer, fine gravel (5%)	
48							CL	Same as above	
	N/A	24	16.0				CL	Same as above	
50									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 8/21/06 @ 1648

Driller: K. Gobell | Total Depth: 115 | End Drilling: 8/22/06 @ 1630

Drilling Method: Rotosonic | Surface Elev.: 735.588 | Converted to Well: Y | Well I.D.: GM-58

Drilling Fluid: Water | North Coor.: 3450.80045 | East Coor.: 7183.08786

Remarks: Water samples 25-30'; 75-80'; 95-100'

Project No.: OH000294.0009 | Datum: TOC Elev=735.462 | Filename: August 2006

ARCADIS

Log of Boring: GM-58

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
							CL	SILTY CLAY Gray, soft, medium plasticity, fine gravel 5%, dry	
	N/A	24	17.0				CL	Same as above	
52									
	N/A	24	17.1				CL	Same as above	
54							SP	SAND Gray, fine, poorly graded	
	N/A	24	16.7				CL	SANDY CLAY Gray, fine-medium sand, stiff, low plasticity, dry	
56									
	N/A	24	17.2				CL	Same as above	
58							CL	SILTY CLAY Dark gray, fine-medium gravel (5%), trace organic material, stiff, low plasticity, dry	
	N/A	24	18.2				CL	Same as above	
60							CL	SILTY CLAY Brown, soft, medium plasticity, moist-dry	
	N/A	24	22.4				CL	Same as above	
62									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 8/21/06 @ 1648

Driller: K. Gobell | Total Depth: 115 | End Drilling: 8/22/06 @ 1630

Drilling Method: Rotosonic | Surface Elev.: 735.588 | Converted to Well: Y | Well I.D.: GM-58

Drilling Fluid: Water | North Coor.: 3450.80045 | East Coor.: 7183.08786

Remarks: Water samples 25-30'; 75-80'; 95-100'

Project No.: OH000294.0009 | Datum: TOC Elev=735.462 | Filename: August 2006

ARCADIS

Log of Boring: GM-58

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
	N/A	24	17.5				CL	Same as above	
64									
	N/A	24	17.5				CL	SILTY CLAY Gray, very stiff, low-medium plasticity, fine gravel (5-10%), dry	
66									
	N/A	24	18.1				CL	Same as above	
68									
	N/A	24	15.5				CL	Same as above	
70							SP	SAND Brown, fine-medium, little silt, wet	
	N/A	24	N/A					No recovery	
72								No recovery	
	N/A	24	N/A					No recovery	
74									
	N/A	24	0.0				GP	GRAVEL	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 8/21/06 @ 1648

Driller: K. Gobell | Total Depth: 115 | End Drilling: 8/22/06 @ 1630

Drilling Method: Rotosonic | Surface Elev.: 735.588 | Converted to Well: Y | Well I.D.: GM-58

Drilling Fluid: Water | North Coor.: 3450.80045 | East Coor.: 7183.08786

Remarks: Water samples 25-30'; 75-80'; 95-100'

Project No.: OH000294.0009 | Datum: TOC Elev=735.462 | Filename: August 2006

ARCADIS

Log of Boring: GM-58

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
								Brown, fine-medium, coarse sand (10-20%), poorly graded, wet	
76									
	N/A	24	0.0				SP	SAND Brown, medium-coarse, poorly graded, wet	
78									
	N/A	24	0.0				SP	Same as above	
80									
	N/A	24	0.0				GW	GRAVEL Brown, fine, medium-coarse sand (30%), wet	
82									
	N/A	24	0.0				SW	SAND Brown, medium-coarse, fine gravel (30%), well graded, wet	
84							SW	Same as above	
	N/A	24	0.0				SP	SAND Olive gray, fine-medium, poorly graded, wet	
86									
	N/A	24	0.0				SP	Same as above	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 8/21/06 @ 1648

Driller: K. Gobell | Total Depth: 115 | End Drilling: 8/22/06 @ 1630

Drilling Method: Rotosonic | Surface Elev.: 735.588 | Converted to Well: Y | Well I.D.: GM-58

Drilling Fluid: Water | North Coor.: 3450.80045 | East Coor.: 7183.08786

Remarks: Water samples 25-30'; 75-80'; 95-100'

Project No.: OH000294.0009 | Datum: TOC Elev=735.462 | Filename: August 2006

ARCADIS

Log of Boring: GM-58

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
88									
	N/A	24	0.0				SP	Same as above	
90									
	N/A	24	0.0				SP	Same as above	
92									
	N/A	24	0.0				SP	Same as above	
94									
	N/A	24	0.0				SP	Same as above	
96							SP	Same as above	
	N/A	24	0.0				SP	Same as above, gray	
98									
	N/A	24	0.0				SP	Same as above	
100									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 8/21/06 @ 1648

Driller: K. Gobell | Total Depth: 115 | End Drilling: 8/22/06 @ 1630

Drilling Method: Rotosonic | Surface Elev.: 735.588 | Converted to Well: Y | Well I.D.: GM-58

Drilling Fluid: Water | North Coor.: 3450.80045 | East Coor.: 7183.08786

Remarks: Water samples 25-30'; 75-80'; 95-100'

Project No.: OH000294.0009 | Datum: TOC Elev=735.462 | Filename: August 2006

ARCADIS

Log of Boring: GM-58

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
	N/A	24	0.0				SW	SAND Brown, fine-coarse, trace fine-medium gravel, well graded, wet	
102									
	N/A	24	0.0				SW	Same as above	
104									
	N/A	24	13.1				GW	GRAVEL Gray, fine-medium, fine-coarse sand (30%), well graded, wet	
106									
	N/A	24	13.2				GW	Same as above	
108							GW	Same as above	
	N/A	24	2.4				GW	Same as above	
110									
	N/A	24	0.7				GW	Same as above	
112									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 8/21/06 @ 1648

Driller: K. Gobell | Total Depth: 115 | End Drilling: 8/22/06 @ 1630

Drilling Method: Rotosonic | Surface Elev.: 735.588 | Converted to Well: Y | Well I.D.: GM-58

Drilling Fluid: Water | North Coor.: 3450.80045 | East Coor.: 7183.08786

Remarks: Water samples 25-30'; 75-80'; 95-100'

Project No.: OH000294.0009 | Datum: TOC Elev=735.462 | Filename: August 2006

ARCADIS

Log of Boring: GM-58

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
114	N/A	24	2.1				GW	Same as above	
								End of boring	
116									
118									
120									
122									
124									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 8/21/06 @ 1648

Driller: K. Gobell | Total Depth: 115 | End Drilling: 8/22/06 @ 1630

Drilling Method: Rotosonic | Surface Elev.: 735.588 | Converted to Well: Y | Well I.D.: GM-58

Drilling Fluid: Water | North Coor.: 3450.80045 | East Coor.: 7183.08786

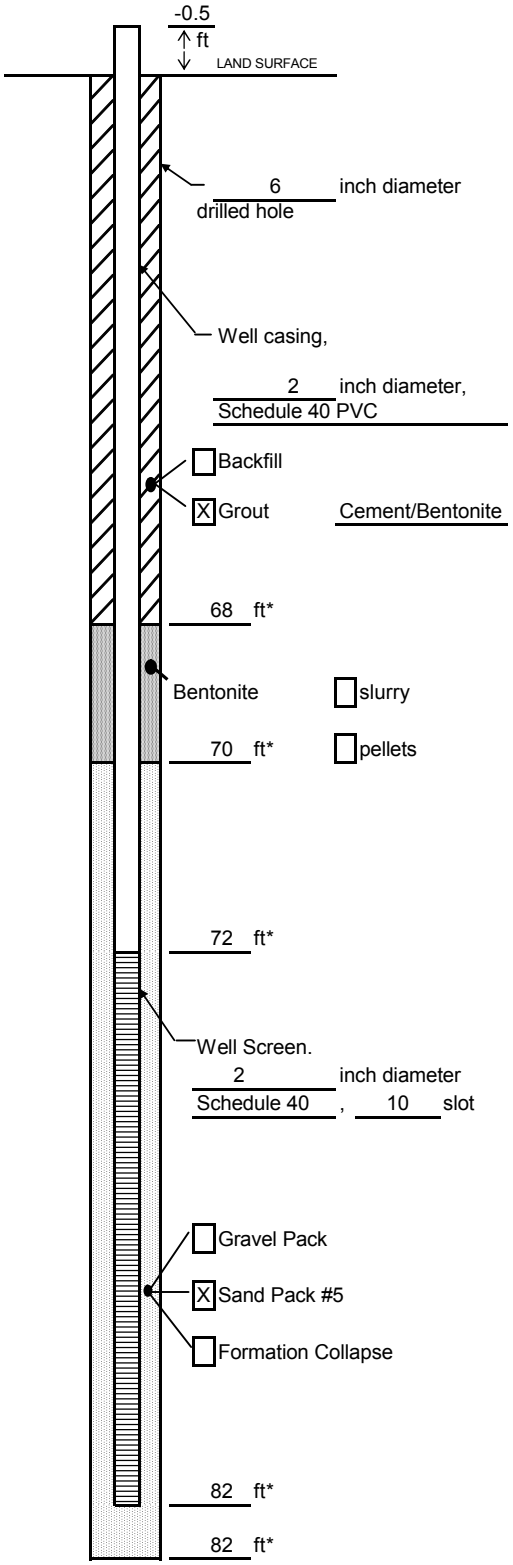
Remarks: Water samples 25-30'; 75-80'; 95-100'

Project No.: OH000294.0009 | Datum: TOC Elev=735.462 | Filename: August 2006

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.
* Depth Below Land Surface

Project General Motors Corporation Well GM-58

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

735.588 feet [x] Surveyed [ ] Estimated

Installation Date(s) 9/1/2006

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Pumping - surge with pump 9/1/06

Fluid Loss During Drilling NM gallons

Water Removed During Development NM gallons

Static Depth to Water 28.32 feet below M.P.

Pumping Depth to Water 79 feet below M.P.

Pumping Duration NM hours

Yield NM gpm Date NA

Specific Capacity NM gpm/ft

Well Purpose Monitoring Well - Well I

Remarks TOC Elevation = 735.462

Time 1600, 1610, 1615, 1620, 1625, 1630

pH 6.78, 6.61, 6.61, 6.58, 6.59, 6.59

Conductivity 1.20, 1.20, 1.20, 1.21, 1.20, 1.20

Turbidity 232, 137, 72, 36, 28, 18

Temp 17.8, 17.3, 17.5, 17.4, 17.3, 17.4

Prepared by J. Manzo/ J. Wallace

ARCADIS

Log of Boring: GM-59

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0								See GM-61 for lithologic description from 0-35'	
2									
4									
6									
8									
10									
12									

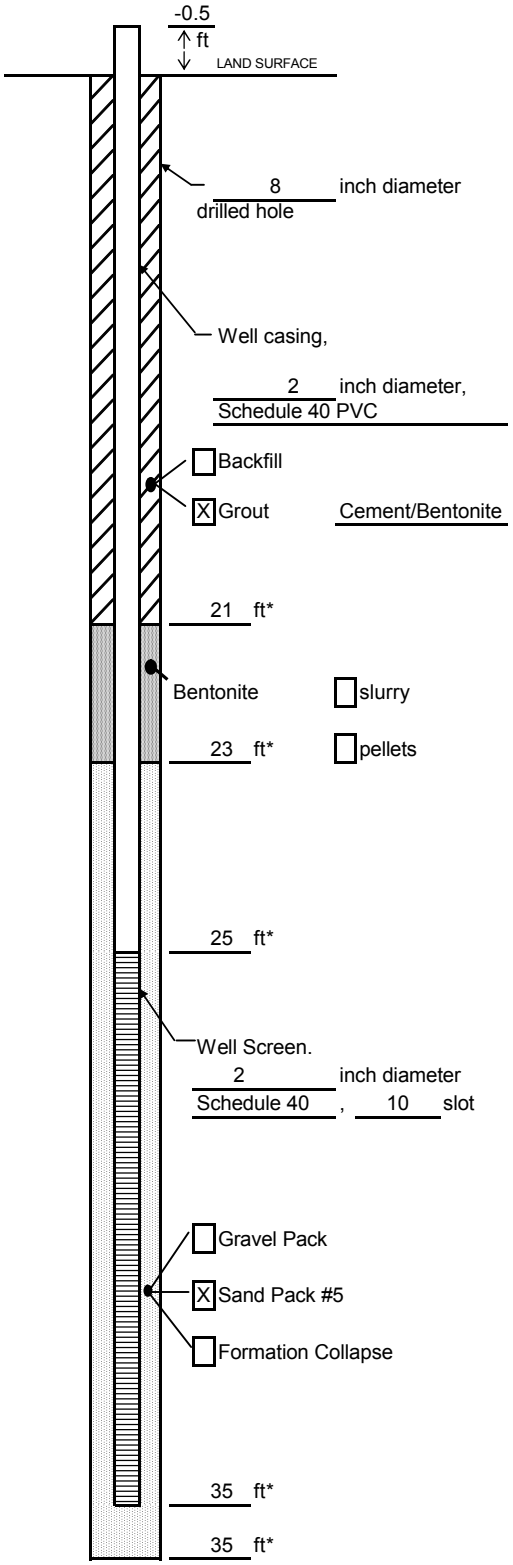
☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: A. Jacobs
Begin Drilling: 8/30/06
Driller: K. Gobell
Total Depth: 35
End Drilling: 8/30/06
Drilling Method: Rotosonic
Surface Elev.: 732.464
Converted to Well: Y Well I.D.: GM-59
Drilling Fluid: Water
North Coor.: 4501.29894
East Coor.: 6323.48631
Remarks: Shallow nested pair to GM-60.
Project No.: OH000294.0008.00002
Datum: TOC Elev 732.246
Filename: July 2006

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.
* Depth Below Land Surface

Project General Motors Corporation Well GM-59

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

732.464 feet [x] Surveyed [ ] Estimated

Installation Date(s) 8/30/2006

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Pumping - surge with pump 9/1/06

Fluid Loss During Drilling ~50 gallons

Water Removed During Development 56.8 gallons

Static Depth to Water 25.8 feet below M.P.

Pumping Depth to Water 24.9 feet below M.P.

Pumping Duration 35.22 hours

Yield 0.62 gpm Date 9/1/06

Specific Capacity NM gpm/ft

Well Purpose Monitoring Well - Well J (Shallow)

Remarks TOC Elevation = 732.246

Time 10:55, 10:58, 11:01, 11:04

pH 6.69, 6.67, 6.66, 6.67

Conductivity 1.43, 1.34, 1.33, 1.34

Temperature 18.4, 18.4, 18.5, 18.5

Turbidity 76, 53, 35, 27

Prepared by A.Jacobs

ARCADIS

Log of Boring: GM-60

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0								See GM-61 for lithologic description from 0-52'	
2									
4									
6									
8									
10									
12									

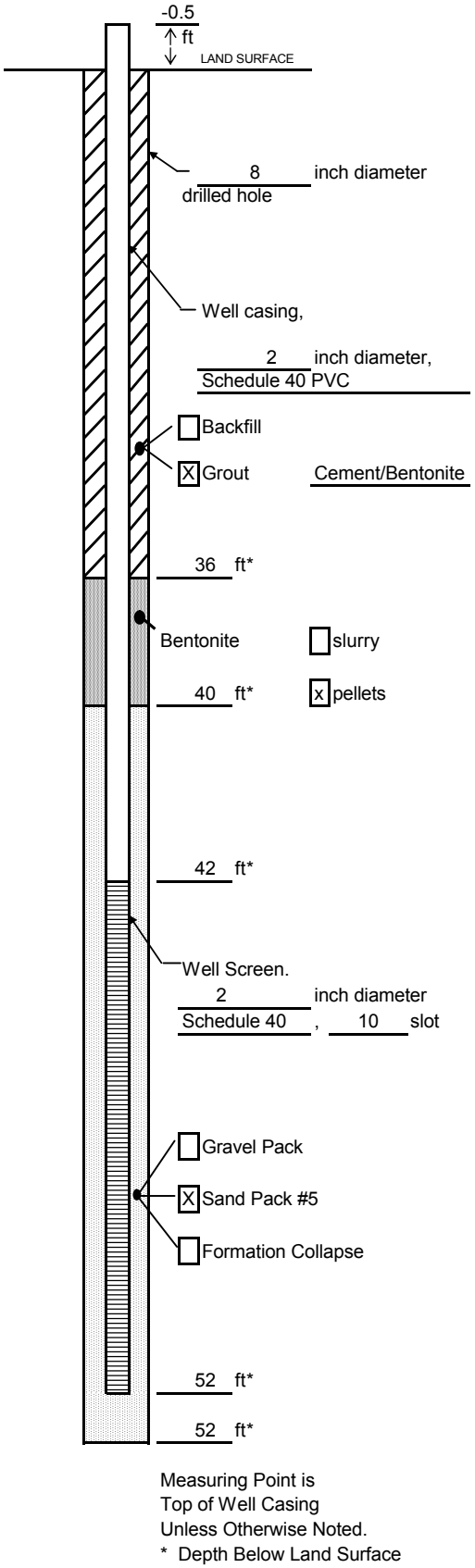
☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: A. Jacobs
Begin Drilling: 8/30/06
Driller: K. Gobell
Total Depth: 52
End Drilling: 8/30/06
Drilling Method: Rotosonic
Surface Elev.: 732.464
Converted to Well: Y Well I.D.: GM-60
Drilling Fluid: Water
North Coor.: 4701.07762
East Coor.: 6323.54823
Remarks: Intermediate nested pair to GM-59.
Project No.: OH000294.0008.00002
Datum: TOC Elev 732.237
Filename: July 2006

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.
* Depth Below Land Surface

Project General Motors Corporation Well GM-60

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

732.464 feet [x] Surveyed

[ ] Estimated

Installation Date(s) 8/30/2006

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Pumping - surge with pump 9/1/06

Fluid Loss During Drilling ~50 gallons

Water Removed During Development ~80 gallons

Static Depth to Water 25.8 feet below M.P.

Pumping Depth to Water 24.8 feet below M.P.

Pumping Duration 0.83 hours

Yield 0.62 gpm Date 9/1/06

Specific Capacity NM gpm/ft

Well Purpose Monitoring Well-Well J (Intermediate)

Remarks TOC Elevation = 732.237

Time 11:48, 11:52, 11:55, 11:58

Temperature 19.2, 19.1, 19.2, 19.1

Condictivity 1.23, 1.22, 1.22, 1.22

pH 6.66, 6.68, 6.65, 6.67

Turbidity 9, 7, 6, 4

Prepared by A. Jacobs / J. Wallace

ARCADIS

Log of Boring: GM-61

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	N/A	24	0.0					ASPHALT/CONCRETE	
2							SW	SAND Brown, fine-coarse, fine-coarse gravel (40%), well graded, wet	
4	N/A	24	0.3				SW	SAND Brown, fine-medium, fine gravel (5%), well graded, moist-dry	
6							SW	SAND Yellowish brown, fine-coarse, fine-coarse gravel (40%), well graded, dry	
8	N/A	24	1.4				SW	Same as above, fine-medium gravel (30%)	
10	N/A	24	0.0				SW	Same as above	
12	N/A	24	0.0				SW	Same as above	
							SW	Same as above	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: T. Fortner
Begin Drilling: 8/23/06 @ 1015
Driller: K. Gobell
Total Depth: 115
End Drilling: 8/24/06 @ 0940
Drilling Method: Rotosonic
Surface Elev.: 732.483
Converted to Well: Y Well I.D.: GM-61
Drilling Fluid: Water
North Coor.: 4501.21590
East Coor.: 6318.06175
Remarks: Water samples 30-35'; 47-52'; 70-75'
Project No.: OH000294.0009
Datum: TOC Elev. 732.225
Filename: August 2006

ARCADIS

Log of Boring: GM-61

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
	N/A	24	0.0				SW	Same as above	
14									
	N/A	24	0.4				SW	Same as above, medium-coarse sand, fine- medium gravel (40%)	
16									
	N/A	24	0.0				SW	Same as above	
18									
	N/A	24	0.0				SW	Same as above	
20									
	N/A	24	0.0				SW	SAND/GRAVEL Yellow brown, medium-coarse sand, fine-coarse gravel (50%), well graded, moist	
22									
	N/A	24	0.0				SW	SAND Light gray, fine-medium, fine-coarse gravel (30%), well graded, dry	
24							SW	Same as above	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 8/23/06 @ 1015

Driller: K. Gobell | Total Depth: 115 | End Drilling: 8/24/06 @ 0940

Drilling Method: Rotosonic | Surface Elev.: 732.483 | Converted to Well: Y | Well I.D.: GM-61

Drilling Fluid: Water | North Coor.: 4501.21590 | East Coor.: 6318.06175

Remarks: Water samples 30-35'; 47-52'; 70-75'

Project No.: OH000294.0009 | Datum: TOC Elev. 732.225 | Filename: August 2006

ARCADIS

Log of Boring: GM-61

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
26	N/A	24	0.0				GW	GRAVEL Yellow brown, fine-coarse, coarse sand (20%), well graded, wet	–
28	N/A	24	0.0				GW	Same as above	
30	N/A	24	0.0				GW	Same as above	
32	N/A	24	6.1				GW	Same as above	
34	N/A	24	3.2				SW	SAND Yellow brown, medium-coarse, fine-coarse gravel (10%), well graded, wet	
36	N/A	24	13.0				GW	Same as above	
							GW	Same as above	
	N/A	24	12.8				GW	Same as above	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 8/23/06 @ 1015

Driller: K. Gobell | Total Depth: 115 | End Drilling: 8/24/06 @ 0940

Drilling Method: Rotosonic | Surface Elev.: 732.483 | Converted to Well: Y | Well I.D.: GM-61

Drilling Fluid: Water | North Coor.: 4501.21590 | East Coor.: 6318.06175

Remarks: Water samples 30-35'; 47-52'; 70-75'

Project No.: OH000294.0009 | Datum: TOC Elev. 732.225 | Filename: August 2006

ARCADIS

Log of Boring: GM-61

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
38									
	N/A	24	12.5				GW	Same as above with little silt	
40									
	N/A	24	11.8				GW	Same as above	
42									
	N/A	24	5.8				GW	Same as above	
44									
	N/A	24	15.1				GW	Same as above	
46									
	N/A	24	14.5				GW	Same as above	
48							GW	Same as above	
	N/A	24	13.9				GW	Same as above	
50									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 8/23/06 @ 1015

Driller: K. Gobell | Total Depth: 115 | End Drilling: 8/24/06 @ 0940

Drilling Method: Rotosonic | Surface Elev.: 732.483 | Converted to Well: Y | Well I.D.: GM-61

Drilling Fluid: Water | North Coor.: 4501.21590 | East Coor.: 6318.06175

Remarks: Water samples 30-35'; 47-52'; 70-75'

Project No.: OH000294.0009 | Datum: TOC Elev. 732.225 | Filename: August 2006

ARCADIS

Log of Boring: GM-61

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
	N/A	24	19.7				GW	Same as above	
52							CL	SILTY CLAY Yellowish orange, trace medium gravel, low plasticity, stiff, dry	
	N/A	24	15.3				CL	Same as above	
54									
	N/A	24	0.0				CL	SILTY CLAY Gray, very stiff, dry, low plasticity, fine-medium gravel (5%), dry	
56									
	N/A	24	0.0				CL	Same as above	
58									
	N/A	24	0.0				CL	Same as above	
60							CL	Same as above	
	N/A	24	0.0				CL	Same as above	
62									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 8/23/06 @ 1015

Driller: K. Gobell | Total Depth: 115 | End Drilling: 8/24/06 @ 0940

Drilling Method: Rotosonic | Surface Elev.: 732.483 | Converted to Well: Y | Well I.D.: GM-61

Drilling Fluid: Water | North Coor.: 4501.21590 | East Coor.: 6318.06175

Remarks: Water samples 30-35'; 47-52'; 70-75'

Project No.: OH000294.0009 | Datum: TOC Elev. 732.225 | Filename: August 2006

ARCADIS

Log of Boring: GM-61

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
	N/A	24	0.0				CL	Same as above	
64									
	N/A	24	0.0				CL	SANDY CLAY Brown, fine sand, very stiff, low plasticity, dry	
66									
	N/A	24	0.0				SW	SAND Brown, fine-medium, fine gravel (10%), well graded, wet	
68									
	N/A	24	0.0				SW	Same as above	
70									
	N/A	24	0.0				SP	Same as above, no gravel	
72							SP	Same as above	
	N/A	24	0.0				SP	Same as above	
74									
	N/A	12	0.0				SW	SAND	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 8/23/06 @ 1015

Driller: K. Gobell | Total Depth: 115 | End Drilling: 8/24/06 @ 0940

Drilling Method: Rotosonic | Surface Elev.: 732.483 | Converted to Well: Y | Well I.D.: GM-61

Drilling Fluid: Water | North Coor.: 4501.21590 | East Coor.: 6318.06175

Remarks: Water samples 30-35'; 47-52'; 70-75'

Project No.: OH000294.0009 | Datum: TOC Elev. 732.225 | Filename: August 2006

ARCADIS

Log of Boring: GM-61

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
76								Brown, fine-coarse gravel and cobbles (20%), well graded, wet	
	N/A	12	0.0				SW	Same as above	
78									
	N/A	12	0.0				SW	Same as above	
80									
	N/A	12	0.0				SW	Same as above	
82									
	N/A	12	0.0				SW	Same as above, gravel and cobbles (25%)	
84							SW	Same as above	
	N/A	12	0.0				SW	Same as above	
86									
	N/A	12	0.0				SW	Same as above	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 8/23/06 @ 1015

Driller: K. Gobell | Total Depth: 115 | End Drilling: 8/24/06 @ 0940

Drilling Method: Rotosonic | Surface Elev.: 732.483 | Converted to Well: Y | Well I.D.: GM-61

Drilling Fluid: Water | North Coor.: 4501.21590 | East Coor.: 6318.06175

Remarks: Water samples 30-35'; 47-52'; 70-75'

Project No.: OH000294.0009 | Datum: TOC Elev. 732.225 | Filename: August 2006

ARCADIS

Log of Boring: GM-61

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
88									
	N/A	12	0.0				SW	Same as above	
90									
	N/A	12	0.0				SW	Same as above	
92									
	N/A	12	0.0				SW	Same as above	
94									
	N/A	18	0.0				SW	Same as above	
96							SW	Same as above	
	N/A	18	0.0				SW	Same as above	
98									
	N/A	18	0.0				SW	Same as above	
100									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 8/23/06 @ 1015

Driller: K. Gobell | Total Depth: 115 | End Drilling: 8/24/06 @ 0940

Drilling Method: Rotosonic | Surface Elev.: 732.483 | Converted to Well: Y | Well I.D.: GM-61

Drilling Fluid: Water | North Coor.: 4501.21590 | East Coor.: 6318.06175

Remarks: Water samples 30-35'; 47-52'; 70-75'

Project No.: OH000294.0009 | Datum: TOC Elev. 732.225 | Filename: August 2006

ARCADIS

Log of Boring: GM-61

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
102	N/A	18	0.0				SW	Same as above	
104	N/A	18	0.0				SW	Same as above	
106	N/A	18	0.0				SW	Same as above	
108	N/A	18	0.0				SW	Same as above	
							SW	Same as above	
110	N/A	18	0.0				SW	Same as above	
112	N/A	18	0.0				SW	Same as above	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: T. Fortner
Begin Drilling: 8/23/06 @ 1015
Driller: K. Gobell
Total Depth: 115
End Drilling: 8/24/06 @ 0940
Drilling Method: Rotosonic
Surface Elev.: 732.483
Converted to Well: Y Well I.D.: GM-61
Drilling Fluid: Water
North Coor.: 4501.21590
East Coor.: 6318.06175
Remarks: Water samples 30-35'; 47-52'; 70-75'
Project No.: OH000294.0009
Datum: TOC Elev. 732.225
Filename: August 2006

ARCADIS

Log of Boring: GM-61

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
114	N/A	18	0.0				SW	Same as above	
								End of boring	
116									
118									
120									
122									
124									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 8/23/06 @ 1015

Driller: K. Gobell | Total Depth: 115 | End Drilling: 8/24/06 @ 0940

Drilling Method: Rotosonic | Surface Elev.: 732.483 | Converted to Well: Y | Well I.D.: GM-61

Drilling Fluid: Water | North Coor.: 4501.21590 | East Coor.: 6318.06175

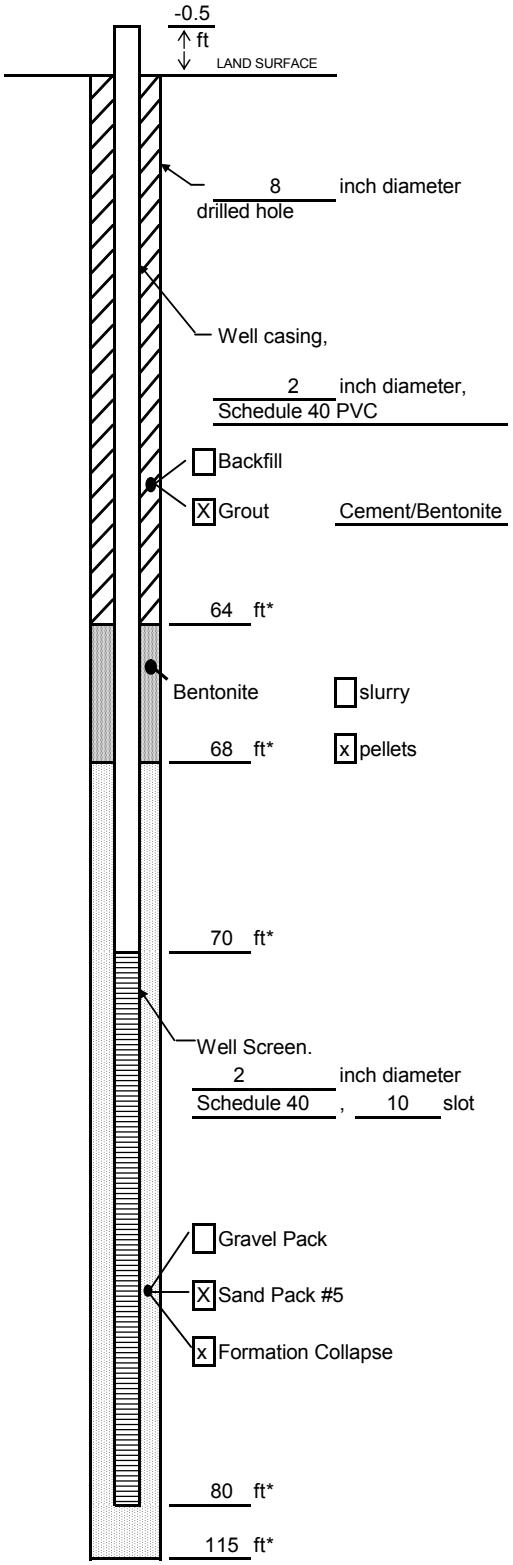
Remarks: Water samples 30-35'; 47-52'; 70-75'

Project No.: OH000294.0009 | Datum: TOC Elev. 732.225 | Filename: August 2006

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.
* Depth Below Land Surface

Project General Motors Corporation Well GM-61

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

732.483 feet [x] Surveyed

[ ] Estimated

Installation Date(s) 8/29/2006

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Pumping - surge with pump 9/1/06

Fluid Loss During Drilling 0 gallons

Water Removed During Development 50 gallons

Static Depth to Water 24.87 feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration 0.70 hours

Yield NM gpm Date 9/1/06

Specific Capacity NM gpm/ft

Well Purpose Monitoring Well - Well J (Deep)

Remarks TOC Elevation = 732.225

Time 14:45, 15:00, 15:05, 15:10, 15:15, 15:20

pH 6.75, 6.55, 6.53, 6.51, 6.50, 6.49

Conductivity 1.26, 1.30, 1.30, 1.31, 1.31, 1.31

Temperature 999, 402, 310, 256, 230, 241

Turbidity 18.8, 18.5, 18.4, 18.3, 18.0, 18.0

Prepared by A. Jacobs/ T. Fotner/ J. Wallace

ARCADIS

Log of Boring: GM-62

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0		N/A						No recovery	
2									
4									
6									
8									
	N/A	24	0.0				SW	SAND Brown, fine-coarse, fine-coarse gravel (30%), well graded, dry	
10									
	N/A	24	15.3				SW	Same as above	
12									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: A. Jacobs
Begin Drilling: 8/29/06 @ 1530
Driller: K. Gobell
Total Depth: 85
End Drilling: 8/30/06 @ 1330
Drilling Method: Rotosonic
Surface Elev.: 722.172
Converted to Well: Y Well I.D.: GM-62
Drilling Fluid: Water
North Coor.: -189.49099
East Coor.: 5442.96098
Remarks: Water samples 30-35'; 40-45'; 60-65'
Project No.: OH000294.0009
Datum: TOC Elev. 722.109
Filename: August 2006

ARCADIS

Log of Boring: GM-62

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
	N/A	24	15.0				SW	Same as above, fine-coarse gravel (45%)	
14									
	N/A	24	14				SW	Same as above	
16									
	N/A	24	14.2				SW	Same as above	
18									
	N/A	24	16.6				SW	Same as above	
20									
	N/A	24	14.8				SP	SAND Brown with few red-orange stringers, fine-medium, fine-medium gravel (35%), poorly graded, moist	
22									
	N/A	24	12.9				SP	Same as above	
24									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: A. Jacobs | Begin Drilling: 8/29/06 @ 1530

Driller: K. Gobell | Total Depth: 85 | End Drilling: 8/30/06 @ 1330

Drilling Method: Rotosonic | Surface Elev.: 722.172 | Converted to Well: Y | Well I.D.: GM-62

Drilling Fluid: Water | North Coor.: -189.49099 | East Coor.: 5442.96098

Remarks: Water samples 30-35'; 40-45'; 60-65'

Project No.: OH000294.0009 | Datum: TOC Elev. 722.109 | Filename: August 2006

ARCADIS

Log of Boring: GM-62

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
26	N/A	24	10.3				SP	SAND Brown, fine-coarse, poorly graded, wet	–
28	N/A	24	16.8				GP	GRAVEL Brown, fine, wet, no plasticity	
30	N/A	24	7.0				GW	GRAVEL Brown, fine-coarse, sand (15%), well graded, wet	
32	N/A	24	3.6				GW	Same as above	
34	N/A	24	15.8				SW	SAND Brown, fine-coarse, medium gravel (20%), well graded, wet	
36	N/A	24	0.0				GW	GRAVEL Brown, fine-medium, fine-coarse sand (20%), well graded, wet	
	N/A	24	0.0				GW	Same as above	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: A. Jacobs | Begin Drilling: 8/29/06 @ 1530

Driller: K. Gobell | Total Depth: 85 | End Drilling: 8/30/06 @ 1330

Drilling Method: Rotosonic | Surface Elev.: 722.172 | Converted to Well: Y | Well I.D.: GM-62

Drilling Fluid: Water | North Coor.: -189.49099 | East Coor.: 5442.96098

Remarks: Water samples 30-35'; 40-45'; 60-65'

Project No.: OH000294.0009 | Datum: TOC Elev. 722.109 | Filename: August 2006

ARCADIS

Log of Boring: GM-62

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
38									
	N/A	24	0.0				GW	Same as above	
40									
	N/A	24	0.0				SW	SAND Brown, fine-coarse, fine-medium gravel (10%), well graded, wet	
42									
	N/A	24	0.0				SW	Same as above	
44									
	N/A	24	0.0				SW	Same as above, fine-coarse gravel (10%)	
46									
	N/A	24	0.0				SW	Same as above	
48									
	N/A	24	0.0				SM	SILTY SAND Brown, fine-medium, fine coarse gravel (10%), well graded, wet	
50									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: A. Jacobs | Begin Drilling: 8/29/06 @ 1530

Driller: K. Gobell | Total Depth: 85 | End Drilling: 8/30/06 @ 1330

Drilling Method: Rotosonic | Surface Elev.: 722.172 | Converted to Well: Y | Well I.D.: GM-62

Drilling Fluid: Water | North Coor.: -189.49099 | East Coor.: 5442.96098

Remarks: Water samples 30-35'; 40-45'; 60-65'

Project No.: OH000294.0009 | Datum: TOC Elev. 722.109 | Filename: August 2006

ARCADIS

Log of Boring: GM-62

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
	N/A	24	0.0				SM	Same as above	
52									
	N/A	24	0.0				SM	Same as above	
54									
	N/A	24	10.1				GP	GRAVEL Brown, Medium-coarse with a few cobbles, poorly graded, wet	
56									
	N/A	24	10.1				GP	Same as above	
58									
	N/A	24	10.1				GP	Same as above	
60							SW	SAND Brown, fine-coarse, well graded, wet	
	N/A	24	25				SW	Same as above	
62									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: A. Jacobs | Begin Drilling: 8/29/06 @ 1530

Driller: K. Gobell | Total Depth: 85 | End Drilling: 8/30/06 @ 1330

Drilling Method: Rotosonic | Surface Elev.: 722.172 | Converted to Well: Y | Well I.D.: GM-62

Drilling Fluid: Water | North Coor.: -189.49099 | East Coor.: 5442.96098

Remarks: Water samples 30-35'; 40-45'; 60-65'

Project No.: OH000294.0009 | Datum: TOC Elev. 722.109 | Filename: August 2006

ARCADIS

Log of Boring: GM-62

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
	N/A	24	2.1				SW	Same as above	
64									
	N/A	24	5.2				GP	GRAVEL Medium-coarse with few cobbles, poorly graded, wet	
66	N/A	24	5.2				SP	SAND Brown, medium-coarse, coarse gravel (15%), poorly graded, wet	
	N/A	24	1.1				SP	Same as above	
68									
	N/A	24	5.6				SP	Same as above	
70									
	N/A	24	3.1				SP	Same as above, coarse sand, fine-coarse gravel (5%)	
72									
	N/A	24	2.9				SW	Same as above	
74									
	N/A	24	4.0				GP	GRAVEL	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: A. Jacobs | Begin Drilling: 8/29/06 @ 1530

Driller: K. Gobell | Total Depth: 85 | End Drilling: 8/30/06 @ 1330

Drilling Method: Rotosonic | Surface Elev.: 722.172 | Converted to Well: Y | Well I.D.: GM-62

Drilling Fluid: Water | North Coor.: -189.49099 | East Coor.: 5442.96098

Remarks: Water samples 30-35'; 40-45'; 60-65'

Project No.: OH000294.0009 | Datum: TOC Elev. 722.109 | Filename: August 2006

ARCADIS

Log of Boring: GM-62

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
								Brown, medium-coarse, poorly graded, wet	
76							SM	SILTY SAND Gray, fine, poorly graded, wet	
	N/A	24	0.7				SM	Same as above	
78									
	N/A	24	4.6				SM	Same as above	
80							SM	SILTY SAND Gray, fine-coarse, medium-coarse gravel (10%), wet	
	N/A	24	2.4				SM	Same as above	
82									
	N/A	24	4.1				SM	Same as above	
84							SM	Same as above	
								End of boring	
86									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: A. Jacobs | Begin Drilling: 8/29/06 @ 1530

Driller: K. Gobell | Total Depth: 85 | End Drilling: 8/30/06 @ 1330

Drilling Method: Rotosonic | Surface Elev.: 722.172 | Converted to Well: Y | Well I.D.: GM-62

Drilling Fluid: Water | North Coor.: -189.49099 | East Coor.: 5442.96098

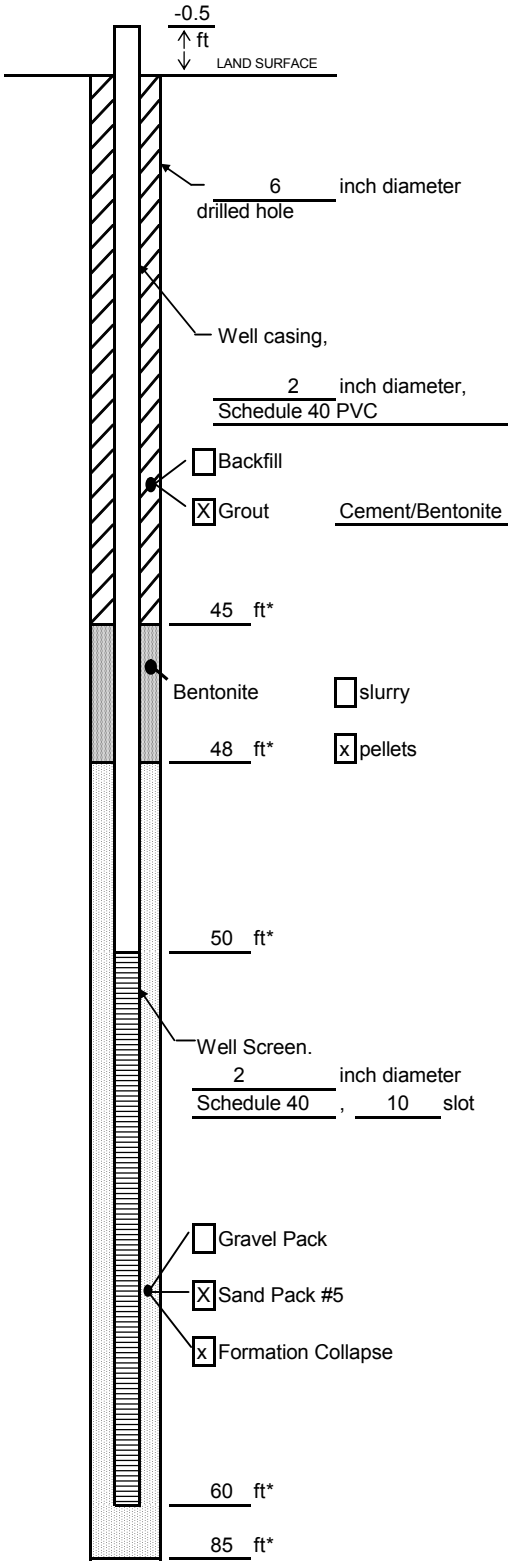
Remarks: Water samples 30-35'; 40-45'; 60-65'

Project No.: OH000294.0009 | Datum: TOC Elev. 722.109 | Filename: August 2006

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.
* Depth Below Land Surface

Project General Motors Corporation Well GM-62

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

722.172 feet [x] Surveyed [ ] Estimated

Installation Date(s) 8/31/2006

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Pumping - surge with pump 9/1/06

Fluid Loss During Drilling ~200 gallons

Water Removed During Development 234 gallons

Static Depth to Water 17.4 feet below M.P.

Pumping Depth to Water 17.6 feet below M.P.

Pumping Duration 2.18 hours

Yield 0.61 gpm Date 9/1/06

Specific Capacity NM gpm/ft

Well Purpose Monitoring Well - Well C

Remarks TOC Elevation = 722.109

Time 9:30, 9:33, 9:35, 9:38

Conductivity 1.09, 1.11, 1.11, 1.11,

Temperature 17.1, 17.1, 17.0, 17.1

pH 6.72, 6.75, 6.75, 6.78

Turbidity 133, 88, 88, 85

Prepared by A. Jacobs

ARCADIS

Log of Boring: GM-63

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0								See RZ-4J for lithologic description from 0-40'	
2									
4									
6									
8									
10									
12									

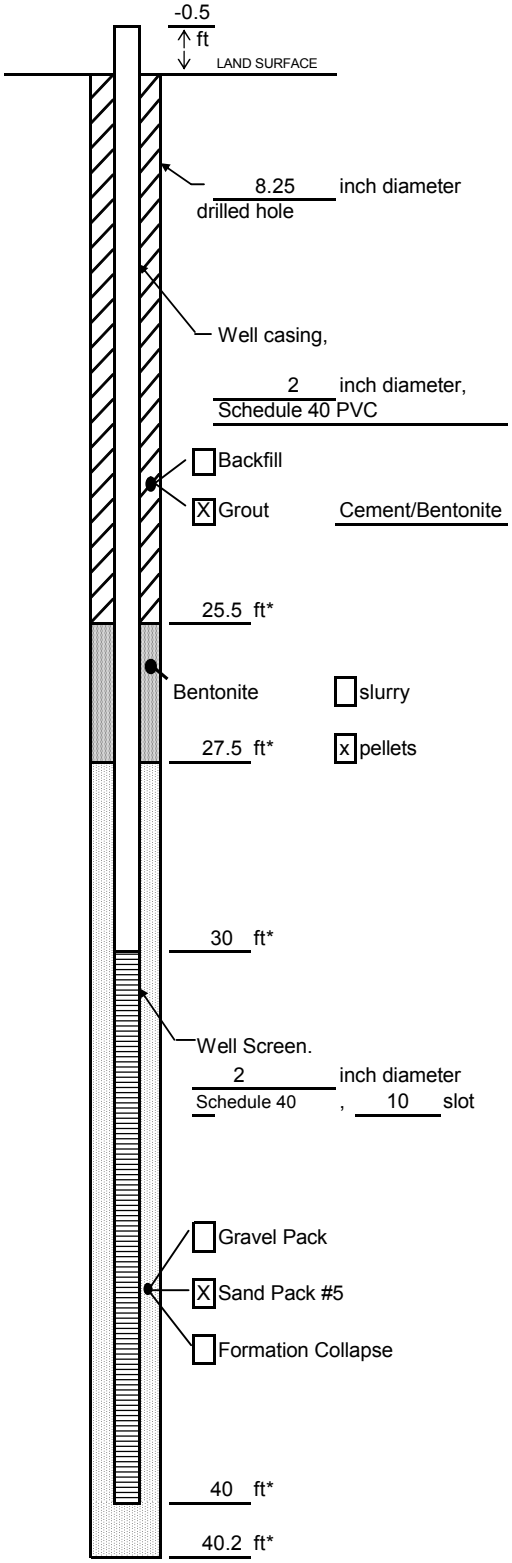
☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: J. Wallace
Begin Drilling: 8/31/06
Driller: D. Remmler
Total Depth: 40
End Drilling: 8/31/06
Drilling Method: Hollow Stem Auger
Surface Elev.: 726.207
Converted to Well: Y Well I.D.: GM-63
Drilling Fluid: Water
North Coor.: 1625.02787
East Coor.: 4918.82945
Remarks: Shallow pair to GM-64.
Project No.: OH000294.0008.00002
Datum: TOC Elev. 725.791
Filename: July 2006

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.
* Depth Below Land Surface

Project General Motors Corporation Well GM-63

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

726.207 feet [x] Surveyed

[ ] Estimated

Installation Date(s) 9/1/2006

Drilling Method Hollow Stem Auger

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Pumping - surge with pump 9/1/06

Fluid Loss During Drilling 15 gallons

Water Removed During Development 50 gallons

Static Depth to Water ~20.2 feet below M.P.

Pumping Depth to Water 38 feet below M.P.

Pumping Duration NA hours

Yield ~1.6 gpm Date 9/1/06

Specific Capacity NM gpm/ft

Well Purpose Monitoring Well

WSU-22 Replacement (Shallow)

Remarks TOC Elevation = 725.791

Time 13:40, 13:45, 13:50, 13:55, 14:00

pH 6.65, 6.58, 6.58, 6.58, 6.59

Conductivity 1.41, 1.41, 1.42, 1.41, 1.41

Turbidity 588, 286, 157, 92, 59

Temperature 18.8, 18.6, 18.6, 18.5, 18.5

Prepared by J. Wallace

ARCADIS

Log of Boring: GM-64

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0								See RZ-4J for lithologic description from 0-60'	
2									
4									
6									
8									
10									
12									

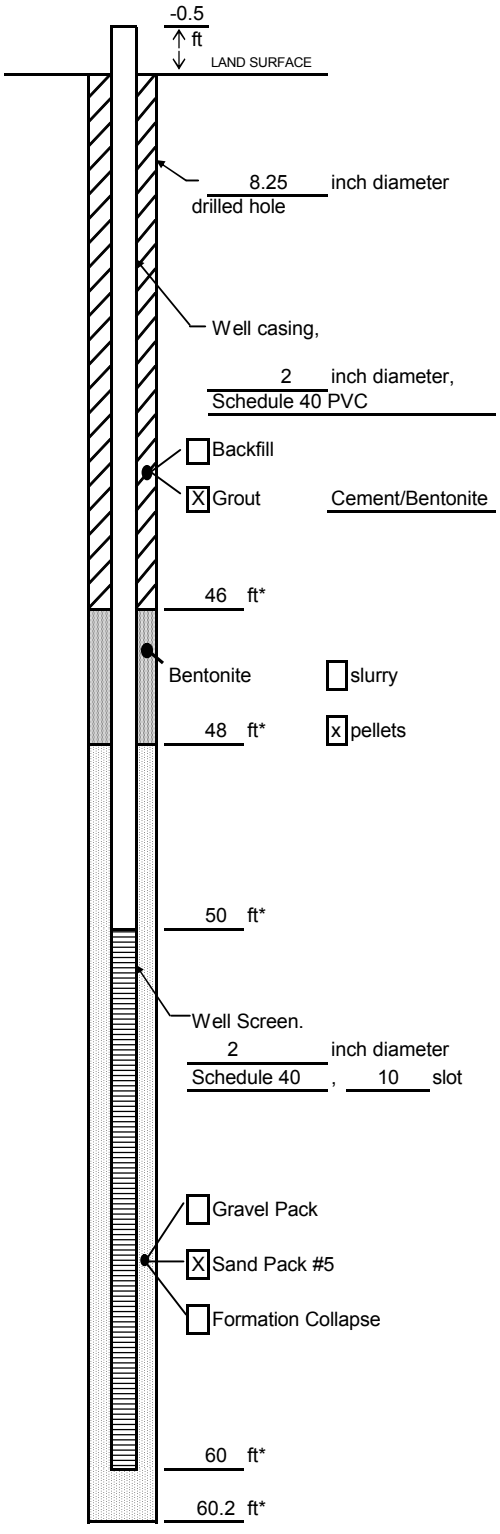
☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: J. Wallace
Begin Drilling: 8/31/06
Driller: D. Remmler
Total Depth: 60
End Drilling: 8/31/06
Drilling Method: Hollow Stem Auger
Surface Elev.: 726.384
Converted to Well: Y Well I.D.: GM-64
Drilling Fluid: Water
North Coor.: 1624.73847
East Coor.: 4913.72063
Remarks: Shallow pair to GM-54.
Project No.: OH000294.0008.00002
Datum: TOC Elev. 725.951
Filename: July 2006

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.
* Depth Below Land Surface

Project General Motors Corporation Well GM-64

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

726.384 feet [x] Surveyed

[ ] Estimated

Installation Date(s) 8/31/2006

Drilling Method Hollow Stem Auger

Drilling Contractor Boart Longyear

Drilling Fluid None. However, ~25 gallons water added due to heaving sands

Development Technique(s) and Date(s)

Pumping - surge with pump

Fluid Loss During Drilling 25 gallons

Water Removed During Development 55 gallons

Static Depth to Water 20.4 feet below M.P.

Pumping Depth to Water 58 feet below M.P.

Pumping Duration 0.85 hours

Yield NM gpm Date 8/31/06

Specific Capacity NM gpm/ft

Well Purpose Monitoring Well

WSU-22 Replacement (Deep)

Remarks TOC Elevation = 725.951

Time 13:00, 13:05, 13:10, 13:15, 13:20, 13:25

pH 6.78, 6.64, 6.64, 6.67, 6.66, 6.67

Conductivity 1.29, 1.28, 1.28, 1.29, 1.29, 1.29

Turbidity 10+, 10+, 999, 999, 999, 10+

Temperature 19.7, 19.7, 19.6, 19.5, 19.6, 19.6

Pumped 25 gallons prior to taking readings

Prepared by J. Wallace

KEY TO SYMBOLS

Symbol **Description**

Strata symbols


High plasticity clay (CH -- C)


Inorganic silts and clays (CH-MH -- MC)


Low plasticity clay (CL -- O)


Low-high plasticity clays (CL-CH -- CO)


Silty low plasticity clay (CL-ML -- CZ)


Fill (FILL -- F)


Clayey gravel (GC -- O8)


Clayey sand and gravel (GC-SC -- DO8)


Silty gravel (GM -- Z8)


Silty clayey gravel (GM-GC -- ZO8)


Silty sand and gravel (GM-SM -- 08)


Poorly graded gravel (GP -- G)


Poorly graded gravel with clay (GP-GC -- DGO3)


Poorly graded gravel with silt (GP-GM -- DGZ3)


Poorly graded gravel and sand (GP-SP -- :G)


Well graded gravel (GW -- 83)

Symbol **Description**


Well graded gravel with clay (GW-GC -- 83O)


Well graded gravel with silt (GW-GM -- 83Z)


Well graded gravel/ clayey gravel (GW-GP -- 83G)


Well graded gravel and sand (GW-SW -- 83D)


Elastic silt (MH -- M)


Silt (ML -- Z)


High plasticity organic clays (OH -- 5)


Low plasticity organic silts (OL -- 4)


Basalt (or generic rock) (ROCK --])


Clayey sand (SC -- DO)


Silty sand (SM -- 0)


Poorly graded clayey silty sand (SM-SC -- :ZO)


Poorly graded silty fine sand (SM-ML -- :Z)


Poorly graded sand (SP -- :)


Poorly graded sand with clay (SP-SC -- :R)


Poorly graded sand with silt (SP-SM -- :=)

KEY TO SYMBOLS

Symbol	Description
Strata symbols	
	Well graded sand (SW -- D)
	Well graded sand with clay (SW-SC -- DR)
	Well graded sand with silt (SW-SM -- D=)
	Interlayered well/poorly graded sand (SW-SP -- D:)
	Silty sandy clay (VC -- 0C)
	Variable gravel and silty sand mix (VG -- 0G)
	Variable sand and silt mix (VS -- 0Y)
	Agglomerate (\)
	Blank (E)
	CH fraction (U)
	CL fraction (R)
	Claystone (H)
	Cobble frac (A)
	Cobbles (B)
	Competent (K)
	Dolomite (()

Symbol	Description
	Extra fine gravel (3)
	Fine gravel (Y)
	Frac rock (X)
	Granite (/)
	Gravel (8)
	Gravel frac (9)
	Intrusive (V)
	Limestone (L)
	Metamorphic rocks ())
	MH fraction (?)
	ML fraction (=)
	Mudstone (7)
	Organics (J)
	Paving (P)
	Peat (Q)
	Sand (S)
	Sandstone (N)
	Schist ($)

KEY TO SYMBOLS

Symbol	Description
Strata symbols	
	Sediment (2)
	Shale (>)
	Shell fragments (&)
	Siltstone (I)
	Topsoil (T)
	Weathered (W)
	EXTRA: alternating dot-dash pattern (|)
	EXTRA: dashed horizontal lines (%)
	EXTRA: medium closely-spaced dots (6)
	EXTRA: narrow-spaced horizontal dashed lines (-)
	EXTRA: random dot pattern (1)
	EXTRA: regularly spaced "V"'s (<)

Symbol	Description
	EXTRA: very narrow cross-hatching (!)
	EXTRA: dashed lines with 3 dots above each dash (.)
	EXTRA: large widely-spaced dots (*)
	EXTRA: small filled triangles ([)
	EXTRA: semi-random dot pattern (:)
	EXTRA: semi-random triangle pattern (')
	EXTRA: zigzag lines (#)
	EXTRA: grass pattern ({)
	EXTRA: tilde sign (})
	EXTRA: randomly arranged square boxes (;)
Misc. Symbols	
	Drill rejection (BOTTOM)
	Boring continues (CONTINUE)
	Water table during drilling (LWATERNF)
	Water table at boring completion (LWATER)

KEY TO SYMBOLS

Symbol	Description
Misc. Symbols	
	Water table during drilling (WATER)
	Water table at boring completion (FWATER)
	Water table during drilling (RWATERNF)
	Water table at boring completion (RWATER)
	(RTARROW)
	Depth to caving (CAVED)
	(CIRCLE)
	(FCIRCLE)
	(HATCHED)
	(XHATCHED)
	(FILLED)
	(BARGRAPH)
	(NOMARKER)
Soil Samplers	
	Auger (A)
	Bulk sample taken from 6 in. auger (B)
	California sampler (C)

Symbol	Description
	Direct Push (D)
	Corps of Engineers sampler (E)
	Bulk/Grab sample (F)
	Piston (I)
	Pitcher (L)
	Denison (O)
	Standard penetration test (P)
	Rock core (R)
	Undisturbed thin wall Shelby tube (S)
	No recovery (X)
	EXTRA: (downward pointing white triangle on black background) (G)
	EXTRA: (double vertical lines) (H)
	EXTRA: (downward pointing outline arrow) (J)
	EXTRA: (downward pointing filled arrow) (K)
	EXTRA: (split diagonally left to right, white on left, black on right) (N)
	EXTRA: (diagonal line from right to left) (T)

KEY TO SYMBOLS

Symbol Description

Soil Samplers



EXTRA: (generic sampling interval)
(U)



EXTRA: (generic sampling interval)
(V)

Monitor Well Details

flush-mount cover
(COVER -- FLUSH,)



riser with cover and protective casing
(CASED RISER -- PROTECT,)



pipe riser
(RISER -- BLANKPVC,)



covered riser
(COVERED RISER -- CAPPED,)



recessed cover set in concrete
(RECESSED -- RECESSED, 13)



top of well, recessed pipe
(SUNKEN -- SUNKEN, 13)



protective casing set in concrete
(CASED -- CASED, 13)



concrete seal
(CONCRETE -- BLANKPVC, 13)



gravel backfill
(GRAVEL -- BLANKPVC, *1)



pipe set in cement grout w/ protective casing
(CEMENT CASED -- CASED, E)



unknown backfill type, blank PVC
(INDETERMINATE -- BLANKPVC, E)



assorted cuttings
(CUTTINGS -- BLANKPVC, O)



bentonite slurry
(BENTONITE -- BLANKPVC, P)

Symbol Description



bentonite pellets
(PELLETS -- BLANKPVC, I)



silica sand, blank PVC
(SAND -- BLANKPVC, 6)



slotted pipe w/ sand
(SLOTTED -- SLOTDPVC, 6)



slotted pipe, unknown backfill
(SLOT/NO FILL -- SLOTDPVC, E)



stylized slotted pipe with no back-fill
(STYLIZED SLOT -- ALTSLOT, E)



endcap on pipe packed in sand
(ENDCAP -- ENDCAP, 6)



no pipe, filler material
(END -- ,])



no pipe, sealed
(SEALED -- , P)



silica sand, no pipe (end plug)
(SAND PLUG -- , 6)



end of well installation
(BLANK -- , E)

Sample Destinations



Composite Sample to Lab
(C)



Grab Sample to Lab
(G)



Split-Spoon not Analyzed
(S)

ARCADIS

Log of Boring: GM-65D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	N/A	24	0.0				CL	CLAY Dark yellowish brown (10 yr 4/4), trace gravel, trace silt, medium plasticity, dry	
2	N/A	24	0.0						
4	N/A	24	0.0						
6	N/A	24	0.0						
							SP	SAND Brown (10 yr 5/3), poorly graded, medium- coarse, trace gravel, dry	
8	N/A	24	1.2						
10	N/A	24	2.2						
12	N/A	24	3.8				SP	Note: 3-4" cobbles @ 12'	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: L. Greene
Begin Drilling: 4/10/2007
Driller: Gerald Sealey
Total Depth: 108
End Drilling: 4/13/2007
Drilling Method: Rotosonic
Surface Elev.: 723.828
Converted to Well: Y Well I.D.: GM-65D
Drilling Fluid: Water
North Coor.: -1491.41443
East Coor.: 4311.00936
Remarks: Hand auger to 11.5'
Project No.: OH000294.0010
Datum: TOC: 723.537
Filename: April 2007

ARCADIS

Log of Boring: GM-65D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
14	N/A	24	1.1						
16	N/A	24	1.2						
18	N/A	24	3.3				GW	GRAVEL WITH SAND Grayish brown (10 yr 5/2), well graded, fine-medium, 30% coarse sand, 5% silt, wet	▼
20	N/A	24	4.7				SP	SAND Grayish brown (10 yr 5/2), poorly graded, medium coarse, 10% gravel (subangular-subround), wet	
22	N/A	24	4.9						
24	N/A	24	5.6						

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: L. Greene
Begin Drilling: 4/10/2007
Driller: Gerald Sealey
Total Depth: 108
End Drilling: 4/13/2007
Drilling Method: Rotosonic
Surface Elev.: 723.828
Converted to Well: Y Well I.D.: GM-65D
Drilling Fluid: Water
North Coor.: -1491.41443
East Coor.: 4311.00936
Remarks: Hand auger to 11.5'
Project No.: OH000294.0010
Datum: TOC: 723.537
Filename: April 2007

ARCADIS

Log of Boring: GM-65D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
								Water sample 25-30' @ 10:40	
26	N/A	24	6.2						
28	N/A	24	7.1						
30	N/A	24	3.4						
32	N/A	24	3.2						
34	N/A	24	3.4						
36	N/A	24	3.2				GP	GRAVEL Light yellowish brown (10 yr 6/4), poorly graded, trace silt, 5% sand, subangular-angular, wet	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: Gerald Sealey
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: L. Greene
Total Depth: 108
Surface Elev.: 723.828
North Coor.: -1491.41443

Begin Drilling: 4/10/2007
End Drilling: 4/13/2007
Converted to Well: Y Well I.D.: GM-65D
East Coor.: 4311.00936

Remarks: Hand auger to 11.5'

Project No.: OH000294.0010
Datum: TOC: 723.537
Filename: April 2007

ARCADIS

Log of Boring: GM-65D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Soil Class.	Description
38	N/A	24	2.0	SP	SAND Light yellowish brown (10 yr 6/4), poorly graded, coarse, <5% gravel, trace silt
				GP	GRAVEL Light yellowish brown (10 yr 6/4), poorly graded, trace silt, 5% sand, subangular-angular, wet
40	N/A	24	0.7	SP	SAND Light yellowish brown (10 yr 4/6), medium-coarse, 10% gravel (subangular-subround), 10% silt, wet
42	N/A	24	0.6		
44	N/A	24	0.5		Note: No silt @ 44'
					Water sample 45-50' @ 11:40
46	N/A	24	0.9		
48	N/A	24	0.7		
50					

Sample Analysis / Sample Type / Graphic Log / Depth to Water

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: L. Greene
Begin Drilling: 4/10/2007
Driller: Gerald Sealey
Total Depth: 108
End Drilling: 4/13/2007
Drilling Method: Rotosonic
Surface Elev.: 723.828
Converted to Well: Y Well I.D.: GM-65D
Drilling Fluid: Water
North Coor.: -1491.41443
East Coor.: 4311.00936
Remarks: Hand auger to 11.5'
Project No.: OH000294.0010
Datum: TOC: 723.537
Filename: April 2007

ARCADIS

Log of Boring: GM-65D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
	N/A	24	3.3				SW	SAND Brown (11 yr 5/3), well graded, 20% gravel (subangular-subround), fine-coarse, wet	
52	N/A	24	3.0						
54	N/A	24	3.4						
							SP	SAND Grayish brown (10 yr 5/2), poorly graded, 5% gravel, 5% silt, coarse grained, wet	
56	N/A	24	3.4						
58	N/A	24	2.4						
60	N/A	24	1.7						
62	N/A	24	1.5				SP	SAND Yellowish brown (10 yr 5/4), poorly graded, fine-coarse, 15% gravel, 5% silt,	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: Gerald Sealey
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: L. Greene
Total Depth: 108
Surface Elev.: 723.828
North Coor.: -1491.41443

Begin Drilling: 4/10/2007
End Drilling: 4/13/2007
Converted to Well: Y Well I.D.: GM-65D
East Coor.: 4311.00936

Remarks: Hand auger to 11.5'

Project No.: OH000294.0010
Datum: TOC: 723.537
Filename: April 2007

ARCADIS

Log of Boring: GM-65D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
								wet	
64	N/A	24	2.2						
66	N/A	24	1.5						
68	N/A	24	0.6				SP	SAND Grayish brown (10 yr 5/2), poorly graded, fine-coarse, 20% gravel (subangular-subround), wet	
70	N/A	24	0.5					Note: gray (10 yr 5/1), 15% fine gravel, trace silt @ 70'	
72	N/A	24	1.3					Water sample 72-77' @ 1345	
74	N/A	24	0.9						

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: L. Greene
Begin Drilling: 4/10/2007
Driller: Gerald Sealey
Total Depth: 108
End Drilling: 4/13/2007
Drilling Method: Rotosonic
Surface Elev.: 723.828
Converted to Well: Y Well I.D.: GM-65D
Drilling Fluid: Water
North Coor.: -1491.41443
East Coor.: 4311.00936
Remarks: Hand auger to 11.5'
Project No.: OH000294.0010
Datum: TOC: 723.537
Filename: April 2007

ARCADIS

Log of Boring: GM-65D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
76	N/A	24	1.0						
78	N/A	24	1.8						
80	N/A	24	1.0						
82	N/A	24	0.0						
84	N/A	24	0.8				SP	SAND Brown (10 yr 5/3), poorly graded, fine coarse, 20% gravel (fine-coarse, subangular-subround), trace silt, wet	
86	N/A	24	0.7						
								Water sample 87-92' @ 10:10	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: Gerald Sealey
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: L. Greene
Total Depth: 108
Surface Elev.: 723.828
North Coor.: -1491.41443

Begin Drilling: 4/10/2007
End Drilling: 4/13/2007
Converted to Well: Y Well I.D.: GM-65D
East Coor.: 4311.00936

Remarks: Hand auger to 11.5'

Project No.: OH000294.0010
Datum: TOC: 723.537
Filename: April 2007

ARCADIS

Log of Boring: GM-65D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
88	N/A	24	0.0				SW	SAND Brown (10 yr 5/3), well graded, fine-coarse, 15% gravel (subangular-subround), wet	
90	N/A	24	0.0						
92	N/A	24	0.0						
94	N/A	24	0.0						
96	N/A	24	0.0						
98	N/A	24	0.5						
100	N/A	24	0.0						

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: L. Greene
Begin Drilling: 4/10/2007
Driller: Gerald Sealey
Total Depth: 108
End Drilling: 4/13/2007
Drilling Method: Rotosonic
Surface Elev.: 723.828
Converted to Well: Y Well I.D.: GM-65D
Drilling Fluid: Water
North Coor.: -1491.41443
East Coor.: 4311.00936
Remarks: Hand auger to 11.5'
Project No.: OH000294.0010
Datum: TOC: 723.537
Filename: April 2007

ARCADIS

Log of Boring: GM-65D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
102	N/A	24	0.0				SW	SAND Grayish brown (10 yr 5/2), well graded, medium-coarse, 5-10% gravel (subround), wet Water sample 102-107' @ 11:00	
104	N/A	24	0.0						
106	N/A	24	0.0						
108								End of boring	
110									
112									

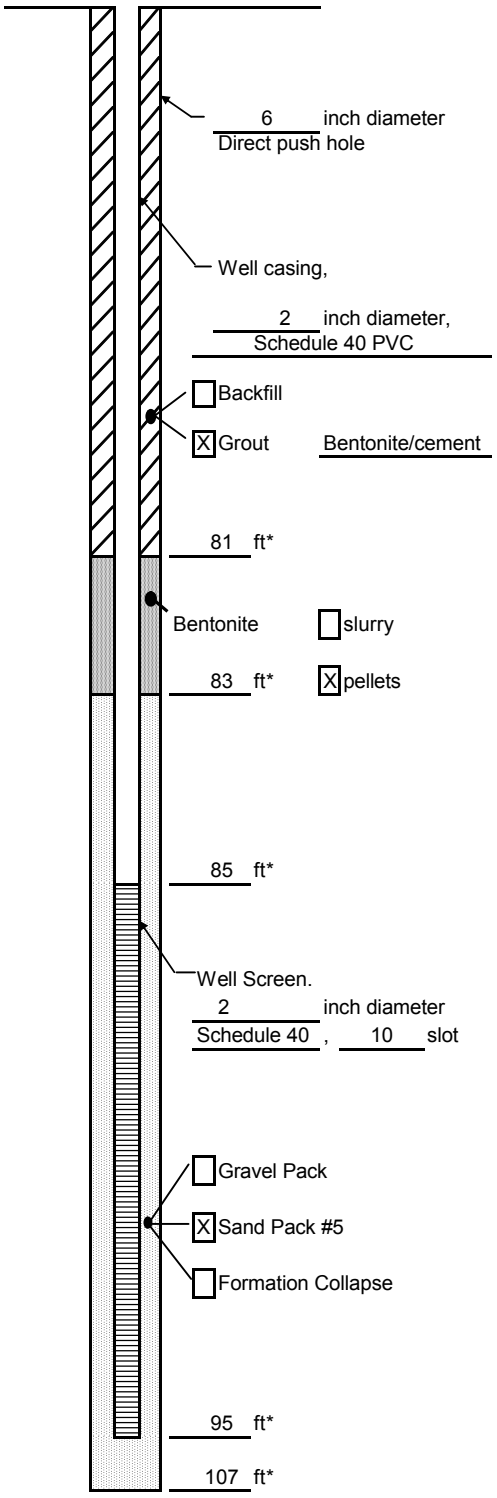
☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: L. Greene
Begin Drilling: 4/10/2007
Driller: Gerald Sealey
Total Depth: 108
End Drilling: 4/13/2007
Drilling Method: Rotosonic
Surface Elev.: 723.828
Converted to Well: Y Well I.D.: GM-65D
Drilling Fluid: Water
North Coor.: -1491.41443
East Coor.: 4311.00936
Remarks: Hand auger to 11.5'
Project No.: OH000294.0010
Datum: TOC: 723.537
Filename: April 2007

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well GM-65D

Town/City Moraine

County Montgomery State Ohio

Permit No. N/A

Land-Surface (LS) Elevation and Datum:

723.828 feet [x] Surveyed

[ ] Estimated

Installation Date(s) 4/18/2007

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water removed during vertical aquifer profiling

Development Technique(s) and Date(s)

Submersible pump - surge with pump

4/24/07 by Jim Wallace

Fluid Loss During installation NM gallons

Water Removed During Development 80 gallons

Static Depth to Water NM feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration 2.50 hours

Yield NM gpm Date 4/24/07

Specific Capacity NM gpm/ft

Well Purpose GW Monitoring

Note; formation collapse to 95'

Remarks Time: 1630, 1635, 1640, 1645

pH: 7.30, 7.27, 7.21, 7.21

Conductivity: 1.30, 1.30, 1.31, 1.31

Turbidity: 10, 10, 7, 8

Temperature: 17.7, 16.8, 16.7, 16.3

Prepared by L. Greene

ARCADIS

Log of Boring: GM-65S

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
50								See boring log GM-65D for lithologic description	
52								End of boring	
54									
56									
58									
60									
62									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: Gerald Sealey
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: L. Greene
Total Depth: 52
Surface Elev.: 723.939
North Coor.: -1488.33143

Begin Drilling: 4/18/2007
End Drilling: 4/18/2007
Converted to Well: Y Well I.D.: GM-65S
East Coor.: 4312.28876

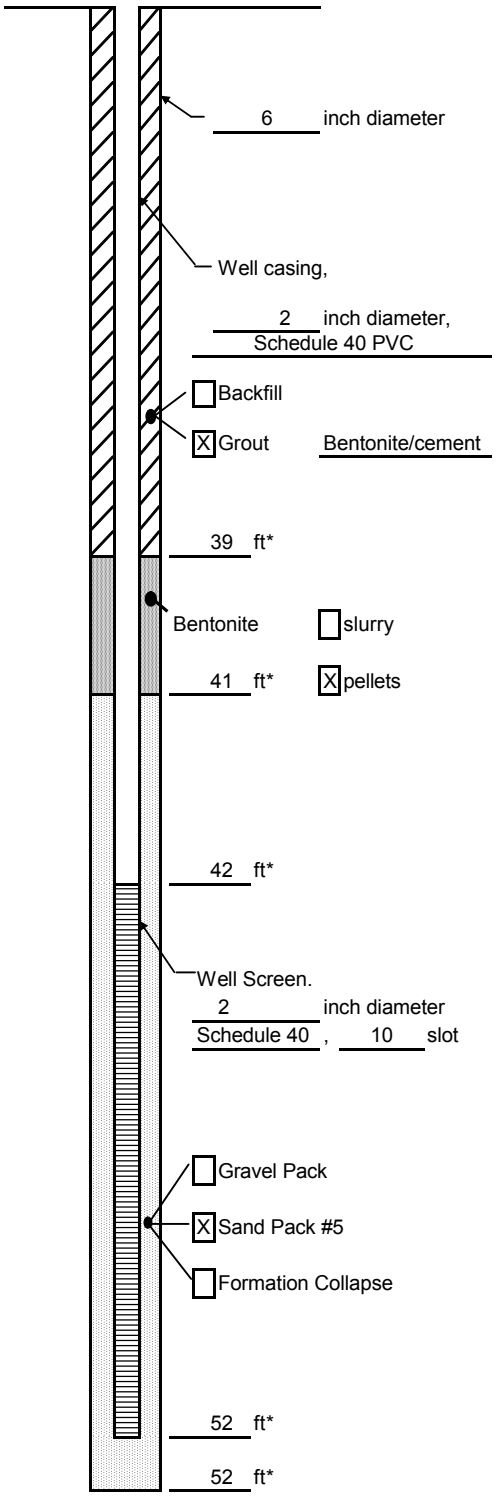
Remarks:

Project No.: OH000294.0010
Datum: TOC: 723.580
Filename: April 2007

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well GM-65S

Town/City Moraine

County Montgomery State Ohio

Permit No. N/A

Land-Surface (LS) Elevation and Datum:

723.939 feet [x] Surveyed

[ ] Estimated

Installation Date(s) 4/18/2007

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water removed during vertical aquifer profiling

Development Technique(s) and Date(s)

Submersible pump - surge with pump

4/24/07 by Jim Wallace

Fluid Loss During installation NM gallons

Water Removed During Development 55 gallons

Static Depth to Water NM feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration 0.5 hours

Yield NM gpm Date 4/24/07

Specific Capacity NM gpm/ft

Well Purpose GW Monitoring

Remarks Time: 1755, 1800, 1805

pH: 7.22, 7.21, 7.19

Conductivity: 1.02, 1.02, 1.01

Turbidity: 10, 10, 10

Temperature: 17.3, 17.1, 17.0

Prepared by L. Greene

ARCADIS

Log of Boring: GM-66

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	N/A	N/A	N/A					CONCRETE	
4	N/A		0.0				CL	SANDY CLAY Yellowish brown, 30% sand, <10% gravel, dry (fill)	
	N/A	24	0.0						
6									
	N/A	24	0.0						
8									
	N/A	24	0.0				SP	SAND Yellowish brown (10 yr 5/4), poorly graded, fine-medium, 15% gravel, dry	
10									
	N/A	24	0.0						
12									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: L. Greene | Begin Drilling: 4/6/2007

Driller: Gerald Sealey | Total Depth: 57 | End Drilling: 4/6/2007

Drilling Method: Rotosonic | Surface Elev.: 733.499 | Converted to Well: Y | Well I.D.: GM-66

Drilling Fluid: Water | North Coor.: 4377.28928 | East Coor.: 5714.48647

Remarks: Water sample 30-35' @ 0945; 50-55' @ 1125

Project No.: OH000294.0010 | Datum: TOC: 733.220 | Filename: April 2007

ARCADIS

Log of Boring: GM-66

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
14	N/A	24	0.0						
16	N/A	24	0.0						
18	N/A	24	0.0					Note: gravel subrounded	
20	N/A	24	0.0				SP	SAND Yellowish brown (10 yr 5/4), poorly graded, fine-medium, 15% gravel (subround), dry	
22	N/A	24	0.0						
24	N/A	24	0.0					Note: black staining @ 23'	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: L. Greene | Begin Drilling: 4/6/2007

Driller: Gerald Sealey | Total Depth: 57 | End Drilling: 4/6/2007

Drilling Method: Rotosonic | Surface Elev.: 733.499 | Converted to Well: Y | Well I.D.: GM-66

Drilling Fluid: Water | North Coor.: 4377.28928 | East Coor.: 5714.48647

Remarks: Water sample 30-35' @ 0945; 50-55' @ 1125

Project No.: OH000294.0010 | Datum: TOC: 733.220 | Filename: April 2007

ARCADIS

Log of Boring: GM-66

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Soil Class.	Description
26	N/A	24	0.0		
	N/A	24	0.0	SW	SAND Grayish brown (10 yr 5/2), well graded, fine-coarse, <5% gravel, moist
28	N/A	24	0.0		
30	N/A	24	0.0		
32	N/A	24	0.0	SW	SAND Grayish brown (10 yr 5/2), well graded, fine-coarse, <5% gravel, moist
34	N/A	24	0.0	GP	GRAVEL WITH SAND Grayish brown (10 yr 5/2), 10% coarse sand
36	N/A	24	0.0	CL	SILTY CLAY Dark gray (10 yr 4/1), 5% gravel (angular-subangular), very stiff, low plasticity

Depth to Water

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: L. Greene | Begin Drilling: 4/6/2007

Driller: Gerald Sealey | Total Depth: 57 | End Drilling: 4/6/2007

Drilling Method: Rotosonic | Surface Elev.: 733.499 | Converted to Well: Y | Well I.D.: GM-66

Drilling Fluid: Water | North Coor.: 4377.28928 | East Coor.: 5714.48647

Remarks: Water sample 30-35' @ 0945; 50-55' @ 1125

Project No.: OH000294.0010 | Datum: TOC: 733.220 | Filename: April 2007

ARCADIS

Log of Boring: GM-66

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
38									
	N/A	24	0.0						
40									
	N/A	24	0.0						
42									
	N/A	24	0.0				SW	SAND WITH GRAVEL Grayish brown (10 yr 5/2), well graded, fine-coarse, 30% gravel (subangular-subround), trace silt, wet	
44									
	N/A	24	0.0				SP	SAND WITH GRAVEL Grayish brown, poorly graded, fine-coarse, 15% gravel, trace silt, wet	
46									
	N/A	24	0.0				SW	SAND WITH GRAVEL Grayish brown (10 yr 5/2), well graded, fine-coarse, 30% gravel, trace silt, wet	
48									
	N/A	24	0.0						
50									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: L. Greene | Begin Drilling: 4/6/2007

Driller: Gerald Sealey | Total Depth: 57 | End Drilling: 4/6/2007

Drilling Method: Rotosonic | Surface Elev.: 733.499 | Converted to Well: Y | Well I.D.: GM-66

Drilling Fluid: Water | North Coor.: 4377.28928 | East Coor.: 5714.48647

Remarks: Water sample 30-35' @ 0945; 50-55' @ 1125

Project No.: OH000294.0010 | Datum: TOC: 733.220 | Filename: April 2007

ARCADIS

Log of Boring: GM-66

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
52	N/A	24	0.0						
54	N/A	24	0.0						
56	N/A	24	0.0				CL	SILTY CLAY Dark grayish brown (10 yr 4/2), 5% gravel (subangular-angular), stiff, very stiff, dry	
58								End of boring	
60									
62									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: L. Greene | Begin Drilling: 4/6/2007

Driller: Gerald Sealey | Total Depth: 57 | End Drilling: 4/6/2007

Drilling Method: Rotosonic | Surface Elev.: 733.499 | Converted to Well: Y | Well I.D.: GM-66

Drilling Fluid: Water | North Coor.: 4377.28928 | East Coor.: 5714.48647

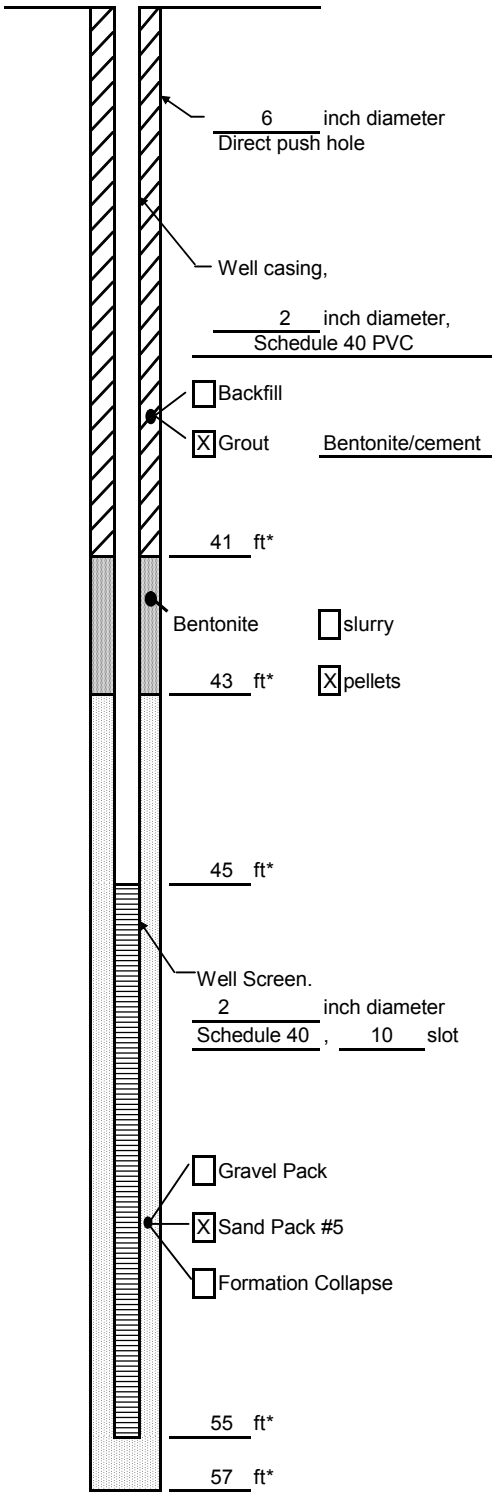
Remarks: Water sample 30-35' @ 0945; 50-55' @ 1125

Project No.: OH000294.0010 | Datum: TOC: 733.220 | Filename: April 2007

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well GM-66

Town/City Moraine

County Montgomery State Ohio

Permit No. N/A

Land-Surface (LS) Elevation and Datum:

733.499 feet [x] Surveyed

[ ] Estimated

Installation Date(s) 4/12/2007

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Submersible pump - surge with pump

4/12/2007

Fluid Loss During installation 50 gallons

Water Removed During Development 171 gallons

Static Depth to Water 22.3 feet below M.P.

Pumping Depth to Water 52 feet below M.P.

Pumping Duration 1.00 hours

Yield 3 gpm Date 4/12/07

Specific Capacity NM gpm/ft

Well Purpose GW Monitoring

Remarks Time: 1533, 1536, 1539, 1542, 1545, 1548

pH: 8.33, 8.23, 8.10, 8.06, 8.09, 8.09

Conductivity: 1.18, 1.21, 1.24, 1.28, 1.26, 1.26

Turbidity: 40, 63, 459, 10+, 10+, 10+

Temperature: 12.9, 12.5, 12.6, 13.6, 13.9, 13.7

Prepared by L. Greene

ARCADIS

Log of Boring: GM-67D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	N/A	24	N/A					ASPHALT	
							FILL	CONCRETE WITH REBAR	
2	N/A	24	0.0				SW	SAND WITH GRAVEL Brown, fine-coarse, well graded, subrounded to subangular, 20% fine-coarse gravel, rounded, dry (fill)	
4	N/A	24	0.0						
6									
	N/A	24	0.0						
8								Note: concrete @ 8'	
	N/A	24	0.0					Note: Light brown, 10% gravel, damp @ 9'	
10									
	N/A	24	0.0						
12									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: T. Fortner
Begin Drilling: 3/27/2007
Driller: Gerald Sealey
Total Depth: 121
End Drilling: 3/27/2007
Drilling Method: Rotosonic
Surface Elev.: 732.644
Converted to Well: Y Well I.D.: GM-67D
Drilling Fluid: Water
North Coor.: 4744.47186
East Coor.: 6082.03970
Remarks:
Project No.: OH000294.0010
Datum: TOC: 732.188
Filename: April 2007

ARCADIS

Log of Boring: GM-67D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Soil Class.	Description	Depth to Water
	N/A	24	0.0		Note: 5% fine-medium rounded gravel, dry	
14						
	N/A	24	0.0			
16						
	N/A	24	0.0			
18						
	N/A	24	0.0	SW	SAND Light brown, fine-coarse, well graded, 10% fine-coarse rounded gravel, moist	
				GW	GRAVEL WITH SAND Brown, fine-coarse, well graded, subround to rounded, 45% medium coarse sand, subround-subangular, wet	
20						
	N/A	24	0.0		GRAVEL WITH SAND Brown, fine-coarse, well graded, subround to rounded, 45% medium coarse sand, subround-subangular, wet	
22					GRAVEL WITH SAND Brown, fine-coarse, well graded, subround to round, 50% medium-coarse sand, subround-subangular.	
	N/A	24	0.0		Note: 2" sandy clay @ 22.1' and 22.5', soft, high plasticity, medium sand 30%, wet	
					Water sample 22.5-27.5' @ 1528	
24					GRAVEL WITH SAND Brown, fine-coarse, well graded, subround to round, 50% medium-coarse sand, subround-subangular	
				SW	SAND Brown, medium-coarse, well graded, subangular, 10% fine-medium	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: T. Fortner
Begin Drilling: 3/27/2007
Driller: Gerald Sealey
Total Depth: 121
End Drilling: 3/27/2007
Drilling Method: Rotosonic
Surface Elev.: 732.644
Converted to Well: Y Well I.D.: GM-67D
Drilling Fluid: Water
North Coor.: 4744.47186
East Coor.: 6082.03970
Remarks:

Project No.: OH000294.0010
Datum: TOC: 732.188
Filename: April 2007

ARCADIS

Log of Boring: GM-67D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
	N/A	24	0.0					subrounded, gravel, wet	
26									
	N/A	24	0.0					Note: Gravel with subrounded-subangular, 10% fine medium subrounded sand @ 27-27.5'	
								Note: subrounded-subangular sand with 15% fine-medium subrounded gravel @ 27.5-29'	
28									
	N/A	24	0.0					Note: Cobble fossiliferous limestone 29- 29.5'	
							CL	SILTY CLAY Gray, very stiff, low plasticity, with 10% coarse subangular sand and fine subrounded gravel, dry	
30									
	N/A	24	0.0						
32									
	N/A	24	0.0						
34									
	N/A	24	0.0						
36									
	N/A	24	0.0				CL	SILTY CLAY Gray, stiff, medium plasticity, 5% coarse subangular sand and fine gravel,	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 3/27/2007

Driller: Gerald Sealey | Total Depth: 121 | End Drilling: 3/27/2007

Drilling Method: Rotosonic | Surface Elev.: 732.644 | Converted to Well: Y | Well I.D.: GM-67D

Drilling Fluid: Water | North Coor.: 4744.47186 | East Coor.: 6082.03970

Remarks:

Project No.: OH000294.0010 | Datum: TOC: 732.188 | Filename: April 2007

ARCADIS

Log of Boring: GM-67D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
38								moist-dry	
	N/A	24	0.0					Note: Gravel fine-medium grained, dry @ 39'	
40									
	N/A	24	0.0						
42									
	N/A	24	0.0						
44									
	N/A	24	0.0				GP	GRAVEL WITH SAND Olive gray, poorly graded, fine-medium, subangular, 25% coarse sand, wet	
46								Water sample 46-51' @ 1043	
	N/A	24	0.0				SW	SAND Olive gray, well graded, medium-coarse, subangular, 10% fine gravel, subrounded, wet	
48									
	N/A	24	0.0					SAND Olive gray, well graded, medium-coarse, subangular, 10% fine gravel, subrounded, wet	
50									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: T. Fortner
Begin Drilling: 3/27/2007
Driller: Gerald Sealey
Total Depth: 121
End Drilling: 3/27/2007
Drilling Method: Rotosonic
Surface Elev.: 732.644
Converted to Well: Y Well I.D.: GM-67D
Drilling Fluid: Water
North Coor.: 4744.47186
East Coor.: 6082.03970
Remarks:

Project No.: OH000294.0010
Datum: TOC: 732.188
Filename: April 2007

ARCADIS

Log of Boring: GM-67D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Soil Class.	Description	Depth to Water
				GW	SANDY GRAVEL Olive gray, well graded, fine-coarse, subrounded with 10% medium-coarse subangular sand, wet	
	N/A	24	0.0	CL	SILTY CLAY Gray, medium-stiff, medium plasticity, 5% fine-medium gravel, moist	
52				SP	SAND Olive gray, poorly graded, fine with 5% coarse, wet	
	N/A	24	0.0		SAND Olive gray, poorly graded, fine with 5% coarse, wet	
54				CL	SILTY CLAY Gray, very stiff, medium plasticity, 5% fine-medium subangular gravel, dry	
	N/A	24	0.0			
56						
	N/A	24	0.8		SANDY CLAY Gray, very stiff, medium plasticity, 5% fine subangular gravel, sand in fine 20%, moist	
58						
	N/A	24	1.1		Note: gravel fine-medium, dry @ 59'	
60						
	N/A	24	0.3			
62						

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 3/27/2007

Driller: Gerald Sealey | Total Depth: 121 | End Drilling: 3/27/2007

Drilling Method: Rotosonic | Surface Elev.: 732.644 | Converted to Well: Y | Well I.D.: GM-67D

Drilling Fluid: Water | North Coor.: 4744.47186 | East Coor.: 6082.03970

Remarks:

Project No.: OH000294.0010 | Datum: TOC: 732.188 | Filename: April 2007

ARCADIS

Log of Boring: GM-67D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Soil Class.	Description
	N/A	24	0.5		
64					Note: Black organic material @ 64'. Fine sand 40% @ 64-65'.
	N/A	24	3.7	GW	GRAVEL WITH SAND Gray, well graded, fine-medium subrounded-rounded, 25% medium-coarse sand, subrounded-subangular, wet
66					
	N/A	24	1.9		Note: Olive gray, 40% coarse sand, subangular, wet @ 67'
68					
	N/A	24	1.4		
70					Note: Gravel, fine-coarse @ 70' Water sample 70-75' @ 1348
	N/A	24	0.7		
72					
	N/A	24	1.7	GW	GRAVEL WITH SAND Gray, well graded, fine-medium subrounded-rounded, 25% medium-coarse sand, subrounded-subangular, wet
74				SW	SAND WITH GRAVEL
				GW	Olive gray, well graded, medium coarse, subangular, 40% fine gravel, wet
					GRAVEL WITH SAND
	N/A	24	2.9	SW	Olive gray, well graded, fine medium, subrounded with 30% medium coarse sand, subangular, wet

Depth to Water

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: T. Fortner
Begin Drilling: 3/27/2007
Driller: Gerald Sealey
Total Depth: 121
End Drilling: 3/27/2007
Drilling Method: Rotosonic
Surface Elev.: 732.644
Converted to Well: Y Well I.D.: GM-67D
Drilling Fluid: Water
North Coor.: 4744.47186
East Coor.: 6082.03970
Remarks:
Project No.: OH000294.0010
Datum: TOC: 732.188
Filename: April 2007

ARCADIS

Log of Boring: GM-67D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Soil Class.	Description
76					SAND Olive gray, well graded medium coarse, subangular with 15% fine subrounded gravel, wet
				SC	CLAYEY SAND 10% medium, subrounded, well graded, fine, clay is soft, high plasticity, wet
	N/A	24	6.3	SW	SAND Olive gray, well graded, medium-coarse subangular, 10% fine subrounded gravel, wet
78					
	N/A	24	8.0		
80					
	N/A	24	1.5		
82					
				SM	SILTY SAND Olive gray, fine, poorly graded, wet
	N/A	24	0.4		
84					SILTY SAND Olive gray, medium coarse well graded, subangular with 30% fine-medium subangular gravel, wet
	N/A	24	0.4		
86					
	N/A	24	0.0	GW	GRAVEL WITH SAND Olive gray, well graded, fine-medium, subangular, with 20% coarse subangular sand, wet

Depth to Water

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: Gerald Sealey
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: T. Fortner
Total Depth: 121
Surface Elev.: 732.644
North Coor.: 4744.47186

Begin Drilling: 3/27/2007
End Drilling: 3/27/2007
Converted to Well: Y Well I.D.: GM-67D
East Coor.: 6082.03970

Remarks:

Project No.: OH000294.0010
Datum: TOC: 732.188
Filename: April 2007

ARCADIS

Log of Boring: GM-67D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Soil Class.	Description	Depth to Water
88					Note: Coarse gravel @ 88.5'	
	N/A	24	0.5	SW	SAND WITH GRAVEL Olive gray, well graded, fine-medium, subangular, with 20% coarse subangular sand, wet	
90					Water sample 90-95' @ 1558	
	N/A	24	0.0			
92						
	N/A	24	0.0			
94						
	N/A	24	0.8			
96						
	N/A	24	0.0	GW	GRAVEL WITH SAND Olive gray-gray, well graded, fine-medium, subrounded-subangular, with 20% medium coarse subangular sand, wet	
98						
	N/A	24	0.0			
100						

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: T. Fortner
Begin Drilling: 3/27/2007
Driller: Gerald Sealey
Total Depth: 121
End Drilling: 3/27/2007
Drilling Method: Rotosonic
Surface Elev.: 732.644
Converted to Well: Y Well I.D.: GM-67D
Drilling Fluid: Water
North Coor.: 4744.47186
East Coor.: 6082.03970
Remarks:
Project No.: OH000294.0010
Datum: TOC: 732.188
Filename: April 2007

ARCADIS

Log of Boring: GM-67D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
102	N/A	24	0.0						
	N/A	24	0.0					Note: trace cobbles @ 103'	
104	N/A	24	0.0						
106							SW	SAND Olive gray, well graded, medium coarse, subangular, 20% fine medium subrounded gravel, wet	
	N/A	24	0.0						
108	N/A	24	0.0						
110	N/A	24	0.0						
112									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: T. Fortner
Begin Drilling: 3/27/2007
Driller: Gerald Sealey
Total Depth: 121
End Drilling: 3/27/2007
Drilling Method: Rotosonic
Surface Elev.: 732.644
Converted to Well: Y Well I.D.: GM-67D
Drilling Fluid: Water
North Coor.: 4744.47186
East Coor.: 6082.03970
Remarks:
Project No.: OH000294.0010
Datum: TOC: 732.188
Filename: April 2007

ARCADIS

Log of Boring: GM-67D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Soil Class.	Description	Depth to Water
114	N/A	24	0.0			
116	N/A	24	0.0	GW	GRAVEL WITH SAND Greenish gray, well graded, fine-medium, subrounded-subangular, 40% medium-coarse subangular sand, wet Water sample 115-120' @ 0833	
118	N/A	24	0.0			
120	N/A	24	0.0		Note: 10% coarse subangular sand @ 119'	
				CL	SANDY CLAY Mottled (green, olive, gray, brown) with 20% fine-coarse and fine gravel 20%, stiff, medium plasticity, moist	
122					End of boring	
124						

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: Gerald Sealey
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: T. Fortner
Total Depth: 121
Surface Elev.: 732.644
North Coor.: 4744.47186

Begin Drilling: 3/27/2007
End Drilling: 3/27/2007
Converted to Well: Y Well I.D.: GM-67D
East Coor.: 6082.03970

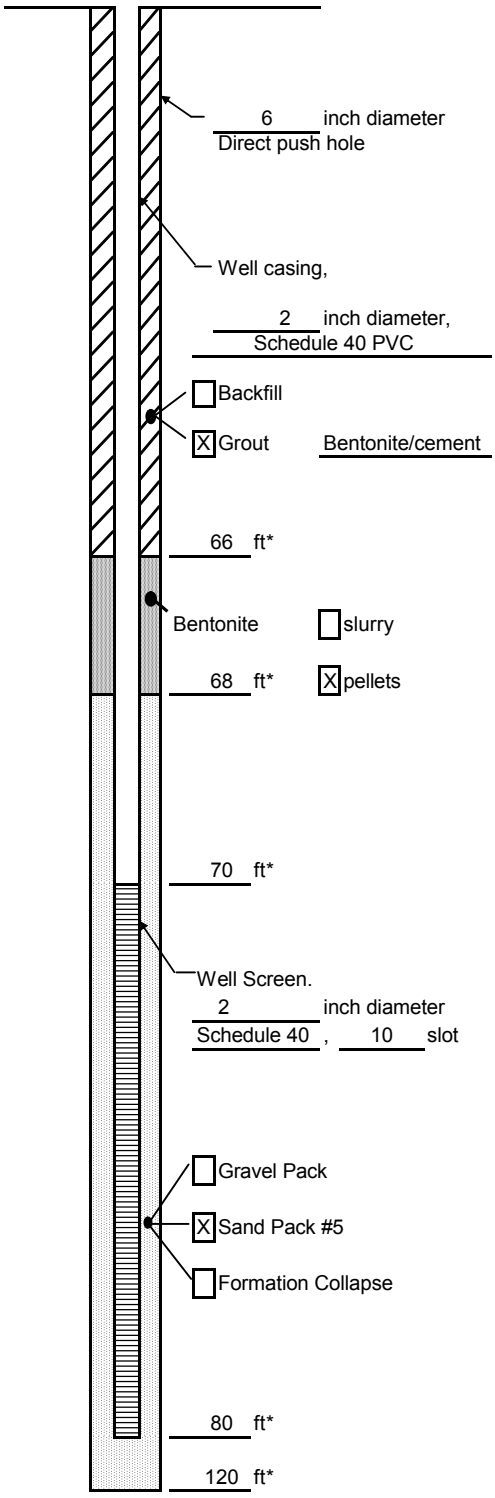
Remarks:

Project No.: OH000294.0010
Datum: TOC: 732.188
Filename: April 2007

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well GM-67D

Town/City Moraine

County Montgomery State Ohio

Permit No. N/A

Land-Surface (LS) Elevation and Datum:

732.644 feet [x] Surveyed

[ ] Estimated

Installation Date(s) 4/4/2007

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water-removed during vertical aquifer profiling

Development Technique(s) and Date(s)

Submersible pump - surge with pump 4/13/07 by Paul Smith

Fluid Loss During installation 50 gallons

Water Removed During Development 135 gallons

Static Depth to Water 21.4 feet below M.P.

Pumping Depth to Water 77 feet below M.P.

Pumping Duration 0.30 hours

Yield 3 gpm Date 4/11/07

Specific Capacity NM gpm/ft

Well Purpose GW Monitoring

Note: formation collapse (120' to 80')
Permanent 6" casing set at RCT
Remarks Time: 1330

pH: 7.48

Conductivity: 1.27

Turbidity: 237

Temperature: 14.1

Well purged dry

Prepared by L. Greene

ARCADIS

Log of Boring: GM-67S

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
50								See boring log GM-67D for lithologic description	
52									
54								End of boring	
56									
58									
60									
62									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: Gerald Sealey
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: L. Greene
Total Depth: 54
Surface Elev.: 732.541
North Coor.: 4744.20516

Begin Drilling: 4/4/2007
End Drilling: 4/4/2007
Converted to Well: Y Well I.D.: GM-67S
East Coor.: 6096.21832

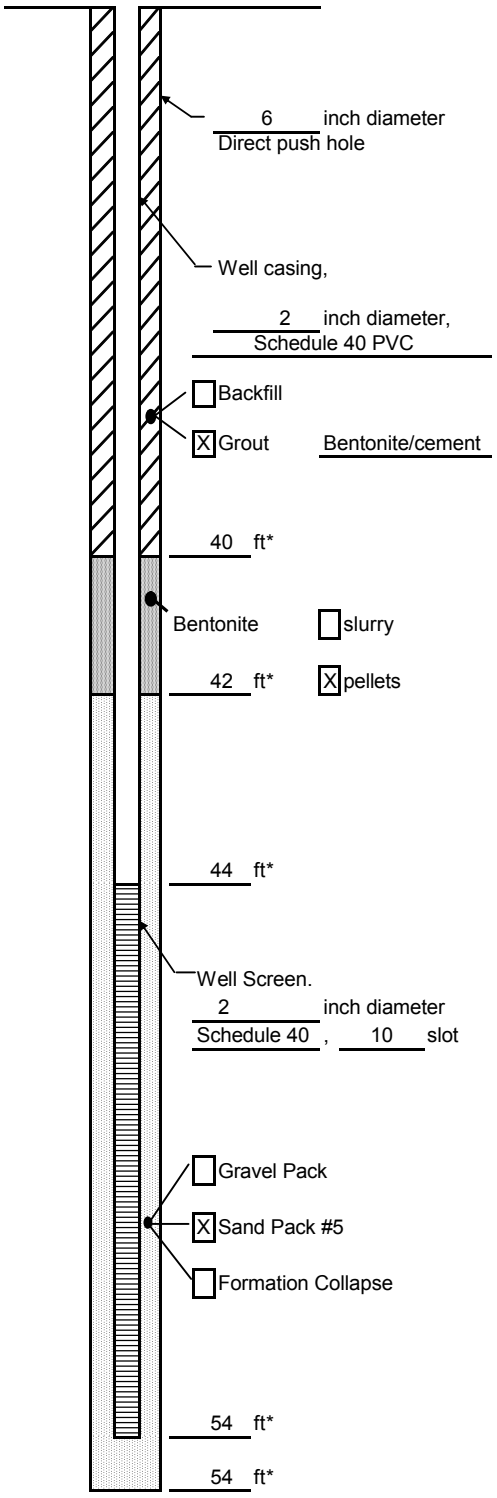
Remarks:

Project No.: OH000294.0010 Datum: TOC: 732.062 Filename: April 2007

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well GM-67S

Town/City Moraine

County Montgomery State Ohio

Permit No. N/A

Land-Surface (LS) Elevation and Datum:

732.541 feet [x] Surveyed

[ ] Estimated

Installation Date(s) 4/4/2007

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water-removed during vertical aquifer profiling 50 gallons used during installation of well

Development Technique(s) and Date(s)

Submersible pump - surge with pump

Fluid Loss During installation 50 gallons

Water Removed During Development 108 gallons

Static Depth to Water 20.9 feet below M.P.

Pumping Depth to Water 51 feet below M.P.

Pumping Duration 0.6 hours

Yield 3 gpm Date 4/12/07

Specific Capacity NM gpm/ft

Well Purpose GW Monitoring

Remarks Time: 0840, 0843, 0846, 0849, 0852, 0855

pH: 7.45, 7.72, 7.82, 7.83, 7.84, 7.80

Conductivity: 1.45, 1.45, 1.43, 1.44, 1.44, 1.43

Turbidity: 400, 335, 326, 107, 107, 19

Temperature: 14.5, 14.9, 15.0, 15.0, 15.0, 15.0

Prepared by L. Greene

ARCADIS

Log of Boring: GM-68D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	N/A	24	N/A					ASPHALT	
								CONCRETE	
2									
	N/A	24	0.6				CL	SANDY CLAY Brown, fine to medium sand, soft, high plasticity, sand 5-10%, fine coarse subangular gravel (up to 3"), damp Note: Trace coal 3.5' (fill)	
4									
	N/A	24	1.0						
6									
	N/A	24	0.0				GW	GRAVEL WITH SAND Light brown, well graded, fine-coarse subangular with medium sand, dry, (fill)	
8									
	N/A	24	0.0						
10									
	N/A	24	0.0						
12									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: L. Greene
Begin Drilling: 4/2/2007
Driller: Gerald Sealey
Total Depth: 150
End Drilling: 4/2/2007
Drilling Method: Rotosonic
Surface Elev.: 732.459
Converted to Well: Y Well I.D.: GM-68D
Drilling Fluid: Water
North Coor.: 4063.53205
East Coor.: 6357.84287
Remarks:

Project No.: OH000294.0010
Datum: TOC: 732.269
Filename: April 2007

ARCADIS

Log of Boring: GM-68D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Soil Class.	Description	Depth to Water
14	N/A	24	0.0			
16	N/A	24	0.0			
18	N/A	24	9.9		Note: brown, saturated @ 18'	▼
20	N/A	24	7.7	GW	GRAVEL WITH SAND Brown, well graded, subangular to angular sand, wet	
22	N/A	24	8.5		Water sample 22-27' @ 1643	
24	N/A	24	1.2			

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: L. Greene
Begin Drilling: 4/2/2007
Driller: Gerald Sealey
Total Depth: 150
End Drilling: 4/2/2007
Drilling Method: Rotosonic
Surface Elev.: 732.459
Converted to Well: Y Well I.D.: GM-68D
Drilling Fluid: Water
North Coor.: 4063.53205
East Coor.: 6357.84287
Remarks:
Project No.: OH000294.0010
Datum: TOC: 732.269
Filename: April 2007

ARCADIS

Log of Boring: GM-68D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Soil Class.	Description
26	N/A	24	0.4		
	N/A	24	0.2		
28				SW	SAND Brown, well graded, medium coarse, subangular with 15% fine subangular gravel, wet
	N/A	24	4.1		Note: Reddish brown (2.5 yr 5/3), with 5% subangular gravel
30				CL	SILTY CLAY Brown (11 yr 5/3), with 5% gravel (angular), very stiff, dry
					Note: Silt with clay, grayish brown (10 yr 5/1), trace gravel, brittle @ 30.5'
	N/A	24	3.0	CL	SILTY CLAY Dark gray (10 yr 4/1), ? gravel, stiff very stiff, moist
32					Note: Dry @ 32'
34					
	N/A	24	0.0		
36					
	N/A	24	7.0		

Sample Analysis / Sample Type / Graphic Log / Depth to Water

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: Gerald Sealey
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: L. Greene
Total Depth: 150
Surface Elev.: 732.459
North Coor.: 4063.53205

Begin Drilling: 4/2/2007
End Drilling: 4/2/2007
Converted to Well: Y Well I.D.: GM-68D
East Coor.: 6357.84287

Remarks:

Project No.: OH000294.0010
Datum: TOC: 732.269
Filename: April 2007

ARCADIS

Log of Boring: GM-68D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
38							SP	SAND Brown, poorly graded, medium-coarse, subround with 15% fine gravel, wet	
	N/A	24	5.7						
40									
	N/A	24	7.6						
42									
	N/A	24	3.5						
44								Water sample 44.5-49.5' @ 0905	
	N/A	24	2.2						
46									
	N/A	24	0.0						
48									
	N/A	24	0.0						
50							CL	CLAY Yellowish brown (10 yr 5/4), 5% angular gravel, low plasticity, very stiff, dry	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: L. Greene
Begin Drilling: 4/2/2007
Driller: Gerald Sealey
Total Depth: 150
End Drilling: 4/2/2007
Drilling Method: Rotosonic
Surface Elev.: 732.459
Converted to Well: Y Well I.D.: GM-68D
Drilling Fluid: Water
North Coor.: 4063.53205
East Coor.: 6357.84287
Remarks:

Project No.: OH000294.0010
Datum: TOC: 732.269
Filename: April 2007

ARCADIS

Log of Boring: GM-68D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
52	N/A	24	0.0					Note: Grayish brown (10 yr 5/2) @ 51'	
								Note: 3" silt lense @ 51.5'	
54	N/A	24	0.0						
56	N/A	24	0.0						
58	N/A	24	0.0						
60	N/A	24	0.0						
62	N/A	24	0.0						

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: L. Greene | Begin Drilling: 4/2/2007

Driller: Gerald Sealey | Total Depth: 150 | End Drilling: 4/2/2007

Drilling Method: Rotosonic | Surface Elev.: 732.459 | Converted to Well: Y | Well I.D.: GM-68D

Drilling Fluid: Water | North Coor.: 4063.53205 | East Coor.: 6357.84287

Remarks:

Project No.: OH000294.0010 | Datum: TOC: 732.269 | Filename: April 2007

ARCADIS

Log of Boring: GM-68D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
	N/A	24	4.4						
64							SW	SAND Brown (10 yr 5/3), well graded, medium coarse, 25% subangular-subround, wet	
	N/A	24	3.7					Water sample 65-70' @ 1120	
66									
	N/A	24	2.1						
68									
	N/A	24	2.2						
70									
	N/A	24	6.4				SP	SAND Brown (10 yr 5/3), poorly graded, medium, <5% gravel, wet	
72									
	N/A	24	0.7						
74									
	N/A	24	5.8						

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: Gerald Sealey
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: L. Greene
Total Depth: 150
Surface Elev.: 732.459
North Coor.: 4063.53205

Begin Drilling: 4/2/2007
End Drilling: 4/2/2007
Converted to Well: Y Well I.D.: GM-68D
East Coor.: 6357.84287

Remarks:

Project No.: OH000294.0010 Datum: TOC: 732.269 Filename: April 2007

ARCADIS

Log of Boring: GM-68D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Soil Class.	Description
76					Note: Yellowish brown (10 yr 5/4), poorly graded, fine @ 75.5' Note: 64'-77' fining downward sequence
	N/A	24	1.8		
78				ML	SILT Grayish brown (10 yr 5/2), with 20% clay lamina, high plasticity, soft, moist), dense silt, wet
	N/A	24	1.8		
80					
	N/A	24	2.2	SP	SAND Grayish brown (10 yr 5/2), poorly graded, medium-coarse, subangular, wet
82				SW	SAND Grayish brown (10 yr 5/2), medium coarse, trace silt, subangular, well graded, 15% fine coarse gravel, wet
	N/A	24	5.7		
84					
	N/A	24	8.7		Water sample 85-90' @ 1410
86					
	N/A	24	3.6		
				GW	GRAVEL WITH SAND

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: Gerald Sealey
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: L. Greene
Total Depth: 150
Surface Elev.: 732.459
North Coor.: 4063.53205

Begin Drilling: 4/2/2007
End Drilling: 4/2/2007
Converted to Well: Y Well I.D.: GM-68D
East Coor.: 6357.84287

Remarks:

Project No.: OH000294.0010
Datum: TOC: 732.269
Filename: April 2007

ARCADIS

Log of Boring: GM-68D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Description
88				Grayish brown (10 yr 5/2), well graded, fine coarse, 30% sand (medium coarse, subangular), with some slit, wet
	N/A	24	6.9	
90				
	N/A	24	4.8	
92				
	N/A	24	6.9	
94				Note: Gray (multi colored gravel), 40% fine coarse grained sand (subangular), trace silt @ 94'
	N/A	24	4.1	
96				
	N/A	24	4.7	Note: Gray (10 yr 5/1), 30% sand (fine coarse) @ 97'
98				
	N/A	24	4.5	
100				

Sample Analysis | Sample Type | Graphic Log | Soil Class. | Depth to Water

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: L. Greene | Begin Drilling: 4/2/2007

Driller: Gerald Sealey | Total Depth: 150 | End Drilling: 4/2/2007

Drilling Method: Rotosonic | Surface Elev.: 732.459 | Converted to Well: Y | Well I.D.: GM-68D

Drilling Fluid: Water | North Coor.: 4063.53205 | East Coor.: 6357.84287

Remarks:

Project No.: OH000294.0010 | Datum: TOC: 732.269 | Filename: April 2007

ARCADIS

Log of Boring: GM-68D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
102	N/A	24	4.6						
104	N/A	24	4.7						
106	N/A	24	4.6				SP	SAND WITH GRAVEL Gray (10 yr 5/1), poorly graded, 25% gravel, subangular-subrounded, medium-coarse, sand, wet	
108	N/A	24	4.4						
110	N/A	24	5.5						
112	N/A	24	4.6				GP	GRAVEL WITH SAND Yellowish brown (10 yr 5/6), poorly graded, 15% silt, 15% sand, wet	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: L. Greene
Begin Drilling: 4/2/2007
Driller: Gerald Sealey
Total Depth: 150
End Drilling: 4/2/2007
Drilling Method: Rotosonic
Surface Elev.: 732.459
Converted to Well: Y Well I.D.: GM-68D
Drilling Fluid: Water
North Coor.: 4063.53205
East Coor.: 6357.84287
Remarks:

Project No.: OH000294.0010
Datum: TOC: 732.269
Filename: April 2007

ARCADIS

Log of Boring: GM-68D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
	N/A	24	5.3						
114									
	N/A	24	4.7					Water sample 115-120' @ 1615	
116									
	N/A	24	4.4						
118									
	N/A	12	4.7						
120	N/A	24	3.2				SM	SILTY SAND Brownish yellow (10 yr 6/6), fine-medium grained, 15% gravel, 20% silt, wet	
122	N/A	24	1.1						
124	N/A	24	2.7				SP	SAND Grayish brown (10 yr 5/2), poorly graded, fine coarse, trace gravel, wet	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: Gerald Sealey
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: L. Greene
Total Depth: 150
Surface Elev.: 732.459
North Coor.: 4063.53205

Begin Drilling: 4/2/2007
End Drilling: 4/2/2007
Converted to Well: Y Well I.D.: GM-68D
East Coor.: 6357.84287

Remarks:

Project No.: OH000294.0010 Datum: TOC: 732.269 Filename: April 2007

ARCADIS

Log of Boring: GM-68D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
126	N/A	24	2.5						
128	N/A	24	3.4						
130	N/A	24	3.5						
132	N/A	24	2.5						
134	N/A	24	3.1						
136	N/A	24	1.7					Note: 5% silt, trace clay @ 136'	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: Gerald Sealey
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: L. Greene
Total Depth: 150
Surface Elev.: 732.459
North Coor.: 4063.53205

Begin Drilling: 4/2/2007
End Drilling: 4/2/2007
Converted to Well: Y Well I.D.: GM-68D
East Coor.: 6357.84287

Remarks:

Project No.: OH000294.0010 Datum: TOC: 732.269 Filename: April 2007

ARCADIS

Log of Boring: GM-68D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
138	N/A	24	2.9						
140	N/A	24	2.4				SW	SAND Grayish brown (10 yr 5/2), well graded, fine-coarse, firm, trace gravel, wet	
142	N/A	24	0.8						
144	N/A	24	1.5						
146	N/A	24	2.3				SP	SAND Grayish brown (10 yr 5/2), poorly graded, fine medium grained, trace gravel, wet	
148	N/A	24	1.1						
150								End of boring	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: Gerald Sealey
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: L. Greene
Total Depth: 150
Surface Elev.: 732.459
North Coor.: 4063.53205

Begin Drilling: 4/2/2007
End Drilling: 4/2/2007
Converted to Well: Y Well I.D.: GM-68D
East Coor.: 6357.84287

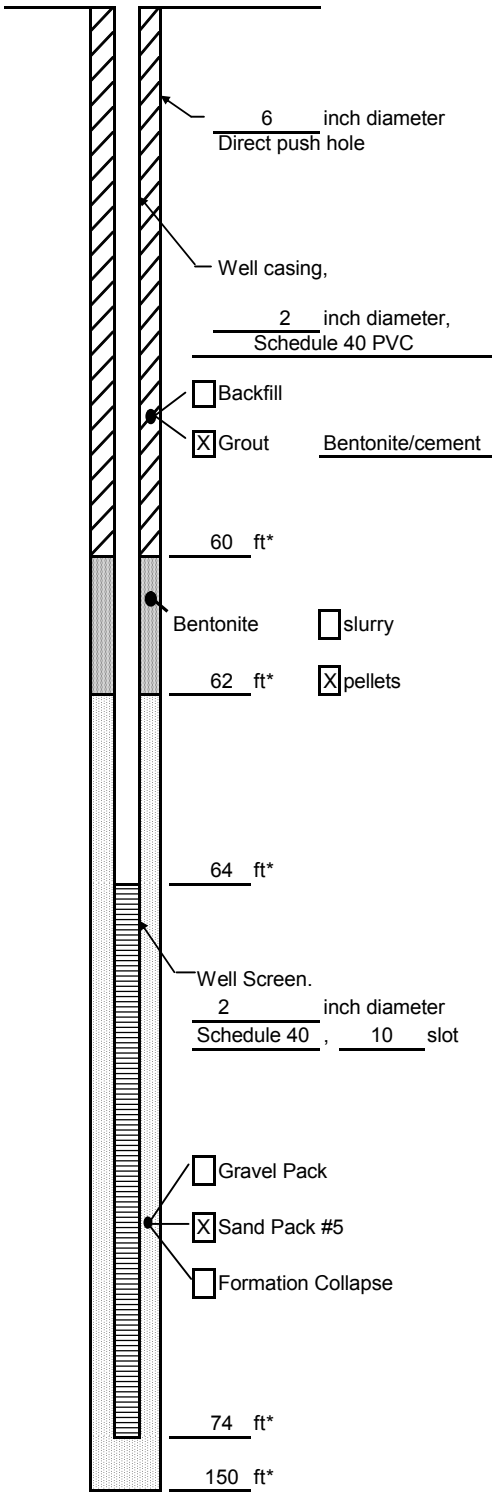
Remarks:

Project No.: OH000294.0010
Datum: TOC: 732.269
Filename: April 2007

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well GM-68D

Town/City Moraine

County Montgomery State Ohio

Permit No. N/A

Land-Surface (LS) Elevation and Datum:

732.459 feet [x] Surveyed

[ ] Estimated

Installation Date(s) 4/19/2007

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water - removed during vertical aquifer profiling

Development Technique(s) and Date(s)

Submersible pump - surge with pump

4/13/07 Paul Smith

Fluid Loss During installation 700 gallons

Water Removed During Development 135 gallons

Static Depth to Water NM feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration 1.00 hours

Yield NM gpm Date 4/13/07

Specific Capacity NM gpm/ft

Well Purpose GW Monitoring

Remarks Permanent 6" casing installed to a depth of 53'. Time: 1115, 1120, 1125, 1130, 1135, 1140

pH: 6.47, 6.63, 6.62, 6.64, 6.65, 6.64

Conductivity: 1.54, 1.44, 1.44, 1.44, 1.41, 1.41

Temperature: 17.0, 16.9, 17.0, 16.9, 17.1, 17.0

Turbidity: 14, 20, 17, 25, 19, 22

Prepared by L. Greene

ARCADIS

Log of Boring: GM-68S

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
46								See boring log GM-68D for lithologic descrption	
48									
50								End of boring	
52									
54									
56									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: Gerald Sealey
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: L. Greene
Total Depth: 49.5
Surface Elev.: 732.477
North Coor.: 4063.53205

Begin Drilling: 4/12/2007
End Drilling: 4/12/2007
Converted to Well: Y Well I.D.: GM-68S
East Coor.: 6357.84287

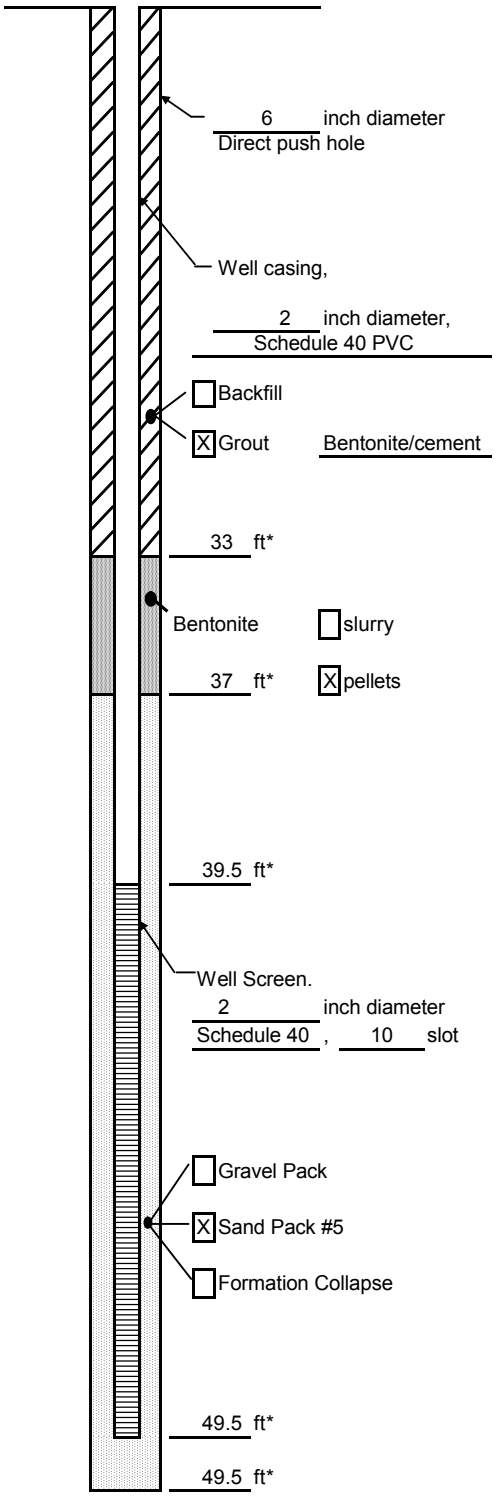
Remarks:

Project No.: OH000294.0010
Datum: TOC: 732.177
Filename: April 2007

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well GM-68S

Town/City Moraine

County Montgomery State Ohio

Permit No. N/A

Land-Surface (LS) Elevation and Datum:

732.477 feet [x] Surveyed

[ ] Estimated

Installation Date(s) 4/12/2007

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Submersible pump - surge with pump 4/13/07 by

Paul Smith

Fluid Loss During installation 50 gallons

Water Removed During Development 195 gallons

Static Depth to Water 21.9 feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration 1.25 hours

Yield 3 gpm Date 4/13/07

Specific Capacity NM gpm/ft

Well Purpose GW Monitoring

Note: formation collapse (150' to 49.5')

Remarks Time: 1325, 1328, 1331, 1334, 1337, 1340

pH: 12.04, 11.78, 11.39, 11.12, 10.98, 10.81

Conductivity: 0.688, 0.700, 0.721, 0.754, 0.760

Turbidity: 287, 10+, 10+, 10+, 10+, 10+

Temperature: 15.8, 16.0, 16.3, 16.4, 16.4, 16.4

Prepared by L. Greene

ARCADIS

Log of Boring: GM-69

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Soil Class.	Description
0	N/A	N/A	N/A		ASPHALT
					CONCRETE
2					
	N/A	24	0.1	GW	GRAVEL Light gray, limestone, fine-coarse gravel with 20% coarse sand, some silt, moist (fill)
4					
	N/A	24	0.2		
6					
	N/A	24	1.7		
8					Note: Dark gray to black 3" layer of wood and metal @ 7.5'
	N/A	24	0.8		
10				SW	SAND WITH GRAVEL Brown, well graded, medium-coarse, subangular-subrounded with 20% fine-coarse subrounded-subangular gravel
	N/A	24	0.1		
12					

Depth to Water

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: Gerald Sealey
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: T. Fortner
Total Depth: 140
Surface Elev.: 732.416
North Coor.: 3021.79146

Begin Drilling: 3/29/2007
End Drilling: 3/30/2007
Converted to Well: Y Well I.D.: GM-69
East Coor.: 6352.18442

Remarks:

Project No.: OH000294.0010
Datum: TOC: 732.080
Filename: April 2007

ARCADIS

Log of Boring: GM-69

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
	N/A	24	0.0						
14									
	N/A	24	0.1						
16									
	N/A	24	0.0					Note: wet @ 17'	▼
18									
	N/A	24	0.0						
20									
	N/A	24	0.0						
22									
	N/A	24	0.0				SW	SAND Brown, well graded, medium coarse, subangular-subrounded with 5% fine-coarse subrounded gravel (trace cobbles up to 4"), wet	
24									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: T. Fortner
Begin Drilling: 3/29/2007
Driller: Gerald Sealey
Total Depth: 140
End Drilling: 3/30/2007
Drilling Method: Rotosonic
Surface Elev.: 732.416
Converted to Well: Y Well I.D.: GM-69
Drilling Fluid: Water
North Coor.: 3021.79146
East Coor.: 6352.18442
Remarks:

Project No.: OH000294.0010
Datum: TOC: 732.080
Filename: April 2007

ARCADIS

Log of Boring: GM-69

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
26	N/A	24	0.0					SAND WITH GRAVEL Brown, well graded, medium-coarse, subangular with 40% fine-coarse gravel, wet	
	N/A	24	0.0				SP	SAND Brown, poorly graded, medium subangular with <5% fine subrounded gravel, wet	
28							GW	GRAVEL WITH SAND Brown, well graded, fine coarse, subround with 30% medium-coarse subangular sand, wet	
	N/A	24	0.0					Note: Brown to red brown, 10% coarse subangular sand with some silt @ 29'	
30								Water sample 30-35' @ 1358	
	N/A	24	0.0				SW	SAND Brown, well graded, medium coarse, subround gravel (trace cobbles up to 4") , wet	
32									
	N/A	24	0.0						
34									
	N/A	24	0.0						
36									
	N/A	24	0.0				GW	GRAVEL WITH SAND Yellowish brown (10 yr 5/4), well graded, fine-coarse subangular gravel up	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: T. Fortner
Begin Drilling: 3/29/2007
Driller: Gerald Sealey
Total Depth: 140
End Drilling: 3/30/2007
Drilling Method: Rotosonic
Surface Elev.: 732.416
Converted to Well: Y Well I.D.: GM-69
Drilling Fluid: Water
North Coor.: 3021.79146
East Coor.: 6352.18442
Remarks:

Project No.: OH000294.0010
Datum: TOC: 732.080
Filename: April 2007

ARCADIS

Log of Boring: GM-69

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
38								to 2", with 30% medium coarse subangular sand, some silt, wet	
	N/A	24	0.0						
40									
	N/A	24	0.0						
42									
	N/A	24	0.0						
44									
	N/A	24	0.0					Note: Light brownish gray (10 yr 6/2)	
46									
	N/A	24	0.0					GRAVEL Light brownish gray, well graded, fine coarse, subrounded-subangular (up to 1.5") with 40% medium-coarse, subangular sand, wet	
48									
	N/A	24	0.0				GP	GRAVEL WITH SAND Light brown gray, poorly graded, fine, subangular-subrounded with 40% medium-coarse subangular sand, wet	
50									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 3/29/2007

Driller: Gerald Sealey | Total Depth: 140 | End Drilling: 3/30/2007

Drilling Method: Rotosonic | Surface Elev.: 732.416 | Converted to Well: Y | Well I.D.: GM-69

Drilling Fluid: Water | North Coor.: 3021.79146 | East Coor.: 6352.18442

Remarks:

Project No.: OH000294.0010 | Datum: TOC: 732.080 | Filename: April 2007

ARCADIS

Log of Boring: GM-69

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Soil Class.	Description	Depth to Water
52	N/A	24	0.0	SP	SAND Light brown gray, poorly graded, medium coarse, subangular, wet	
54	N/A	24	0.0			
56	N/A	24	0.0		Note: Gray, fine-medium @ 55.5'	
58	N/A	24	0.0		Water sample 57-62' @ 1623	
60	N/A	24	0.0	SW	SAND WITH GRAVEL Light brownish gray, well graded, some silt, medium-coarse, subangular, with 30% fine coarse subrounded gravel, wet	
62	N/A	24	0.0	GW	GRAVEL WITH SAND Light brownish gray, well graded, fine, subangular-subrounded with 40%	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: T. Fortner
Begin Drilling: 3/29/2007
Driller: Gerald Sealey
Total Depth: 140
End Drilling: 3/30/2007
Drilling Method: Rotosonic
Surface Elev.: 732.416
Converted to Well: Y Well I.D.: GM-69
Drilling Fluid: Water
North Coor.: 3021.79146
East Coor.: 6352.18442
Remarks:

Project No.: OH000294.0010
Datum: TOC: 732.080
Filename: April 2007

ARCADIS

Log of Boring: GM-69

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Soil Class.	Description	Depth to Water
	N/A	24	0.0	CL	medium-coarse sand. Note: Bottom 3" is dark gray with staining and strong odor	
					SILTY CLAY Dark grayish brown (10 yr 4/2), very stiff, medium plasticity with 3% fine subangular gravel, dry	
64					SILTY CLAY Dark gray (2.5 yr 4/1), high plasticity, with 5% subangular gravel (trace coarse, subangular gravel up to 1.5"), dry	
	N/A	24	0.0			
66						
	N/A	24	0.0		Note: Medium plasticity	
				SM	SILTY SAND	
68				SP	Mottled brown-gray, dense, wet	
					SAND Brown, poorly graded, medium coarse with some silt, wet	
	N/A	24	0.0	GW	GRAVEL WITH SAND Brown, well graded with trace silt, fine-coarse (cobbles up to 4") with 40% medium coarse subangular sand, wet	
70						
	N/A	24	0.0			
72					Water sample 72-77' @ 0828	
	N/A	24	0.0			
74						
	N/A	24	0.0			

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 3/29/2007

Driller: Gerald Sealey | Total Depth: 140 | End Drilling: 3/30/2007

Drilling Method: Rotosonic | Surface Elev.: 732.416 | Converted to Well: Y | Well I.D.: GM-69

Drilling Fluid: Water | North Coor.: 3021.79146 | East Coor.: 6352.18442

Remarks:

Project No.: OH000294.0010 | Datum: TOC: 732.080 | Filename: April 2007

ARCADIS

Log of Boring: GM-69

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Soil Class.	Description
76					
	N/A	24	0.0	GW	Same as above
78					
	N/A	24	0.0	SM	SILTY SAND Brownish yellow (10 yr 6/8), fine, dense, some silt, wet
80					
				CL	SILTY CLAY Gray, high plasticity, soft, moist
	N/A	24	0.0	SM	SILTY SAND Brownish yellow, fine, dense some silt, wet
82				CL	SILTY CLAY Gray, soft, high plasticity, moist
	N/A	24	0.0	SM	SILTY SAND Brownish yellow, poorly graded, fine medium, wet
84					
	N/A	24	0.0	SP	SAND Grayish brown (10 yr 5/2), poorly graded, fine-medium, wet
86					
	N/A	24	0.0		

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 3/29/2007

Driller: Gerald Sealey | Total Depth: 140 | End Drilling: 3/30/2007

Drilling Method: Rotosonic | Surface Elev.: 732.416 | Converted to Well: Y | Well I.D.: GM-69

Drilling Fluid: Water | North Coor.: 3021.79146 | East Coor.: 6352.18442

Remarks:

Project No.: OH000294.0010 | Datum: TOC: 732.080 | Filename: April 2007

ARCADIS

Log of Boring: GM-69

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
88									
	N/A	24	0.0				GW	GRAVEL WITH SAND Grayish brown, well graded trace of silt, fine-coarse (up to 2"), subround with medium coarse subangular sand, wet	
90									
	N/A	24	0.0						
92								Water sample @ 92-97' @ 0943	
	N/A	24	0.0						
94									
	N/A	24	0.0						
96									
	N/A	24	0.0						
98									
	N/A	24	0.0						
100									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: T. Fortner
Begin Drilling: 3/29/2007
Driller: Gerald Sealey
Total Depth: 140
End Drilling: 3/30/2007
Drilling Method: Rotosonic
Surface Elev.: 732.416
Converted to Well: Y Well I.D.: GM-69
Drilling Fluid: Water
North Coor.: 3021.79146
East Coor.: 6352.18442
Remarks:

Project No.: OH000294.0010
Datum: TOC: 732.080
Filename: April 2007

ARCADIS

Log of Boring: GM-69

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
	N/A	24	0.0					Note: Gravel up 4" @ 101'	
102									
	N/A	24	0.0						
104									
	N/A	24	0.0						
106									
	N/A	24	0.0						
108									
	N/A	24	0.0						
110									
	N/A	24	0.0						
112									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: T. Fortner
Begin Drilling: 3/29/2007
Driller: Gerald Sealey
Total Depth: 140
End Drilling: 3/30/2007
Drilling Method: Rotosonic
Surface Elev.: 732.416
Converted to Well: Y Well I.D.: GM-69
Drilling Fluid: Water
North Coor.: 3021.79146
East Coor.: 6352.18442
Remarks:

Project No.: OH000294.0010
Datum: TOC: 732.080
Filename: April 2007

ARCADIS

Log of Boring: GM-69

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
	N/A	24	0.0				SW	SAND WITH GRAVEL Brown (10 yr 5/3), well graded, medium-coarse, subangular with 30% fine coarse (up to 2") subrounded gravel, wet	
114									
	N/A	24	0.0					Water sample 115-120' @ 1053	
116									
	N/A	24	0.0						
118									
	N/A	12	0.0						
120	N/A	24	0.9				CL	SILTY CLAY Dark gray (10 yr 4/1), <5% gravel (angular), stiff, dry	
122	N/A	24	1.						
124	N/A	24	2.4					Note: 30% sand, <5% gravel (angular), moist @ 124'	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: T. Fortner | Begin Drilling: 3/29/2007

Driller: Gerald Sealey | Total Depth: 140 | End Drilling: 3/30/2007

Drilling Method: Rotosonic | Surface Elev.: 732.416 | Converted to Well: Y | Well I.D.: GM-69

Drilling Fluid: Water | North Coor.: 3021.79146 | East Coor.: 6352.18442

Remarks:

Project No.: OH000294.0010 | Datum: TOC: 732.080 | Filename: April 2007

ARCADIS

Log of Boring: GM-69

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
126	N/A	24	1.3						
128	N/A	24	4.3					Note: No sand @ 128'	
130	N/A	24	2.2						
132	N/A	24	0.0						
134	N/A	24	0.0						
136	N/A	24	1.4				SC	CLAYEY SAND	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: T. Fortner
Begin Drilling: 3/29/2007
Driller: Gerald Sealey
Total Depth: 140
End Drilling: 3/30/2007
Drilling Method: Rotosonic
Surface Elev.: 732.416
Converted to Well: Y Well I.D.: GM-69
Drilling Fluid: Water
North Coor.: 3021.79146
East Coor.: 6352.18442
Remarks:
Project No.: OH000294.0010
Datum: TOC: 732.080
Filename: April 2007

ARCADIS

Log of Boring: GM-69

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
138								Dark gray (10 yr 4/1), 30% silt, fine sand, moist	
							SM	SILTY SAND Dark gray (10 yr 4/1), trace clay, trace gravel (angular), moist	
140								End of boring	
142									
144									
146									
148									
150									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: Gerald Sealey
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: T. Fortner
Total Depth: 140
Surface Elev.: 732.416
North Coor.: 3021.79146

Begin Drilling: 3/29/2007
End Drilling: 3/30/2007
Converted to Well: Y Well I.D.: GM-69
East Coor.: 6352.18442

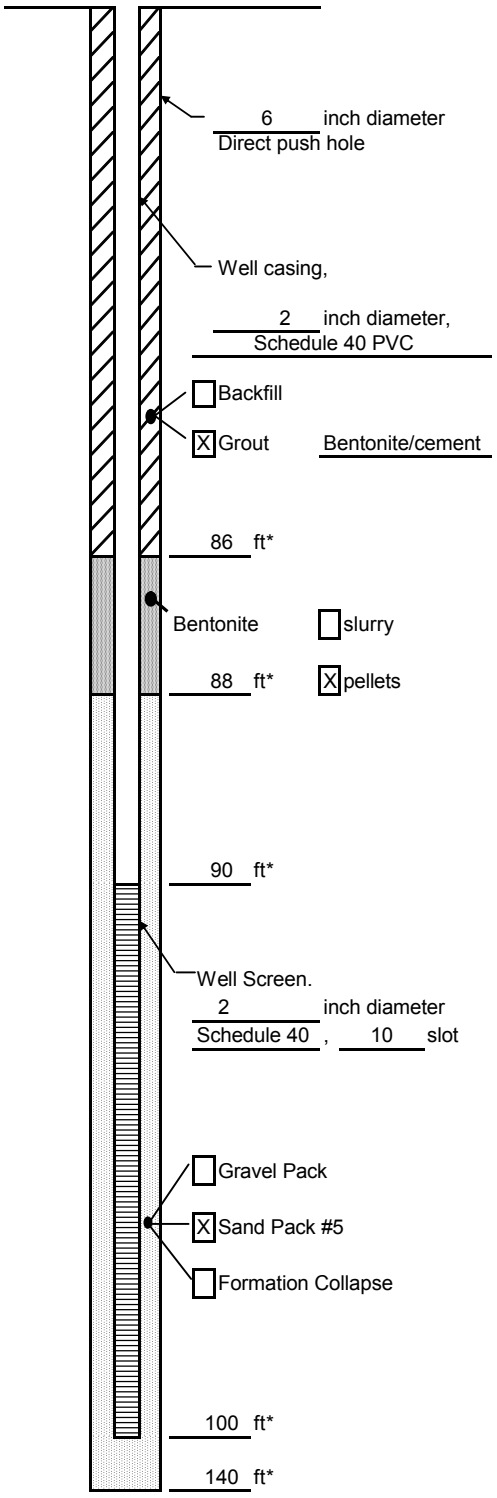
Remarks:

Project No.: OH000294.0010 Datum: TOC: 732.080 Filename: April 2007

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well GM-69

Town/City Moraine

County Montgomery State Ohio

Permit No. N/A

Land-Surface (LS) Elevation and Datum:

732.416 feet [x] Surveyed

[ ] Estimated

Installation Date(s) 4/9/2007

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water - removed during vertical aquifer profiling, 50 gallons used during well installation

Development Technique(s) and Date(s)

Pumping, surge with pump

Fluid Loss During installation 50 gallons

Water Removed During Development 135 gallons

Static Depth to Water 22 feet below M.P.

Pumping Depth to Water 50 feet below M.P.

Pumping Duration 0.75 hours

Yield 3 gpm Date 4/12/07

Specific Capacity NM gpm/ft

Well Purpose GW Monitoring

Note: Bentonite chip from 140-120', formation collapse from 120-100', permanent 6" casing installed at RCT.

Remarks Time: 1018, 1021, 1024, 1027, 1030

pH: 7.93, 7.91, 7.90, 7.88, 7.75

Conductivity: 1.33, 1.34, 1.33, 1.32, 1.34

Turbidity: 72, 17, 15, 130, 97

Temperature: 14.7, 14.6, 14.6, 14.7, 15.0

Prepared by L. Greene

ARCADIS

Log of Boring: GM-70

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	N/A	N/A	N/A				FILL	FILL Utility cleared material	
10	N/A	24	7.8				SP	SAND Yellowish brown (10 yr 5/6), poorly graded, trace silt, fine-medium grained, 20% gravel (angular-subround), dry	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: Gerald Sealey
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: L. Greene
Total Depth: 120
Surface Elev.: 737.470
North Coor.: 3887.32724

Begin Drilling: 4/5/2007
End Drilling: 4/5/2007
Converted to Well: Y Well I.D.: GM-70
East Coor.: 7282.84039

Remarks:

Project No.: OH000294.0010 Datum: TOC: 737.186 Filename: April 2007

ARCADIS

Log of Boring: GM-70

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
	N/A	24	7.0						
14									
	N/A	24	7.9					Note: Coarse sand, yellowish brown (10 yr 5/6), 30% gravel @ 15'	
16									
	N/A	24	7.2						
18									
	N/A	24	9.2						
20									
	N/A	24	6.2						
22									
	N/A	24	11.4						
24									
							SP	SAND Yellowish brown (10 yr 5/4), poorly graded, <5% gravel (subangular-	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: Gerald Sealey
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: L. Greene
Total Depth: 120
Surface Elev.: 737.470
North Coor.: 3887.32724

Begin Drilling: 4/5/2007
End Drilling: 4/5/2007
Converted to Well: Y Well I.D.: GM-70
East Coor.: 7282.84039

Remarks:

Project No.: OH000294.0010
Datum: TOC: 737.186
Filename: April 2007

ARCADIS

Log of Boring: GM-70

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
	N/A	24	10.2					subround) , fine medium, dry Note: Yellowish brown (10 yr 5/6), 30% gravel, coarse, moist	
26									
	N/A	24	8.7				GP	GRAVEL WITH SAND Yellowish brown (10 yr 5/6), poorly graded, medium grained, 20% sand, subangular-angular, wet	
28									
	N/A	24	8.0						
30									
	N/A	24	6.9						
32									
	N/A	24	7.6						
34									
	N/A	24	8.0				SP	SAND Yellowish brown (10 yr 5/4), poorly graded, medium coarse, 10% gravel (subangular-subround), wet	
36									
	N/A	24	6.1				GW	GRAVEL WITH SAND Brown (10 yr 5/4), well graded, fine medium 10% sand, subangular-	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: L. Greene | Begin Drilling: 4/5/2007

Driller: Gerald Sealey | Total Depth: 120 | End Drilling: 4/5/2007

Drilling Method: Rotosonic | Surface Elev.: 737.470 | Converted to Well: Y | Well I.D.: GM-70

Drilling Fluid: Water | North Coor.: 3887.32724 | East Coor.: 7282.84039

Remarks:

Project No.: OH000294.0010 | Datum: TOC: 737.186 | Filename: April 2007

ARCADIS

Log of Boring: GM-70

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
38								subround, wet	
	N/A	24	7.5						
40								Water sample 40-45' @ 1150	
	N/A	24	7.2						
42								Note: Fine-coarse, sandy gravel, 10% sand	
	N/A	24	6.8						
44									
	N/A	24	7.4						
46									
	N/A	24	1.5				CL	SILTY CLAY Dark grayish brown (10 yr 4/2), 5% gravel (angular-subangular), very stiff, low plasticity, dry	
48									
	N/A	24	4.7						
50									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: L. Greene | Begin Drilling: 4/5/2007

Driller: Gerald Sealey | Total Depth: 120 | End Drilling: 4/5/2007

Drilling Method: Rotosonic | Surface Elev.: 737.470 | Converted to Well: Y | Well I.D.: GM-70

Drilling Fluid: Water | North Coor.: 3887.32724 | East Coor.: 7282.84039

Remarks:

Project No.: OH000294.0010 | Datum: TOC: 737.186 | Filename: April 2007

ARCADIS

Log of Boring: GM-70

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Soil Class.	Description
52	N/A	24	3.9	ML	CLAYEY SILT Dark grayish brown (10 yr 4/2), <5% gravel (subround), moist
	N/A	24	4.3		
54				CL	SILTY CLAY Dark grayish brown (10 yr 4/2), 5% gravel (subangular-angular), very stiff, brittle, low plasticity, dry
	N/A	24	4.8		
56					
	N/A	24	5.0		
58					
	N/A	24	4.6		
60					
	N/A	24	5.1		
62					

Sample Analysis | Sample Type | Graphic Log | Depth to Water

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: L. Greene | Begin Drilling: 4/5/2007

Driller: Gerald Sealey | Total Depth: 120 | End Drilling: 4/5/2007

Drilling Method: Rotosonic | Surface Elev.: 737.470 | Converted to Well: Y | Well I.D.: GM-70

Drilling Fluid: Water | North Coor.: 3887.32724 | East Coor.: 7282.84039

Remarks:

Project No.: OH000294.0010 | Datum: TOC: 737.186 | Filename: April 2007

ARCADIS

Log of Boring: GM-70

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Soil Class.	Description	Depth to Water
	N/A	24	5.6			
64						
	N/A	24	4.7	SP	SAND Dark grayish brown (10 yr 4/2), poorly graded, fine-medium, <5% fine gravel, moist	
66				CL	SILTY CLAY Dark grayish brown (10 yr 4/2), 5% gravel, subangular-angular, very stiff, brittle, low plasticity, dry	
	N/A	24	3.4			
68						
	N/A	24	5.1			
70						
	N/A	24	4.8			
72				SP	SAND Yellowish brown (10 yr 5/4), poorly graded, 15% gravel (subangular-angular), medium-coarse, wet	
	N/A	24	4.4		Water sample 73-78' @ 1520	
74						
	N/A	24	5.2			

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: L. Greene | Begin Drilling: 4/5/2007

Driller: Gerald Sealey | Total Depth: 120 | End Drilling: 4/5/2007

Drilling Method: Rotosonic | Surface Elev.: 737.470 | Converted to Well: Y | Well I.D.: GM-70

Drilling Fluid: Water | North Coor.: 3887.32724 | East Coor.: 7282.84039

Remarks:

Project No.: OH000294.0010 | Datum: TOC: 737.186 | Filename: April 2007

ARCADIS

Log of Boring: GM-70

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Soil Class.	Description	Depth to Water
76						
	N/A	24	5.2			
78						
	N/A	24	7.0		Note: 25% gravel (subangular-subround) @ 79'	
80						
	N/A	24	6.1	ML	CLAYEY SILT Yellowish brown (10 yr 5/4), orange mottling, dry	
				SP	SAND Dark gray (1o yr 4/1), poorly graded, fine, wet	
82						
	N/A	24	7.8		Note: Dark grayish brown (10 yr 4/2), <5% gravel @ 83'	
84						
	N/A	24	4.5			
86						
	N/A	24	5.6			

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: L. Greene | Begin Drilling: 4/5/2007

Driller: Gerald Sealey | Total Depth: 120 | End Drilling: 4/5/2007

Drilling Method: Rotosonic | Surface Elev.: 737.470 | Converted to Well: Y | Well I.D.: GM-70

Drilling Fluid: Water | North Coor.: 3887.32724 | East Coor.: 7282.84039

Remarks:

Project No.: OH000294.0010 | Datum: TOC: 737.186 | Filename: April 2007

ARCADIS

Log of Boring: GM-70

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
88								Note: 15-20% gravel @ 88'	
	N/A	24	7.5					Note: 5% Gravel, trace silt	
90									
	N/A	24	7.6						
92									
	N/A	24	6.7				SW	SAND Dark grayish brown (10 yr 4/2), well graded, fine-coarse, 5% gravel, moist, trace silt, seems of fine sand <2", wet Water sample 93-98' @ 1650	
94									
	N/A	24	3.6						
96									
	N/A	24	7.0						
98								Note: 15% gravel, no fine sand seams @ 98'	
	N/A	24	5.7						
100									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: L. Greene
Begin Drilling: 4/5/2007
Driller: Gerald Sealey
Total Depth: 120
End Drilling: 4/5/2007
Drilling Method: Rotosonic
Surface Elev.: 737.470
Converted to Well: Y Well I.D.: GM-70
Drilling Fluid: Water
North Coor.: 3887.32724
East Coor.: 7282.84039
Remarks:

Project No.: OH000294.0010
Datum: TOC: 737.186
Filename: April 2007

ARCADIS

Log of Boring: GM-70

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
	N/A	24	7.1						
102								Note: 25-30% fine gravel, fine-coarse, trace silt @ 102'	
	N/A	24	6.8						
104									
	N/A	24	5.4						
106									
	N/A	24	5.1						
108									
	N/A	24	4.2				SP	SAND Dark grayish brown (10 yr 4/2), poorly graded, fine-coarse, 5% gravel (subangular-subround), wet	
110									
	N/A	24	2.1						
112								Water sample 112-117' @ 1810	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: L. Greene | Begin Drilling: 4/5/2007

Driller: Gerald Sealey | Total Depth: 120 | End Drilling: 4/5/2007

Drilling Method: Rotosonic | Surface Elev.: 737.470 | Converted to Well: Y | Well I.D.: GM-70

Drilling Fluid: Water | North Coor.: 3887.32724 | East Coor.: 7282.84039

Remarks:

Project No.: OH000294.0010 | Datum: TOC: 737.186 | Filename: April 2007

ARCADIS

Log of Boring: GM-70

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
114	N/A	24	3.7						
	N/A	24	3.5						
116									
	N/A	24	5.5				CL	SILTY CLAY Dark gray (10 yr 4/1), trace fine gravel (fossiliferous limestone), stiff, dry	
118									
	N/A	12	2.2						
120								End of boring	
122									
124									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: Gerald Sealey
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: L. Greene
Total Depth: 120
Surface Elev.: 737.470
North Coor.: 3887.32724

Begin Drilling: 4/5/2007
End Drilling: 4/5/2007
Converted to Well: Y Well I.D.: GM-70
East Coor.: 7282.84039

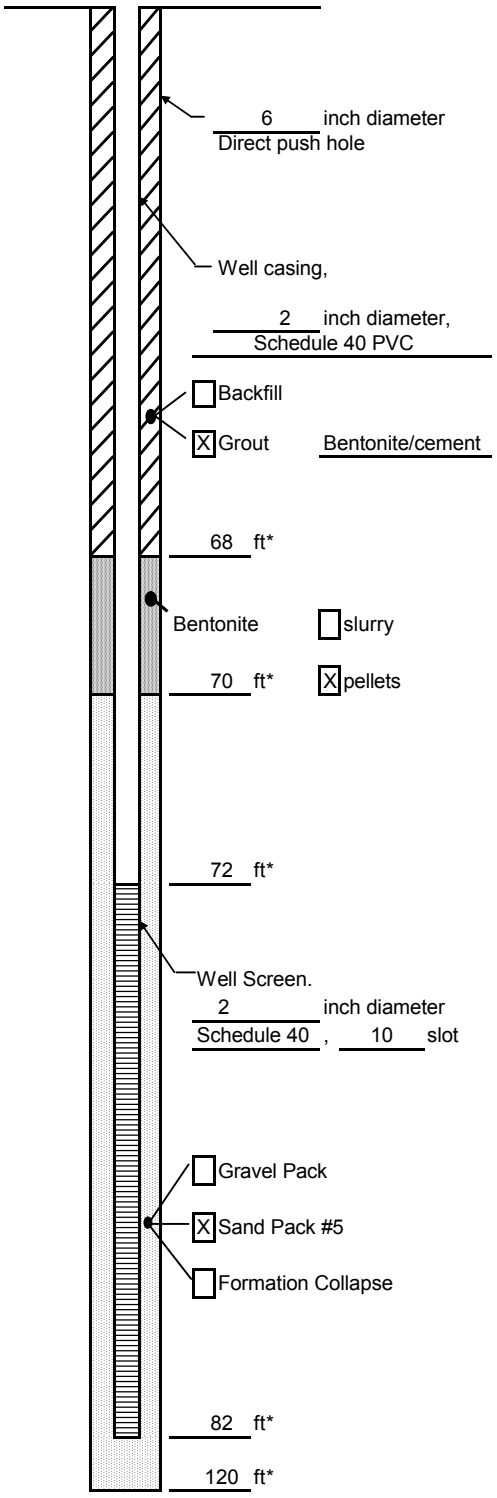
Remarks:

Project No.: OH000294.0010
Datum: TOC: 737.186
Filename: April 2007

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well GM-70

Town/City Moraine

County Montgomery State Ohio

Permit No. N/A

Land-Surface (LS) Elevation and Datum:

737.470 feet [x] Surveyed

[ ] Estimated

Installation Date(s) 4/12/2007

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Submersible pump, surge with pump

4/13/07 Paul Smith

Fluid Loss During installation 50 gallons

Water Removed During Development 60 gallons

Static Depth to Water 26.5 feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration 0.50 hours

Yield 3 gpm Date 4/13/07

Specific Capacity NM gpm/ft

Well Purpose GW Monitoring

Note: formation collapse 120-82'

Remarks Time: 1219, 1222, 1225, 1228, 1231

pH: 7.49, 7.84, 7.94, 7.99, 8.01

Conductivity: 1.09, 1.08, 1.06, 1.05, 1.06

Turbidity: 17, 4, 10+, 10+, 10+

Temperature: 15.7, 15.7, 15.8, 15.9, 15.8

Prepared by L. Greene

ARCADIS

Log of Boring: GM-71

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	N/A	24	NM					CONCRETE	
							FILL	FILL Sand and gravel, fill	
10	N/A	24	10.4				SP	SAND Dark yellowish brown (10 yr 4/4), poorly graded, medium, 30% gravel (subround), dry	
12	N/A	24	5.9						

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: L. Greene
Begin Drilling: 4/16/2007
Driller: Chris
Total Depth: 36
End Drilling: 4/16/2007
Drilling Method: Rotosonic
Surface Elev.: 737.194
Converted to Well: Y Well I.D.: GM-71
Drilling Fluid: Water
North Coor.: 4493.83914
East Coor.: 6849.32868
Remarks: Water sample 26-31' @ 1020
Project No.: OH000294.0010
Datum: TOC: 736.817
Filename: April 2007

ARCADIS

Log of Boring: GM-71

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
14	N/A	24	3.8						
16	N/A	24	8.6						
18	N/A	24	5.0				SW	SAND Yellowish brown (10 yr 5/4), well graded, fine-coarse, 20% gravel/cobbles (angular-subround), dry	
20	N/A	24	21.0						
22	N/A	24	8.1						
24	N/A	24	5.4						

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: Chris
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: L. Greene
Total Depth: 36
Surface Elev.: 737.194
North Coor.: 4493.83914
Begin Drilling: 4/16/2007
End Drilling: 4/16/2007
Converted to Well: Y Well I.D.: GM-71
East Coor.: 6849.32868
Remarks: Water sample 26-31' @ 1020
Project No.: OH000294.0010
Datum: TOC: 736.817
Filename: April 2007

ARCADIS

Log of Boring: GM-71

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
26	N/A	24	1.5						
28	N/A	24	8.0				SP	GRAVEL WITH SAND Brown (10 yr 5/3), poorly graded, fine medium gravel, (subround-subangular), 10% sand, wet	▼
30	N/A	24	1.7				CL	SILTY CLAY Grayish brown (10 yr 5/2), 5% gravel (angular-subround), dry	
32	N/A	24	2.2						
34	N/A	24	0.9						
36								End of boring	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: L. Greene | Begin Drilling: 4/16/2007

Driller: Chris | Total Depth: 36 | End Drilling: 4/16/2007

Drilling Method: Rotosonic | Surface Elev.: 737.194 | Converted to Well: Y | Well I.D.: GM-71

Drilling Fluid: Water | North Coor.: 4493.83914 | East Coor.: 6849.32868

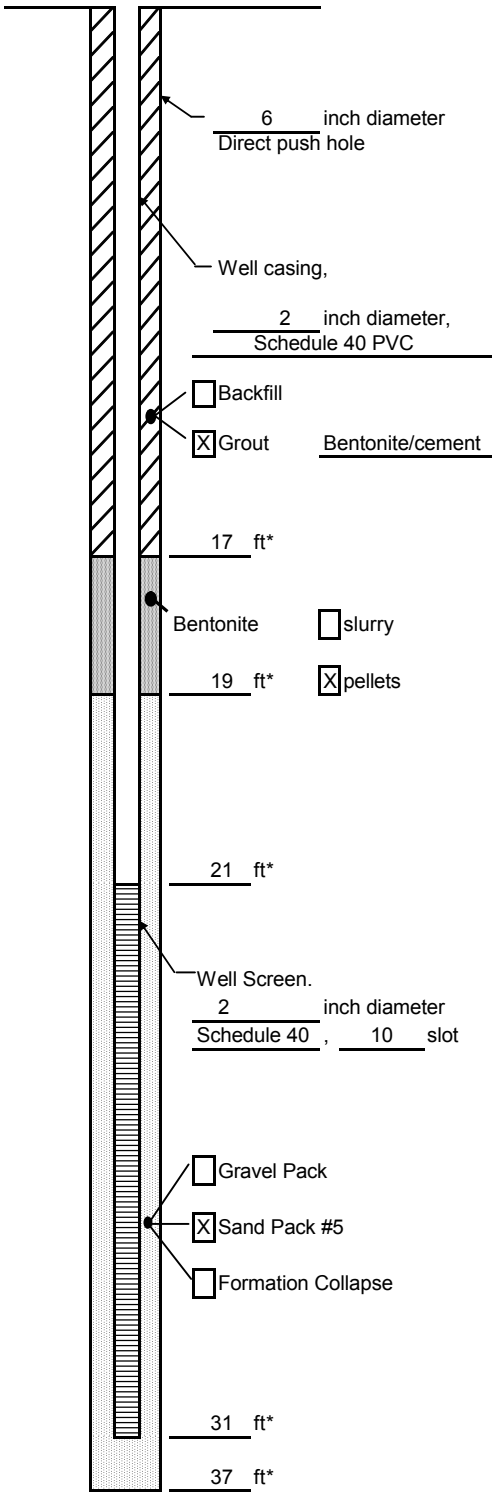
Remarks: Water sample 26-31' @ 1020

Project No.: OH000294.0010 | Datum: TOC: 736.817 | Filename: April 2007

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well GM-71

Town/City Moraine

County Montgomery State Ohio

Permit No. N/A

Land-Surface (LS) Elevation and Datum:

737.194 feet [x] Surveyed

[ ] Estimated

Installation Date(s) 4/20/2007

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Submersible pump, surge with pump

4/26/07 Jim Wallace

Fluid Loss During Drilling 200 gallons

Water Removed During Development 60 gallons

Static Depth to Water 25.62 feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration 1 hours

Yield 1 gpm Date 4/26/07

Specific Capacity NM gpm/ft

Well Purpose Monitoring well

Remarks Time: 1125, 1130, 1135, 1140, 1145

pH: 6.81, 6.80, 6.74, 6.78, 6.80

Conductivity: 2.21, 214, 2.12, 2.12, 2.12

Turbidity: 58, 17, 10, 6, 10

Temperature: 17.2, 17.9, 17.8, 17.8, 17.7

Prepared by L. Greene

ARCADIS

Log of Boring: GM-72

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
								0-30 feet see boring log GM-71 for lithologic description	
30	N/A	24	2.3				CL	CLAY Light brown (10 yr 5/7), hard, 10% gravel, dry	
32	N/A	24	4.7					Note: Olive gray (10 yr 5/1) @ 32'	
34	N/A	24	3.1						
36	N/A	24	5.9						
							SW	SAND WITH GRAVEL Light brown (10 yr 6/4), medium-coarse, with 40% gravel (gravel up to 2"), loose, wet	
38	N/A	24	6.2						
40	N/A	24	5.4						

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: J. Wallace | Begin Drilling: 4/24/2007

Driller: Chris | Total Depth: 68 | End Drilling: 4/24/2007

Drilling Method: Rotosonic | Surface Elev.: 737.050 | Converted to Well: Y | Well I.D.: GM-72

Drilling Fluid: Water | North Coor.: 4496.04384 | East Coor.: 6860.84485

Remarks: Water sample 42-47' @ 0930; 57-62' @ 1325

Project No.: OH000294.0010 | Datum: TOC: 736.778 | Filename: April 2007

ARCADIS

Log of Boring: GM-72

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
42	N/A	24	5.9						
44	N/A	24	7.0						
46	N/A	24	3.6				GW	GRAVEL WITH SAND Light brown, loose, gravel up to 3", 20% sand, wet	
48	N/A	24	6.6				GP	GRAVEL Light brown to gray (10 yr 6/4), poorly graded, fine to medium gravel, loose, well rounded, with 10% sand, wet	
50	N/A	24	2.6					Note: Gravel up 1", 10% sand @ 50'	
52	N/A	24	5.1					Note: No gravel larger than 0.5" @ 52'	
54									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: J. Wallace | Begin Drilling: 4/24/2007

Driller: Chris | Total Depth: 68 | End Drilling: 4/24/2007

Drilling Method: Rotosonic | Surface Elev.: 737.050 | Converted to Well: Y | Well I.D.: GM-72

Drilling Fluid: Water | North Coor.: 4496.04384 | East Coor.: 6860.84485

Remarks: Water sample 42-47' @ 0930; 57-62' @ 1325

Project No.: OH000294.0010 | Datum: TOC: 736.778 | Filename: April 2007

ARCADIS

Log of Boring: GM-72

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Soil Class.	Description	Depth to Water
	N/A	24	5.6			
				GW	GRAVEL Light brown (10 yr 6/4) with fine sand, silt and some clay, wet	
56	N/A	24	9.4		Note: No clay @ 56'	
				SP	SAND Light brown (10 yr 4/4), fine to medium sand, loose, <10% gravel, wet	
58	N/A	24	26.4	GW	GRAVEL Light brown with 30% fine to medium sand, loose, wet	
60	N/A	24	7.7	SP	SAND Light brown (10 yr 5/2), medium sand with 30% gravel, loose, wet	
					Note: Fine sand @ 61'	
62	N/A	24	4.7	CL	CLAY Gray (10 yr 4/1), hard, with <10% gravel, dry	
64	N/A	24	4.1			
66	N/A	12	4.1			

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear | Geologist: J. Wallace | Begin Drilling: 4/24/2007

Driller: Chris | Total Depth: 68 | End Drilling: 4/24/2007

Drilling Method: Rotosonic | Surface Elev.: 737.050 | Converted to Well: Y | Well I.D.: GM-72

Drilling Fluid: Water | North Coor.: 4496.04384 | East Coor.: 6860.84485

Remarks: Water sample 42-47' @ 0930; 57-62' @ 1325

Project No.: OH000294.0010 | Datum: TOC: 736.778 | Filename: April 2007

ARCADIS

Log of Boring: GM-72

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
								End of boring	

68
70
72
74
76
78

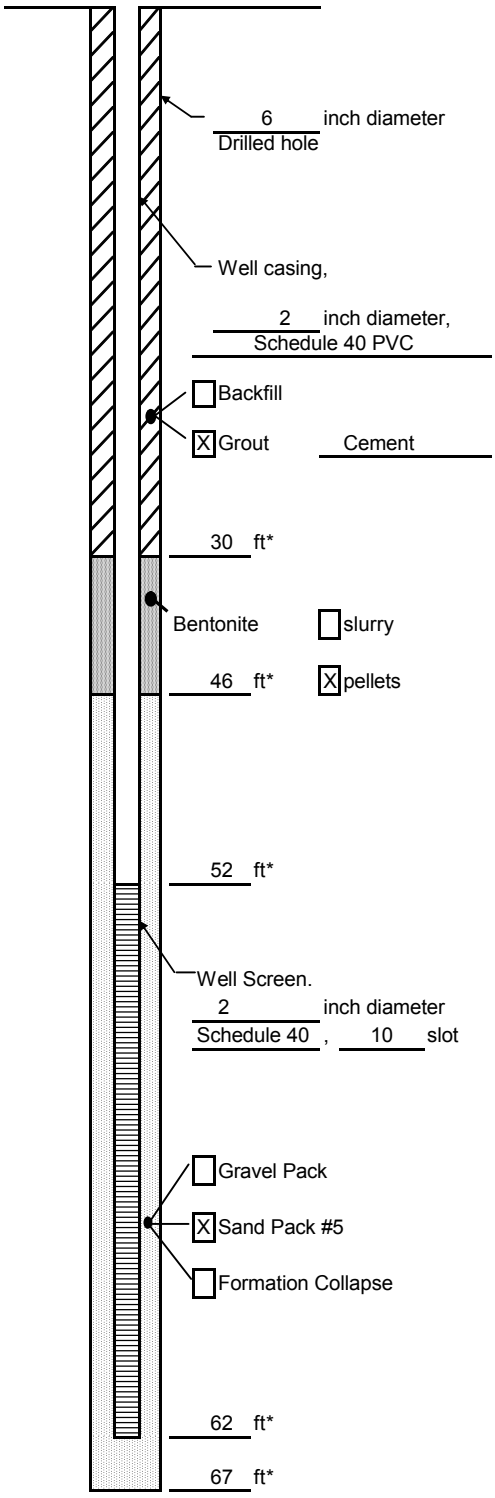
☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: J. Wallace
Begin Drilling: 4/24/2007
Driller: Chris
Total Depth: 68
End Drilling: 4/24/2007
Drilling Method: Rotosonic
Surface Elev.: 737.050
Converted to Well: Y Well I.D.: GM-72
Drilling Fluid: Water
North Coor.: 4496.04384
East Coor.: 6860.84485
Remarks: Water sample 42-47' @ 0930; 57-62' @ 1325
Project No.: OH000294.0010
Datum: TOC: 736.778
Filename: April 2007

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well GM-72

Town/City Moraine

County Montgomery State Ohio

Permit No. N/A

Land-Surface (LS) Elevation and Datum:

737.050 feet [x] Surveyed

[ ] Estimated

Installation Date(s) 4/26/2007

Drilling Method Sonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Fluid Loss During Drilling 15 gallons

Water Removed During Development _____ gallons

Static Depth to Water _____ feet below M.P.

Pumping Depth to Water _____ feet below M.P.

Pumping Duration _____ hours

Yield _____ gpm Date _____

Specific Capacity _____ gpm/ft

Well Purpose Monitoring well

Remarks

Prepared by J. Wallace

ARCADIS

Soil Boring Log

Boring No.: GM-73

Sheet: 1 of 8

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 10/09/2007
Date Completed: 10/09/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Cloudy, 60's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
							See GM-71 and GM-72 logs for 0 to 67 feet.	

Drilling Co.: Frontz
Driller: Dave S.
Drilling Method: Rotosonic
Drilling Fluid: Water
Remarks: SD=Sonic Drilling

Sampling Method: Core Barrel
Sampling Interval: 10 feet
Water Level Start: NA
Water Level Finish: NA
Converted to Well: ☒ Yes ☐ No
Surface Elev.: 734.34 TOC=736.97
North Coor: 4494.3
East Coor: 6842.5

SOIL BORING LOG BORING LOG.GPJ ARCADIS.GDT 2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-73

Sheet: 2 of 8

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 10/09/2007
Date Completed: 10/09/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Cloudy, 60's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
							See GM-71 and GM-72 logs for 0 to 67 feet.	
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								

Remarks:

SOIL BORING LOG_BORING LOG.GPJ_ARCADIS.GDT 2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-73

Sheet: 3 of 8

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 10/09/2007
Date Completed: 10/09/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Cloudy, 60's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
							See GM-71 and GM-72 logs for 0 to 67 feet.	
32								
33								
34								
35								
36								
37								
38								
39								
40								
41								
42								
43								
44								
45								
46								
47								

Remarks:

SOIL BORING LOG_BORING LOG.GPJ_ARCADIS.GDT 2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-73

Sheet: 4 of 8

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 10/09/2007
Date Completed: 10/09/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Cloudy, 60's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
48							See GM-71 and GM-72 logs for 0 to 67 feet.	
49								
50								
51								
52								
53								
54								
55								
56								
57								
58								
59								
60								
61								
62								
63								

Remarks:

SOIL BORING LOG_BORING LOG.GPJ_ARCADIS.GDT 2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-73

Sheet: 5 of 8

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 10/09/2007
Date Completed: 10/09/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Cloudy, 60's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
64							See GM-71 and GM-72 logs for 0 to 67 feet.	
65								
66								
67			12		0.0		CLAY (CL), gray, hard, low plasticity, trace sand and gravel, dry.	
68			24		1.2			
69							SAND (SW), brown, well graded, loose, fine-coarse, trace subangular gravel, moist.	
70			24		0.9			
71							Note: Trace silt at 71 feet.	
72			24	GM-73, 70 to 75 feet, 10/11/07, 12:35	1.6		GRAVELLY SAND (SW), brown, well graded, loose, trace silt, wet.	
73								
74			24		2.2		SAND WITH GRAVEL (SW), brown, well graded, loose, trace silt, wet.	
75								
76			24		1.9		SANDY GRAVEL (GW), grayish brown, well graded, loose, trace silt, wet.	
77								
78			24		3.0			
79								

Remarks:

SOIL BORING LOG_BORING LOG.GPJ_ARCADIS.GDT_2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-73

Sheet: 6 of 8

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 10/09/2007
Date Completed: 10/09/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Cloudy, 60's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
80			24		2.5		SAND (SW), brown, well graded, fine-coarse, medium loose, wet.	
81							SAND (SP), brown, poorly graded, medium loose-medium dense, fine grained, moist.	
82			24	SD	3.6			
83								
84			24		5.2			
85								
86			24		4.8			
87								
88			24		3.6			
89								
90			24		5.6			
91							Note: 3 inch silt seam at 91 feet.	
92			24		3.2		GRAVELLY SAND (SW), brown, well graded, loose, fine-coarse, wet, medium gravel.	
93								
94			24		2.8		Note: Cobbles present at 94 - 96 feet.	
95								

Remarks:

SOIL BORING LOG BORING LOG.GPJ ARCADIS.GDT 2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-73

Sheet: 7 of 8

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 10/09/2007
Date Completed: 10/09/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Cloudy, 60's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
96			24		3.2		GRAVELLY SAND (SW), brown, well graded, loose, fine-coarse, wet, medium gravel. Note: Medium-coarse gravel at 96 feet.	
97								
98			24	GM-73, 95 to 100 feet, 10/11/07, 15:15	4.7			
99								
100			24		2.9			
101								
102			24	SD	0.5		SANDY GRAVEL (GW), grayish brown, well graded, loose, trace silt, wet.	
103								
104			24		2.3			
105								
106			24		3.0			
107								
108			24		2.9			
109								
110			24		1.7			
111								

Remarks:

ARCADIS

Soil Boring Log

Boring No.: GM-73

Sheet: 8 of 8

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 10/09/2007
Date Completed: 10/09/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Cloudy, 60's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
112			24		2.2		SANDY GRAVEL (GW), grayish brown, well graded, loose, trace silt, wet.	
113								
114			24		3.1			
115								
116			24		1.2			
117								
118			24	GM-73, 115 to 120 feet, 10/11/07, 17:50 SD	2.8			
119								
120								
121								
122								
123								
124								
125								
126								
127								

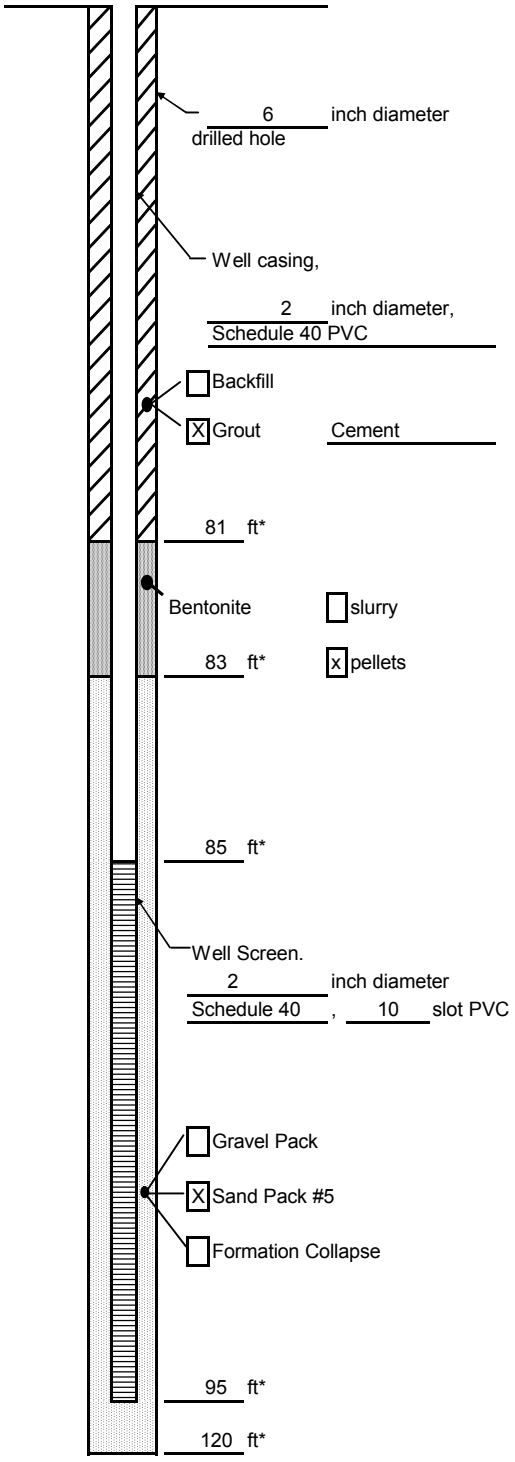
Remarks:

SOIL BORING LOG BORING LOG.GPJ ARCADIS.GDT 2/13/08

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.
* Depth Below Land Surface

Project General Motors Corporation Well GM-73

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

737.34 feet [X] Surveyed [ ] Estimated

Installation Date(s) 9/21/2007

Drilling Method Rotosonic

Drilling Contractor Frontz Driling

Drilling Fluid Water

Development Technique(s) and Date(s)

Submersible pump and surge 10/22/07

Fluid Loss During Drilling 120 gallons

Water Removed During Development 142.3 gallons

Static Depth to Water 30.18 feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration 1.00 hours

Yield NM gpm Date 10/22/07

Specific Capacity NM gpm/ft

Well Purpose GW monitoring

Remarks Formation collapse from 120' to 95' ;
permanent casing set at 63'

	1V	2V	3V	4V	5V
Ph	6.83	6.87	6.90	6.89	6.88
Conductivity	1.82	1.82	1.83	1.82	1.84
Turbidity	1.9	1.2	0.9	1.8	1.1
Temperature:	18.5	18.4	18.4	18.3	18.3

Prepared by L. Greene

ARCADIS

Soil Boring Log

Boring No.: GM-74D

Sheet: 1 of 8

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 08/29/2007
Date Completed: 09/17/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Sunny 70's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
1							Utility clearance with water knife (8-27-07). CONCRETE	
2								
3								
4								
5			0				Material excavated	
6								
7			24	GP	>2000		SAND (SP), brownish gray, poorly graded, fine to medium, trace silt; medium dense, dry, cobbles present.	
8								
9			0	GP			No return.	
10								
11			0	GP			No return, cobble in tooling shoe.	
12								
13			12	GP	906		SAND (SP), brown, poorly graded, fine to medium, trace medium gravel, medium dense, dry.	
14								
15								

Drilling Co.: Frontz
Driller: Dave S.
Drilling Method: Direct push/Rotosonic
Drilling Fluid: Water
Remarks: Permanent casing (10 inch) installed to 30.5 feet.
GP=Geoprobe
SD=Sonic Drilling

Sampling Method: 10 feet x 4 inch Core Barrel
Sampling Interval: 10 feet
Water Level Start: 26 feet
Water Level Finish: --
Converted to Well: ☒ Yes ☐ No
Surface Elev.: 732.5
North Coor: 4203.3
East Coor: 6417.2

SOIL BORING LOG BORING LOG.GPJ ARCADIS.GDT 2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-74D

Sheet: 2 of 8

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 08/29/2007
Date Completed: 09/17/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Sunny 70's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
16			24	GP	570		SAND (SP), brown, poorly graded, fine to medium, trace medium gravel, medium dense, dry.	
17			6	GP	1024		No return.	
18							SAND (SP), brown, poorly graded, fine to medium, trace medium gravel, dense, dry. Note: broken up cobbles.	
19			24	GP	1201			
20								
21			3	GP	473			
22								
23			24	GP	512		SAND (SW), grayish brown, well graded, fine to coarse, trace silt, medium dense, dry; silt is oxidized.	
24								
25			12	GP	37.0		SAND (SW), grayish brown, well graded, fine to coarse, trace silt, medium dense, dry; wet at 26 feet; silt is oxidized.	
26								
27			24		269		SAND (SW), grayish brown, well graded, fine to coarse, trace silt, medium dense, dry silt is oxidized.	
28								
29			24	GM-74, 26 to 31 feet, 8/29/07, 17:30 GP	0.0		SILT (ML), dark gray, very stiff, hard, trace angular gravel, trace clay, dry.	
30								
31			12	GP	0.0			

Remarks:

SOIL BORING LOG BORING LOG.GPJ ARCADIS.GDT 2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-74D

Sheet: 3 of 8

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 08/29/2007
Date Completed: 09/17/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Sunny 70's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
32			12		0.0		CLAYEY SILT (ML), dark gray, very stiff to hard, low plasticity, trace angular gravel, dry.	
33								
34			24		0.3			
35							SAND (SW), orangish brown, well graded, fine to coarse, little gravel, loose, damp.	
36			24	SD	0.5			
37								
38			24		1.6			
39								
40			24		0.0		SANDY GRAVEL (GW), gray, well graded, fine to coarse, loose, wet.	
41								
42			24		0.0			
43								
44			24		0.0			
45								
46			24		0.7		SAND (SW), brown, well graded, fine to coarse, medium loose, trace subrounded gravel, wet.	
47								

Remarks:

SOIL BORING LOG BORING LOG.GPJ ARCADIS.GDT 2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-74D

Sheet: 4 of 8

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 08/29/2007
Date Completed: 09/17/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Sunny 70's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
48			24	GM-74, 45 to 50 feet, (9/17/07, 14:34	1.7		SAND (SW), brown, well graded, fine to coarse, medium loose, trace subrounded gravel, wet.	
49								
50			24		0.0		SILTY SAND (SW), orangish brown, well graded, trace clay, cohesive, very stiff to hard, dry.	
51							CLAYEY SILT (ML), dark gray, very stiff, no plasticity, trace angular gravel, trace sand, dry.	
52			24		0.0			
53								
54			24		0.0			
55				SD			3 inch silt seam at 55 feet.	
56			24		0.0		SILT (ML), gray, cohesive, trace clay, medium stiff, dry.	
57								
58			24		0.0		CLAYEY SILT (ML), dark gray, very stiff, no plasticity, trace angular gravel, trace sand, dry.	
59								
60			24		0.0		CLAYEY SILT (ML), dark gray, very stiff hard, very low plasticity, trace angular gravel, trace sand, and organic material, dry.	
61								
62			24		0.0			
63								

Remarks:

SOIL BORING LOG_BORING LOG.GPJ_ARCADIS.GDT 2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-74D

Sheet: 5 of 8

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 08/29/2007
Date Completed: 09/17/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Sunny 70's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
64							CLAYEY SILT (ML), dark gray, very stiff hard, very low plasticity, trace angular gravel, trace sand, and organic material, dry.	
65				SD			Wood at 65 feet (6 inches)..	
66			24		2.0			
67							SAND (SW), orangish brown, well graded, fine to coarse, some gravel (subround), loose, wet.	
68			24		1.8			
69								
70			24		0.0			
71								
72			24		0.0			
73								
74			24		0.0			
75				SD				
76			24		0.0			
77							SAND (SW), orangish brown, poorly graded, fine to medium grained, cohesive, medium loose, damp.	
78			24		0.0			
79							SILT (ML), gray, medium soft, dry.	

Remarks:

SOIL BORING LOG_BORING LOG.GPJ_ARCADIS.GDT 2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-74D

Sheet: 6 of 8

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 08/29/2007
Date Completed: 09/17/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Sunny 70's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
80							SILT (ML), gray, medium soft, dry.	
81			24		1.7		SAND (SP), gray, poorly graded, fine grained, trace silt, medium loose, wet.	
82			24		8.2			
83							SILT (ML), gray, medium soft to stiff, dry.	
84			24		12.6		SAND (SW), dark gray, well graded, fine to coarse, trace silt, loose, wet.	
85				SD				
86			24		13.8			
87								
88			24		6.1		Note: Some subrounded gravel at 88 feet.	
89								
90			24		2.0		Note: trace small cobbles.	
91								
92			24		1.7			
93							SAND (SW), brownish gray, well graded, fine to coarse, trace gravel, loose, wet.	
94			24		0.5			
95				SD				

Remarks:

SOIL BORING LOG_BORING LOG.GPJ_ARCADIS.GDT_2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-74D

Sheet: 7 of 8

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 08/29/2007
Date Completed: 09/17/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Sunny 70's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
96			24		1.1		SAND (SW), brownish gray, well graded, fine to coarse, trace gravel, loose, wet.	
97								
98			24		1.4			
99								
100			24		1.0		Note: trace small cobbles and some gravel.	
101								
102			24		0.0			
103								
104			24		0.0			
105				SD				
106			24		0.0			
107								
108			24		0.1			
109								
110			24		0.0		SAND (SW), dark gray, well graded, fine to medium, trace gravel, medium loose, wet.	
111								

Remarks:

ARCADIS

Soil Boring Log

Boring No.: GM-74D

Sheet: 8 of 8

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 08/29/2007
Date Completed: 09/17/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Sunny 70's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
112			24		0.7			
113							SANDY GRAVEL (SW), gray, fine to coarse, well graded, loose, wet.	
114			24		0.5			
115				SD			CLAYEY SAND (SW), brown, well graded, little gravel, fine to coarse, cohesive, medium loose to dense, wet.	
116			24		0.0			
117								
118			24		0.0			
119								
120								
121								
122								
123								
124								
125								
126								
127								

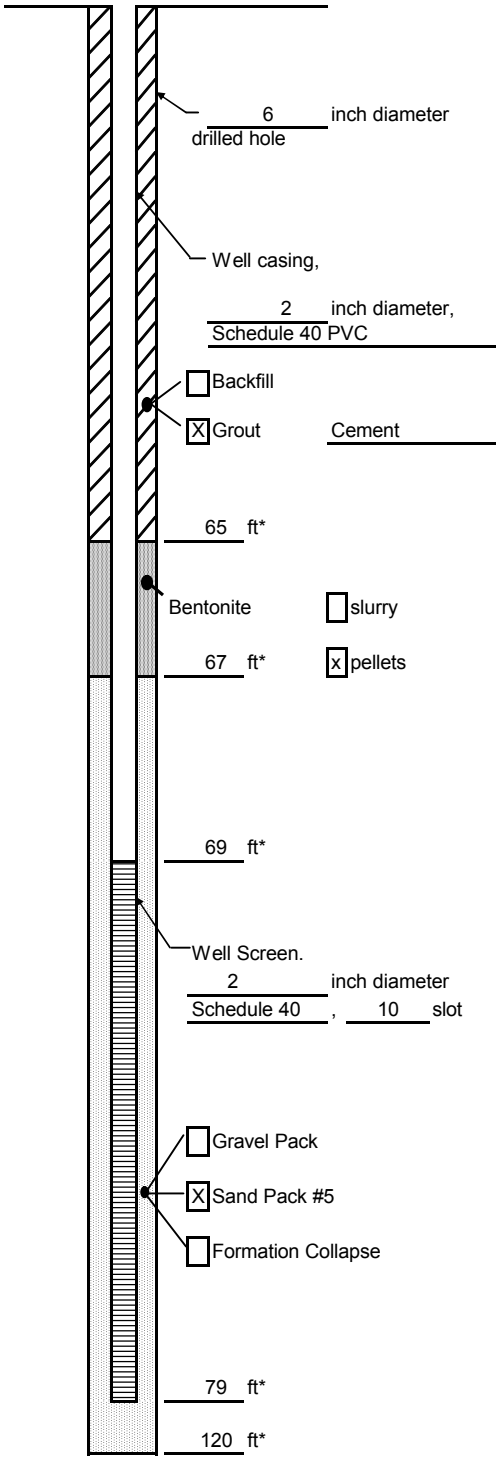
Remarks:

SOIL BORING LOG_BORING LOG.GPJ_ARCADIS.GDT 2/13/08

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.
* Depth Below Land Surface

Project General Motors Corporation Well GM-74D

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

732.49 feet [x] Surveyed [ ] Estimated

Installation Date(s) 9/21/2007

Drilling Method Rotosonic

Drilling Contractor Frontz Driling

Drilling Fluid Water

Development Technique(s) and Date(s)

Submersible pump & surge - 9/24/2007.

Fluid Loss During Drilling _____ gallons

Water Removed During Development _____ gallons

Static Depth to Water _____ feet below M.P.

Pumping Depth to Water _____ feet below M.P.

Pumping Duration _____ hours

Yield _____ gpm Date _____

Specific Capacity _____ gpm/ft

Well Purpose Monitoring Well

Remarks 8" permanent casing to 30.5 feet north well at GM-74 location

Prepared by L. Greene

ARCADIS

Soil Boring Log

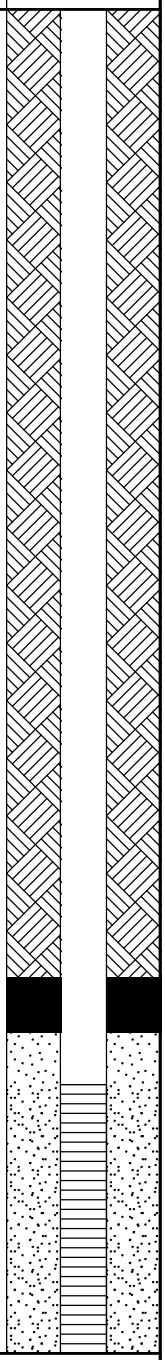
Boring No.: GM-74S

Sheet: 1 of 1

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 09/21/2007
Date Completed: 09/21/2007

Logger: L. Greene
Editor: J.Hunt
Weather Conditions: Sunny 70's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
1–50							See boring log GM-74D for lithologic description.	

Drilling Co.: Frontz
Driller: Dave S.
Drilling Method: Rotosonic
Drilling Fluid: Water
Remarks:

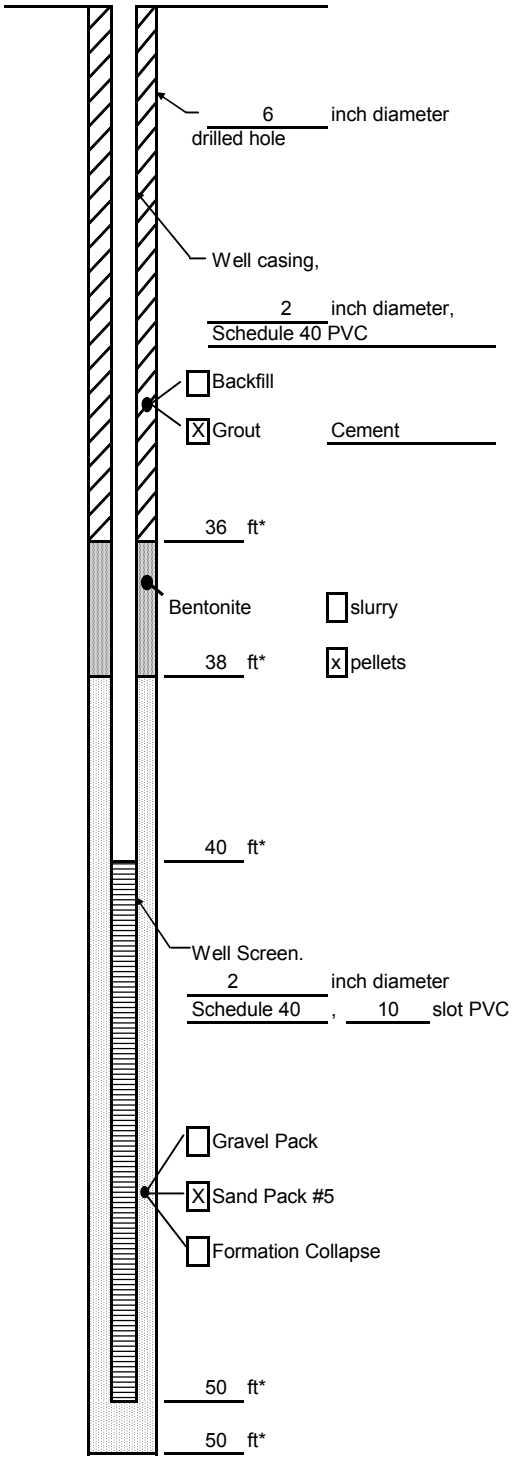
Sampling Method: Core Barrel
Sampling Interval: 10 feet
Water Level Start: NA
Water Level Finish: NA
Converted to Well: ☒ Yes ☐ No
Surface Elev.: 732.52 TOC=732.17
North Coor: 4197.6
East Coor: 6416.5

SOIL BORING LOG BORING LOG.GPJ ARCADIS.GDT 2/13/08

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.
* Depth Below Land Surface

Project General Motors Corporation Well GM-74S

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

732.52 feet [x] Surveyed [ ] Estimated

Installation Date(s) 9/21/2007

Drilling Method Rotosonic

Drilling Contractor Frontz Driling

Drilling Fluid Water

Development Technique(s) and Date(s)

Submersible pump & surge - 9/24/2007. All drilling fluid removed during VAS.

Fluid Loss During Drilling N/A gallons

Water Removed During Development 60 gallons

Static Depth to Water 25.01 feet below M.P.

Pumping Depth to Water 45 feet below M.P.

Pumping Duration 0.30 hours

Yield 3 gpm Date 9/24/07

Specific Capacity NM gpm/ft

Well Purpose Monitoring Well

Remarks South well @ GM-74 location

Time:16:20, 16:23, 16:26, 16:29

pH: 6.66, 6.65, 6.62, 6.60

Conductivity: 2.17, 1.99, 2.01, 1.94

Turbidity: 78, 64, 60, 62

Temperature: 22.3, 22.6, 22.4, 22.0

Prepared by L. Greene

ARCADIS

Soil Boring Log

Boring No.: GM-75D

Sheet: 1 of 8

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 08/29/2007
Date Completed: 09/12/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Sunny 70's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
1							Utility clearing with water knife (8-27-07). CONCRETE	
2								
3								
4							Material excavated	
5								
6								
7								
8								
9								
10								
11	X		12	GP	2000		SAND (SP), dark brown, poorly graded, fine to medium, trace silt and clay, medium dense, dry.	
12								
13	X		10	GP			No return.	
14								
15	X							

Drilling Co.: Frontz
Driller: Dave S.
Drilling Method: Direct push/Rotosonic
Drilling Fluid: Water
Remarks: GP=Geoprobe
SD=Sonic Drilling

Sampling Method: 10 feet x 4 inch Core Barrel
Sampling Interval: 10 feet
Water Level Start: 31.5 feet
Water Level Finish: --
Converted to Well: ☒ Yes ☐ No
Surface Elev.: 738.13 TOC=737.68
North Coor: 4604.3
East Coor: 6622.7

SOIL BORING LOG BORING LOG.GPJ ARCADIS.GDT 2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-75D

Sheet: 2 of 8

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 08/29/2007
Date Completed: 09/12/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Sunny 70's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
16			12	GP	1150		GRAVELLY SAND (SP), brownish gray, poorly graded, medium to coarse, medium loose, 30% gravel (subangular to subrounded), dry.	
17			0	GP			No return.	
18								
19			24	GP	364		GRAVELLY SAND (SP), brownish gray, poorly graded, medium to coarse, medium loose, 30% gravel (subangular to subrounded), dry at 19.5 feet trace of silt, yellowish brown.	
20								
21			0	GP			No return.	
22								
23			24	GP	>2000		GRAVELLY SAND (SP), brownish gray, poorly graded, medium to coarse, medium loose, 30% gravel (subangular to subrounded), dry.	
24								
25			0	GP			No return.	
26								
27			24	GP	>2000		SAND (SP), with gravel, dark yellowish brown, poorly graded, fine to coarse, 15% gravel, medium loose, dry.	
28								
29			0	GP			No return.	
30								
31				GP				

Remarks:

SOIL BORING LOG BORING LOG.GPJ ARCADIS.GDT 2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-75D

Sheet: 3 of 8

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 08/29/2007
Date Completed: 09/12/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Sunny 70's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
32			18		1043		SAND (SP), dark yellowish brown, fine to coarse, 5% to 10% gravel, poorly graded, medium loose, dry, wet at 31.5 feet.	
33			0	GP			No return.	
34								
35			15		>2000		SAND (SW), grayish brown well graded, fine to coarse, some gravel (10%), medium loose, wet.	
36								
37			0	GP GM-75, 35 to 40 feet, 8/29/07, 14:00			No return.	
38								
39			12	GP	155		SAND (SW), grayish brown well graded, fine to coarse, some gravel (10%), medium loose, wet.	
40								
41			24		1.0		GRAVELLY SAND (SW), brownish gray, well graded, trace cobbles, medium coarse, loose, wet.	
42			24		0.7			
43								
44			24		0.3			
45				SD				
46			24		0.2		Note: Trace of silt at 46 feet.	
47								

Remarks:

ARCADIS

Soil Boring Log

Boring No.: GM-75D

Sheet: 4 of 8

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 08/29/2007
Date Completed: 09/12/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Sunny 70's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
48			24		1.1		SAND (SW), brownish gray, well graded, trace cobbles, medium to coarse, loose, wet.	
49							GRAVELLY SAND (SW), brownish gray well graded, trace cobbles, medium to coarse, loose, wet.	
50								
51			24		0.8			
52			24		0.0		SILT (ML), dark gray, trace gravel, stiff to very stiff, dry (till), trace clay.	
53								
54			24		0.1			
55							SILT (ML), dark gray, black mottling (organic), medium loose to medium dense, dry.	
56			24		0.6		SAND (SP), brown, poorly graded, fine to coarse, medium loose, wet.	
57								
58			24	GM-75, 56 to 61 feet, 9/14/07, 12:00	1.1			
59								
60							Note: Brownish gray and damp at 60 feet.	
61			24		0.0			
62			24		0.0			
63								

Remarks:

ARCADIS

Soil Boring Log

Boring No.: GM-75D

Sheet: 5 of 8

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 08/29/2007
Date Completed: 09/12/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Sunny 70's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
64			24		0.0		CLAYEY SILT (ML), dark gray, very stiff; hard, trace gravel and sand, dry.	
65				SD				
66			24		0.0			
67								
68			24		1.7			
69							GRAVELLY SAND (SW), yellowish brown, well graded, fine to coarse, loose, wet.	
70			24		0.0			
71								
72			24		0.0			
73								
74			24		0.0			
75				SD				
76			24		0.0			
77								
78			24		0.3			
79							SAND (SW), brownish gray, well graded, (20% gravel), medium loose, wet.	

Remarks:

ARCADIS

Soil Boring Log

Boring No.: GM-75D

Sheet: 6 of 8

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 08/29/2007
Date Completed: 09/12/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Sunny 70's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
80							SAND (SW), brownish gray, well graded, (20% gravel), medium loose, wet.	
81			24		39.7		SAND (SW), brown, poorly graded, fine to medium, medium loose, damp.	
82			24		59.2		Note: Brownish gray, and oxidation at 82 feet.	
83								
84			24		5.6		SILTY SAND (SW), gray, fine grained, medium loose to medium dense, damp.	
85				SD				
86			24		11.6		Note: Clayey silt seam at 86 feet (3 inches).	
87							SAND (SP), brownish gray, poorly graded, medium loose, damp.	
88			24		1.1		SAND (SW), brownish gray, well graded, fine to coarse, trace clay and gravel, dense, damp.	
89							GRAVELLY SAND (SW), brownish gray, fine to coarse, loose, wet.	
90								
91			24		1.0		SANDY GRAVEL (GW), gray, well graded, fine to coarse, loose, wet.	
92			24		2.7			
93								
94			24		3.4			
95				SD				

Remarks:

SOIL BORING LOG BORING LOG.GPJ ARCADIS.GDT 2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-75D

Sheet: 7 of 8

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 08/29/2007
Date Completed: 09/12/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Sunny 70's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
96			24		3.0		SANDY GRAVEL (GW), gray, well graded, fine to coarse, loose, wet.	
97								
98			24		1.2			
99								
100			24		0.0		Note: cobbles present at 100 feet.	
101								
102			24		0.9			
103								
104			24		0.0			
105				SD				
106			24		0.0			
107								
108			24		0.0			
109								
110			24		0.0			
111								

Remarks:

SOIL BORING LOG_BORING LOG.GPJ_ARCADIS.GDT_2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-75D

Sheet: 8 of 8

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 08/29/2007
Date Completed: 09/12/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Sunny 70's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
112			24		0.7		SAND (SW), gray, well graded, fine to coarse, trace gravel, medium loose, wet.	
113								
114			24		1.0		SAND (SW), grayish brown, poorly graded, fine grained, medium loose, damp.	
115				SD				
116			24		0.3			
117								
118			24		0.0		Note: Trace large gravel at 118 feet.	
119								
120								
121								
122								
123								
124								
125								
126								
127								

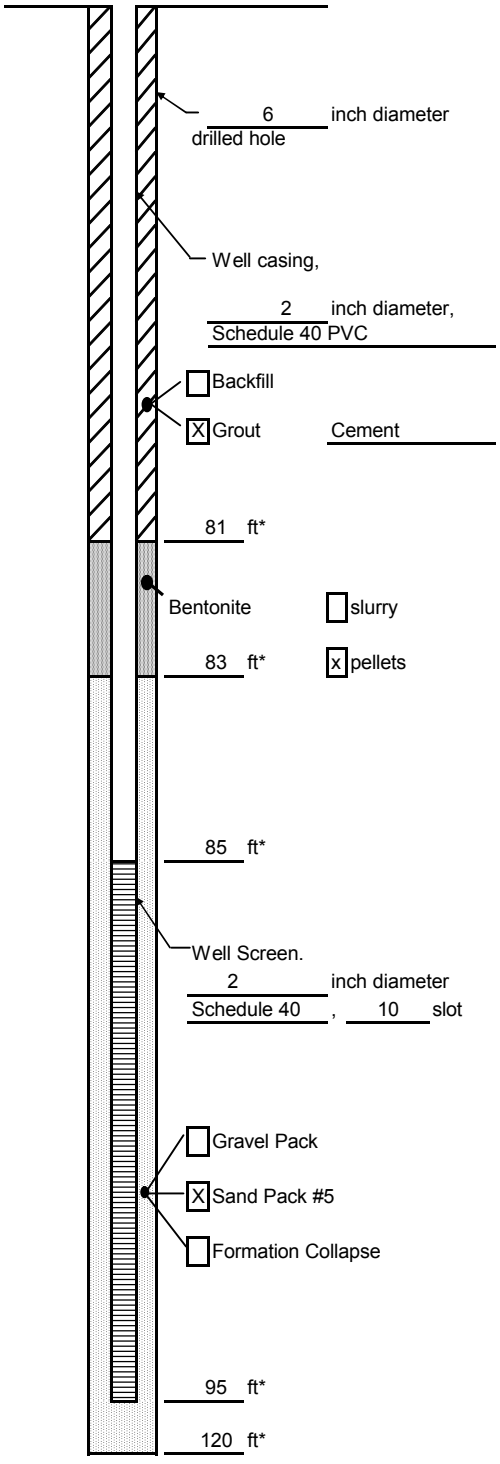
Remarks:

SOIL BORING LOG_BORING LOG.GPJ_ARCADIS.GDT 2/13/08

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.
* Depth Below Land Surface

Project General Motors Corporation Well GM-75D

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

738.13 feet [x] Surveyed [ ] Estimated

Installation Date(s) 9/20/2007

Drilling Method Rotosonic

Drilling Contractor Frontz Driling

Drilling Fluid Water

Development Technique(s) and Date(s)

Submersible pump & surge - 9/25/2007. All drilling fluid removed during VAS.

Fluid Loss During Drilling N/A gallons

Water Removed During Development 60 gallons

Static Depth to Water 30.53 feet below M.P.

Pumping Depth to Water 90 feet below M.P.

Pumping Duration 0.30 hours

Yield 3 gpm Date 9/25/07

Specific Capacity NM gpm/ft

Well Purpose Monitoring Well

Remarks West well at GM-75 location

Time: 11:30, 11:33, 11:36, 11:39

pH: 6.34, 6.34, 6.31, 6.33

Conductivity: 1.70, 1.80, 1.77, 1.79

Turbidity: 338, 210, 10, 198

Temperature: 18.7, 18.7, 18.7, 18.5

Prepared by L. Greene

ARCADIS

Soil Boring Log

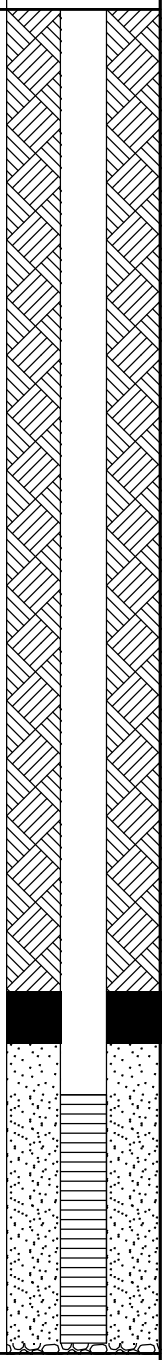
Boring No.: GM-75S

Sheet: 1 of 1

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 09/18/2007
Date Completed: 09/18/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Sunny 70's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
1–52							See boring log GM-75D for lithologic description.	

Drilling Co.: Frontz
Driller: Dave S.
Drilling Method: Rotosonic
Drilling Fluid: Water
Remarks:

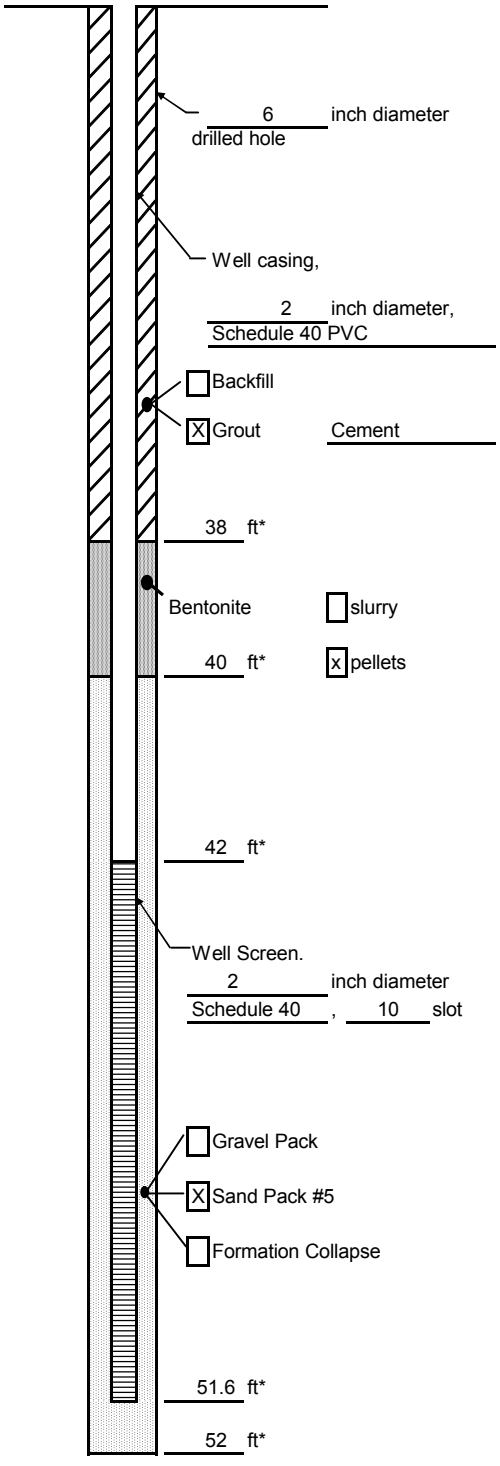
Sampling Method: Core Barrel
Sampling Interval: 10 feet
Water Level Start: NA
Water Level Finish: NA
Converted to Well: ☒ Yes ☐ No
Surface Elev.: 738.26 TOC=737.69
North Coor: 4604.6
East Coor: 6634.7

SOIL BORING LOG BORING LOG.GPJ ARCADIS.GDT 2/13/08

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.
* Depth Below Land Surface

Project General Motors Corporation Well GM-75S

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

738.26 feet [x] Surveyed [ ] Estimated

Installation Date(s) 9/18/2007

Drilling Method Rotosonic

Drilling Contractor Frontz Driling

Drilling Fluid Water

Development Technique(s) and Date(s)

Submersible pump & surge - 9/25/2007. All drilling fluid removed during VAS.

Fluid Loss During Drilling NA gallons

Water Removed During Development 60 gallons

Static Depth to Water 30.44 feet below M.P.

Pumping Depth to Water 47 feet below M.P.

Pumping Duration 0.30 hours

Yield 3 gpm Date 9/25/07

Specific Capacity NM gpm/ft

Well Purpose Monitoring Well

Remarks East well @ GM-75 location

Time: 10:50, 10:53, 10:56, 10:59

pH: 6.52, 6.57, 6.50, 6.51

Conductivity: 1.45, 1.39, 1.37, 1.36

Turbidity: 435, 222, 113, 87

Temperature: 20.2, 20.1, 19.8, 19.8

Prepared by L. Greene

ARCADIS

Soil Boring Log

Boring No.: GM-76D

Sheet: 1 of 8

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 07/06/2007
Date Completed: 07/09/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Indoor

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
1							CONCRETE	
2							SAND WITH GRAVEL (SP), brown, poorly graded, medium-coarse, 25-30% gravel (subrounded), fine-coarse, dry.	
3								
4								
5								
6								
7								
8								
9								
10								
11			24		0.3		SAND WITH GRAVEL (SP), dark brown, poorly graded, fine-coarse, 15% gravel (subrounded), medium-loose, dry.	
12								
13			24		2.5			
14								
15			24		11.9			

Drilling Co.: Boart Longyear
Driller: Walter Tidwell
Drilling Method: Rotosonic
Drilling Fluid: Water
Remarks: Non-invasive water knife/vac used to elevation to 10 feet.
SD=Sonic Drilling

Sampling Method: Core Barrel
Sampling Interval: 10 feet
Water Level Start: 34 feet
Water Level Finish: --
Converted to Well: ☒ Yes ☐ No
Surface Elev.: 739.48 TOC=738.94
North Coor: 5391.8
East Coor: 6729.9

SOIL BORING LOG BORING LOG.GPJ ARCADIS.GDT 2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-76D

Sheet: 2 of 8

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 07/06/2007
Date Completed: 07/09/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Indoor

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
16			24	SD	10.0		SAND WITH GRAVEL (SP), dark brown, poorly graded, fine-coarse, 15% gravel (subrounded), medium-loose, dry.	
17							Note: pale brown (10 YR 6/3) at 17 feet.	
18			12		5.1			
19							No return.	
20								
21								
22								
23								
24								
25				SD				
26			24		6.0		SAND (SP), pale brown (10 YR 6/3), poorly graded, fine-coarse, trace gravel, medium-loose, dry.	
27								
28			24		2.5			
29								
30								
31			24		1.5		CLAYEY SAND (SP), grayish brown, poorly graded (10 YR 5/2), low plasticity, fine-medium grained, 20% clay, medium-soft, moist.	

Remarks:

SOIL BORING LOG_BORING LOG.GPJ_ARCADIS.GDT_2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-76D

Sheet: 3 of 8

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 07/06/2007
Date Completed: 07/09/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Indoor

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
32			24		0.8		CLAYEY SAND (SP), grayish brown, poorly graded (10 YR 5/2), low plasticity, fine-medium grained, 20% clay, medium-soft, moist.	
33							SAND (SP), dark gray (10 YR 4/1), poorly graded, trace clay and gravel, damp.	
34			24	GM-76, 32 to 36 feet, 7/6/07, 12:33	0.7		SAND AND GRAVEL (GW), gray (10 YR 5/1), well graded, fine-medium, 15% coarse sand, wet.	
35								
36			24		0.7		SILTY SAND (SP), brown (10 YR 5/3), poorly graded, fine, cohesive, slight dense, moist.	
37								
38			24		0.6		SAND (SP), dark gray 910 YR 4/1), poorly graded, trace clay and gravel, damp.	
39							CLAYEY SILT (ML), gray (10 YR 5/1), very stiff, trace gravel, low plasticity, dry.	
40			24		8.9			
41								
42			24		3.1			
43								
44			24		0.7			
45								
46			24		1.7			
47								

Remarks:

ARCADIS

Soil Boring Log

Boring No.: GM-76D

Sheet: 4 of 8

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 07/06/2007
Date Completed: 07/09/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Indoor

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
48			12		0.8		CLAYEY SILT (ML), gray (10 YR 5/1), very stiff, trace gravel, low plasticity, dry.	
49							SAND (SP), very dark grayish brown (10 YR 3/2), poorly graded, fine-medium, loose, damp.	
50			24	GM-76, 48 to 52 feet, 7/6/07, 18:45	1.1			
51							CLAYEY SAND (SP), very dark grayish brown (10 YR 3/2), poorly graded, fine, trace gravel, damp.	
52			24		0.2			
53								
54			24		0.7		SILT (ML), very dark grayish brown (10 YR 3/2), trace sand and gravel, stiff-very stiff, dry.	
55				SD				
56			24		1.7		CLAYEY SILT, very dark grayish brown (10 YR 3/2), trace sand and gravel, stiff-very stiff, low plasticity, dry.	
57								
58			24		2.3			
59								
60			24		32			
61								
62			24		50.1			
63								

Remarks:

SOIL BORING LOG BORING LOG.GPJ ARCADIS.GDT 2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-76D

Sheet: 5 of 8

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 07/06/2007
Date Completed: 07/09/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Indoor

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
64			24		50.8		CLAYEY SILT, very dark grayish brown (10 YR 3/2), trace sand and gravel, stiff-very stiff, low plasticity, dry.	
65				SD				
66			24		48.7			
67								
68			24		35.1			
69								
70			24		13.5		SANDY GRAVEL (GW), grayish brown (10 YR 5/2), well graded, 30% sand, wet.	
71								
72			24	GM-76, 70 to 74 feet, 7/9/07, 08:55	2.6		SAND WITH GRAVEL (SW), grayish brown (10 YR 5/2), well graded, fine-coarse, wet.	
73								
74			24		7.6		GRAVEL (GP), grayish brown (10 YR 5/2), poorly graded, coarse, round-subround, wet.	
75							SAND (SP), grayish brown (10 YR 5/2), poorly graded, fine-medium grained, wet.	
76			24		1.4			
77								
78			24		11.7			
79								

Remarks:

SOIL BORING LOG_BORING LOG.GPJ_ARCADIS.GDT_2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-76D

Sheet: 6 of 8

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 07/06/2007
Date Completed: 07/09/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Indoor

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
80							SAND (SP), grayish brown (10 YR 5/2), poorly graded, fine-medium grained, wet.	
81			24		25.9		SILTY SAND (SP), grayish brown (10 YR 5/2), poorly graded, fine, dense, damp.	
82			24		27.9		SAND (SP), grayish brown (10 YR 5/2), poorly graded, fine-medium, medium dense, damp.	
83								
84			24		31.8			
85								
86			24		33.3			
87								
88			24		33.7			
89								
90				GM-76, 88 to 92 feet, 7/9/07, 11:58			No return.	
91								
92								
93								
94								
95				SD				

Remarks:

SOIL BORING LOG BORING LOG.GPJ ARCADIS.GDT 2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-76D

Sheet: 7 of 8

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 07/06/2007
Date Completed: 07/09/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Indoor

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
96							No return.	
			24		1.7			
97							SANDY GRAVEL (GW), gray (10 YR 5/1), well sorted, medium-coarse, wet.	
98			24		0.9			
99								
100							No return.	
101								
102								
103								
104								
105				SD				
106			24		24.8		SAND (SW), dark grayish brown (10 YR 4/2), well sorted, fine-coarse, trace gravel, damp.	
107								
108			24		21.9			
109								
110								
			24		28.3		Note: Little gravel at 110 feet.	
111								

Remarks:

SOIL BORING LOG BORING LOG.GPJ ARCADIS.GDT 2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-76D

Sheet: 8 of 8

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 07/06/2007
Date Completed: 07/09/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Indoor

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
112			24		31.1		SAND (SW), dark grayish brown (10 YR 4/2), well sorted, fine-coarse, trace gravel, damp.	
113							GRAVELLY SAND (SP), grayish brown (10 YR 5/2), poorly graded, medium loose, damp.	
114			24		30.3			
115							SILTY SAND (SP), brown (10 YR 5/3), poorly graded, fine, medium dense, damp.	
116			24		25.6			
117								
118			24	GM-76, 116 to 120 feet, 7/9/07, 18:08	27.7			
119								
120								
121								
122								
123								
124								
125								
126								
127								

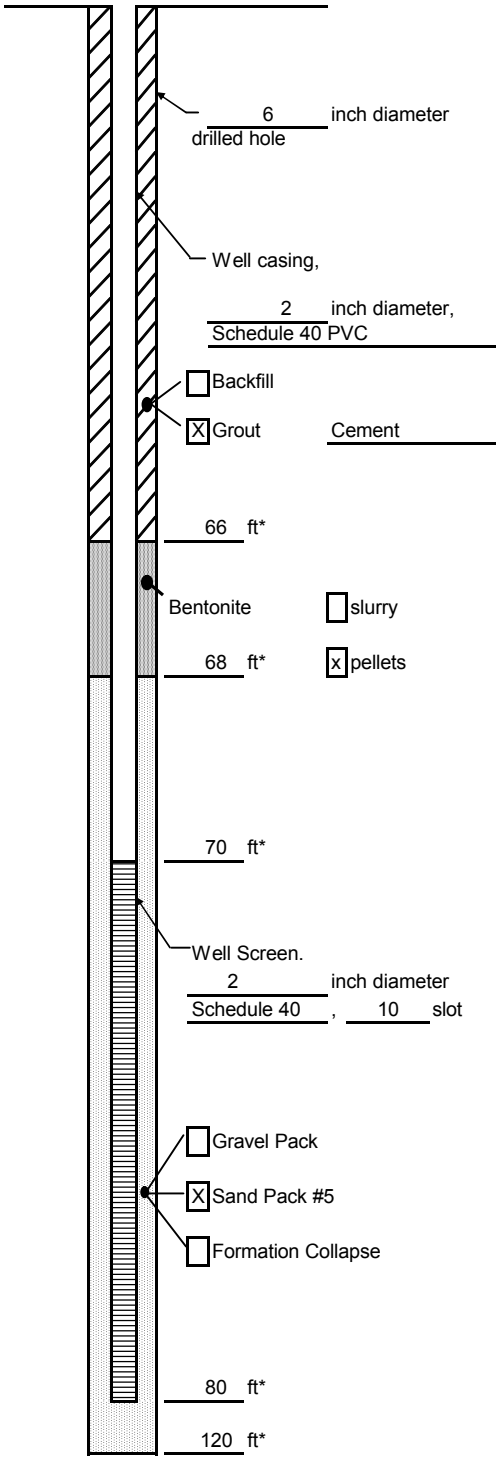
Remarks:

SOIL BORING LOG_BORING LOG.GPJ_ARCADIS.GDT 2/13/08

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.
* Depth Below Land Surface

Project General Motors Corporation Well GM-76D

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

739.48 feet [X] Surveyed [ ] Estimated

Installation Date(s) 7/10/2007

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Pump and surge - 7/10/07

Fluid Loss During Drilling N/A gallons

Water Removed During Development ~45 gallons

Static Depth to Water 29.55 feet below M.P.

Pumping Depth to Water 87 feet below M.P.

Pumping Duration ~.5 hours

Yield ~1.5 gpm Date 7/10/07

Specific Capacity NM gpm/ft

Well Purpose GW Monitoring

Remarks GW Parameters (1V = 8.1 gallons)

	1V	2V	3V	4V	5V
pH:	7.64	7.17	7.10	7.11	7.01
Conductivity:	1.40	1.42	1.41	1.40	1.39
Turbidity:	0	37	0	5	6
Temperature:	20.8	20.5	20.9	20.4	20.4

Prepared by L. Greene

ARCADIS

Soil Boring Log

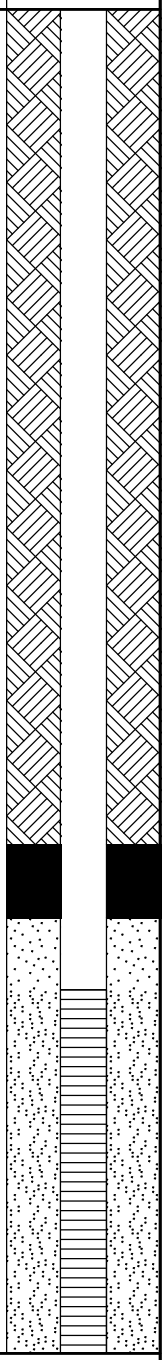
Boring No.: GM-76S

Sheet: 1 of 1

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 07/08/2007
Date Completed: 07/08/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Indoors

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
1–37							See boring log GM-76D for lithologic description.	

Drilling Co.: Frontz
Driller: Dave S.
Drilling Method: Rotosonic
Drilling Fluid: Water
Remarks:

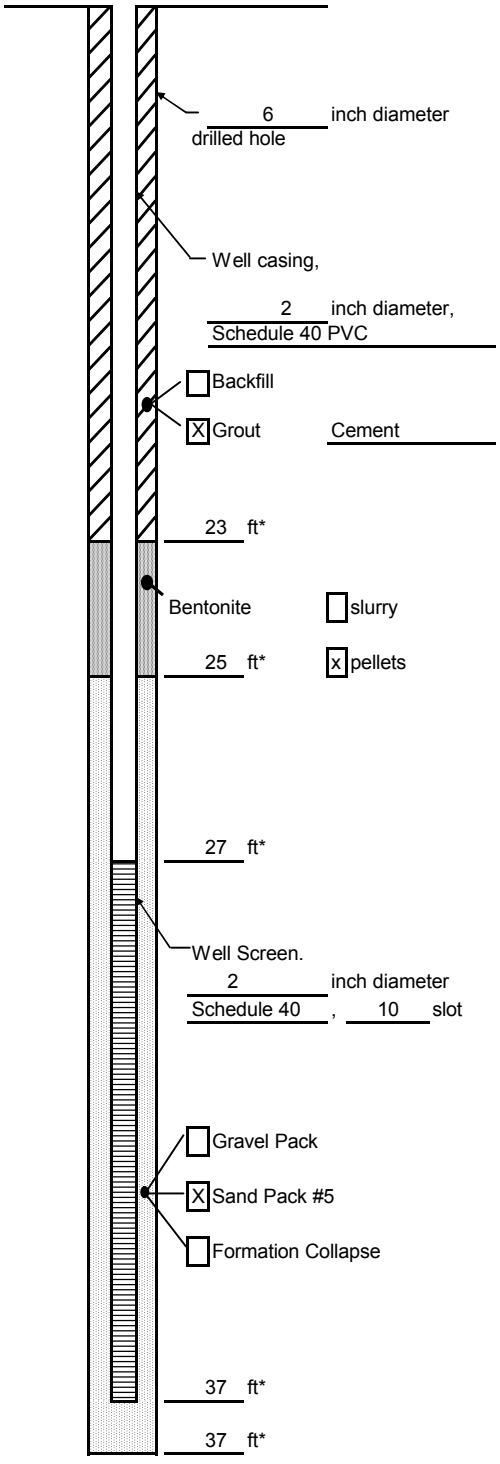
Sampling Method: Core Barrel
Sampling Interval: 10 feet
Water Level Start: NA
Water Level Finish: NA
Converted to Well: ☒ Yes ☐ No
Surface Elev.: 739.49 TOC=739.00
North Coor: 5396.6
East Coor: 6730.8

SOIL BORING LOG BORING LOG.GPJ ARCADIS.GDT 2/13/08

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.
* Depth Below Land Surface

Project General Motors Corporation Well GM-76S

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

739.49 feet [X] Surveyed [ ] Estimated

Installation Date(s) 7/8/2007

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Pump & surge - 7/10/07

Fluid Loss During Drilling 50 gallons

Water Removed During Development 50 gallons

Static Depth to Water 29.44 feet below M.P.

Pumping Depth to Water 35' feet below M.P.

Pumping Duration 7.00 hours

Yield ~1.5 gpm Date 9/25/07

Specific Capacity NM gpm/ft

Well Purpose GW Monitoring

Remarks GW Parameters (IV = 1.2 gallons)

	1V	2V	3V	4V	5V	6V
pH -	8.52	8.01	8.60	7.90	7.79	7.69
Conductivity:	.718	.619	.589	.640	.653	.651
Turbidity:	1	0	999	1	0	0
Temperature:	23.3	22.0	22.5	21.8	21.7	21.7

Prepared by L. Greene

ARCADIS

Soil Boring Log

Boring No.: GM-77D

Sheet: 1 of 7

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 09/05/2007
Date Completed: 09/07/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Sunny 80's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
1							Sand and Gravel - utility clearance with water knife (9/4/07).	
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12			24		0.0		SAND WITH GRAVEL (SW), light grayish brown, well graded, fine to coarse, fine to coarse gravel, medium loose, dry.	
13								
14			24		0.0			
15								

Drilling Co.: Frontz
Driller: Dave S.
Drilling Method: Rotosonic
Drilling Fluid: Water
Remarks: SD=Sonic Drilling

Sampling Method: 10 feet x 6 inch Core Barrel
Sampling Interval: 10 feet
Water Level Start: 34 feet
Water Level Finish: --
Converted to Well: ☒ Yes ☐ No
Surface Elev.: 741.52 TOC=740.93
North Coor: 3615.4
East Coor: 7740.8

SOIL BORING LOG BORING LOG.GPJ ARCADIS.GDT 2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-77D

Sheet: 2 of 7

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 09/05/2007
Date Completed: 09/07/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Sunny 80's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
16			24	SD	0.0		SAND WITH GRAVEL (SW), light grayish brown, well graded, fine to coarse, fine to coarse gravel, medium loose, dry.	
17								
18			24		0.0			
19								
20			24		0.0		Note: Cobbles present at 20 feet.	
21								
22			24		0.0			
23								
24			24		0.0			
25				SD				
26			24		0.0			
27								
28			24		0.0			
29								
30			24		0.0			
31								

Remarks:

SOIL BORING LOG BORING LOG.GPJ ARCADIS.GDT 2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-77D

Sheet: 3 of 7

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 09/05/2007
Date Completed: 09/07/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Sunny 80's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
32			24		0.0		SAND WITH GRAVEL (SW), light grayish brown, well graded, fine to coarse, fine to coarse gravel, medium loose, dry.	
33								
34			24		0.0		SANDY GRAVEL (GW), brown, well graded, medium grained, medium loose, wet.	
35							SAND (SP), brown, poorly graded, fine to coarse, medium loose, some gravel, wet.	
36			24		0.0			
37								
38			24	GM-77, 35 to 40 feet, 9/6/07, 8:42	0.0			
39								
40								
41			24		0.0		SANDY GRAVEL (GW), well graded, medium to coarse, loose, wet.	
42			24		0.0			
43							SANDY SILT (ML), brownish gray, little gravel, medium stiff, very moist.	
44			24		0.0			
45				SD				
46			24		0.0		SILT (ML), grayish brown with orange mottling, trace sand and gravel, stiff to very stiff, dry.	
47								

Remarks:

ARCADIS

Soil Boring Log

Boring No.: GM-77D

Sheet: 4 of 7

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 09/05/2007
Date Completed: 09/07/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Sunny 80's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
48			24		0.0		CLAYEY SILT (ML), gray, trace coarse sand, clay and gravel (angular to subrounded), very stiff to hard, dry.	
49								
50			24		0.0			
51								
52			24		0.0			
53								
54			24		0.0			
55				SD				
56			24		0.0			
57								
58			24		0.0			
59								
60			24		0.0			
61								
62			24		0.0			
63								

Remarks:

ARCADIS

Soil Boring Log

Boring No.: GM-77D

Sheet: 5 of 7

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 09/05/2007
Date Completed: 09/07/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Sunny 80's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
64			24		0.0		CLAYEY SILT (ML), gray, trace coarse sand, clay and gravel (angular to subrounded), very stiff to hard, dry.	
65				SD				
66			24		0.0			
67								
68			24		0.0			
69								
70			24		0.0			
71								
72			24		0.0			
73							SAND (SP), brown, poorly graded, medium to coarse, trace gravel and trace silt, loose, wet.	
74			24		0.0		Note: Little gravel and silt at 74 feet.	
75				SD				
76			24		0.0		SAND (SP), brown, medium to coarse, some gravel and trace silt, well graded, loose, wet.	
77								
78			24		0.0		SAND (SP), brown, well graded, medium to coarse, with coarse gravel and trace cobbles (70 to 80 feet exhibits upward fining) trace silt, loose, wet.	
79								

Remarks:

SOIL BORING LOG BORING LOG.GPJ ARCADIS.GDT 2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-77D

Sheet: 6 of 7

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 09/05/2007
Date Completed: 09/07/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Sunny 80's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
80								
81			24		0.0		GRAVEL (GW), gray, well graded, medium to coarse, 15% coarse sand, loose, wet.	
82			24		0.0		SAND (SP), yellowish brown, poorly graded, fine (some medium), trace silt, medium loose, wet.	
83								
84			24		0.0			
85				SD				
86			24		0.0		SAND (SP), yellowish brown, poorly graded, fine (some medium), trace silt, medium loose, wet. Note: Gray mottling.	
87								
88			24		0.0		SAND (SP), grayish brown, poorly graded, fine (some medium), trace silt, medium loose, wet.	
89							SILTY SAND (SP), grayish brown, fine, medium loose, moist.	
90							CLAYEY SILT (ML), grayish brown, low plasticity, moist.	
91			24		0.0		SAND (SP), yellowish brown, poorly graded, fine to medium, loose to medium loose, wet.	
92			24		0.0		SILTY SAND (SP), yellowish brown, fine, medium to soft, wet.	
93							SAND (SW), grayish brown, well graded, fine to coarse, loose, wet.	
94			24		0.0			
95				SD			SAND (SW), dark gray, well graded, fine to coarse, loose, wet.	

Remarks:

ARCADIS

Soil Boring Log

Boring No.: GM-77D

Sheet: 7 of 7

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 09/05/2007
Date Completed: 09/07/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Sunny 80's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
96			24		0.0		SAND (SW), dark gray, well graded, fine to coarse, loose, wet.	
97							SILT (ML), dark gray with black mottling, trace gravel, medium stiff to soft, dry, organic material and odor.	
98			24		0.0			
99							SILT (ML), dark gray, trace sand and clay and gravel, stiff, dry.	
100								
101								
102								
103								
104								
105								
106								
107								
108								
109								
110								
111								

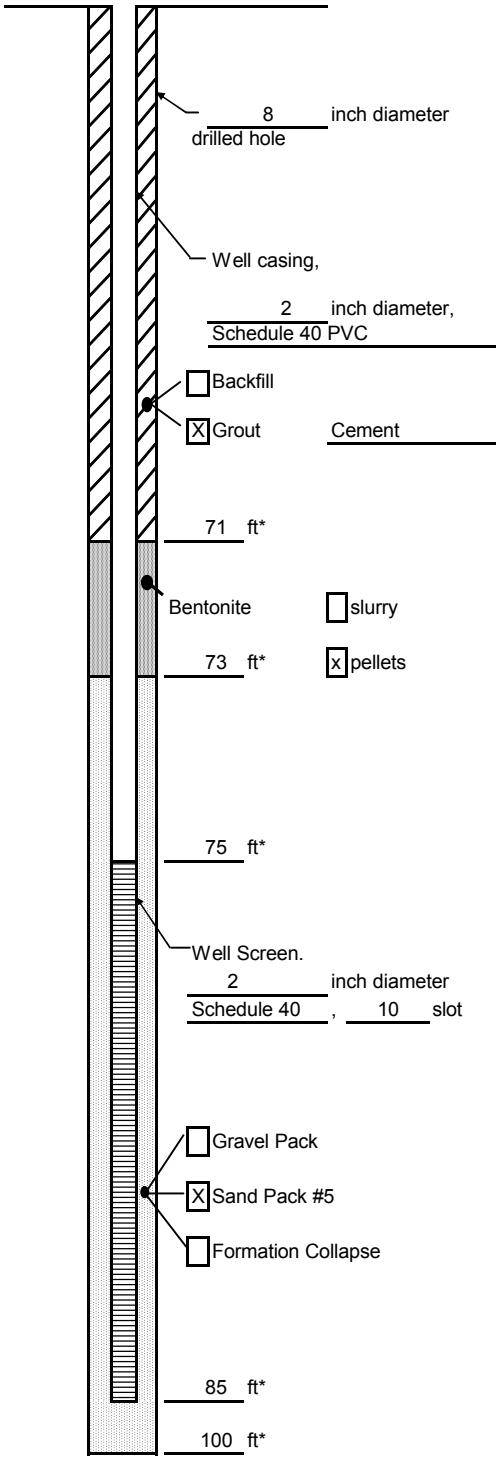
Remarks:

SOIL BORING LOG_BORING LOG.GPJ_ARCADIS.GDT_2/13/08

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.
* Depth Below Land Surface

Project General Motors Corporation Well GM-77D

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

741.52 feet [x] Surveyed [ ] Estimated

Installation Date(s) 9/11/2007

Drilling Method Rotosonic

Drilling Contractor Frontz Driling

Drilling Fluid Water

Development Technique(s) and Date(s)

Submersible pump & surge - 9/25/2007. All drilling fluid removed during VAS.

Fluid Loss During Drilling N/A gallons

Water Removed During Development 40 gallons

Static Depth to Water 33.98 feet below M.P.

Pumping Depth to Water 80 feet below M.P.

Pumping Duration 0.30 hours

Yield 3 gpm Date 9/25/07

Specific Capacity NM gpm/ft

Well Purpose Monitoring Well

Remarks Collapse from 100' to 85'

Time: 9:05, 9:08, 9:11, 9:14

pH: 6.81, 6.74, 6.73, 6.77

Conductivity: 1.37, 1.29, 1.28, 1.35

Turbidity: 999, 672, 547, 77

Temperature: 17.6, 17.5, 17.2, 17.2

Prepared by L. Greene

ARCADIS

Soil Boring Log

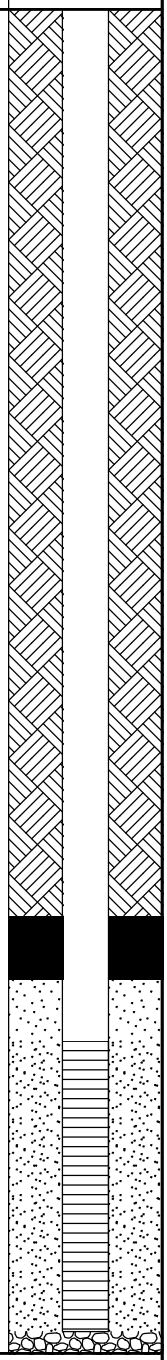
Boring No.: GM-77S

Sheet: 1 of 1

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 09/12/2007
Date Completed: 09/12/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Sunny 80's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
1–43							See boring log GM-75D for lithologic description.	

Drilling Co.: Frontz
Driller: Dave S.
Drilling Method: Rotosonic
Drilling Fluid: Water
Remarks:

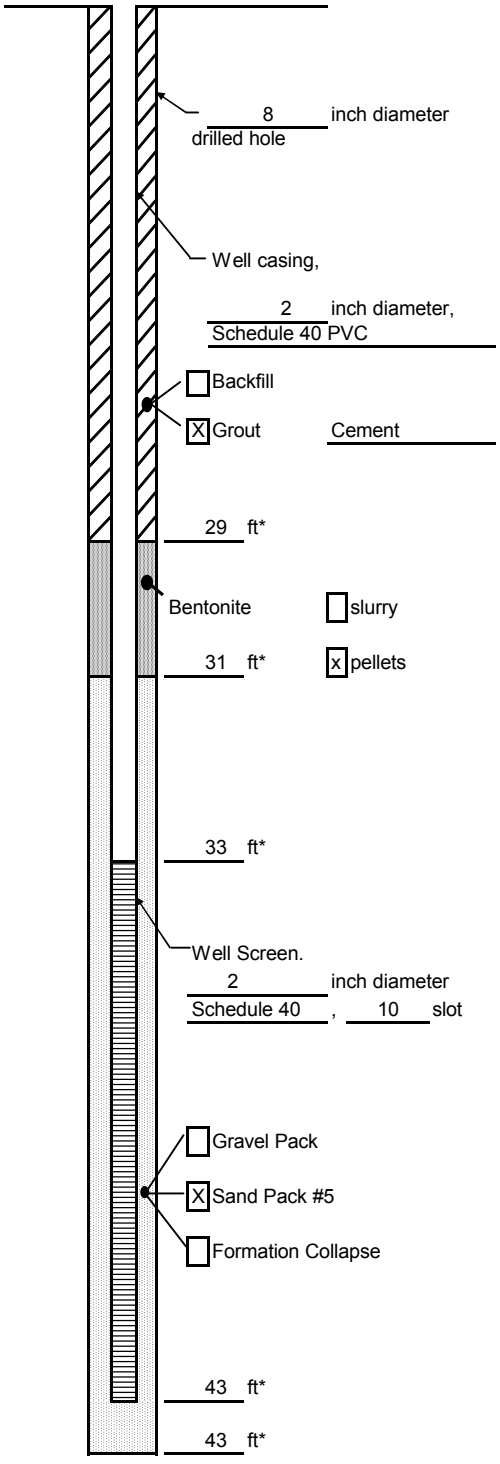
Sampling Method: Core Barrel
Sampling Interval: 10 feet
Water Level Start: NA
Water Level Finish: NA
Converted to Well: ☒ Yes ☐ No
Surface Elev.: 741.49 TOC=741.14
North Coor: 3618.3
East Coor: 7743.0

SOIL BORING LOG BORING LOG.GPJ ARCADIS.GDT 2/13/08

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.
* Depth Below Land Surface

Project General Motors Corporation Well GM-77S

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

741.49 feet [x] Surveyed [ ] Estimated

Installation Date(s) 9/12/2007

Drilling Method Rotosonic

Drilling Contractor Frontz Driling

Drilling Fluid Water

Development Technique(s) and Date(s)

Submersible pump & surge - 9/25/2007. All drilling fluid removed during VAS.

Fluid Loss During Drilling N/A gallons

Water Removed During Development 30 gallons

Static Depth to Water 33.71 feet below M.P.

Pumping Depth to Water 38 feet below M.P.

Pumping Duration 0.20 hours

Yield 3 gpm Date 9/25/07

Specific Capacity NM gpm/ft

Well Purpose Monitoring Well

Remarks

Time: 9:40, 9:43, 9:46, 9:49

pH: 7.66, 7.64, 7.70, 7.59

Conductivity: 0.526, 1.09, 0.99, 1.02

Turbidity:999, 999, 680, 10

Temperature: 20.8, 2.05, 21.0, 20.7

Prepared by L. Greene

ARCADIS

Soil Boring Log

Boring No.: GM-78

Sheet: 1 of 5

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 10/16/2007
Date Completed: 10/16/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Rain, 60's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
1							Utility clearance with water knife (10/10/07).	
2								
3								
4								
5								
6								
7								
8								
9								
10								
11			12		0.5		SAND (SW), brown, well graded, fine-medium grained, trace medium gravel, loose, dry.	
12			24		0.7			
13								
14			24		1.0			
15								

Drilling Co.: Frontz
Driller: Dave S.
Drilling Method: Rotosonic
Drilling Fluid: Water
Remarks: SD=Sonic Drilling

Sampling Method: 10 feet x 4 inch Core Barrel
Sampling Interval: 10 feet
Water Level Start: --
Water Level Finish: --
Converted to Well: ☒ Yes ☐ No
Surface Elev.: 721.58 TOC=721.18
North Coor: -267.0
East Coor: 5722.8

SOIL BORING LOG BORING LOG.GPJ ARCADIS.GDT 2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-78

Sheet: 2 of 5

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 10/16/2007
Date Completed: 10/16/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Rain, 60's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
16			24	SD	0.9		SAND (SW), brown, well graded, fine-medium grained, trace medium gravel, loose, dry.	
17							Note: 3 inch fine gravel seam at 17 feet.	
18			12		1.8		Note: Wet at 18 feet.	
19			12		2.0		GRAVELLY SAND (GW), grayish brown, well graded, medium loose, trace silt, wet.	
20			24		1.8			
21								
22			24	GM-78, 20 to 25 feet, 10/16/07, 9:20	1.3			
23								
24			24		0.5			
25								
26			24		2.4			
27								
28			12		1.9			
29			12		1.5		GRAVEL (GP), gray, poorly graded, medium-coarse, loose, wet.	
30			24		1.3			
31								

Remarks:

SOIL BORING LOG BORING LOG.GPJ ARCADIS.GDT 2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-78

Sheet: 3 of 5

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 10/16/2007
Date Completed: 10/16/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Rain, 60's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
32			24		1.7		GRAVEL (GP), gray, poorly graded, medium-coarse, loose, wet.	
33							SAND (SW), grayish brown, well graded, fine-coarse, some gravel, medium loose, wet.	
34			24		1.4			
35				SD				
36			24		1.7			
37								
38			12		1.9			
39			12		2.0		SAND (SP), brown, poorly graded, fine-coarse, trace gravel and silt, medium loose, wet.	
40			24		2.1			
41								
42			24	GM-78, 40 to 45 feet, 10/16/07, 10:40	1.7		Note: 2 inch gravel seam at 41.5 feet.	
43								
44			24		2.1			
45								
46			24		1.9			
47								

Remarks:

ARCADIS

Soil Boring Log

Boring No.: GM-78

Sheet: 4 of 5

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 10/16/2007
Date Completed: 10/16/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Rain, 60's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
48			12		2.1		SAND (SP), brown, poorly graded, fine-coarse, trace gravel and silt, medium loose, wet.	
49			12		1.7		Note: Grayish brown, no trace gravel and silt, medium dense at 49 feet.	
50			24		1.2			
51								
52			24		1.5			
53								
54			24		0.9			
55				SD				
56			24		1.1			
57								
58			12		0.9		GRAVEL (GP), grayish brown, poorly graded, trace sand, loose, wet .	
59			12		0.7		SAND (SP), brown, poorly graded, fine-medium, loose, moist.	
60			24		1.2			
61								
62			24		1.5		SAND (SW), brown, well graded, fine-coarse, some gravel, loose, wet.	
63								

Remarks:

SOIL BORING LOG BORING LOG.GPJ ARCADIS.GDT 2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-78

Sheet: 5 of 5

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 10/16/2007
Date Completed: 10/16/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Rain, 60's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
64			24		1.3		SAND (SW), brown, well graded, fine-coarse, some gravel, loose, wet.	
65							SAND (SP), brown, poorly graded, fine-coarse, loose, wet.	
66			24		1.9			
67				GM-78, 65 to 70 feet, 10/16/07				
68			24		1.1			
69								
70								
71								
72								
73								
74								
75								
76								
77								
78								
79								

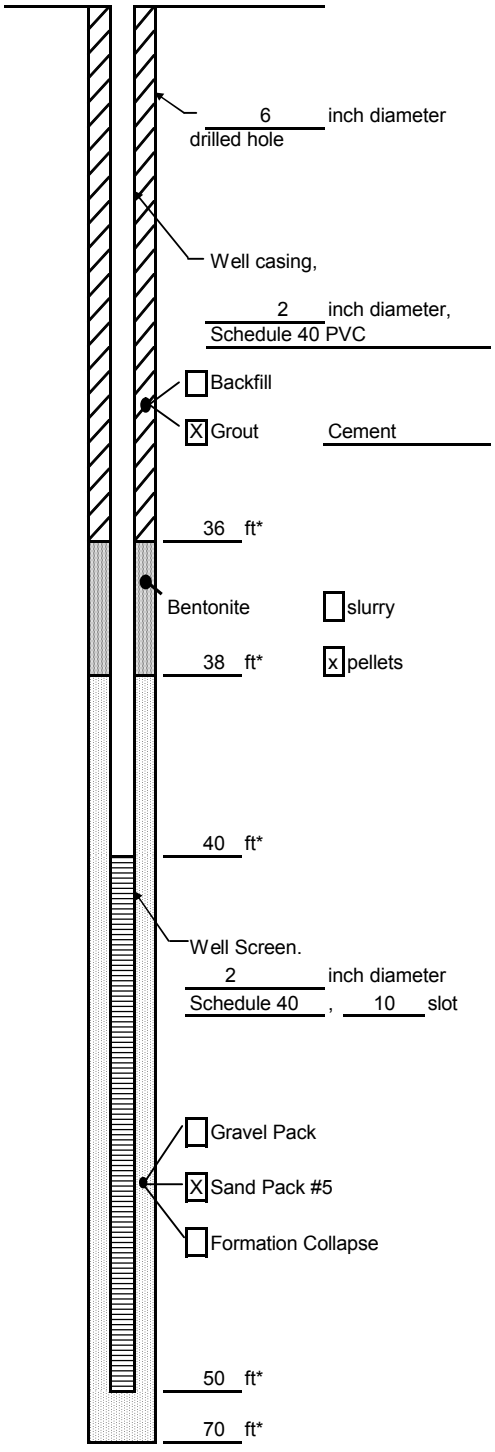
Remarks:

SOIL BORING LOG_BORING LOG.GPJ_ARCADIS.GDT 2/13/08

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.
* Depth Below Land Surface

Project General Motors Corporation Well GM-78

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

721.58 feet [X] Surveyed

[ ] Estimated

Installation Date(s) 10/18/2007

Drilling Method Rotosonic

Drilling Contractor Frontz Driling

Drilling Fluid Water

Development Technique(s) and Date(s)

Submersible pump & surge - 10/18/07

Fluid Loss During Drilling 80 gallons

Water Removed During Development 106 gallons

Static Depth to Water 17.1 feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration 0.75 hours

Yield 4 gpm Date 10/18/07

Specific Capacity NM gpm/ft

Well Purpose GW Monitoring

Remarks IV = 1 well volume = 5.16 gallons

	1V	2V	3V	4V	5V
Ph	7.38	7.39	7.36	7.36	7.35
Conductivity:	1.50	1.48	1.48	1.49	1.48
Turbidity:	211	239	125	185	179
Temperature:	14.4	14.4	14.3	14.3	14.3

Prepared by L. Greene

ARCADIS

Soil Boring Log

Boring No.: GM-79

Sheet: 1 of 4

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 10/15/2007
Date Completed: 10/15/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Sunny, 70's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
1							Utility clearance with water knife (10/11/07).	
2								
3								
4								
5								
6								
7								
8								
9								
10			24		0.4		SAND (SW), brown, well graded, fine-medium grained, trace coarse gravel, dry, loose.	
11								
12			24		0.7			
13								
14			24		0.6			
15								

Drilling Co.: Frontz
Driller: Dave S.
Drilling Method: Rotosonic
Drilling Fluid: Water
Remarks: SD=Sonic Drilling

Sampling Method: 10 feet x 4 inch Core Barrel
Sampling Interval: 10 feet
Water Level Start: 16 feet
Water Level Finish: --
Converted to Well: ☒ Yes ☐ No
Surface Elev.: 718.54 TOC=717.91
North Coor: -28.8
East Coor: 3623.2

SOIL BORING LOG_BORING LOG.GPJ_ARCADIS.GDT 2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-79

Sheet: 2 of 4

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 10/15/2007
Date Completed: 10/15/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Sunny, 70's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
16			24		0.5		SAND (SW), grayish brown, well graded, medium-coarse, some gravel, trace silt, moist, loose.	
17								
18			12	GM-79, 16 to 21 feet, 10/15/07, 11:15	0.5			
19			12		0.0		GRAVEL (GP), gray, poorly graded, coarse grained, loose, wet.	
20			0				No recovery.	
21								
22			0					
23								
24			0					
25				SD				
26			0					
27								
28			0					
29			12		0.3		GRAVEL (GP), brownish gray, poorly graded, coarse, loose, wet, trace sand. Note: cobbles present.	
30			12					
31								

Remarks:

SOIL BORING LOG BORING LOG.GPJ ARCADIS.GDT 2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-79

Sheet: 3 of 4

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 10/15/2007
Date Completed: 10/15/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Sunny, 70's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
32			0				No recovery.	
33								
34			0					
35								
36			0					
37								
38			0	GM-79, 35 to 40 feet, 10/15/07, 13:30				
39			12		0.7		SANDY GRAVEL (GW), orangish brown, well graded, fine-medium, trace silt, loose wet.	
40			24		0.5			
41							GRAVELLY SAND (SW), orangish brown, well graded, fine-coarse, trace silt, medium loose, wet.	
42			24		0.8			
43								
44			24		0.5		SANDY GRAVEL (GW), grayish brown, well graded, fine-coarse, loose, wet.	
45				SD				
46			24		1.2			
47							SAND (SW), brown, well graded, fine-coarse, little gravel, loose, moist.	

Remarks:

SOIL BORING LOG_BORING LOG.GPJ_ARCADIS.GDT_2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-79

Sheet: 4 of 4

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 10/15/2007
Date Completed: 10/15/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Sunny, 70's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
48			24		1.1		SAND (SW), brown, well graded, fine-coarse, little gravel, loose, moist.	
49					0.7			
50							Note: Silt seam at 49.8 feet.	
51			24		0.5		GRAVELLY SAND (SW), brown, well graded, fine-coarse, medium loose, wet.	
52			24		0.3			
53								
54			24		0.1		SILT (ML), gray, medium soft, damp. Note: Orange staining at interface (54 feet).	
55				SD			Note: Very stiff-hard, dry at 55 feet.	
56			24		0.2			
57								
58			12		0.0			
59								
60								
61								
62								
63								

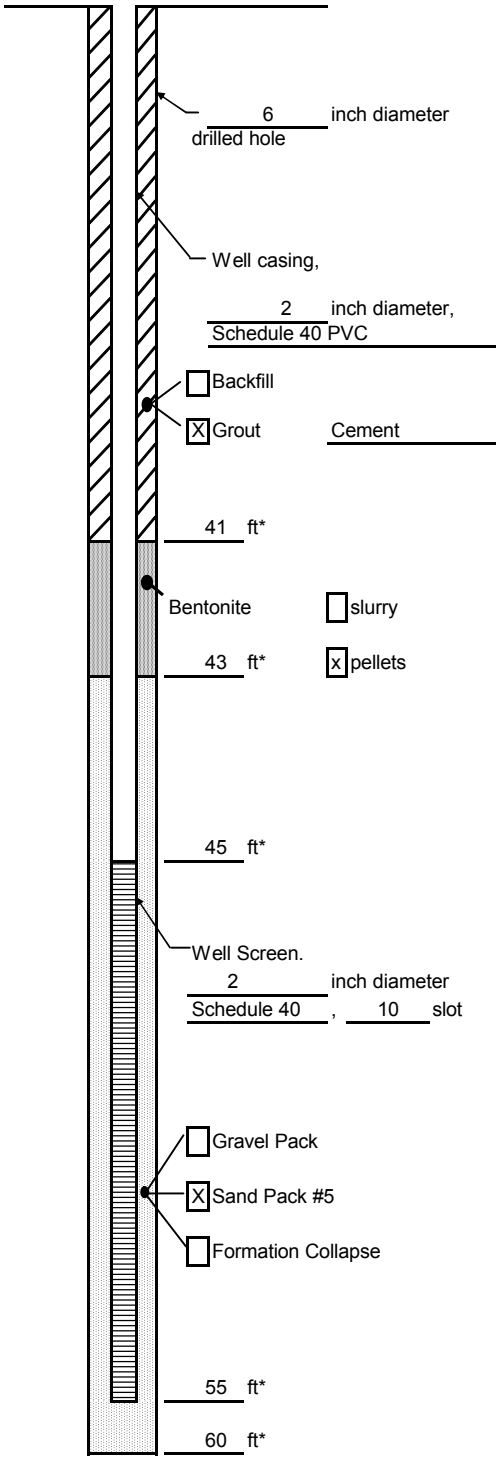
Remarks:

SOIL BORING LOG_BORING LOG.GPJ_ARCADIS.GDT 2/13/08

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.
* Depth Below Land Surface

Project General Motors Corporation Well GM-79

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

718.54 feet [X] Surveyed [ ] Estimated

Installation Date(s) 10/17/2007

Drilling Method Rotosonic

Drilling Contractor Frontz Driling

Drilling Fluid Water

Development Technique(s) and Date(s)

Pump and surge 10/22/07

Fluid Loss During Drilling 100 gallons

Water Removed During Development 111 gallons

Static Depth to Water 15.00 feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration 1 hours

Yield 4 gpm Date 10/22/07

Specific Capacity NM gpm/ft

Well Purpose GW Monitoring

Remarks IV = 1 well volume = 6.25 gallons

	1V	2V	3V	4V	5V
pH	6.69	6.92	6.93	6.94	6.95
Conductivity	1.44	1.44	1.44	1.43	1.44
Turbidity	232	111	97.7	90.1	98.4
Temperature	17.1	17.1	17.1	17.1	17.1

Prepared by L. Greene

ARCADIS

Soil Boring Log

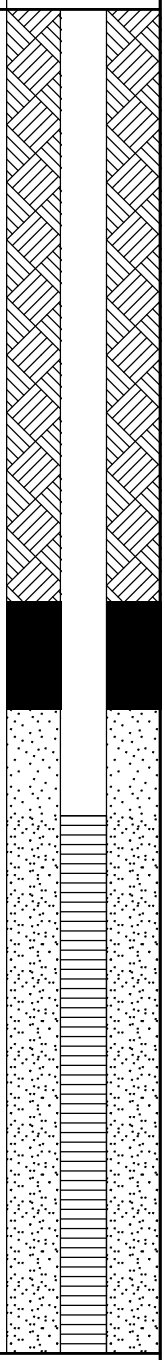
Boring No.: GM-80

Sheet: 1 of 1

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 10/16/2007
Date Completed: 10/16/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions:

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
1–25							See boring log GM-81 for lithologic description.	

Drilling Co.: Frontz
Driller: Dave S.
Drilling Method: Rotosonic
Drilling Fluid: Water
Remarks:

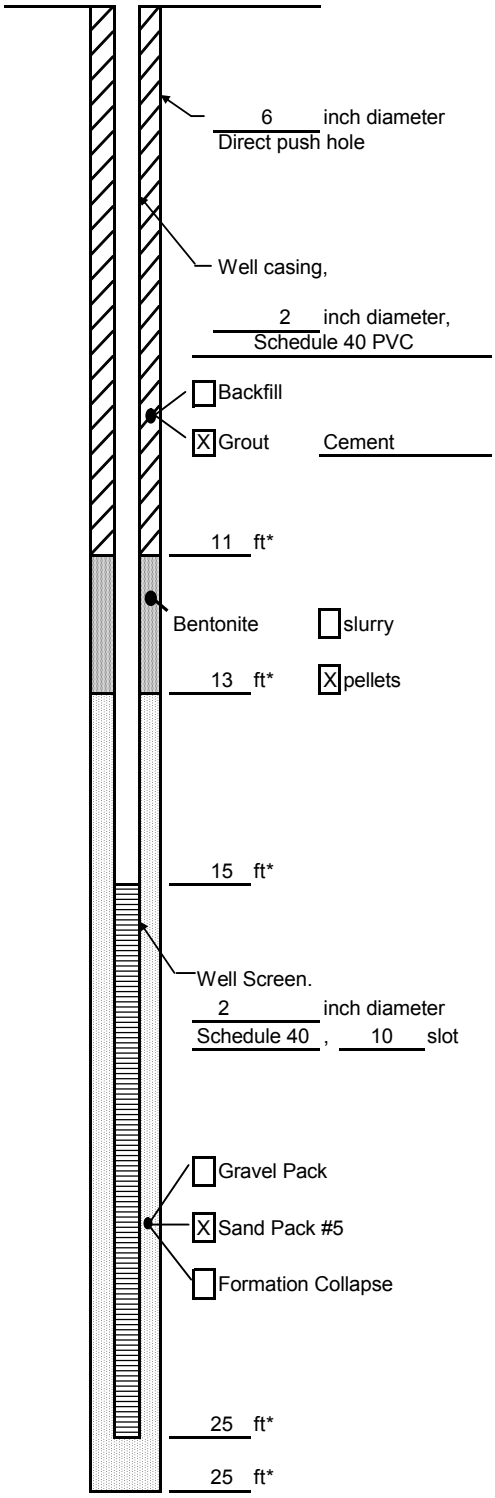
Sampling Method: Core Barrel
Sampling Interval: 10 feet
Water Level Start: NA
Water Level Finish: NA
Converted to Well: ☒ Yes ☐ No
Surface Elev.: 716.23 TOC=715.82
North Coor: -1045.7
East Coor: 7352.9

SOIL BORING LOG BORING LOG.GPJ ARCADIS.GDT 2/13/08

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well GM-80

Town/City Moraine

County Montgomery State Ohio

Permit No. N/A

Land-Surface (LS) Elevation and Datum:

716.230 feet [X] Surveyed

[ ] Estimated

Installation Date(s) 10/16/2007

Drilling Method Rotosonic

Drilling Contractor Frontz Drilling

Drilling Fluid Water

Development Technique(s) and Date(s)

Submersible pump - surge with pump

10/18/2007

Fluid Loss During installation 60 gallons

Water Removed During Development ~100 gallons

Static Depth to Water 13.27 feet below M.P.

Pumping Depth to Water ~20' feet below M.P.

Pumping Duration 0.4 hours

Yield 4 gpm Date 10/18/07

Specific Capacity NM gpm/ft

Well Purpose GW Monitoring

Remarks Time: 1110 1113 1116 1119 1122

pH: 7.27 7.32 7.34 7.35 7.39

Conductivity: .844 .809 .808 .805 .801

Turbidity: -10 -10 -10 -10 -10

Temperature: 15.1 15.0 14.9 14.9 14.9

Prepared by L. Greene

ARCADIS

Soil Boring Log

Boring No.: GM-81

Sheet: 1 of 6

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 10/11/2007
Date Completed: 10/11/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Overcast 60's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
1							Utility clearance notes with water knife (10/11/07)	
2								
3								
4								
5								
6								
7								
8								
9								
10								
11							Note: No recovery cobble in shoe.	
12								
13								
14								
15							Note: Ground water 14 feet.	

Drilling Co.: Frontz
Driller: Dave S.
Drilling Method: Rotosonic
Drilling Fluid: Water
Remarks: SD=Sonic Drilling

Sampling Method: 10 feet x 4 inch Core Barrel
Sampling Interval: 10 feet
Water Level Start: 14 feet
Water Level Finish: --
Converted to Well: ☒ Yes ☐ No
Surface Elev.: 715.80 TOC=715.31
North Coor: -1062.7
East Coor: 3752.2

SOIL BORING LOG BORING LOG.GPJ ARCADIS.GDT 2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-81

Sheet: 2 of 6

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 10/11/2007
Date Completed: 10/11/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Overcast 60's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
16				GM-80, 15 to 20 feet, 10/11/07, 11:55			Note: No recovery cobble in shoe.	
17								
18								
19								
20								
21			24		0.4		SAND (SW), grayish brown, loose, well graded, with gravel (fine-coarse), fine-coarse grained, wet.	
22			24		0.5			
23								
24			24		0.7			
25				SD				
26			24		0.6			
27								
28			24		0.8			
29								
30			24		1.2			
31								

Remarks:

SOIL BORING LOG BORING LOG.GPJ ARCADIS.GDT 2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-81

Sheet: 3 of 6

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 10/11/2007
Date Completed: 10/11/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Overcast 60's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
32			24		0.7		GRAVELLY SAND (SW), brown, well graded, fine-coarse, loose, wet.	
33								
34			24		1.3			
35							Note: Silty clay seam at 34.75 feet.	
36			24		1.3		SANDY GRAVEL (GW), brown, well graded, loose, trace silt, wet.	
37								
38			24	GM-80, 35 to 40 feet, 10/11/07, 14:50	0.9		SAND (SW), brown, well graded, loose, some gravel, wet.	
39								
40								
41			24		0.7			
42			24		0.5			
43								
44			24		0.3		SANDY GRAVEL (GW), orangish brown, well graded, fine-coarse, loose, wet.	
45				SD				
46			24		0.4			
47								

Remarks:

SOIL BORING LOG BORING LOG.GPJ ARCADIS.GDT 2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-81

Sheet: 4 of 6

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 10/11/2007
Date Completed: 10/11/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Overcast 60's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
48			24		0.3		GRAVELLY SAND (SW), orangish brown, well graded, fine-coarse, trace silt, loose, wet.	
49								
50								
51			24		0.1			
52							GRAVEL (GP), orangish brown, poorly graded, loose, trace sand, wet.	
53			24		0.8		SAND (SP), gray, poorly graded, fine-coarse, medium loose, trace gravel, moist.	
54								
55			24		0.7			
56								
57			24	GM-80, 55 to 60 feet, 10/11/07, 16:50	1.0			
58								
59			24		0.4			
60								
61			24		0.1		SAND (SW), gray, well graded, coarse, loose, wet.	
62								
63			24		0.0			

Remarks:

SOIL BORING LOG_BORING LOG.GPJ_ARCADIS.GDT 2/13/08

ARCADIS

Soil Boring Log

Boring No.: GM-81

Sheet: 5 of 6

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 10/11/2007
Date Completed: 10/11/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Overcast 60's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
64			24		0.5		SAND (SW), gray, well graded, coarse, loose, wet.	
65				SD				
66			24		0.7			
67								
68			24		1.0			
69								
70			24		0.8		SILTY CLAY (CL), dark gray, very stiff-hard, trace gravel, low plasticity, dry.	
71								
72			24		1.2		GRAVELLY SAND (SW), gray, well graded, loose, wet.	
73								
74			24		1.0		SAND (SW), gray, well graded, loose, some gravel, wet.	
75				SD				
76			24		0.9			
77								
78			24		0.3			
79								

Remarks:

ARCADIS

Soil Boring Log

Boring No.: GM-81

Sheet: 6 of 6

Project Name: General Motors Corporation
Project Number: OH000294.0010.00002
Project Location: Moraine, Ohio

Date Started: 10/11/2007
Date Completed: 10/11/2007

Logger: L. Greene
Editor: J. Hunt
Weather Conditions: Overcast 60's

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details
80							SAND (SW), gray, well graded, loose, some gravel, wet.	
81			24		1.0		SAND (SP), gray, poorly graded, medium loose, trace gravel, wet.	
82			24		0.1		SANDY GRAVEL (SW), gray, well graded, loose, wet (medium-coarse gravel).	
83								
84			24		0.0			
85								
86			24		0.7		SAND (SW), gray, well graded, loose, some gravel, fine-coarse, wet.	
87				GM-80, 85 to 90 feet, 10/11/07, 18:50				
88			24		1.6			
89								
90								
91								
92								
93								
94								
95								

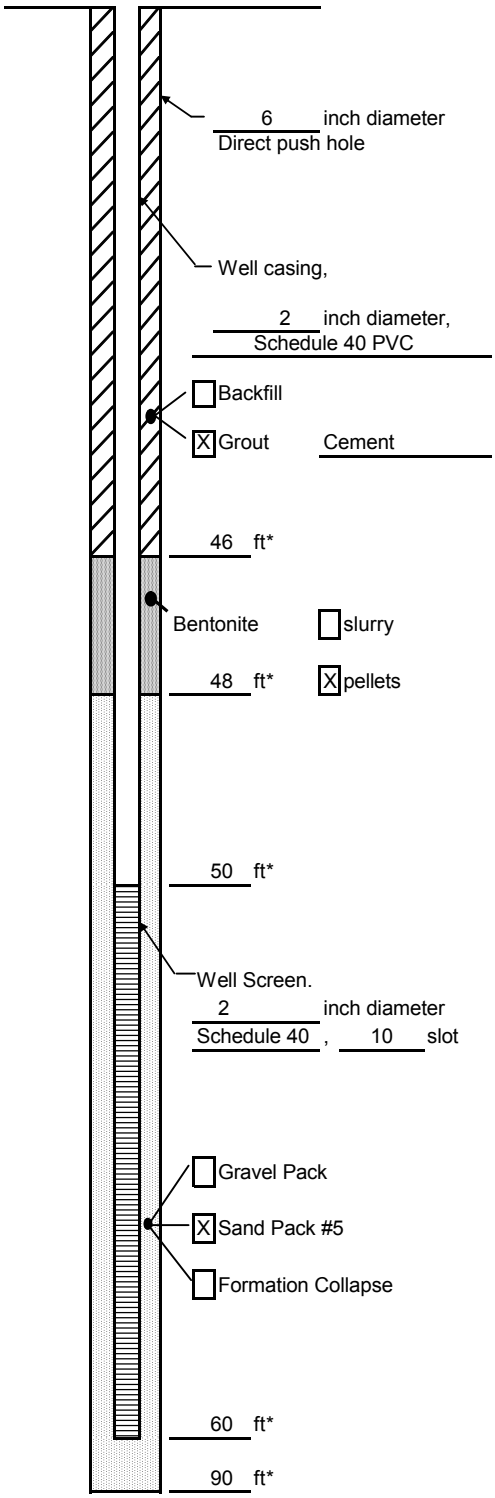
Remarks:

SOIL BORING LOG BORING LOG.GPJ ARCADIS.GDT 2/13/08

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well GM-81

Town/City Moraine

County Montgomery State Ohio

Permit No. N/A

Land-Surface (LS) Elevation and Datum:

715.800 feet [X] Surveyed

[ ] Estimated

Installation Date(s) 10/16/2007

Drilling Method Rotosonic

Drilling Contractor Frontz Drilling

Drilling Fluid Water

Development Technique(s) and Date(s)

Submersible pump - surge with pump

10/18/2007

Fluid Loss During installation 100 gallons

Water Removed During Development ~140 gallons

Static Depth to Water 13.02 feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration 0.7 hours

Yield 4 gpm Date 10/18/07

Specific Capacity NM gpm/ft

Well Purpose GW Monitoring

Remarks

Time: 1150 1153 1156 1159 1202

pH: 7.45 7.47 7.48 7.49 7.49

Conductivity: .858 .867 .866 .867 .868

Turbidity: 901 467 348 257 109

Temperature: 14.8 14.1 14.0 13.9 13.8

Prepared by L. Greene

ARCADIS

SOIL BORING/WELL CONSTRUCTION LOG

WELL NO.: **GM-82**

TOTAL DEPTH: **119.50**

PROJECT INFORMATION

PROJECT: **GM/REALM**

SITE LOCATION: **Moraine, Ohio**

LOGGED BY: **Joseph Rumschlag**

DATE STARTED: **1/28/2008**

DATE COMPLETED: **2/19/2008**

DRILLING INFORMATION

DRILLING CO.: **Frontz Drilling**

DRILLER: **Dave S.**

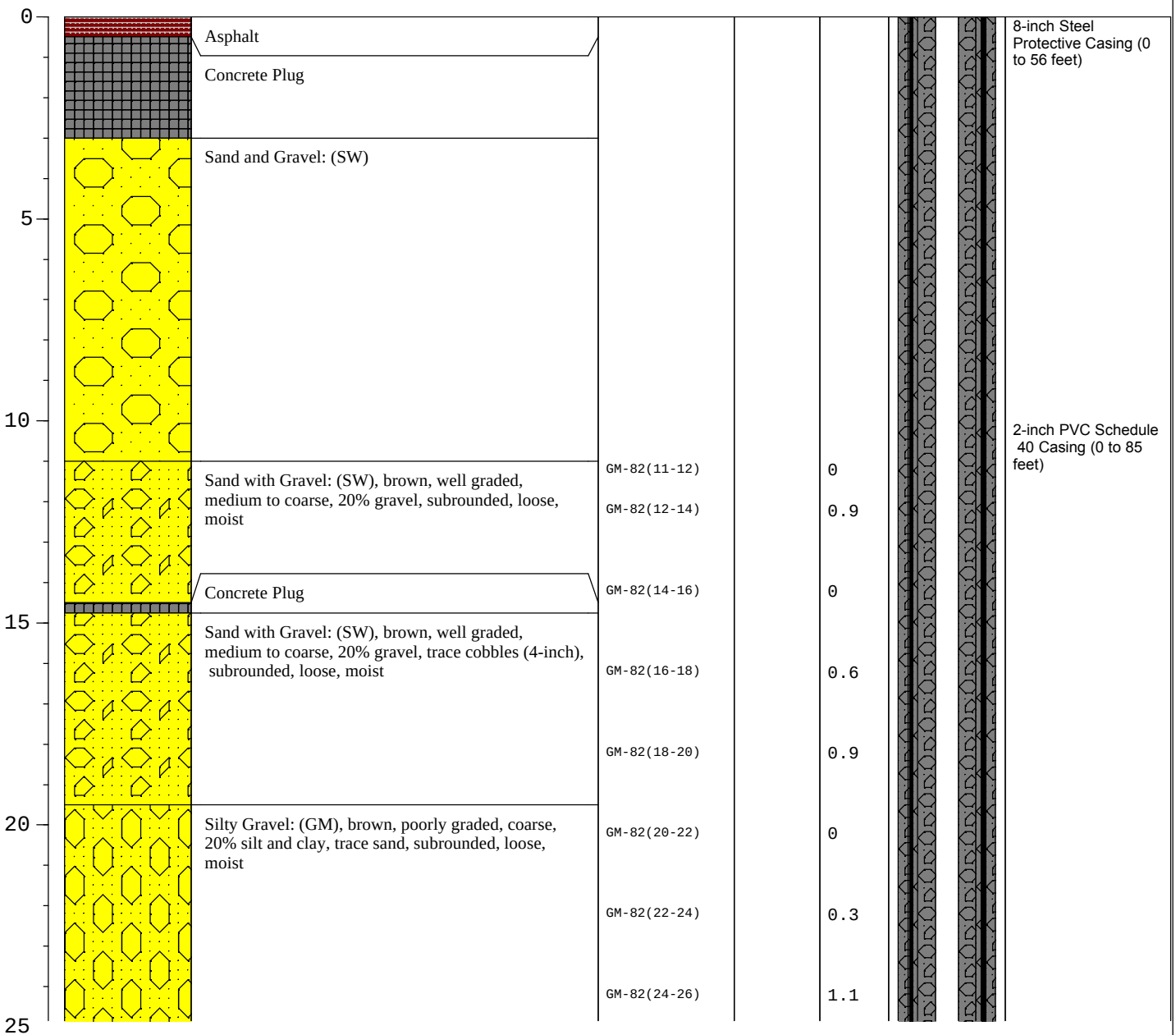
DRILLING METHOD: **Rotosonic**

COORDINATES:

Northing: 3639.74

Easting: 6107.09

Elevation: 732.55



ARCADIS

SOIL BORING/WELL CONSTRUCTION LOG

WELL NO.: **GM-82**

TOTAL DEPTH: **119.50**

PROJECT INFORMATION

PROJECT: **GM/REALM**

SITE LOCATION: **Moraine, Ohio**

LOGGED BY: **Joseph Rumschlag**

DATE STARTED: **1/28/2008**

DATE COMPLETED: **2/19/2008**

DRILLING INFORMATION

DRILLING CO.: **Frontz Drilling**

DRILLER: **Dave S.**

DRILLING METHOD: **Rotosonic**

COORDINATES:

Northing: 3639.74

Easting: 6107.09

Elevation: 732.55

DEPTH	SOIL SYMBOLS	SOIL DESCRIPTION	SAMPLE ID	SUDAN IV	PID (ppm)	WELL CONSTRUCTION DETAILS
25		Sand with Gravel: (SW), brown, well graded, medium to coarse, 15% gravel (2-inch), 5% silt, loose, moist	GM-82(26-28)		1.5	
		Sand with Gravel: (SW-SM), brown, well graded, medium to coarse, 25% gravel, 10% silt, trace cobbles, loose, moist	GM-82(28-30)		41.5	
30		Sand with Gravel: (SW), very dark gray (5Y 3/1), well graded, coarse, 15% gravel, sheen, odor, loose, wet	GM-82(30-32)		37.8	
		Sand: (SP), grayish brown (10YR 5/2), poorly graded, medium to coarse, 10% gravel (1.5-inch), loose, wet	GM-82(32-34)		1.9	
		Sand with Gravel: (SW), very dark gray, well graded, medium to coarse, 20% gravel (2-inch), sheen, loose, wet	GM-82(34-36)		1.8	
35		Silt: (ML), brownish yellow (10YR 6/8), gray mottling, very stiff, moist	GM-82(36-38)		0.7	
		Silt: Same As Above with very dark gray mottling. NOTE: At 34.5 feet, 3-inch seam of sand, very dark gray, poorly graded, coarse, loose, wet	GM-82(38-40)		0.5	
		Sand: (SP), very dark gray, poorly graded, medium to coarse, loose, wet	GM-82(40-42)		0.6	
40		Silty Clay: (CL), very dark gray, 15% silt, trace sub-angular, fine gravel, medium to high plasticity, very stiff, moist	GM-82(42-44)		0.8	
			GM-82(44-46)		1.6	
45			GM-82(46-48)		1.5	
			GM-82(48-50)		1.1	
		Sand with Gravel: Silty (SM), brown (10YR 4/3),				

ARCADIS

SOIL BORING/WELL CONSTRUCTION LOG

WELL NO.: **GM-82**

TOTAL DEPTH: **119.50**

PROJECT INFORMATION

PROJECT: **GM/REALM**

SITE LOCATION: **Moraine, Ohio**

LOGGED BY: **Joseph Rumschlag**

DATE STARTED: **1/28/2008**

DATE COMPLETED: **2/19/2008**

DRILLING INFORMATION

DRILLING CO.: **Frontz Drilling**

DRILLER: **Dave S.**

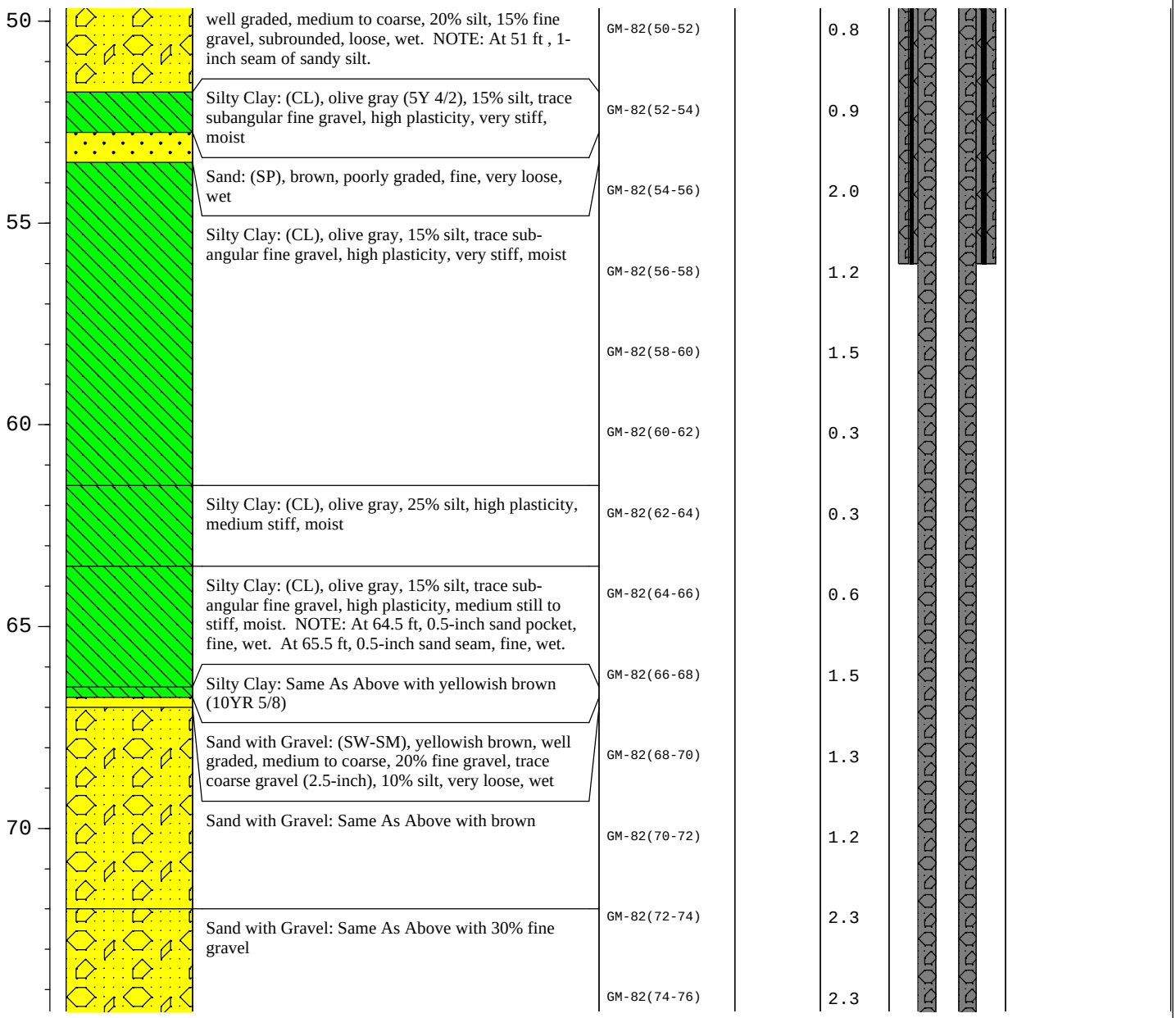
DRILLING METHOD: **Rotosonic**

COORDINATES:

Northing: 3639.74

Easting: 6107.09

Elevation: 732.55



DEPTH	SOIL SYMBOLS	SOIL DESCRIPTION	SAMPLE ID	SUDAN IV	PID (ppm)	WELL CONSTRUCTION DETAILS
50		well graded, medium to coarse, 20% silt, 15% fine gravel, subrounded, loose, wet. NOTE: At 51 ft , 1-inch seam of sandy silt.	GM-82(50-52)		0.8	
		Silty Clay: (CL), olive gray (5Y 4/2), 15% silt, trace subangular fine gravel, high plasticity, very stiff, moist	GM-82(52-54)		0.9	
		Sand: (SP), brown, poorly graded, fine, very loose, wet	GM-82(54-56)		2.0	
55		Silty Clay: (CL), olive gray, 15% silt, trace sub-angular fine gravel, high plasticity, very stiff, moist	GM-82(56-58)		1.2	
			GM-82(58-60)		1.5	
60			GM-82(60-62)		0.3	
		Silty Clay: (CL), olive gray, 25% silt, high plasticity, medium stiff, moist	GM-82(62-64)		0.3	
		Silty Clay: (CL), olive gray, 15% silt, trace sub-angular fine gravel, high plasticity, medium still to stiff, moist. NOTE: At 64.5 ft, 0.5-inch sand pocket, fine, wet. At 65.5 ft, 0.5-inch sand seam, fine, wet.	GM-82(64-66)		0.6	
65		Silty Clay: Same As Above with yellowish brown (10YR 5/8)	GM-82(66-68)		1.5	
		Sand with Gravel: (SW-SM), yellowish brown, well graded, medium to coarse, 20% fine gravel, trace coarse gravel (2.5-inch), 10% silt, very loose, wet	GM-82(68-70)		1.3	
70		Sand with Gravel: Same As Above with brown	GM-82(70-72)		1.2	
		Sand with Gravel: Same As Above with 30% fine gravel	GM-82(72-74)		2.3	
			GM-82(74-76)		2.3	

SOIL BORING/WELL CONSTRUCTION LOG

WELL NO.: **GM-82**

TOTAL DEPTH: **119.50**

PROJECT INFORMATION

PROJECT: **GM/REALM**

SITE LOCATION: **Moraine, Ohio**

LOGGED BY: **Joseph Rumschlag**

DATE STARTED: **1/28/2008**

DATE COMPLETED: **2/19/2008**

DRILLING INFORMATION

DRILLING CO.: **Frontz Drilling**

DRILLER: **Dave S.**

DRILLING METHOD: **Rotosonic**

COORDINATES:

Northing: 3639.74

Easting: 6107.09

Elevation: 732.55

DEPTH	SOIL SYMBOLS	SOIL DESCRIPTION	SAMPLE ID	SUDAN IV	PID (ppm)	WELL CONSTRUCTION DETAILS
75						
		Silty Sand: (SM), brown, poorly graded, fine, 25% silt, loose to medium dense, wet	GM-82(76-78)		0.9	
		Sandy Silt: (SM) brown, 15% sand, trace clay, rapid dilatency, low plasticity, laminated, loading structure at 78.25 ft, medium stiff to soft, wet. Clay content increases to 40% at depth (78.25 ft)	GM-82(78-80)		2.7	
80		Silty Sand: (SM), brown, poorly graded, fine, 25% silt, loose to medium dense, wet	GM-82(80-82)		2.2	Bentonite Pellets
			GM-82(82-84)		3.8	
			GM-82(84-86)		4.1	
85		Gravel: (GW), brown, well graded, fine, 30% coarse sand, 10% coarse gravel (3-inch), trace silt, sub-rounded, very loose, wet				2-inch PVC Screen, 0.010 slot (85 to 95 feet)
		Sand: (SP), brown, poorly graded, fine, trace fine gravel, loose, wet	GM-82(86-88)		12.2	
		Sand with Gravel: (SW), brown, well graded, coarse, 15% fine gravel, trace coarse gravel (1.5-inch), very loose, wet	GM-82(88-90)		3.3	
90		Sand with Gravel: Same As Above with yellowish brown (10YR 5/6) staining on gravel	GM-82(90-92)		8.7	Sand Pack #5
		Sand with Gravel: Note: Color change to light yellowish brown (10YR 6/4) and trace cobbles (3.5-inch)	GM-82(92-94)		5.2	
		Silty Gravel: (GM), light yellowish brown, poorly graded, fine, 15% silt, trace coarse sand, subrounded, loose, wet	GM-82(94-96)		1.6	
95		Silty Gravel: Note: Color change to brown				
		Sand: (SP), brown, poorly graded, fine, 15% gravel (2-inch), trace silt, very loose, wet	GM-82(96-98)		1.1	
		Sand: Same As Above with medium to coarse sand	GM-82(98-100)		1.8	
		Sand: (SP), brown, poorly graded, fine, very loose,				

ARCADIS

SOIL BORING/WELL CONSTRUCTION LOG

WELL NO.: **GM-82**

TOTAL DEPTH: **119.50**

PROJECT INFORMATION

PROJECT: **GM/REALM**

SITE LOCATION: **Moraine, Ohio**

LOGGED BY: **Joseph Rumschlag**

DATE STARTED: **1/28/2008**

DATE COMPLETED: **2/19/2008**

DRILLING INFORMATION

DRILLING CO.: **Frontz Drilling**

DRILLER: **Dave S.**

DRILLING METHOD: **Rotosonic**

COORDINATES:

Northing: 3639.74

Easting: 6107.09

Elevation: 732.55

DEPTH	SOIL SYMBOLS	SOIL DESCRIPTION	SAMPLE ID	SUDAN IV	PID (ppm)	WELL CONSTRUCTION DETAILS
100		wet; gradual coarsening downward, fine to coarse gravel, poorly graded	GM-82(100-102)		1.9	
		Sand with Gravel: (SW), brown, w. graded, fine, 20% fine gravel, trace coarse gravel (3-inch), trace silt, very loose, wet.	GM-82(102-104)		1.5	
		Sand with Gravel: Same As Above with coarse sand	GM-82(104-106)		1.7	
105		Gravel: (GW), brown, well graded, fine, 40% coarse to medium sand, trace coarse gravel (1.5-inch), trace silt, sub-rounded to rounded, very loose, wet	GM-82(106-108)		2.0	
		Sand with Gravel: (SW), brown, well graded, fine, 15% fine gravel, trace silt, very loose wet	GM-82(108-110)		1.9	
110		Sand with Gravel: Same As Above with 25% fine gravel and coarse sand	GM-82(110-112)		1.5	
			GM-82(112-114)		1.4	
			GM-82(114-116)		1.3	
115		Sand with Gravel: (SW), brown, well graded, medium, 20% fine gravel, trace coarse gravel (3-inch), trace silt, very loose, wet	GM-82(116-118)		1.3	
			GM-82(118-120)		1.3	

ARCADIS

SOIL BORING/WELL CONSTRUCTION LOG

WELL NO.: **GM-83D**

TOTAL DEPTH: **120**

PROJECT INFORMATION

PROJECT: **GM/REALM**

SITE LOCATION: **Moraine, Ohio**

LOGGED BY: **Joe Rumschlag**

DATE STARTED: **2/07/2008**

DATE COMPLETED: **2/11/2008**

DRILLING INFORMATION

DRILLING CO.: **Frontz Drilling**

DRILLER: **Dave S.**

DRILLING METHOD: **Rotosonic**

COORDINATES:

Northing: 3718.85

Easting: 3844.34

Elevation: 726.41

DEPTH	SOIL SYMBOLS	SOIL DESCRIPTION	SAMPLE ID	SUDAN IV	PID (ppm)	WELL CONSTRUCTION DETAILS
0		SAND and GRAVEL: No Recovery				2-inch PVC Schedule 40 Casing (0 to 110 feet)
10		SILTY SAND: (SM), brown (10YR 5/3), well graded gravel, medium to coarse, 20% fine to coarse gravel, 15% with silt, trace cobbles, loose, dry	GM-83D(12-14)		0	
15		SAND WITH GRAVEL: (SW), brown, well graded, fine to medium, 20% fine gravel, trace silt, very loose, wet	GM-83D(14-16)		0	
		SILTY SAND: (SM), brown, well graded, medium to coarse, 20% fine to coarse gravel, 15% silt, trace cobbles, loose, dry	GM-83D(16-18)		0	
		SAND WITH GRAVEL: (SW), brown, well graded, fine to medium, 20% fine gravel, 10% coarse gravel (1.5-inch), trace silt, very loose, wet	GM-83D(18-20)		0	
20		SAND WITH GRAVEL: (SW), brown, well graded, medium to coarse, 30% fine gravel, trace coarse gravel (2-inch), trace silt, subround, very loose, wet				
		No Recovery				
25						

ARCADIS

SOIL BORING/WELL CONSTRUCTION LOG

WELL NO.: **GM-83D**

TOTAL DEPTH: **120**

PROJECT INFORMATION

PROJECT: **GM/REALM**

SITE LOCATION: **Moraine, Ohio**

LOGGED BY: **Joe Rumschlag**

DATE STARTED: **2/07/2008**

DATE COMPLETED: **2/11/2008**

DRILLING INFORMATION

DRILLING CO.: **Frontz Drilling**

DRILLER: **Dave S.**

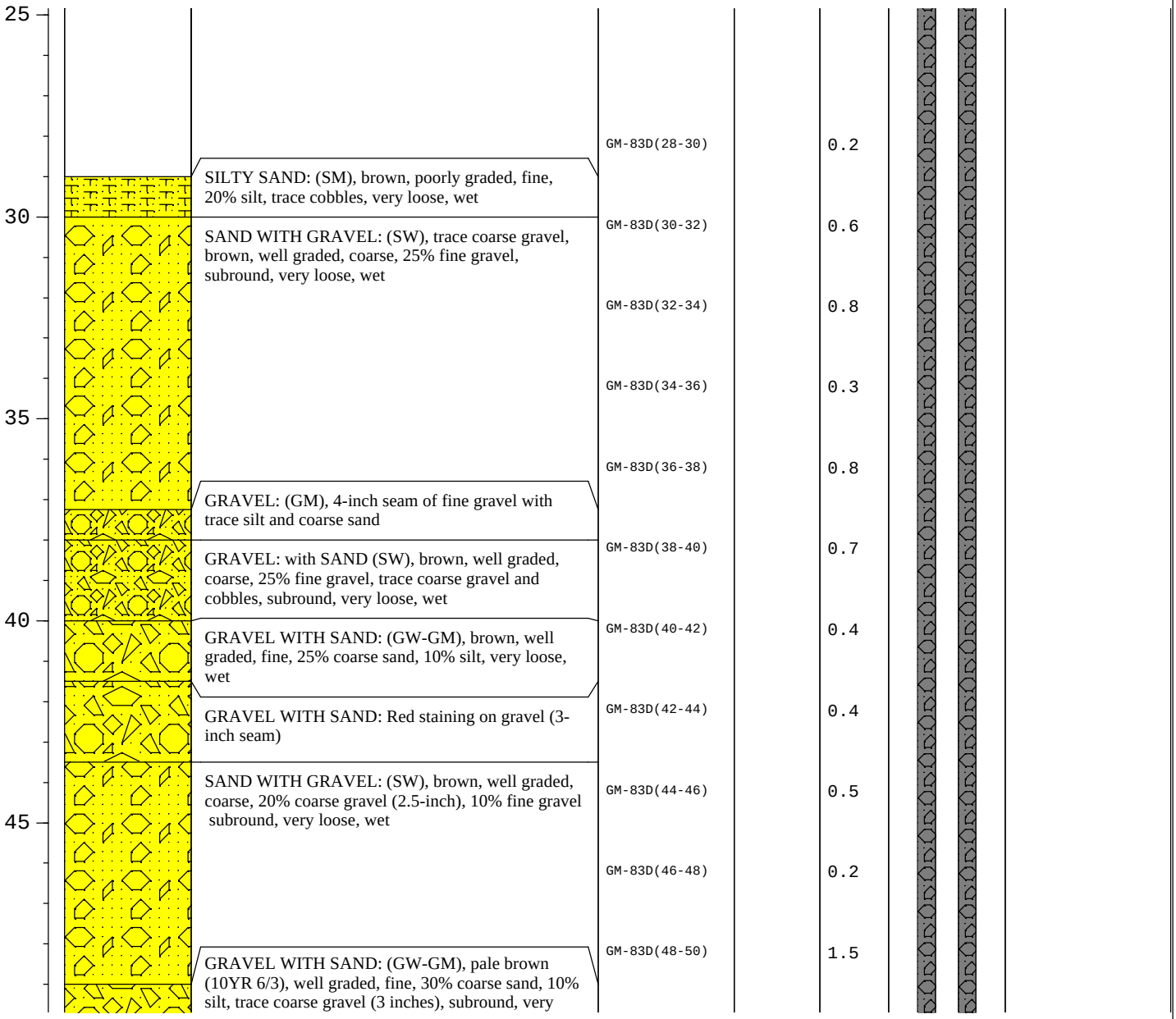
DRILLING METHOD: **Rotosonic**

COORDINATES:

Northing: 3718.85

Easting: 3844.34

Elevation: 726.41



ARCADIS

SOIL BORING/WELL CONSTRUCTION LOG

WELL NO.: **GM-83D**

TOTAL DEPTH: **120**

PROJECT INFORMATION

PROJECT: **GM/REALM**

SITE LOCATION: **Moraine, Ohio**

LOGGED BY: **Joe Rumschlag**

DATE STARTED: **2/07/2008**

DATE COMPLETED: **2/11/2008**

DRILLING INFORMATION

DRILLING CO.: **Frontz Drilling**

DRILLER: **Dave S.**

DRILLING METHOD: **Rotosonic**

COORDINATES:

Northing: 3718.85

Easting: 3844.34

Elevation: 726.41

DEPTH	SOIL SYMBOLS	SOIL DESCRIPTION	SAMPLE ID	SUDAN IV	PID (ppm)	WELL CONSTRUCTION DETAILS
50		loose, wet	GM-83D(50-52)		0.9	
		SAND WITH GRAVEL: (SW), brown, well graded, fine, 15 to 20% fine gravel, very loose, wet	GM-83D(52-54)		0.8	
		SAND WITH GRAVEL: (SW), same as above except sand is becoming coarse, 4-inch cobble at 52.5 feet	GM-83D(54-56)		0.2	
55		SILTY GRAVEL: (GM), brown, well graded, fine, 20% silt, 10% coarse sand, subround, very loose, wet	GM-83D(56-58)		0.4	
		SILTY CLAY: (CL), brown, 20% silt, trace fine gravel, high plasticity, stiff, moist	GM-83D(58-60)		0.3	
		SILTY CLAY: (CL), dark gray (7.5YR 4/.), 15% silt, trace subangular gravel, high plasticity, very stiff, moist NOTE: at 63.5 ft - woody debris, moist	GM-83D(60-62)		0.2	
60			GM-83D(62-64)		0.1	
		CLAY: (CL), 1-inch seam of sandy clay, 25% fine sand, medium dense, moist	GM-83D(64-66)		0.2	
		SAND WITH GRAVEL: (SW), brown, well graded, coarse, 25% fine gravel, trace coarse gravel (1.5-inch), trace silt, subround, very loose, wet	GM-83D(66-68)		0.3	
65		SAND WITH GRAVEL: Becoming finer with depth	GM-83D(68-70)		0.2	
		SAND: (SP), brown, poorly graded, fine, trace fine gravel, loose, wet	GM-83D(70-72)		0.4	
		SILTY SAND: (SM), brown, poorly graded, fine, 35% silt, rapid dilatency, loose, wet	GM-83D(72-74)		0	
70			GM-83D(74-76)		0	

ARCADIS

SOIL BORING/WELL CONSTRUCTION LOG

WELL NO.: **GM-83D**

TOTAL DEPTH: **120**

PROJECT INFORMATION

PROJECT: **GM/REALM**

SITE LOCATION: **Moraine, Ohio**

LOGGED BY: **Joe Rumschlag**

DATE STARTED: **2/07/2008**

DATE COMPLETED: **2/11/2008**

DRILLING INFORMATION

DRILLING CO.: **Frontz Drilling**

DRILLER: **Dave S.**

DRILLING METHOD: **Rotosonic**

COORDINATES:

Northing: 3718.85

Easting: 3844.34

Elevation: 726.41

DEPTH	SOIL SYMBOLS	SOIL DESCRIPTION	SAMPLE ID	SUDAN IV	PID (ppm)	WELL CONSTRUCTION DETAILS
75						
		SANDY SILT: (ML), brown, 20% fine sand, trace clay, rapid dilatency, none to low plasticity, laminations, soft, wet	GM-83D(76-78)		0	
		SAND: (SP), brown, poorly graded, fine, loose, wet	GM-83D(78-80)		0.4	
80		SAND WITH GRAVEL: (SW), brown, well graded, coarse, 15% fine gravel, trace coarse gravel (2.5-inch), subround to subangular, very loose, wet	GM-83D(80-82)		0.6	
		GRAVEL WITH SAND: (GW), brown, well graded, fine to coarse (3-inch), 30% coarse sand, trace silt, trace cobbles, subround, very loose, wet	GM-83D(82-84)		0.9	
		SAND WITH GRAVEL: (SW), brown, well graded, coarse, 15% fine gravel, 10% coarse gravel (3-inch), round, very loose, wet	GM-83D(84-86)		0.4	
85		GRAVEL WITH SAND: (GW), brown, well graded, fine grained, 20% medium to coarse sand, trace coarse gravel (1.5-inch), subround, very loose, wet	GM-83D(86-88)		0.5	
		SAND WITH GRAVEL: (SW), brown, well graded, coarse, 15% fine gravel, 10% coarse gravel (3-inch), round, very loose, wet	GM-83D(88-90)		0.6	
90		SAND WITH GRAVEL: (SW), brown, well graded, coarse, 10% fine gravel, 15% coarse gravel (3-inch), round, very loose, wet	GM-83D(90-92)		1.2	
		SAND: (SP), brown, poorly graded, medium to coarse, trace coarse gravel (2-inch), trace fine gravel, very loose, wet	GM-83D(92-94)		0.5	
		SAND WITH GRAVEL: (SW), brown, well graded, medium, 10% fine gravel, 5% coarse gravel (2.5-inch), subround, very loose, wet	GM-83D(94-96)		0.1	
95			GM-83D(96-98)		0.6	
		GRAVEL WITH SAND: (GW), brown, well graded, fine to coarse (2.5-inch), 30% coarse sand, trace silt, subround, very loose, wet	GM-83D(98-100)		0.9	

ARCADIS

SOIL BORING/WELL CONSTRUCTION LOG

WELL NO.: **GM-83D**

TOTAL DEPTH: **120**

PROJECT INFORMATION

PROJECT: **GM/REALM**

SITE LOCATION: **Moraine, Ohio**

LOGGED BY: **Joe Rumschlag**

DATE STARTED: **2/07/2008**

DATE COMPLETED: **2/11/2008**

DRILLING INFORMATION

DRILLING CO.: **Frontz Drilling**

DRILLER: **Dave S.**

DRILLING METHOD: **Rotosonic**

COORDINATES:

Northing: 3718.85

Easting: 3844.34

Elevation: 726.41

DEPTH	SOIL SYMBOLS	SOIL DESCRIPTION	SAMPLE ID	SUDAN IV	PID (ppm)	WELL CONSTRUCTION DETAILS
100						
		SAND: (SP), brown, poorly graded, fine, loose, wet	GM-83D(100-102)		0.2	
		SAND WITH GRAVEL: (SW), brown, well graded, medium to coarse, 35% fine gravel, trace coarse gravel (2.5-inch), trace silt, subround, very loose, wet	GM-83D(102-104)		0	
			GM-83D(104-106)		0.1	
105						
		SAND WITH GRAVEL: (SW), same as above except 10% coarse gravel (2.5-inch)	GM-83D(106-108)		0.2	Bentonite Pellets
			GM-83D(108-110)		0.2	Sand Pack #5
		SAND: (SP), brown, poorly graded, fine to medium, very loose, wet				
110			GM-83D(110-112)		0.4	2-inch PVC Screen, 0.010 slot (110 to 120 feet)
		SAND: (SP), same as above, except coarsens downward to coarse sand with trace fine gravel				
		GRAVEL WITH SAND: (GW), brown, well graded, fine, 40% medium to coarse sand, 10% coarse gravel (2-inch), trace silt, subround, very loose, wet	GM-83D(112-114)		0.5	
			GM-83D(114-116)		0.5	
115		SAND WITH GRAVEL: (SW), brown, well graded, fine to medium, 20% fine gravel, trace coarse gravel (1.5-inch), very loose, wet	GM-83D(116-118)		0.4	
		SAND WITH GRAVEL: (SW), same as above, except sand is becoming coarser				
		SAND: (SP), brown, poorly graded, fine grained, trace fine gravel, very loose, wet	GM-83D(118-120)		0.3	
120						

ARCADIS

SOIL BORING/WELL CONSTRUCTION LOG

WELL NO.: **GM-83S**

TOTAL DEPTH: **54.0**

PROJECT INFORMATION

PROJECT: **GM/REALM**

SITE LOCATION: **Moraine, Ohio**

LOGGED BY: **Joe Rumschlag**

DATE STARTED: **2/20/2008**

DATE COMPLETED: **2/20/2008**

DRILLING INFORMATION

DRILLING CO.: **Frontz Drilling**

DRILLER: **Dave S.**

DRILLING METHOD: **Rotosonic**

COORDINATES:

Northing: 3717.849

Easting: 3837.048

Elevation: 726.44

DEPTH	SOIL SYMBOLS	SOIL DESCRIPTION	SAMPLE ID	SUDAN IV	PID (ppm)	WELL CONSTRUCTION DETAILS
0		SAND and GRAVEL: This boring was drilled without collected soil samples. The soil description presented below is from GM-83D.				2-inch PVC Schedule 40 Casing (0 to 44 feet)
5						
10		SILTY SAND: (SM), brown (10YR 5/3), well graded gravel, medium to coarse, 20% fine to coarse gravel, 15% with silt, trace cobbles, loose, dry				
15		SAND WITH GRAVEL: (SW), brown, well graded, fine to medium, 20% fine gravel, trace silt, very loose, wet				
		SILTY SAND: (SM), brown, well graded, medium to coarse, 20% fine to coarse gravel, 15% silt, trace cobbles, loose, dry				
		SAND WITH GRAVEL: (SW), brown, well graded, fine to medium, 20% fine gravel, 10% coarse gravel (1.5-inch), trace silt, very loose, wet				
20		SAND WITH GRAVEL: (SW), brown, well graded, medium to coarse, 30% fine gravel, trace coarse gravel (2-inch), trace silt, subround, very loose, wet				Bentonite Grout
		No Recovery				
25						

ARCADIS

SOIL BORING/WELL CONSTRUCTION LOG

WELL NO.: **GM-83S**

TOTAL DEPTH: **54.0**

PROJECT INFORMATION

PROJECT: **GM/REALM**

SITE LOCATION: **Moraine, Ohio**

LOGGED BY: **Joe Rumschlag**

DATE STARTED: **2/20/2008**

DATE COMPLETED: **2/20/2008**

DRILLING INFORMATION

DRILLING CO.: **Frontz Drilling**

DRILLER: **Dave S.**

DRILLING METHOD: **Rotosonic**

COORDINATES:

Northing: 3717.849

Easting: 3837.048

Elevation: 726.44

DEPTH	SOIL SYMBOLS	SOIL DESCRIPTION	SAMPLE ID	SUDAN IV	PID (ppm)	WELL CONSTRUCTION DETAILS
25						
		SILTY SAND: (SM), brown, poorly graded, fine, 20% silt, trace cobbles, very loose, wet				
30		SAND WITH GRAVEL: (SW), trace coarse gravel, brown, well graded, coarse, 25% fine gravel, subround, very loose, wet				
35		GRAVEL: (GM), 4-inch seam of fine gravel with trace silt and coarse sand				
		GRAVEL: with SAND (SW), brown, well graded, coarse, 25% fine gravel, trace coarse gravel and cobbles, subround, very loose, wet				
40		GRAVEL WITH SAND: (GW-GM), brown, well graded, fine, 25% coarse sand, 10% silt, very loose, wet				Bentonite Pellets
		GRAVEL WITH SAND: Red staining on gravel (3-inch seam)				Sand Pack #5
		SAND WITH GRAVEL: (SW), brown, well graded, coarse, 20% coarse gravel (2.5-inch), 10% fine gravel subround, very loose, wet				2-inch PVC Screen, 0.010 slot (44 to 54 feet)
45		GRAVEL WITH SAND: (GW-GM), pale brown (10YR 6/3), well graded, fine, 30% coarse sand, 10% silt, trace coarse gravel (3 inches), subround, very				

ARCADIS

SOIL BORING/WELL CONSTRUCTION LOG

WELL NO.: **GM-83S**

TOTAL DEPTH: **54.0**

PROJECT INFORMATION

PROJECT: **GM/REALM**

SITE LOCATION: **Moraine, Ohio**

LOGGED BY: **Joe Rumschlag**

DATE STARTED: **2/20/2008**

DATE COMPLETED: **2/20/2008**

DRILLING INFORMATION

DRILLING CO.: **Frontz Drilling**

DRILLER: **Dave S.**

DRILLING METHOD: **Rotosonic**

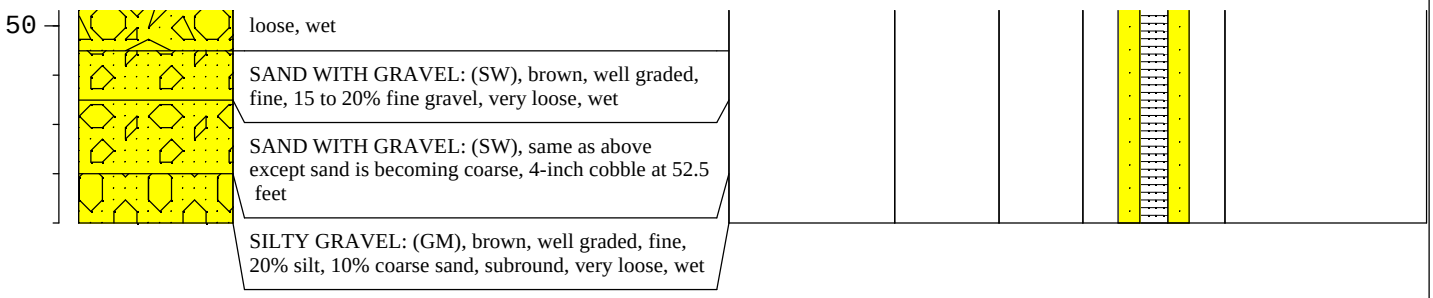
COORDINATES:

Northing: 3717.849

Easting: 3837.048

Elevation: 726.44

DEPTH	SOIL SYMBOLS	SOIL DESCRIPTION	SAMPLE ID	SUDAN IV	PID (ppm)	WELL CONSTRUCTION DETAILS
50		loose, wet				
		SAND WITH GRAVEL: (SW), brown, well graded, fine, 15 to 20% fine gravel, very loose, wet				
		SAND WITH GRAVEL: (SW), same as above except sand is becoming coarse, 4-inch cobble at 52.5 feet				
		SILTY GRAVEL: (GM), brown, well graded, fine, 20% silt, 10% coarse sand, subround, very loose, wet				



ARCADIS

SOIL BORING/WELL CONSTRUCTION LOG

WELL NO.: **GM-84**

TOTAL DEPTH: **120.0**

PROJECT INFORMATION

PROJECT: **GM/REALM**

SITE LOCATION: **Moraine, Ohio**

LOGGED BY: **Joe Rumschlag**

DATE STARTED: **2/1/2008**

DATE COMPLETED: **2/5/2008**

DRILLING INFORMATION

DRILLING CO.: **Frontz Drilling**

DRILLER: **Dave S.**

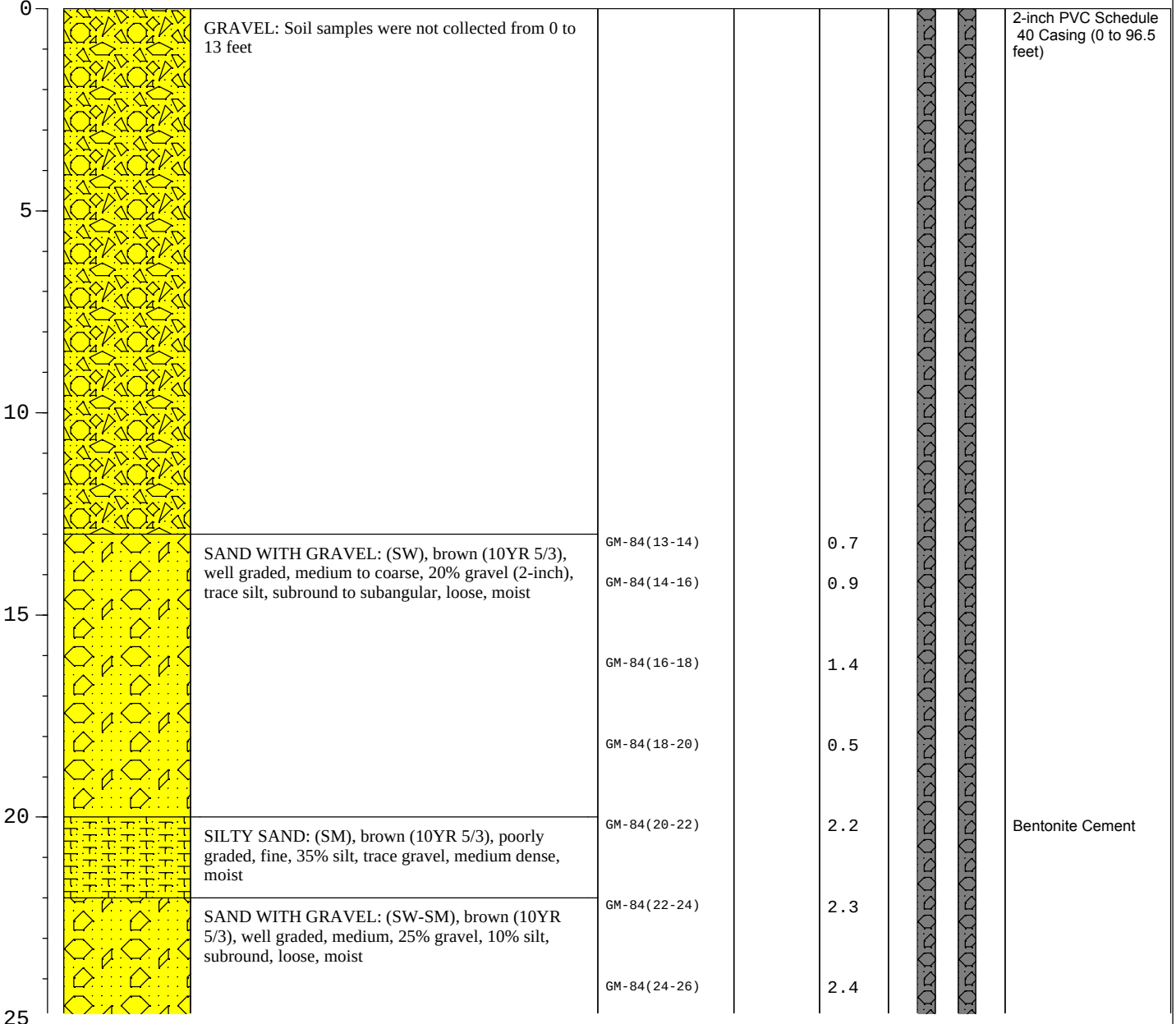
DRILLING METHOD: **Rotosonic**

COORDINATES:

Northing: 2580.278

Easting: 7605.892

Elevation: 740.44



ARCADIS

SOIL BORING/WELL CONSTRUCTION LOG

WELL NO.: **GM-84**

TOTAL DEPTH: **120.0**

PROJECT INFORMATION

PROJECT: **GM/REALM**

SITE LOCATION: **Moraine, Ohio**

LOGGED BY: **Joe Rumschlag**

DATE STARTED: **2/1/2008**

DATE COMPLETED: **2/5/2008**

DRILLING INFORMATION

DRILLING CO.: **Frontz Drilling**

DRILLER: **Dave S.**

DRILLING METHOD: **Rotosonic**

COORDINATES:

Northing: 2580.278

Easting: 7605.892

Elevation: 740.44

DEPTH	SOIL SYMBOLS	SOIL DESCRIPTION	SAMPLE ID	SUDAN IV	PID (ppm)	WELL CONSTRUCTION DETAILS
25			GM-84(26-28)		1.8	
			GM-84(28-30)		2.7	
30			GM-84(30-32)		1.1	
			GM-84(32-34)		1.6	
			GM-84(34-36)		1.4	
35		SAND WITH GRAVEL: (SW-SM), brown (10YR 5/3), well graded, medium, 25% gravel, 15% silt, trace cobbles, subround, loose, wet	GM-84(36-38)		1.3	
		SAND WITH GRAVEL: (SW), brown (10YR 5/3), well graded, medium, 25% gravel, trace silt, loose, moist	GM-84(38-40)		1.8	
		SAND WITH GRAVEL: (SP), brown, poorly graded, coarse, 15% fine gravel, subangular, loose, wet	GM-84(40-42)		2.5	
40			GM-84(42-44)		1.6	
		SILTY GRAVEL: with Sand (GM), brown, well graded, coarse, 35% coarse sand, 20% silt, trace clay, medium dense, subrounded, wet	GM-84(44-46)		0.7	
			GM-84(46-48)		0.8	
45		SAND: (SP), brown, poorly graded, fine, loose, wet	GM-84(48-50)		0.8	
		SAND: Same As Above with trace silt				

ARCADIS

SOIL BORING/WELL CONSTRUCTION LOG

WELL NO.: **GM-84**

TOTAL DEPTH: **120.0**

PROJECT INFORMATION

PROJECT: **GM/REALM**

SITE LOCATION: **Moraine, Ohio**

LOGGED BY: **Joe Rumschlag**

DATE STARTED: **2/1/2008**

DATE COMPLETED: **2/5/2008**

DRILLING INFORMATION

DRILLING CO.: **Frontz Drilling**

DRILLER: **Dave S.**

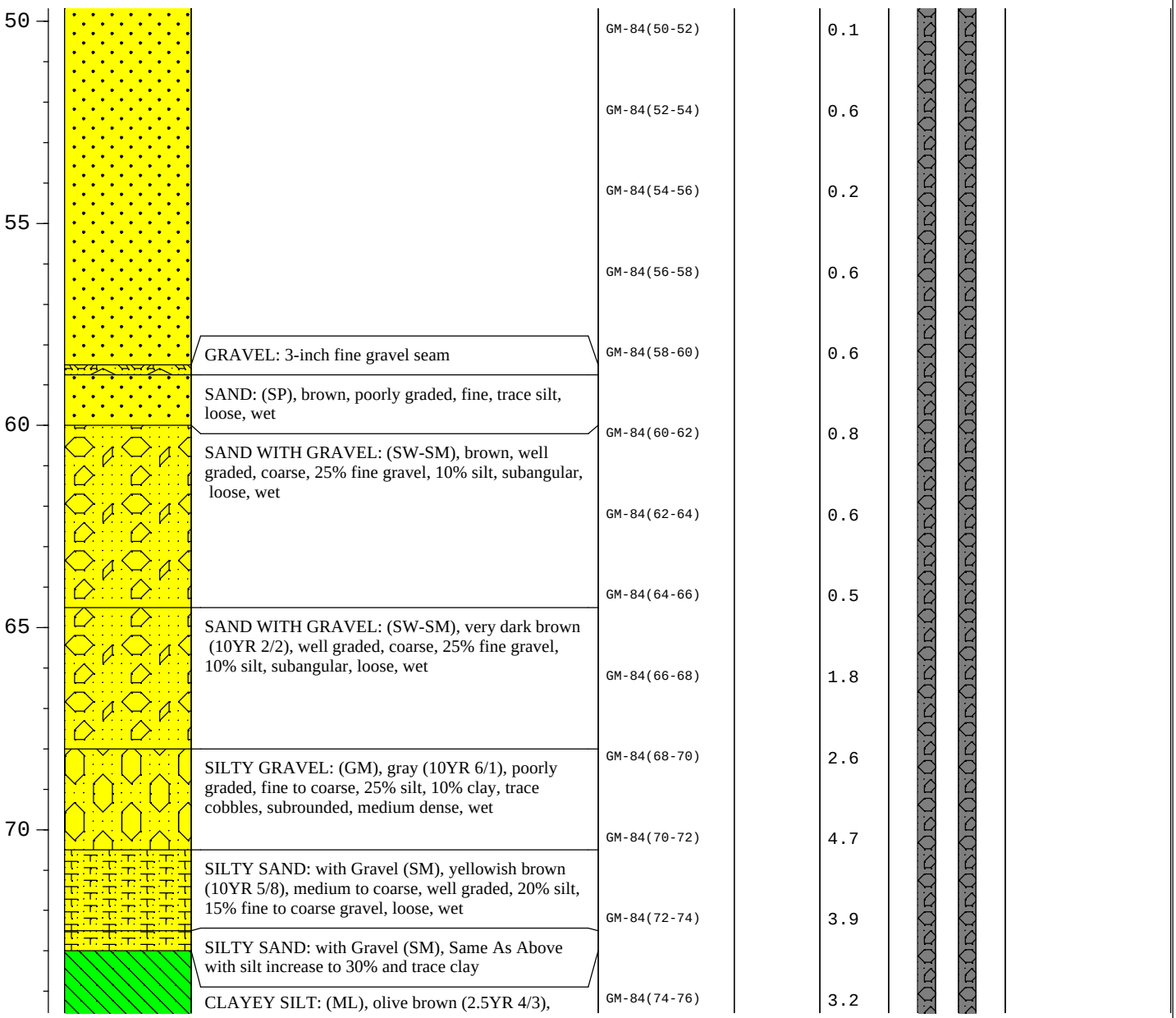
DRILLING METHOD: **Rotosonic**

COORDINATES:

Northing: 2580.278

Easting: 7605.892

Elevation: 740.44



DEPTH	SOIL SYMBOLS	SOIL DESCRIPTION	SAMPLE ID	SUDAN IV	PID (ppm)	WELL CONSTRUCTION DETAILS
			GM-84(50-52)		0.1	
			GM-84(52-54)		0.6	
			GM-84(54-56)		0.2	
			GM-84(56-58)		0.6	
			GM-84(58-60)		0.6	
			GM-84(60-62)		0.8	
			GM-84(62-64)		0.6	
			GM-84(64-66)		0.5	
			GM-84(66-68)		1.8	
			GM-84(68-70)		2.6	
			GM-84(70-72)		4.7	
			GM-84(72-74)		3.9	
			GM-84(74-76)		3.2	

ARCADIS

SOIL BORING/WELL CONSTRUCTION LOG

WELL NO.: **GM-84**

TOTAL DEPTH: **120.0**

PROJECT INFORMATION

PROJECT: **GM/REALM**

SITE LOCATION: **Moraine, Ohio**

LOGGED BY: **Joe Rumschlag**

DATE STARTED: **2/1/2008**

DATE COMPLETED: **2/5/2008**

DRILLING INFORMATION

DRILLING CO.: **Frontz Drilling**

DRILLER: **Dave S.**

DRILLING METHOD: **Rotosonic**

COORDINATES:

Northing: 2580.278

Easting: 7605.892

Elevation: 740.44

DEPTH	SOIL SYMBOLS	SOIL DESCRIPTION	SAMPLE ID	SUDAN IV	PID (ppm)	WELL CONSTRUCTION DETAILS
75		15% clay, trace fine gravel, low plasticity, stiff, dry				
		CLAY: (CL), gray (10YR 5/1), 10% silt, trace fine gravel, trace cobbles, medium to high plasticity, very stiff, dry	GM-84(76-78)		2.6	
			GM-84(78-80)		3.5	
80			GM-84(80-82)		3	
			GM-84(82-84)		2.9	
			GM-84(84-86)		0.9	
85			GM-84(86-88)		1.3	
			GM-84(88-90)		2.5	
90		SILTY CLAY: (CL), dark to grayish brown (10YR 4/2), 20% silt, trace coarse sand and fine gravel, low plasticity, laminations, dry. Subverticle structure present @ 91.25 ft, light grayish brown (10YR 6/2)	GM-84(90-92)		0.2	
		SAND: (SP), brown (10YR 4/3), poorly graded, fine to medium, trace silt, trace coarse sand, subangular, very loose, wet	GM-84(92-94)		0.4	Bentonite Pellets
		SAND WITH GRAVEL: (SW), brown (10YR 4/3), well graded, medium to coarse, 15% gravel, trace silt, very loose, wet. NOTE: at 96 feet 2-inch iron stained seem, yellow (10YR 7/8)	GM-84(94-96)		0.6	Sand Pack #5
95			GM-84(96-98)		0.5	2-inch PVC Screen, 0.010 slot (96.5 to 106.5 feet)
		SAND: (SP), brown (10YR 4/3), poorly graded, medium, trace coarse sand, very loose, wet	GM-84(98-100)		0.5	
		SAND WITH GRAVEL: (SW), brown (10YR 4/3),				

ARCADIS

SOIL BORING/WELL CONSTRUCTION LOG

WELL NO.: **GM-84**

TOTAL DEPTH: **120.0**

PROJECT INFORMATION

PROJECT: **GM/REALM**

SITE LOCATION: **Moraine, Ohio**

LOGGED BY: **Joe Rumschlag**

DATE STARTED: **2/1/2008**

DATE COMPLETED: **2/5/2008**

DRILLING INFORMATION

DRILLING CO.: **Frontz Drilling**

DRILLER: **Dave S.**

DRILLING METHOD: **Rotosonic**

COORDINATES:

Northing: 2580.278

Easting: 7605.892

Elevation: 740.44

DEPTH	SOIL SYMBOLS	SOIL DESCRIPTION	SAMPLE ID	SUDAN IV	PID (ppm)	WELL CONSTRUCTION DETAILS
100		well graded, medium to coarse, 15 to 20% gravel, trace silt, very loose, wet.	GM-84(100-102)		0.5	
		SAND WITH GRAVEL: (SW), brown (10YR 5/3), well graded, medium to coarse, 20 to 25% fine gravel, trace coarse gravel (2-inch), trace silt, subrounded, very loose, wet	GM-84(102-104)		0.3	
		SAND WITH GRAVEL: (SW), Same As Above with coarse sand	GM-84(104-106)		0.2	
105		SAND WITH GRAVEL: Note: fining downwards to 105.5				
		SAND: (SP), brown, poorly graded, fine, trace gravel, trace silt, very loose, wet	GM-84(106-108)		0.3	
		SAND WITH GRAVEL: (SW), brown, well graded, medium to coarse, 20 to 25% fine gravel, trace coarse gravel (3-inch), trace silt, sub-angular, very loose, wet	GM-84(108-110)		0.3	
110			GM-84(110-112)		0.5	
		SAND WITH GRAVEL: (SW), brown, well graded, coarse, 30 to 35% fine gravel, 10% coarse gravel, trace silt, very loose, wet	GM-84(112-114)		1.1	
		GRAVEL WITH SAND: (GW-GM), brown, well graded, fine to coarse, 20% coarse sand, 10% silt, loose, wet	GM-84(114-116)		0.9	
115		SAND WITH GRAVEL: (SW), brown, well graded, coarse, 30 to 35% fine gravel, 10% coarse gravel (1.5-inch), trace silt, very loose, wet	GM-84(116-118)		0.5	
		SAND WITH GRAVEL: (SW), Note: fining downwards to 118.5 with trace coarse gravel	GM-84(118-120)		1.2	
120		SAND WITH GRAVEL: (SW), brown, well graded, medium to coarse, 20% fine gravel, trace coarse gravel, sub-rounded, very loose, wet				
		GRAVEL: (GW), Note: 3-inch coarse gravel seam				

KEY TO SYMBOLS

Symbol **Description**

Strata symbols


High plasticity clay (CH -- C)


Inorganic silts and clays (CH-MH -- MC)


Low plasticity clay (CL -- O)


Low-high plasticity clays (CL-CH -- CO)


Silty low plasticity clay (CL-ML -- CZ)


Fill (FILL -- F)


Clayey gravel (GC -- O8)


Clayey sand and gravel (GC-SC -- DO8)


Silty gravel (GM -- Z8)


Silty clayey gravel (GM-GC -- ZO8)


Silty sand and gravel (GM-SM -- 08)


Poorly graded gravel (GP -- G)


Poorly graded gravel with clay (GP-GC -- DGO3)


Poorly graded gravel with silt (GP-GM -- DGZ3)


Poorly graded gravel and sand (GP-SP -- :G)


Well graded gravel (GW -- 83)

Symbol **Description**


Well graded gravel with clay (GW-GC -- 83O)


Well graded gravel with silt (GW-GM -- 83Z)


Well graded gravel/ clayey gravel (GW-GP -- 83G)


Well graded gravel and sand (GW-SW -- 83D)


Elastic silt (MH -- M)


Silt (ML -- Z)


High plasticity organic clays (OH -- 5)


Low plasticity organic silts (OL -- 4)


Basalt (or generic rock) (ROCK --])


Clayey sand (SC -- DO)


Silty sand (SM -- 0)


Poorly graded clayey silty sand (SM-SC -- :ZO)


Poorly graded silty fine sand (SM-ML -- :Z)


Poorly graded sand (SP -- :)


Poorly graded sand with clay (SP-SC -- :R)


Poorly graded sand with silt (SP-SM -- :=)

KEY TO SYMBOLS

Symbol	Description
Strata symbols	
	Well graded sand (SW -- D)
	Well graded sand with clay (SW-SC -- DR)
	Well graded sand with silt (SW-SM -- D=)
	Interlayered well/poorly graded sand (SW-SP -- D:)
	Silty sandy clay (VC -- 0C)
	Variable gravel and silty sand mix (VG -- 0G)
	Variable sand and silt mix (VS -- 0Y)
	Agglomerate (\)
	Blank (E)
	CH fraction (U)
	CL fraction (R)
	Claystone (H)
	Cobble frac (A)
	Cobbles (B)
	Competent (K)
	Dolomite (()

Symbol	Description
	Extra fine gravel (3)
	Fine gravel (Y)
	Frac rock (X)
	Granite (/)
	Gravel (8)
	Gravel frac (9)
	Intrusive (V)
	Limestone (L)
	Metamorphic rocks ())
	MH fraction (?)
	ML fraction (=)
	Mudstone (7)
	Organics (J)
	Paving (P)
	Peat (Q)
	Sand (S)
	Sandstone (N)
	Schist ($)

KEY TO SYMBOLS

Symbol	Description
Strata symbols	
	Sediment (2)
	Shale (>)
	Shell fragments (&)
	Siltstone (I)
	Topsoil (T)
	Weathered (W)
	EXTRA: alternating dot-dash pattern (|)
	EXTRA: dashed horizontal lines (%)
	EXTRA: medium closely-spaced dots (6)
	EXTRA: narrow-spaced horizontal dashed lines (-)
	EXTRA: random dot pattern (1)
	EXTRA: regularly spaced "V"'s (<)

Symbol	Description
	EXTRA: very narrow cross-hatching (!)
	EXTRA: dashed lines with 3 dots above each dash (.)
	EXTRA: large widely-spaced dots (*)
	EXTRA: small filled triangles ([)
	EXTRA: semi-random dot pattern (:)
	EXTRA: semi-random triangle pattern (')
	EXTRA: zigzag lines (#)
	EXTRA: grass pattern ({)
	EXTRA: tilde sign (})
	EXTRA: randomly arranged square boxes (;)
Misc. Symbols	
	Drill rejection (BOTTOM)
	Boring continues (CONTINUE)
	Water table during drilling (LWATERNF)
	Water table at boring completion (LWATER)

KEY TO SYMBOLS

Symbol	Description
Misc. Symbols	
	Water table during drilling (WATER)
	Water table at boring completion (FWATER)
	Water table during drilling (RWATERNF)
	Water table at boring completion (RWATER)
	(RTARROW)
	Depth to caving (CAVED)
	(CIRCLE)
	(FCIRCLE)
	(HATCHED)
	(XHATCHED)
	(FILLED)
	(BARGRAPH)
	(NOMARKER)
Soil Samplers	
	Auger (A)
	Bulk sample taken from 6 in. auger (B)
	California sampler (C)

Symbol	Description
	Direct Push (D)
	Corps of Engineers sampler (E)
	Bulk/Grab sample (F)
	Piston (I)
	Pitcher (L)
	Denison (O)
	Standard penetration test (P)
	Rock core (R)
	Undisturbed thin wall Shelby tube (S)
	No recovery (X)
	EXTRA: (downward pointing white triangle on black background) (G)
	EXTRA: (double vertical lines) (H)
	EXTRA: (downward pointing outline arrow) (J)
	EXTRA: (downward pointing filled arrow) (K)
	EXTRA: (split diagonally left to right, white on left, black on right) (N)
	EXTRA: (diagonal line from right to left) (T)

KEY TO SYMBOLS

Symbol Description

Soil Samplers



EXTRA: (generic sampling interval)
(U)



EXTRA: (generic sampling interval)
(V)

Monitor Well Details

flush-mount cover
(COVER -- FLUSH,)



riser with cover and protective casing
(CASED RISER -- PROTECT,)



pipe riser
(RISER -- BLANKPVC,)



covered riser
(COVERED RISER -- CAPPED,)



recessed cover set in concrete
(RECESSED -- RECESSED, 13)



top of well, recessed pipe
(SUNKEN -- SUNKEN, 13)



protective casing set in concrete
(CASED -- CASED, 13)



concrete seal
(CONCRETE -- BLANKPVC, 13)



gravel backfill
(GRAVEL -- BLANKPVC, *1)



pipe set in cement grout w/ protective casing
(CEMENT CASED -- CASED, E)



unknown backfill type, blank PVC
(INDETERMINATE -- BLANKPVC, E)



assorted cuttings
(CUTTINGS -- BLANKPVC, O)



bentonite slurry
(BENTONITE -- BLANKPVC, P)

Symbol Description



bentonite pellets
(PELLETS -- BLANKPVC, I)



silica sand, blank PVC
(SAND -- BLANKPVC, 6)



slotted pipe w/ sand
(SLOTTED -- SLOTDPVC, 6)



slotted pipe, unknown backfill
(SLOT/NO FILL -- SLOTDPVC, E)



stylized slotted pipe with no back-fill
(STYLIZED SLOT -- ALTSLOT, E)



endcap on pipe packed in sand
(ENDCAP -- ENDCAP, 6)



no pipe, filler material
(END -- ,])



no pipe, sealed
(SEALED -- , P)



silica sand, no pipe (end plug)
(SAND PLUG -- , 6)



end of well installation
(BLANK -- , E)

Sample Destinations



Composite Sample to Lab
(C)



Grab Sample to Lab
(G)



Split-Spoon not Analyzed
(S)

Section 11

Test Well Logs
TW-1 and TW-2

Test Wells

TW-1 and TW-2

TEST WELL #1
(Installed 6/10 - 6/14/89)

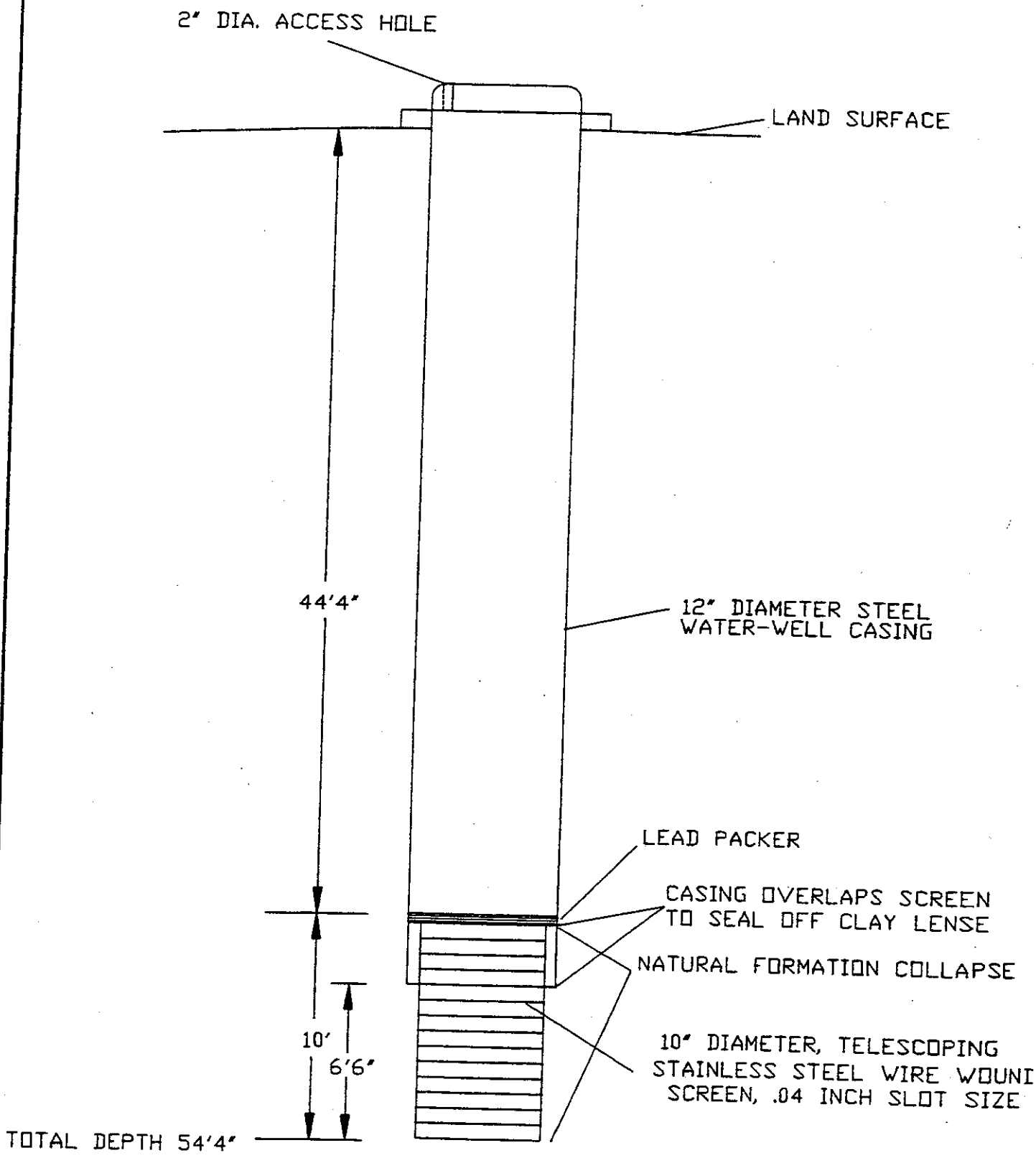
Sample Interval Depth (feet)	Description
0-5	Fine grained till, greasy texture, high percentage of clay and silt sized grains, brown to dark brown color. Mud-like texture upon contact with water
5-7	Sand and gravel outwash, varying in size from medium-grain sand to large gravel cobbles (2-3 inches in diameter). 50-70 percent of the outwash appears to be calcareous in composition and quite angular and fragmented in shape. The remaining 30-50 percent of the sand and gravel outwash is composed of grains showing various degrees of roundedness. Overall, the outwash is dull gray.
7-12	Poorly sorted glacial outwash similar to previous sample. Fewer cobble-sized gravel, grains as a whole are less angular and fragmented and depict a greater degree of roundedness. There is also a corresponding decrease in the amount of calcareous grains and an increase in the percentage of medium-sized sand grains. Outwash is still a dull gray color.
12-27	Very similar to sand and gravel outwash previously described. The only significant change is the appearance of very large cobbles (up to 6 inches in diameter) and large fragments of limestone "flatrock". the limestone fragments are very competent and fossiliferous. There is also an increase in the abundance of medium-sized sand grains (the smallest grains yet encountered). The majority of the sand and gravel grains are rounded to some degree with a small percentage of grains having an angular shape. Sand and gravel of metamorphic and volcanic

Sample Interval Depth (feet)	Description
	origin are increasingly common. The outwash is still dull gray in color.
27-38	Sand and gravel outwash with characteristics very similar to previous sediments with two significant differences. First, there is a noticeable decrease in the overall grain size. There are very few large cobbles and limestone flatrock fragments, and there is an increase in the amount of sand grains. The majority of the sand grains are medium-sized. Fine grained sands are also evident for the first time. Large clumps of fine and medium grained sands were observed indicating a higher cohesiveness and an increase in finer-grained sands and, perhaps, even silt sized grains. Secondly, iron staining was observed for the first time on a majority of the sand and gravel grains indicating either the seasonal high water mark, the unsaturated capillary fringe zone or, perhaps, even the present water table (another less likely possibility is that the iron staining indicates water levels of a Paleo-environment). The outwash is dull gray in places, but is primarily an orange-rust color due to the iron staining.
38-43	Primarily a well sorted-coarse sand and fine gravel outwash with no cobbles nor fragments of limestone flatrock. There is nothing finer than the coarse sand except a trace amount of medium grained sands. This outwash also has a rich brownish color to it and, as a whole, is quite different from the previous sand and gravel outwash.

Sample Interval Depth (feet)	Description
43-45	Poorly sorted, dull gray sand and gravel outwash with large cobbles up to 7-8 inches in diameter. There is an increase in medium sized sand grains. This outwash is similar to the outwash encountered above the 27-foot level.
45-46	Moderately-poorly sorted clay, silt, and fine sand clumps. Gravel grains up to 3/4-inches in diameter were observed in the clay matrix. This sediment was very cohesive and had a greasy texture. The clay and silt was a silvery-gray and violet color with rust colored stipples.
46-48	The same as from 45-46 but intermixed with sand and gravel outwash similar to that encountered from 43-45 feet.
48-50	Even less clay, silt and fine sand, primarily a sand and gravel outwash with cobbles up to 2-3 inches in diameter. The sand and gravel is a gray-tan color.
50-53	Sand and gravel outwash with an increase in the clay and silt content. Outwash varies in size from fine-grained sand to medium-grained gravel (cobbles 2-3 inches in diameter). Outwash is gray-tan color.
53-56	Same as above with less clay and silt and an increase in grain size. Still an abundance of fine-grained sands, but also an increase in the size of the cobbles and the gravel. Some fragments of fossiliferous limestone flatrock (3-3-1/2 inches in diameter) were also observed.

Sample Interval Depth (feet)	Description
56-58	Tan colored clay and silt till. Some large grained sands and fine gravels are observed as inclusions in the clay and silt matrix. This is the unit on which the recovery well is to be placed.

Total Well Depth: 54' 4"
Screened Interval: 44' 4" - 54' 4"
Total Length of Steel Casing: 50 feet, with approximately 2 feet above ground and 4 feet of overlap surrounding the screen
Pump Depth: 51 feet below ground
Comments: There is 50 feet of steel casing with an inside diameter of 23 inches. 48 feet is below ground surface and (approximately) 2 feet above ground surface. The casing consists of 10-foot sections which were welded together on the site prior to being driven into the ground. The screen is 0.04 slot wire wrapped stainless steel with an inside diameter of 10 inches. The annulus between the screen and the casing was sealed by compressing a lead ring located on top of the screen expanding the lead in a horizontal direction until in contact with the inside of the casing (see diagram). The bottom of the screen is at 54' 4". The steel casing overlaps the screen by about 4 feet so that a clay lense encountered between 45-48 feet will not be in direct contact with the screen. The well was installed using the Cable Tool Drilling Method.

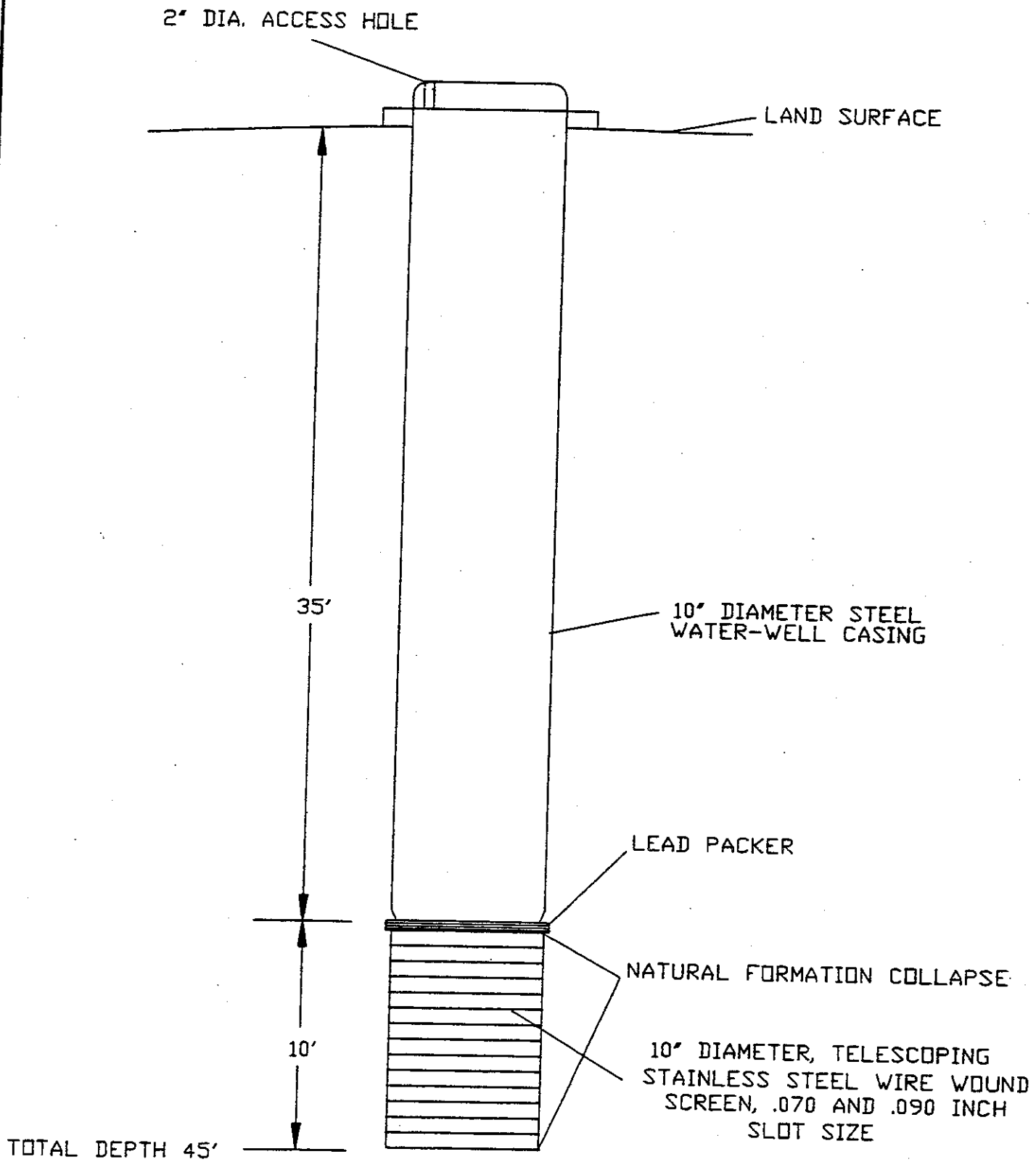


SCALE
NOT TO SCALE

GERAGHTY & MILLER, INC.
Environmental Services

WELL CONSTRUCTION DETAILS OF TEST WELL #1 INSTALLED JUNE 14, 1985

FIGURE



SCALE
NOT TO SCALE

GERAGHTY & MILLER, INC.
Environmental Services

WELL CONSTRUCTION DETAILS OF TEST WELL #2 INSTALLED MAY 8, 1989

FIGURE

GERAGHTY & MILLER, INC.
Ground-Water Consultants

PROJECT NO. 0HO610DY05	BORE HOLE NO. Test Well #2
PROJECT Harrison Radiator	LOCATION Dayton, Ohio
DRILLING CONTRACTOR Reynolds Supply, Inc.	DRILLING EQUIPMENT Cable Tool
HYDROGEOLOGIST J.B. Naser/G.H. Colvin	DRILLER Rick Wilmot
DATE START / TIME 5-5-89	DATE FINISH / TIME
SURFACE ELEVATION	TOTAL DEPTH 48 feet
WELL CASING 10 inch	SCREEN TYPE Stainless Steel
LENGTH 10 foot	SLOT .070 and .090

REMARKS

BORE HOLE LOG

DEPTH (FT.)	SAMPLE (NO.)	LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)	GRAPHIC
5		Fill: SILT (50%); Clay (20%); med. gravel (10%); sand (20%); med. brown		0.0	
10		Fill: CLAY (40%); sand (40%); gravel (20%); dk. gray		0.0	
15		GRAVEL (40%); cs. sand (30%); med. sand (15%); tr. fine sand; tr. silt, gray GRAVEL (35%); v. cs. sand (30%); cobbles (20%); cs. sand (10%); tr. med. sand; tr. fine sand, gray			
20		GRAVEL (40%); cobbles (30%); v. cs. sand (20%); tr. cs. sand (20%); tr. cs. sand; tr. med. sand, gray, cobbles and gravel is nearly equant and rounded		0.0	
25		GRAVEL (40%); cobbles (25%); v. cs. sand (20%); cs. sand (10%); tr. med. sand; reddish brown	color change	0.2	
30					

GERAGHTY & MILLER, INC.
Ground-Water Consultants

PROJECT NO. OH0610DY05

BORE HOLE NO. Test Well #2

PROJECT Harrison Radiator

LOCATION Dayton, Ohio

REMARKS

DEPTH (FT.)	SAMPLE NO.	LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)	GRAPHIC
40		GRAVEL (30%); v. cs. sand (35%); cobbles (10%); cs. sand (15%); med. & fine sand; gray brown; sand fraction is angular, gravel fraction is rounded			
				0.3	
		same as above but contains significantly more silt			
45		Till: CLAY (50%); gravel (30%); v. cs. sand (15%); cs. sand (tr.); brn.			
		Bottom of boring = 48 feet			
50					
55					
60					
65					
70					

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Section 12

RZ Boring Logs

RZ-1A through RZ-1I (no logs)

RZ-3A through RZ-3VV
(logs for RZ-3E, RZ-3O, RZ-3Y,
and RZ-3RR through RZ-3VV)

RZ-4A through RZ-4O

RZ-1 and RZ-3

Drilling and Well Construction Table for Reactive Zone Wells, AOI 7 Interim Measures, General Motors Corporation, Moraine, Ohio.

Well	Drilling & Installation[1]								
	Dates Installed	Geologist	Boring Depth (ft)	Lithology near Bottom of Boring (ft bls)	Screen Length (ft)	Northing	Easting	Ground Elevation (ft above msl)	MP Elevation (ft above msl)
RZ-1A	9/1/99	WJF	34	wet s&g; UCT@33.8	10	5124.38	5916.68	730.73	729.62
RZ-1B	9/3/99	JEK	33	wet s&g; UCT@32	10	5124.39	5932.06	730.49	729.19
RZ-1C	9/1/99	WJF	33	wet s&g; UCT@32.8	10	5124.58	5958.33	730.37	729.39
RZ-1D	9/2/99	WJF	29	wet s&g; UCT@28.5	10	5123.61	5980.29	729.91	728.50
RZ-1E	9/9/99	WJF	26	wet s&g; UCT@25.8	10	5123.09	6008.17	728.88	727.78
RZ-1F	9/7/99	WJF	26	wet s&g; UCT@25.5	10	5123.72	6028.50	728.21	727.46
RZ-1G	9/8/99	WJF	27	wet s&g; UCT@26.5	10	5123.53	6054.29	728.20	727.15
RZ-1H	9/2/99	JEK	28	wet s&g; UCT@27	10	5123.87	6075.29	728.61	727.65
RZ-1I	9/7/99	WJF	27	silt/clay; UCT@26.25	10	5122.97	6101.05	728.14	727.24
RZ-3A	9/15/99	EMG	50	fine sand	20	1633.31	5196.13	727.86	726.74
RZ-3B	9/21/99	JEK	50	fine sand	20	1641.25	5216.37	728.64	727.74
RZ-3C	9/21-22/99	JEK	50	fine sand	20	1642.69	5240.87	729.53	728.19
RZ-3D	9/22/99	JEK	50	fine sand	20	1640.70	5265.04	729.76	728.64
RZ-3E	9/10-14/99	WJF	63[2]	fine sand; RCT@63[3]	20	1635.81	5290.21	729.89	728.65
RZ-3F	9/23/99	JEK	50	fine sand	20	1628.95	5312.43	729.50	728.54
RZ-3G	9/17-21/99	JEK	50	fine sand	20	1626.57	5330.91	729.69	728.67
RZ-3H	9/29/99	WJF	50	fine sand	20	1620.72	5362.76	730.18	729.28
RZ-3I	9/16/99	EMG	50	fine sand	20	1615.97	5387.16	730.31	729.36
RZ-3J	9/27-28/99	WJF	50	fine sand	20	1610.15	5411.99	730.88	729.85
RZ-3K	9/28-29/99	WJF	50	fine sand	20	1604.52	5435.89	731.41	730.41
RZ-3L	9/14-15/99	EMG	49	clayey sand	20	1599.26	5459.88	731.73	730.65
RZ-3M	9/30/99	WJF	50	fine sand	20	1572.15	5476.65	730.96	729.96
RZ-3N	9/30/99	WJF	47	silty sand	20	1571.19	5504.66	731.21	729.99
RZ-3O	9/7-10/99	JEK	68	fine sand; RCT@67.5[3]	40	1589.03	5527.52	732.74	731.76
RZ-3P	9/29-30/99	WJF	50	fine sand	20	1603.91	5547.61	733.14	731.72
RZ-3Q	9/16-17/99	JEK	50	fine sand	20	1612.39	5563.87	732.27	731.22
RZ-3R	9/28-29/99	WJF	49.5	fine sand	20	1629.07	5589.67	731.89	730.85
RZ-3S	9/27-28/99	WJF	50	fine sand	20	1639.80	5605.23	731.92	731.00
RZ-3T	9/14/99	JEK	50	fine sand	20	1656.72	5629.27	731.77	730.62
RZ-3U	9/23-27/99	JEK	50	fine sand	20	1673.60	5656.93	731.52	730.37
RZ-3V	9/21/99	JEK	50	fine sand	20	1685.66	5672.56	731.77	730.82

Well	Drilling & Installation[1]								
	Dates Installed	Geologist	Boring Depth (ft)	Lithology near Bottom of Boring (ft bls)	Screen Length (ft)	Northing	Easting	Ground Elevation (ft above msl)	MP Elevation (ft above msl)
RZ-3W	9/21-22/99	JEK	50	fine sand	20	1698.95	5694.08	731.55	730.42
RZ-3X	9/22/99	JEK	50	fine sand	20	1713.91	5714.86	731.65	730.74
RZ-3Y	9/10-13/99	JEK	58[2]	fine sand; RCT@58[3]	20	1729.22	5733.98	732.18	731.03
RZ-3Z	9/20/99	JEK	50	fine sand	20	1748.15	5751.43	730.77	729.64
RZ-3AA	9/17-20/99	JEK	50	fine sand	20	1766.17	5767.40	730.47	729.47
RZ-3BB	9/16/99	JEK	50	fine sand	20	1785.86	5782.17	730.26	729.26
RZ-3CC	9/15/99	JEK	48	fine sand	20	1802.28	5816.40	730.55	729.39
RZ-3DD	9/14-15/99	JEK	50	fine sand	20	1805.78	5828.72	729.94	728.96
RZ-3EE	10/4/99	WJF	50	fine sand	20	1657.86	5921.38	726.87	725.84
RZ-3FF	10/4/99	WJF	50	fine sand	20	1657.65	5945.83	726.53	725.53
RZ-3GG	10/4/99	WJF	50	fine sand	20	1658.54	5976.23	726.74	725.77
RZ-3HH	10/7/99	WJF	50	fine sand	20	1658.55	5995.72	726.93	725.91
RZ-3II	10/7/99	WJF	50	fine sand	20	1658.89	6022.53	727.08	726.08
RZ-3JJ	10/6/99	WJF	50	fine sand	20	1659.01	6046.97	727.29	726.24
RZ-3KK	10/4-5/99	WJF	46	fine sand	20	1653.16	6070.74	727.43	726.31
RZ-3LL	not drilled[4]								
RZ-3MM	10/6/99	WJF	50	fine sand	20	1659.20	6123.41	727.92	726.92
RZ-3NN	10/7/99	WJF	50	fine sand	20	1658.91	6148.36	728.05	726.88
RZ-3OO	10/7/99	WJF	50	fine sand	20	1659.06	6172.88	728.16	727.22
RZ-3PP	10/4-5/99	WJF	50	fine sand	20	1658.82	6198.16	728.26	727.22
RZ-3QQ	10/6/99	WJF	50	fine sand	20	1658.98	6223.18	728.24	727.31

(1) All wells have the following specifications: Driller = Belasco Drilling Services, Inc.; screen and riser = 3" diameter PVC; drilling method = hollow stem auger; hole diameter = 10"; sampling method = 2'x2" stainless steel split spoon; screen bottom coincides with depth of borehole; formation collapse and sand pack to 2 ft above screen; 3 to 5 ft of bentonite pellets; grout slurry to surface; 18" square flushmount vault at surface. Survey units are in feet relative to plant origin and to mean sea level.

(2) RZ-3E and RZ-3Y were redrilled after reaching till due to heaving sands; bottom of casing set at 50 ft bls.

(3) More complete drilling logs were prepared for carbon introduction wells RZ-3E, RZ-3O, and RZ-3Y.

(4) RZ-3LL was not drilled due to interferences with underground utilities.

WJF - William J. Ferguson.
JEK - John E. Keller.
EMG - Eric M. Gray.
MP Elevation - Measuring Point elevation at the top of PVC casing.

ft - feet.
bls - below land surface.
msl - mean sea level.
s&g - sand and gravel.

UCT - Upper Clay Till.
RCT - Regional Clay Till.

Drilling and Well Construction Table for Oxidation Wells, AOI 7, Interim Measures, General Motors Corporation, Moraine, Ohio.

Well	Drilling & Installation[1]								
	Dates Installed	Geologist	Boring Depth (ft)	Lithology near Bottom of Boring (ft bls)	Screen Length (ft)	Northing	Easting	Ground Elevation (ft above msl)	MP Elevation (ft above msl)
OW-1	8/23/99	WJF	33	wet s&g; UCT@32	5	5402.87	6019.70	730.98	730.11
OW-2	8/23/99	WJF	36	wet s&g; UCT@35	5	5378.73	6020.24	730.99	730.09
OW-3	8/30/99	WJF	33	wet s&g; UCT@32	5	5398.30	6022.32	731.06	730.24
OW-4	8/30/99	JEK	37	wet s&g; UCT@36	5	5693.69	5968.90	735.13	734.28
OW-5	8/30/99	JEK	37	wet s&g; UCT@36.25	5	5595.57	5969.64	733.69	732.69
OW-6	8/30/99	WJF	39	wet s&g; UCT@38.5	5	5627.91	6072.11	734.93	733.98

(1) All wells have the following specifications: Driller = Belasco Drilling Services, Inc.; screen and riser = 2" diameter Schedule 5S Type 304 stainless steel; hole diameter = 8"; sampling method = 2'x2" stainless steel split spoon; screen bottom coincides with depth of borehole; formation collapse and sand pack to 2 ft above screen; 3 to 5 ft of bentonite slurry (OW-1 and OW-2 have pellets); grout slurry to surface; 12" diamater flushmount manhole at surface; drilling method = hollow stem auger; survey units are in feet relative to plant origin and to mean sea level.

WJF - William J. Ferguson.
JEK - John E. Keller.
UCT - Upper Clay Till.
MP Elevation - Measuring Point elevation at the top of PVC casing.

ft - feet.
bls - below land surface.
msl - mean sea level.
s&g - sand and gravel.

g:\public\gmotors\gmcms\owlogs.xls

Borehole Number: RZ-3E

Client: General Motors

Site Location: Moraine, Ohio

Project: Interim Measures

Project No: OH000294.0002.00007

SUBSURFACE PROFILE				SAMPLE				
Depth (feet)	Symbol	Description	Estimated Water Level	Sample Sent To Lab?	Sample Interval	Blows/ft	Recovery (feet)	HNU (ppm)
0		Ground Surface						
0-2		***SAND/GRAVEL*** sand and gravel; some black staining; some debris; such as wood fragments, nails, etc.; dry; no odor			0-2		2.0	0
2-4		***SAND/GRAVEL*** sand and gravel with much black staining; dry; some fine black wood particles which had the high readings; other materials same as seen in RZ-30			2-4		1.0	70.0
4-6		***SAND*** very little recovery; sand dark brown-black			4-6		0.1	3.0
6-8		***SAND/GRAVEL*** sand and gravel; slightly moist; black staining; some odor			6-8		1.0	0.0
8-10		***SAND/GRAVEL*** sand and gravel; slightly moist; looks clean; no odor			8-10		1.5	0.2
10-12		***SAND/GRAVEL*** very little recovery			10-12		0.1	0
12-14		***SAND/GRAVEL*** sand and gravel; slightly moist; no staining			12-14		1.5	0.5
14-16					14-16		0.8	0
16-18					16-18		1.5	0.2
18-20					18-20		1.5	0
20		Stop split spooning-auger down beyond this point. Some heaving sands and regional clay till at 63' bls. Due to heavy sands, the well could not be set at till and was therefore set at 50'						
21-32								

Scientist: Bill Ferguson/Eric Gray
Project Manager: Nancy Gillotti
Drilling Co.: Belasco Drilling
Driller: Ray/Matt
Drilling Method: Hollow Stem Auger
Drilling Fluid: NA

Begin Drilling: 9/10/99
End Drilling: 9/14/99
Hole Size: 10"
Total Depth: 63'
Datum:
File Name: gmotors\gmcrfi\winlogs\r2-3e.log

Surface Elev.: 729.89
North Coor.: 1635.81147
East Coor.: 5290.20644
Converted to Well: Yes
Well Name: RZ-3E
Revised: 3/1/00

Borehole Number: RZ-3E

Client: General Motors

Site Location: Moraine, Ohio

Project: Interim Measures

Project No: OH000294.0002.00007

SUBSURFACE PROFILE				SAMPLE				
Depth (feet)	Symbol	Description	Estimated Water Level	Sample Sent To Lab?	Sample Interval	Blows/ft	Recovery (feet)	HNU (ppm)
33								
34								
35								
36								
37								
38								
39								
40								
41								
42								
43								
44								
45								
46								
47								
48								
49								
50								
51								
52								
53								
54								
55								
56								
57								
58								
59								
60								
61								
62								
63								
64		End of Borehole						

Scientist: Bill Ferguson/Eric Gray
Project Manager: Nancy Gillotti
Drilling Co.: Belasco Drilling
Driller: Ray/Matt
Drilling Method: Hollow Stem Auger
Drilling Fluid: NA

Begin Drilling: 9/10/99
End Drilling: 9/14/99
Hole Size: 10"
Total Depth: 63'
Datum:
File Name: gmotors\gmcrfi\winlogs\r2-3e.log

Surface Elev.: 729.89
North Coor.: 1635.81147
East Coor.: 5290.20644
Converted to Well: Yes
Well Name: RZ-3E
Revised: 3/1/00

Borehole Number: RZ-30

Client: General Motors

Site Location: Moraine, Ohio

Project: Interim Measures

Project No: OH000294.0002.00007

SUBSURFACE PROFILE				SAMPLE				
Depth (feet)	Symbol	Description	Estimated Water Level	Sample Sent To Lab?	Sample Interval	Blows/ft	Recovery (feet)	HNU (ppm)
0		Ground Surface						
0		***TOP SOIL*** grass with topsoil layer						
1		***CLAY*** clay with red streaks and sand with some gravel; dry			0-2		0.8	0
2		***CLAY/SILT*** brown clay with silt; some gravel present; dry						
3					2-4		1.3	1.5
4		***CLAY*** black clay; oily odor; well compacted (fill material)						
4		white and gray cumbly fill material; oily odor						
5					4-6		1.0	2.0
6		***SAND/GRAVEL*** yellow, pink-brown fill material; some sand and gravel; weak oily odor						
7					6-8		1.0	2.0
8		***SAND/GRAVEL*** black sand and gravel; weak oily odor; some fill material present						
9					8-10		0.8	0.75
10		***SAND/GRAVEL*** blue to black fill material; slight oily odor; some sand and gravel at top						
11					10-12		1.5	3.0
12								

Scientist: J.E.K.
Project Manager: Nancy Gillotti
Drilling Co.: Belasco Drilling
Driller: Greg/Rick
Drilling Method: Hollow Stem Auger
Drilling Fluid: NA

Begin Drilling: 9/7/99
End Drilling: 9/10/99
Hole Size: 10"
Total Depth: 68'
Datum:
File Name: gmotors\gmcrfi\winlog\rz-30.log

Surface Elev.: 732.74
North Coor.: 1589.02814
East Coor.: 5527.52146
Converted to Well: Yes
Well Name: RZ-30
Revised: 3/1/00

Borehole Number: RZ-30

Client: General Motors

Site Location: Moraine, Ohio

Project: Interim Measures

Project No: OH000294.0002.00007

SUBSURFACE PROFILE				SAMPLE				
Depth (feet)	Symbol	Description	Estimated Water Level	Sample Sent To Lab?	Sample Interval	Blows/ft	Recovery (feet)	HNU (ppm)
13		***SAND/GRAVEL*** fill material (black) at base which grades into sand and gravel at top; weak oily smell; sand and gravel relatively clean. Hit something at 13' had to move hole over 5' to the east (towards RZ-3P) but still 5' from fence. Drilled to 14' for split spoon sample. Hit another object at 6.5' had to move hole 2' west (3rd hole is between original hole and 2nd hole)			12-14		0.3	2.25
14								
15		***SAND*** sand (medium-coarse); dry; no trace of fill material			14-16		1.2	0
16		***SAND/GRAVEL*** sand and gravel (coarse); cobble size; dry						
17					16-18		0.8	0
18		***SAND/GRAVEL*** coarse sand and gravel; cobble size; dry; faint oily odor						
19					18-20		1.2	0
20		***SAND/GRAVEL*** coarse sand and gravel; dry; losely packed						
21					20-22		0.4	0
22		***SAND/GRAVEL*** coarse sand and gravel; dry; faint oily odor						
23					22-24		2.0	0
24								

Scientist: J.E.K.
Project Manager: Nancy Gillotti
Drilling Co.: Belasco Drilling
Driller: Greg/Rick
Drilling Method: Hollow Stem Auger
Drilling Fluid: NA

Begin Drilling: 9/7/99
End Drilling: 9/10/99
Hole Size: 10"
Total Depth: 68'
Datum:
File Name: gmotors\gmcrfi\winlog\rz-30.log

Surface Elev.: 732.74
North Coor.: 1589.02814
East Coor.: 5527.52146
Converted to Well: Yes
Well Name: RZ-30
Revised: 3/1/00

Borehole Number: RZ-30

Client: General Motors

Site Location: Moraine, Ohio

Project: Interim Measures

Project No: OH000294.0002.00007

SUBSURFACE PROFILE				SAMPLE				
Depth (feet)	Symbol	Description	Estimated Water Level	Sample Sent To Lab?	Sample Interval	Blows/ft	Recovery (feet)	HNU (ppm)
25		***SAND/GRAVEL*** medium to coarse sand and gravel; dry; some compaction			24-26		0.6	0
26		***SAND/GRAVEL*** sand and gravel; dry; very faint oily odor still present			26-28		1.1	0.3
28		***SAND/GRAVEL*** sand and gravel; dry; compacted			28-30		1.5	0
30		***SAND/GRAVEL*** sand and gravel; gravel dominant; dry; loosely compacted			30-32		0.4	0
32		***SAND/GRAVEL*** coarse sand and gravel; wet; compacted	▼		32-34		1.4	0
34		***SAND/GRAVEL*** sand and gravel; wet; slightly compacted			34-36		0.8	0
36								

Scientist: J.E.K.
Project Manager: Nancy Gillotti
Drilling Co.: Belasco Drilling
Driller: Greg/Rick
Drilling Method: Hollow Stem Auger
Drilling Fluid: NA

Begin Drilling: 9/7/99
End Drilling: 9/10/99
Hole Size: 10"
Total Depth: 68'
Datum:
File Name: gmotors\gmcrfi\winlog\rz-30.log

Surface Elev.: 732.74
North Coor.: 1589.02814
East Coor.: 5527.52146
Converted to Well: Yes
Well Name: RZ-30
Revised: 3/1/00

Borehole Number: RZ-30

Client: General Motors

Site Location: Moraine, Ohio

Project: Interim Measures

Project No: OH000294.0002.00007

SUBSURFACE PROFILE				SAMPLE				
Depth (feet)	Symbol	Description	Estimated Water Level	Sample Sent To Lab?	Sample Interval	Blows/ft	Recovery (feet)	HNU (ppm)
37		***SAND/GRAVEL*** gravel dominant with coarse sand; wet			36-38		1.0	0
38		***SAND/GRAVEL*** coarse sand and gravel with gravel becoming dominant at base; wet			38-40		1.1	0
39								
40		***SAND*** coarse sand; wet						
41		***CLAY*** brown clay; well compacted; wet			40-42		1.2	0
42		***SAND/GRAVEL*** coarse sand and gravel; wet						
43		***CLAY*** gray clay; well compacted; wet			42-44		2.0	0
44		***SAND/GRAVEL*** sand and gravel; wet						
45		***CLAY*** gray clay; wet; well compacted			44-46		2.0	0
46		***SAND/GRAVEL*** sand and gravel; wet; black coloration						
47		***SAND/GRAVEL*** sand and gravel; wet			46-48		0.75	0
48								

Scientist: J.E.K.
Project Manager: Nancy Gillotti
Drilling Co.: Belasco Drilling
Driller: Greg/Rick
Drilling Method: Hollow Stem Auger
Drilling Fluid: NA

Begin Drilling: 9/7/99
End Drilling: 9/10/99
Hole Size: 10"
Total Depth: 68'
Datum:
File Name: gmotors\gmcrfi\winlog\rz-30.log

Surface Elev.: 732.74
North Coor.: 1589.02814
East Coor.: 5527.52146
Converted to Well: Yes
Well Name: RZ-30
Revised: 3/1/00

Borehole Number: RZ-30

Client: General Motors

Site Location: Moraine, Ohio

Project: Interim Measures

Project No: OH000294.0002.00007

SUBSURFACE PROFILE				SAMPLE				
Depth (feet)	Symbol	Description	Estimated Water Level	Sample Sent To Lab?	Sample Interval	Blows/ft	Recovery (feet)	HNU (ppm)
49		No split spoons taken due to heavy sands, drilled down to till at 63.5' but central drilling core and augers became stuck so hole was abandoned. Started drilling 4th hole (5' west of the orignial hole) hit something at 32.5' and could not drill through-hole was abandoned. Started 5th hole (2.5' east of 4th hole) hit till at 67.5', set well at 68'.						
50								
51								
52								
53								
54								
55								
56								
57								
58								
59								
60								

Scientist: J.E.K.
Project Manager: Nancy Gillotti
Drilling Co.: Belasco Drilling
Driller: Greg/Rick
Drilling Method: Hollow Stem Auger
Drilling Fluid: NA

Begin Drilling: 9/7/99
End Drilling: 9/10/99
Hole Size: 10"
Total Depth: 68'
Datum:
File Name: gmotors\gmcrfi\winlog\rz-30.log

Surface Elev.: 732.74
North Coor.: 1589.02814
East Coor.: 5527.52146
Converted to Well: Yes
Well Name: RZ-30
Revised: 3/1/00

Borehole Number: RZ-30

Client: General Motors

Site Location: Moraine, Ohio

Project: Interim Measures

Project No: OH000294.0002.00007

SUBSURFACE PROFILE				SAMPLE				
Depth (feet)	Symbol	Description	Estimated Water Level	Sample Sent To Lab?	Sample Interval	Blows/ft	Recovery (feet)	HNU (ppm)
61		No split spoons taken due to heavy sands, drilled down to till at 63.5' but central drilling core and augers became stuck so hole was abandoned. Started drilling 4th hole (5' west of the orignial hole) hit something at 32.5' and could not drill through-hole was abandoned. Started 5th hole (2.5' east of 4th hole) hit till at 67.5', set well at 68'.						
62								
63								
64		***REGIONAL/CLAY TILL***						
65								
66								
67								
68		End of Borehole						
69								
70								
71								
72								

Scientist: J.E.K.
Project Manager: Nancy Gillotti
Drilling Co.: Belasco Drilling
Driller: Greg/Rick
Drilling Method: Hollow Stem Auger
Drilling Fluid: NA

Begin Drilling: 9/7/99
End Drilling: 9/10/99
Hole Size: 10"
Total Depth: 68'
Datum:
File Name: gmotors\gmcrfi\winlog\rz-30.log

Surface Elev.: 732.74
North Coor.: 1589.02814
East Coor.: 5527.52146
Converted to Well: Yes
Well Name: RZ-30
Revised: 3/1/00

Borehole Number: RZ-3Y

Client: General Motors

Site Location: Moraine, Ohio

Project: Interim Measures

Project No: OH000294.0002.00007

SUBSURFACE PROFILE				SAMPLE				
Depth (feet)	Symbol	Description	Estimated Water Level	Sample Sent To Lab?	Sample Interval	Blows/ft	Recovery (feet)	HNU (ppm)
0		Ground Surface						
0		***TOP SOIL*** top soil; organic matter present			0-2		0.9	0
1		***CLAY*** brown clay; with sand; dry						
2		***SAND/GRAVEL*** sand and gravel; dry; very loosely compacted			2-4		1.1	0
3		***SAND/GRAVEL*** sand and gravel; dry						
4		***CLAY*** fill material; black; crumbly; clay-like material			4-6		0.5	0
5		fill material; black; faint oily smell						
6		***SAND/GRAVEL*** sand and gravel; dry; faint oily odor			6-8		0.5	0
7		***SAND/GRAVEL*** sand and gravel; dry; black discoloration; some cohesion						
8		***SAND*** fill material; black; dry; contains some sand			8-10		0.6	0
9								
10		***SAND/GRAVEL*** sand and gravel; dry; no coloration or staining			10-12		1.5	0
11		***SAND/GRAVEL*** sand and gravel; dry; some staining						
12		***CLAY*** clay; dark brown-gray; slightly moist			12-14		1.5	0
13		***CLAY*** light brown clay; slightly moist; contains some gravel						
14		***SAND/GRAVEL*** sand and gravel; black discoloration; moist			14-16		1.25	0
15		***SAND*** clean coarse sand; moist						
16								

Scientist: J.E.K.
Project Manager: Nancy Gillotti
Drilling Co.: Belasco Drilling
Driller: Greg/Rick
Drilling Method: Hollow Stem Auger
Drilling Fluid: NA

Begin Drilling: 9/10/99
End Drilling: 9/13/99
Hole Size: 10"
Total Depth: 50'
Datum:
File Name: gmotors\gmcrfi\winlog\rz-3y.log

Surface Elev.: 732.18
North Coor.: 1729.22419
East Coor.: 5733.97932
Converted to Well: Yes
Well Name: RZ-3Y
Revised: 3/1/00

Borehole Number: RZ-3Y

Client: General Motors

Site Location: Moraine, Ohio

Project: Interim Measures

Project No: OH000294.0002.00007

SUBSURFACE PROFILE				SAMPLE				
Depth (feet)	Symbol	Description	Estimated Water Level	Sample Sent To Lab?	Sample Interval	Blows/ft	Recovery (feet)	HNU (ppm)
17		***SAND/GRAVEL*** sand and grave; moist; relatively clean (some black discoloration at top of spoon)			16-18		2.0	0
18		***SAND/GRAVEL*** sand and gravel; moist; clean						
19								
20		Drilled down to till at 58' but encountered heavy sands coming into the augers. At the till about 8' of material was overlying the center rods which prevented the well from being set. The augers had to be pulled out and the hole re-drilled down to 50' to set the well.						
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								

Scientist: J.E.K.
Project Manager: Nancy Gillotti
Drilling Co.: Belasco Drilling
Driller: Greg/Rick
Drilling Method: Hollow Stem Auger
Drilling Fluid: NA

Begin Drilling: 9/10/99
End Drilling: 9/13/99
Hole Size: 10"
Total Depth: 50'
Datum:
File Name: gmotors\gmcrfi\winlog\rz-3y.log

Surface Elev.: 732.18
North Coor.: 1729.22419
East Coor.: 5733.97932
Converted to Well: Yes
Well Name: RZ-3Y
Revised: 3/1/00

Borehole Number: RZ-3Y

Client: General Motors

Site Location: Moraine, Ohio

Project: Interim Measures

Project No: OH000294.0002.00007

SUBSURFACE PROFILE				SAMPLE				
Depth (feet)	Symbol	Description	Estimated Water Level	Sample Sent To Lab?	Sample Interval	Blows/ft	Recovery (feet)	HNU (ppm)
33								
34								
35								
36								
37								
38								
39								
40								
41								
42								
43								
44								
45								
46								
47								
48								

Scientist: J.E.K.	Begin Drilling: 9/10/99	Surface Elev.: 732.18
Project Manager: Nancy Gillotti	End Drilling: 9/13/99	North Coor.: 1729.22419
Drilling Co.: Belasco Drilling	Hole Size: 10"	East Coor.: 5733.97932
Driller: Greg/Rick	Total Depth: 50'	Converted to Well: Yes
Drilling Method: Hollow Stem Auger	Datum:	Well Name: RZ-3Y
Drilling Fluid: NA	File Name: gmotors\gmcrfi\winlog\rz-3y.log	Revised: 3/1/00

Borehole Number: RZ-3Y

Client: General Motors

Site Location: Moraine, Ohio

Project: Interim Measures

Project No: OH000294.0002.00007

SUBSURFACE PROFILE				SAMPLE				
Depth (feet)	Symbol	Description	Estimated Water Level	Sample Sent To Lab?	Sample Interval	Blows/ft	Recovery (feet)	HNU (ppm)
49								
50		End of Borehole						
51								
52								
53								
54								
55								
56								
57								
58								
59								
60								
61								
62								
63								
64								

Scientist: J.E.K.
Project Manager: Nancy Gillotti
Drilling Co.: Belasco Drilling
Driller: Greg/Rick
Drilling Method: Hollow Stem Auger
Drilling Fluid: NA

Begin Drilling: 9/10/99
End Drilling: 9/13/99
Hole Size: 10"
Total Depth: 50'
Datum:
File Name: gmotors\gmcrfi\winlog\rz-3y.log

Surface Elev.: 732.18
North Coor.: 1729.22419
East Coor.: 5733.97932
Converted to Well: Yes
Well Name: RZ-3Y
Revised: 3/1/00

RZ-3R

ARCADIS

Log of Boring: RZ-3RR

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	N/A	24	-					ASPHALT	
							FILL	FILL Brown, gravely clay with sand and gravel, fill, dry	
2	N/A	24	-					CONCRETE	
							ML	SILT Brown, clayey silt with sand and gravel, hard, no plasticity, dry	
4	N/A	24	1.1				ML	SILT Brown, clayey silt with sand and gravel, hard, no plasticity, dry	
6	N/A	24	1.0				SW	SAND Fine to coarse grained sand (60%) and gravel (40%), dry, well graded	
8	N/A	24	2.3				SW	SAND Fine to coarse grained sand (60%) and gravel (40%), dry, well graded	
10	N/A	24	2.8				SW	SAND Fine to coarse grained sand (80%) and cobble-sized gravel (20%), dry, well graded	
12									

☒ Composite Sample to Lab ■ Grab Sample to Lab ⬚ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: D. O'Mara
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 60
Surface Elev.: 724.61
North Coor.: 39°41'22.213"

Begin Drilling: 5/2/05 @ 1443
End Drilling: 5/2/05 @ 1525
Converted to Well: Y Well I.D.: RZ-3RR
East Coor.: 84°13'21.312"

Remarks:

Project No.: OH000294.0007.00008 Datum: Filename: RZ May 2005 Soil Boring

ARCADIS

Log of Boring: RZ-3RR

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
12	N/A	24	2.3				SW	SAND Fine to coarse grained sand (80%) and cobble-sized gravel (20%), dry, well graded	
14	N/A	24	1.8				SW	SAND Fine to coarse grained sand (80%) and cobble-sized gravel (20%), dry, well graded	
16	N/A	24	1.0				SW	SAND Fine to coarse grained sand (80%) and cobble-sized gravel (20%), dry, well graded	
18	N/A	24	1.8				SW	SAND Fine to coarse grained sand (80%) and cobble-sized gravel (20%), dry, well graded	
20	N/A	24	0.8				SW	SAND Wet (saturated), medium to coarse grained sand (75%) and gravel (25%), cobbles visible, well graded	▼
22	N/A	24	2.2				SW	SAND Wet (saturated), medium to coarse grained sand (75%) and gravel (25%), cobbles visible, well graded	
24									

☒ Composite Sample to Lab ■ Grab Sample to Lab ⬚ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: D. O'Mara
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 60
Surface Elev.: 724.61
North Coor.: 39°41'22.213"

Begin Drilling: 5/2/05 @ 1443
End Drilling: 5/2/05 @ 1525
Converted to Well: Y Well I.D.: RZ-3RR
East Coor.: 84°13'21.312"

Remarks:

Project No.: OH000294.0007.00008 Datum: Filename: RZ May 2005 Soil Boring

ARCADIS

Log of Boring: RZ-3RR

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
24	N/A	24	1.1				SW	SAND Wet (saturated), medium to coarse grained sand (75%) and gravel (25%), cobbles visible, well graded	
26	N/A	24	0.8				GW	GRAVEL Wet (saturated), medium to coarse grained sand (25%) and gravel (75), cobbles visible, well graded	
28	N/A	24	1.1				SW	SAND Wet (saturated), medium to coarse grained sand (75%) and gravel (25%), cobbles visible, well graded	
30	N/A	24	1.1				SW	SAND Wet (saturated), medium to coarse grained sand (75%) and gravel (25%), cobbles visible, well graded	
32	N/A	24	1.3				SW	SAND Wet (saturated), medium to coarse grained sand (75%) and gravel (25%), cobbles visible, well graded	
34	N/A	24	1.1				SW	SAND Wet (saturated), medium to coarse grained sand (75%) and gravel (25%), cobbles visible, well graded	
36									

☒ Composite Sample to Lab ■ Grab Sample to Lab ⊡ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: D. O'Mara
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 60
Surface Elev.: 724.61
North Coor.: 39°41'22.213"

Begin Drilling: 5/2/05 @ 1443
End Drilling: 5/2/05 @ 1525
Converted to Well: Y Well I.D.: RZ-3RR
East Coor.: 84°13'21.312"

Remarks:

Project No.: OH000294.0007.00008 Datum: Filename: RZ May 2005 Soil Boring

ARCADIS

Log of Boring: RZ-3RR

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
36	N/A	24	1.1				SW	SAND Wet (saturated), medium to coarse grained sand (75%) and gravel (25%), cobbles visible, well graded	
38	N/A	24	1.3				SW	SAND Wet (saturated), medium to coarse grained sand (75%) and gravel (25%), cobbles visible, well graded	
40	N/A	24	0.8				SW	SAND Wet (saturated), medium to coarse grained sand (75%) and gravel (25%), cobbles visible, well graded	
42	N/A	24	1.1				SW	SAND Wet (saturated), medium to coarse grained sand (75%) and gravel (25%), cobbles visible, well graded	
44	N/A	24	1.1				SP	SAND Fine to medium grained sand (90%) and gravel (10%), cobbles visible, wet (saturated), poorly graded	
46	N/A	24	0.8				SP	SAND Fine to medium grained sand (90%) and gravel (10%), cobbles visible, wet (saturated), poorly graded	
48									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: D. O'Mara
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 60
Surface Elev.: 724.61
North Coor.: 39°41'22.213"

Begin Drilling: 5/2/05 @ 1443
End Drilling: 5/2/05 @ 1525
Converted to Well: Y Well I.D.: RZ-3RR
East Coor.: 84°13'21.312"

Remarks:

Project No.: OH000294.0007.00008 Datum: Filename: RZ May 2005 Soil Boring

ARCADIS

Log of Boring: RZ-3RR

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
48	N/A	24	1.3				SP	SAND Fine to medium grained sand (90%) and gravel (10%), cobbles visible, wet (saturated), poorly graded	
50	N/A	24	1.1				SW	SAND Medium to coarse grained sand (60%) and gravel (40%), wet (saturated), cobbles visible, well graded	
52	N/A	24	1.1				CL	CLAY Gray, clayey silt, hard, no plasticity, 10% gravel, dry, till	
54	N/A	24	0.8				CL	CLAY Gray, clayey silt, hard, no plasticity, 10% gravel, dry, till	
56	N/A	24	1.1				CL	CLAY Gray, clayey silt, hard, no plasticity, 10% gravel, dry, till	
58	N/A	24	0.8				CL	CLAY Gray, clayey silt, hard, no plasticity, 10% gravel, dry, till	
60									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: D. O'Mara
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 60
Surface Elev.: 724.61
North Coor.: 39°41'22.213"

Begin Drilling: 5/2/05 @ 1443
End Drilling: 5/2/05 @ 1525
Converted to Well: Y Well I.D.: RZ-3RR
East Coor.: 84°13'21.312"

Remarks:

Project No.: OH000294.0007.00008 Datum: Filename: RZ May 2005 Soil Boring

ARCADIS

Log of Boring: RZ-3RR

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
60								End of boring	
62									
64									
66									
68									
70									
72									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▨ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: D. O'Mara
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 60
Surface Elev.: 724.61
North Coor.: 39°41'22.213"

Begin Drilling: 5/2/05 @ 1443
End Drilling: 5/2/05 @ 1525
Converted to Well: Y Well I.D.: RZ-3RR
East Coor.: 84°13'21.312"

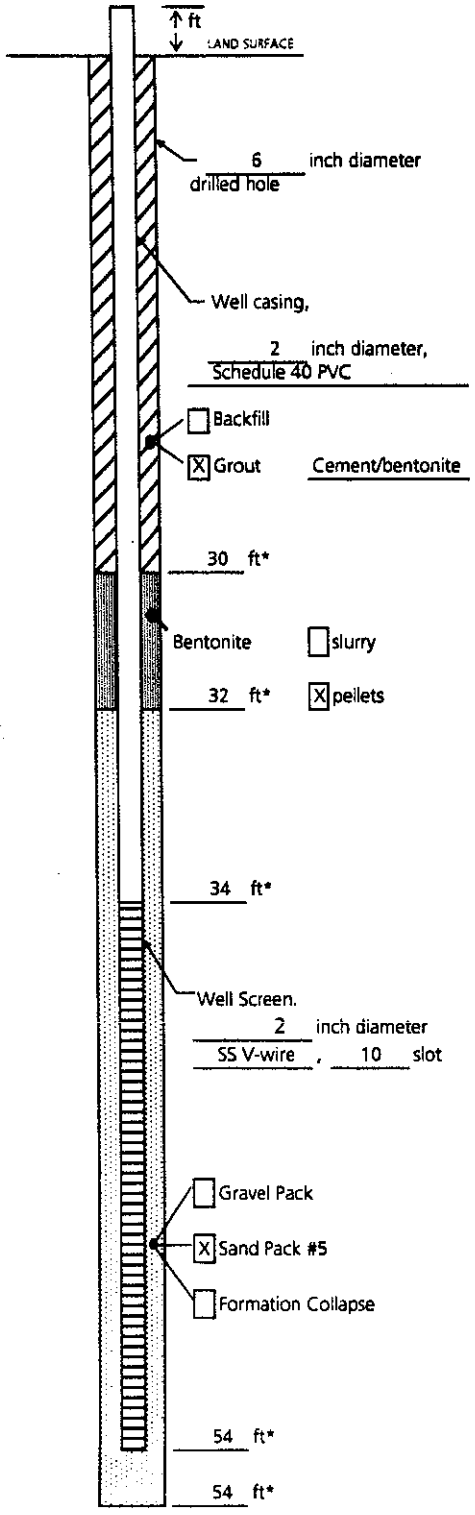
Remarks:

Project No.: OH000294.0007.00008 Datum: Filename: RZ May 2005 Soil Boring

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project OH000294.0007.00008 Well RZ-3RR

Town/City Moraine

County Montgomery State Ohio

Permit No.

Land-Surface (LS) Elevation and Datum:

724.61 feet [X] Surveyed

[ ] Estimated

Installation Date(s) 5/2/2005

Drilling Method Rotosonic

Drilling Contractor Prosonic

Drilling Fluid Potable water

(approximately 125 gallons)

Development Technique(s) and Date(s)

Submersible pump (proactive mini-typhoon)

Fluid Loss During Drilling N/A gallons

Water Removed During Development 60 gallons

Static Depth to Water NM feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration 0.50 hours

Yield 2 gpm Date 5/2/2005

Specific Capacity NM gpm/ft

Well Purpose Introduction well

Remarks

Prepared by J. Manzo

ARCADIS

Log of Boring: RZ-3SS

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Soil Class.	Description	Depth to Water
0	N/A	24	-		ASPHALT	
				FILL	FILL Gravely sand with silt, dry	
2	N/A	24	1.0	FILL	FILL 8" asphalt, gravely sand with silt, dry	
					Concrete	
				ML	SILT Dark gray, clayey silt, dry, no plasticity, hard, 10% sand and gravel	
4	N/A	24	1.1	ML	SILT Dark gray, clayey silt, dry, no plasticity, hard, 10% sand and gravel	
6	N/A	24	0.8	ML	SILT Dark gray, clayey silt, dry, no plasticity, hard, 10% sand and gravel	
8	N/A	24	1.0	SW	SAND Fine to coarse grained sand (75%) and gravel (25%), cobbles visible, dry, well graded	
10	N/A	24	1.1	SW	SAND Fine to coarse grained sand (75%) and gravel (25%), cobbles visible, dry, well graded	
12						

☒ Composite Sample to Lab ■ Grab Sample to Lab ⬚ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: D. O'Mara
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 60
Surface Elev.: 724.57
North Coor.: 39°41'22.124"

Begin Drilling: 5/2/05 @ 10:15
End Drilling: 5/2/05 @ 10:58
Converted to Well: Y Well I.D.: RZ-3SS
East Coor.: 84°13'21.149"

Remarks:

Project No.: OH000294.0007.00008 Datum: Filename: RZ May 2005 Soil Boring

ARCADIS

Log of Boring: RZ-3SS

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
12	N/A	24	2.3				SW	SAND Fine to coarse grained sand (75%) and gravel (25%), cobbles visible, dry, well graded	
14	N/A	24	2.0				SW	SAND Fine to coarse grained sand (75%) and gravel (25%), cobbles visible, dry, well graded	
16	N/A	24	1.8				SW	SAND Fine to coarse grained sand (75%) and gravel (25%), cobbles visible, dry, well graded	
18	N/A	24	1.0				SW	SAND Fine to coarse grained sand (75%) and gravel (25%), cobbles visible, dry, well graded	
20	N/A	24	1.0				SW	SAND Medium to coarse-grained sand (80%) and gravel (20%), wet (saturated), cobbles visible	▼
22	N/A	24	1.3				SW	SAND Medium to coarse-grained sand (80%) and gravel (20%), wet (saturated), cobbles visible	
24									

☒ Composite Sample to Lab ■ Grab Sample to Lab ⬚ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: D. O'Mara
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 60
Surface Elev.: 724.57
North Coor.: 39°41'22.124"

Begin Drilling: 5/2/05 @ 10:15
End Drilling: 5/2/05 @ 10:58
Converted to Well: Y Well I.D.: RZ-3SS
East Coor.: 84°13'21.149"

Remarks:

Project No.: OH000294.0007.00008 Datum: Filename: RZ May 2005 Soil Boring

ARCADIS

Log of Boring: RZ-3SS

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
24	N/A	24	0.8				SW	SAND Medium to coarse-grained sand (80%) and gravel (20%), wet (saturated), cobbles visible	
26	N/A	24	1.1				SW	SAND Medium to coarse-grained sand (80%) and gravel (20%), wet (saturated), cobbles visible	
28	N/A	24	0.8				SW	SAND Medium to coarse-grained sand (80%) and gravel (20%), wet (saturated), cobbles visible	
30	N/A	24	1.1				SW	SAND Medium to coarse-grained sand (80%) and gravel (20%), wet (saturated), cobbles visible	
32	N/A	24	0.8				SW	SAND Medium to coarse-grained sand (80%) and gravel (20%), wet (saturated), cobbles visible	
34	N/A	24	0.8				SW	SAND Medium to coarse-grained sand (80%) and gravel (20%), wet (saturated), cobbles visible	
36									

☒ Composite Sample to Lab ■ Grab Sample to Lab ⊡ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: D. O'Mara
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 60
Surface Elev.: 724.57
North Coor.: 39°41'22.124"

Begin Drilling: 5/2/05 @ 10:15
End Drilling: 5/2/05 @ 10:58
Converted to Well: Y Well I.D.: RZ-3SS
East Coor.: 84°13'21.149"

Remarks:

Project No.: OH000294.0007.00008 Datum: Filename: RZ May 2005 Soil Boring

ARCADIS

Log of Boring: RZ-3SS

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
36	N/A	24	1.0				SW	SAND Medium to coarse-grained sand (80%) and gravel (20%), wet (saturated), cobbles visible	
38	N/A	24	1.3				SW	SAND Medium to coarse-grained sand (80%) and gravel (20%), wet (saturated), very large cobbles visible	
40	N/A	24	0.8				SP	SAND Fine grained sand and silt, 10% gravel, poorly sorted, wet (saturated), cobbles visible	
42	N/A	24	1.3				SP	SAND Fine grained sand and silt, 10% gravel, poorly sorted, wet (saturated), cobbles visible	
44	N/A	24	1.3				SP	SAND Fine grained sand and silt, 10% gravel, poorly sorted, wet (saturated), cobbles visible	
46	N/A	24	0.8				SP	SAND Fine grained sand and silt, 10% gravel, poorly sorted, wet (saturated), cobbles visible	
48									

☒ Composite Sample to Lab ■ Grab Sample to Lab ⬚ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: D. O'Mara
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 60
Surface Elev.: 724.57
North Coor.: 39°41'22.124"

Begin Drilling: 5/2/05 @ 10:15
End Drilling: 5/2/05 @ 10:58
Converted to Well: Y Well I.D.: RZ-3SS
East Coor.: 84°13'21.149"

Remarks:

Project No.: OH000294.0007.00008 Datum: Filename: RZ May 2005 Soil Boring

ARCADIS

Log of Boring: RZ-3SS

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
48	N/A	24	1.1				SP	SAND Fine grained sand and silt, 10% gravel, poorly sorted, wet (saturated), cobbles visible	
50	N/A	24	0.8				SW	SAND medium to coarse grained sand and gravel, wet (saturated), well graded	
52	N/A	24	1.3				CL	CLAY Gray, clayey silt, hard, no plasticity, dry, till, 10% gravel	
54	N/A	24	1.1				CL	CLAY Gray, clayey silt, hard, no plasticity, dry, till, 10% gravel	
56	N/A	24	1.1				CL	CLAY Gray, clayey silt, hard, no plasticity, dry, till, 10% gravel	
58	N/A	24	0.8				CL	CLAY Gray, clayey silt, hard, no plasticity, dry, till, 10% gravel	
60									

☒ Composite Sample to Lab ■ Grab Sample to Lab ⬚ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: D. O'Mara
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 60
Surface Elev.: 724.57
North Coor.: 39°41'22.124"

Begin Drilling: 5/2/05 @ 10:15
End Drilling: 5/2/05 @ 10:58
Converted to Well: Y Well I.D.: RZ-3SS
East Coor.: 84°13'21.149"

Remarks:

Project No.: OH000294.0007.00008 Datum: Filename: RZ May 2005 Soil Boring

ARCADIS

Log of Boring: RZ-3SS

General Motors Corporation Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
60								End of boring	
62									
64									
66									
68									
70									
72									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▦ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: D. O'Mara
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: D. Manzo
Total Depth: 60
Surface Elev.: 724.57
North Coor.: 39°41'22.124"
Begin Drilling: 5/2/05 @ 10:15
End Drilling: 5/2/05 @ 10:58
Converted to Well: Y Well I.D.: RZ-3SS
East Coor.: 84°13'21.149"
Remarks:
Project No.: OH000294.0007.00008 Datum: Filename: RZ May 2005 Soil Boring

ARCADIS

Log of Boring: RZ-3TT

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
12	N/A	24	1.1				SW	SAND Dry, fine to medium grained sand (50%) and gravel (50%), cobbles visible	
14	N/A	24	1.1				SW	SAND Dry, fine to medium grained sand (50%) and gravel (50%), cobbles visible	
16	N/A	24	1.4				SW	SAND Dry, fine to medium grained sand (50%) and gravel (50%), cobbles visible	
18	N/A	24	1.8				SW	SAND Dry, fine to medium grained sand (50%) and gravel (50%), cobbles visible	
20	N/A	24	1.1				GW	GRAVEL Wet (saturated), coarse-grained gravel (60%), cobbles and fine to coarse grained sand (40%), well graded	
22	N/A	24	1.1				GW	GRAVEL Wet (saturated), coarse-grained gravel (60%), cobbles and fine to coarse grained sand (40%), well graded	
24									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: D. O'Mara
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 60
Surface Elev.: 724.53
North Coor.: 39°41'22.034"

Begin Drilling: 4/29/05 @ 8:04
End Drilling: 4/29/05 @ 9:03
Converted to Well: Y Well I.D.: RZ-3TT
East Coor.: 84°13'21.022"

Remarks:

Project No.: OH000294.0007.00008 Datum: Filename: RZ May 2005 Soil Boring

ARCADIS

Log of Boring: RZ-3TT

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
24	N/A	24	1.0				SW	SAND Fine to coarse grained sand (75%) and gravel (25%), wet (saturated), well graded	
26	N/A	24	1.1				SW	SAND Fine to coarse grained sand (75%) and gravel (25%), wet (saturated), well graded	
28	N/A	24	0.8				SW	SAND Fine to coarse grained sand (75%) and gravel (25%), wet (saturated), well graded	
30	N/A	24	1.1				SW	SAND Fine to coarse grained sand (75%) and gravel (25%), wet (saturated), well graded	
32	N/A	24	0.8				SW	SAND Fine to coarse grained sand (75%) and gravel (25%), wet (saturated), well graded	
34	N/A	24	1.0				GW	GRAVEL Medium grained gravel (80%) and medium to coarse grained sand (20%), wet (saturated)	
36									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▨ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: D. O'Mara
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 60
Surface Elev.: 724.53
North Coor.: 39°41'22.034"

Begin Drilling: 4/29/05 @ 8:04
End Drilling: 4/29/05 @ 9:03
Converted to Well: Y Well I.D.: RZ-3TT
East Coor.: 84°13'21.022"

Remarks:

Project No.: OH000294.0007.00008 Datum: Filename: RZ May 2005 Soil Boring

ARCADIS

Log of Boring: RZ-3TT

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
36	N/A	24	0.8				GW	GRAVEL Medium grained gravel (80%) and medium to coarse grained sand (20%), wet (saturated)	
							SW	SAND Fine to coarse sand (75%) and gravel (25%), wet (saturated), well graded	
38	N/A	24	0.8				SW	SAND Fine to coarse sand (75%) and gravel (25%), wet (saturated), well graded	
40	N/A	24	0.8				SW	SAND Fine to coarse sand (75%) and gravel (25%), wet (saturated), well graded	
42	N/A	24	1.1				SW	SAND Fine to medium grained sand (90%) and gravel (10%), wet (saturated), cobbles visible	
44	N/A	24	1.1				SP	SAND Fine grained sand (90%) and gravel (10%), wet (saturated), poorly graded	
46	N/A	24	1.0				SP	SAND Fine grained sand (90%) and gravel (10%), wet (saturated), poorly graded	
48									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: D. O'Mara
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 60
Surface Elev.: 724.53
North Coor.: 39°41'22.034"

Begin Drilling: 4/29/05 @ 8:04
End Drilling: 4/29/05 @ 9:03
Converted to Well: Y Well I.D.: RZ-3TT
East Coor.: 84°13'21.022"

Remarks:

Project No.: OH000294.0007.00008 Datum: Filename: RZ May 2005 Soil Boring

ARCADIS

Log of Boring: RZ-3TT

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Soil Class.	Description	Depth to Water
48	N/A	24	1.1	SP	SAND Fine grained sand (90%) and gravel (10%), wet (saturated), poorly graded	
50	N/A	24	0.8	SW	SAND Coarse grained sand and gravel with gray clay, no plasticity, well graded, wet (saturated)	
52	N/A	24	1.1	ML	CLAY Gray, clayey silt, hard, no plasticity, dry, 10% gravel, till	
54	N/A	24	0.8	ML	CLAY Gray, clayey silt, hard, no plasticity, dry, 10% gravel, till	
56	N/A	24	1.0	ML	CLAY Gray, clayey silt, hard, no plasticity, dry, 10% gravel, till	
58	N/A	24	1.0	ML	CLAY Gray, clayey silt, hard, no plasticity, dry, 10% gravel, till	
60						

Sample Analysis / Sample Type / Graphic Log

☒ Composite Sample to Lab ■ Grab Sample to Lab ▭ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: D. O'Mara
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 60
Surface Elev.: 724.53
North Coor.: 39°41'22.034"

Begin Drilling: 4/29/05 @ 8:04
End Drilling: 4/29/05 @ 9:03
Converted to Well: Y Well I.D.: RZ-3TT
East Coor.: 84°13'21.022"

Remarks:

Project No.: OH000294.0007.00008 Datum: Filename: RZ May 2005 Soil Boring

ARCADIS

Log of Boring: RZ-3TT

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
60								End of boring	
62									
64									
66									
68									
70									
72									

☒ Composite Sample to Lab ■ Grab Sample to Lab ⬚ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: D. O'Mara
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 60
Surface Elev.: 724.53
North Coor.: 39°41'22.034"

Begin Drilling: 4/29/05 @ 8:04
End Drilling: 4/29/05 @ 9:03
Converted to Well: Y Well I.D.: RZ-3TT
East Coor.: 84°13'21.022"

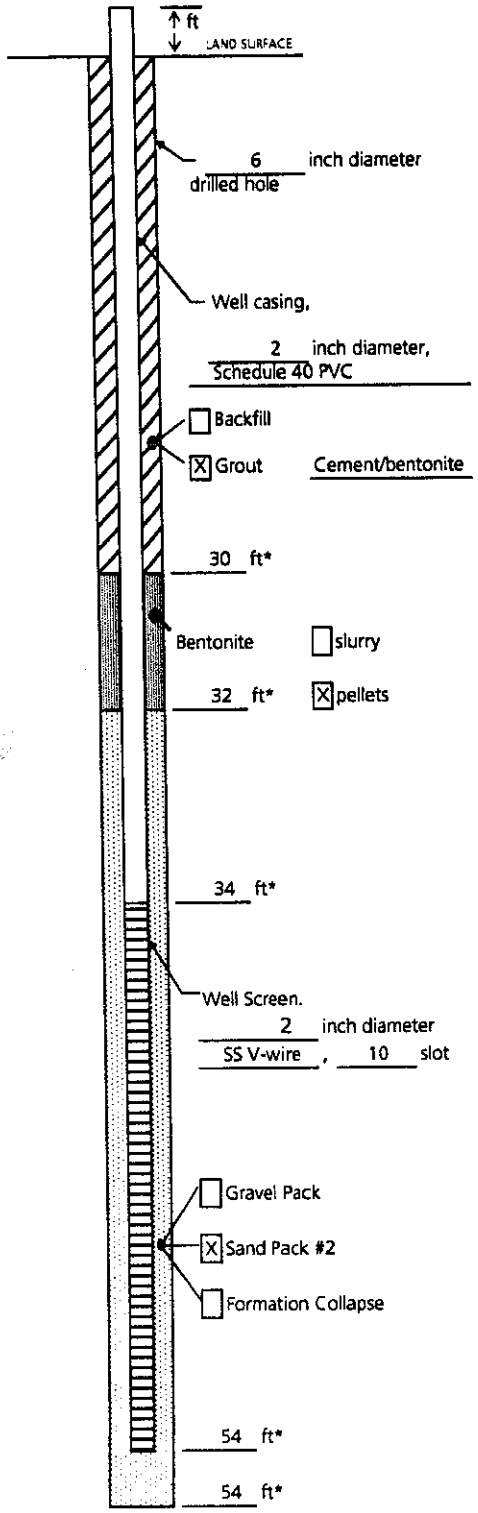
Remarks:

Project No.: OH000294.0007.00008 Datum: Filename: RZ May 2005 Soil Boring

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project OH000294.0007.00008 Well RZ-3TT

Town/City Moraine

County Montgomery State Ohio

Permit No.

Land-Surface (LS) Elevation and Datum:

724.53 feet [X] Surveyed

[ ] Estimated

Installation Date(s) 4/29/2005

Drilling Method Rotosonic

Drilling Contractor Prosonic

Drilling Fluid Potable water

(approximately 120 gallons)

Development Technique(s) and Date(s)

Submersible pump (proactive mini-typhoon)

Fluid Loss During Drilling N/A gallons

Water Removed During Development 60 gallons

Static Depth to Water NM feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration 0.50 hours

Yield 2 gpm Date 5/2/2005

Specific Capacity NM gpm/ft

Well Purpose Introduction well

Remarks

Prepared by J. Manzo

ARCADIS

Log of Boring: RZ-3UU

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Soil Class.	Description	Depth to Water
0	N/A	24	9.3		ASPHALT	
				FILL	FILL Brown, clay silt with gravel, concrete, brick present	
2	N/A	24	7.8	ML	SILT Black, clayey silt with gravel, hard, no plasticity, dry	
4	N/A	24	6.5	ML	SILT Black, clayey silt with gravel, hard, no plasticity, dry	
6	N/A	24	38.5	ML	SILT Black, clayey silt with gravel, hard, no plasticity, dry, hydrocarbon odor present	
8	N/A	24	44.5	ML	SILT Black, clayey silt with gravel, hard, no plasticity, dry, hydrocarbon odor present	
10	N/A	24	20.9	ML	SILT Brown, clayey silt, medium hardness, dry, slight plasticity	
12						

Sample Analysis | Sample Type | Graphic Log

☒ Composite Sample to Lab ■ Grab Sample to Lab ▭ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: D. O'Mara
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 60
Surface Elev.: 723.97
North Coor.: 39°41'21.899"

Begin Drilling: 4/28/05 @ 1448
End Drilling: 4/28/05 @ 1531
Converted to Well: Y Well I.D.: RZ-3UU
East Coor.: 84°13'20.915"

Remarks:

Project No.: OH000294.0007.00008 Datum: Filename: RZ May 2005 Soil Boring

ARCADIS

Log of Boring: RZ-3UU

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
12	N/A	24	14.1				SW	SAND Fine to coarse grained sand (75%) and gravel (25%), cobbles visible, dry, well graded	
14	N/A	24	4.2				SW	SAND Fine to coarse grained sand (75%) and gravel (25%), cobbles visible, dry, well graded	
16	N/A	24	1.8				SW	SAND Fine to coarse grained sand (75%) and gravel (25%), cobbles visible, dry, well graded	
18	N/A	24	1.3				SW	SAND Fine to coarse grained sand (75%) and gravel (25%), cobbles visible, dry, well graded	
20	N/A	24	1.0				SW	SAND Fine to coarse sand (50%) and gravel (50%), well graded, cobbles visible	▼
22	N/A	24	2.1				SW	SAND Fine to coarse sand (50%) and gravel (50%), well graded, cobbles visible	
24									

☒ Composite Sample to Lab ■ Grab Sample to Lab ⬚ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: D. O'Mara
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 60
Surface Elev.: 723.97
North Coor.: 39°41'21.899"

Begin Drilling: 4/28/05 @ 1448
End Drilling: 4/28/05 @ 1531
Converted to Well: Y Well I.D.: RZ-3UU
East Coor.: 84°13'20.915"

Remarks:

Project No.: OH000294.0007.00008 Datum: Filename: RZ May 2005 Soil Boring

ARCADIS

Log of Boring: RZ-3UU

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
24	N/A	24	2.4				SW	SAND Fine to coarse sand (50%) and gravel (50%), well graded, cobbles visible	
26	N/A	24	1.7				SW	SAND Fine to coarse sand (75%) and gravel (25%), cobbles visible, wet (saturated), well graded	
28	N/A	24	1.1				SW	SAND Fine to coarse sand (75%) and gravel (25%), cobbles visible, wet (saturated), well graded	
30	N/A	24	1.9				GW	GRAVEL Fine to coarse grained sand (25%) and gravel (75%), cobbles visible, well graded, wet (saturated)	
32	N/A	24	1.7				GW	GRAVEL Fine to coarse grained sand (25%) and gravel (75%), cobbles visible, well graded, wet (saturated)	
34	N/A	24	2.1				GW	GRAVEL Fine to coarse grained sand (25%) and gravel (75%), cobbles visible, well graded, wet (saturated)	
36									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: D. O'Mara
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 60
Surface Elev.: 723.97
North Coor.: 39°41'21.899"

Begin Drilling: 4/28/05 @ 1448
End Drilling: 4/28/05 @ 1531
Converted to Well: Y Well I.D.: RZ-3UU
East Coor.: 84°13'20.915"

Remarks:

Project No.: OH000294.0007.00008 Datum: Filename: RZ May 2005 Soil Boring

ARCADIS

Log of Boring: RZ-3UU

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
36	N/A	24	1.3				SW	SAND Fine to coarse grained sand (90%) and gravel (10%), cobbles visible, well graded, wet (saturated)	
38	N/A	24	1.1				SW	SAND Fine to coarse grained sand (90%) and gravel (10%), cobbles visible, well graded, wet (saturated)	
40	N/A	24	1.6				SP	SAND Fine to medium grained sand (90%) and gravel (10%), poorly sorted, wet (saturated)	
42	N/A	24	2.2				SP	SAND Fine to medium grained sand (90%) and gravel (10%), poorly sorted, wet (saturated)	
44	N/A	24	1.9				SP	SAND Fine to medium grained sand (90%) and gravel (10%), poorly sorted, wet (saturated)	
46	N/A	24	1.7				SP	SAND Fine to medium grained sand (90%) and gravel (10%), poorly sorted, wet (saturated)	
48									

☒ Composite Sample to Lab ■ Grab Sample to Lab ⬚ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: D. O'Mara
Drilling Method: Rotosonic
Drilling Fluid: Water
Remarks:

Geologist: D. Manzo
Total Depth: 60
Surface Elev.: 723.97
North Coor.: 39°41'21.899"

Begin Drilling: 4/28/05 @ 1448
End Drilling: 4/28/05 @ 1531
Converted to Well: Y Well I.D.: RZ-3UU
East Coor.: 84°13'20.915"

Project No.: OH000294.0007.00008 Datum: Filename: RZ May 2005 Soil Boring

ARCADIS

Log of Boring: RZ-3UU

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
48	N/A	24	1.0				SP	SAND Fine to medium grained sand (90%) and gravel (10%), poorly sorted, wet (saturated)	
50	N/A	24	1.5				SP	SAND Fine to medium grained sand (90%) and gravel (10%), poorly sorted, wet (saturated)	
52	N/A	24	1.2				SW	SAND Interbedded gray clay (till), sand and gravel, wet (saturated), well graded	
54	N/A	24	1.7				SW	SAND Interbedded gray clay (till), sand and gravel, wet (saturated), well graded	
							CL	CLAY Gray, clayey silt, hard, no plasticity, 10% gravel, till	
56	N/A	24	1.0				CL	CLAY Gray, clayey silt, hard, no plasticity, 10% gravel, till	
58	N/A	24	1.5				CL	CLAY Gray, clayey silt, hard, no plasticity, 10% gravel, till	
60									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: D. O'Mara
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 60
Surface Elev.: 723.97
North Coor.: 39°41'21.899"

Begin Drilling: 4/28/05 @ 1448
End Drilling: 4/28/05 @ 1531
Converted to Well: Y Well I.D.: RZ-3UU
East Coor.: 84°13'20.915"

Remarks:

Project No.: OH000294.0007.00008 Datum: Filename: RZ May 2005 Soil Boring

ARCADIS

Log of Boring: RZ-3UU

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
60								End of boring	
62									
64									
66									
68									
70									
72									

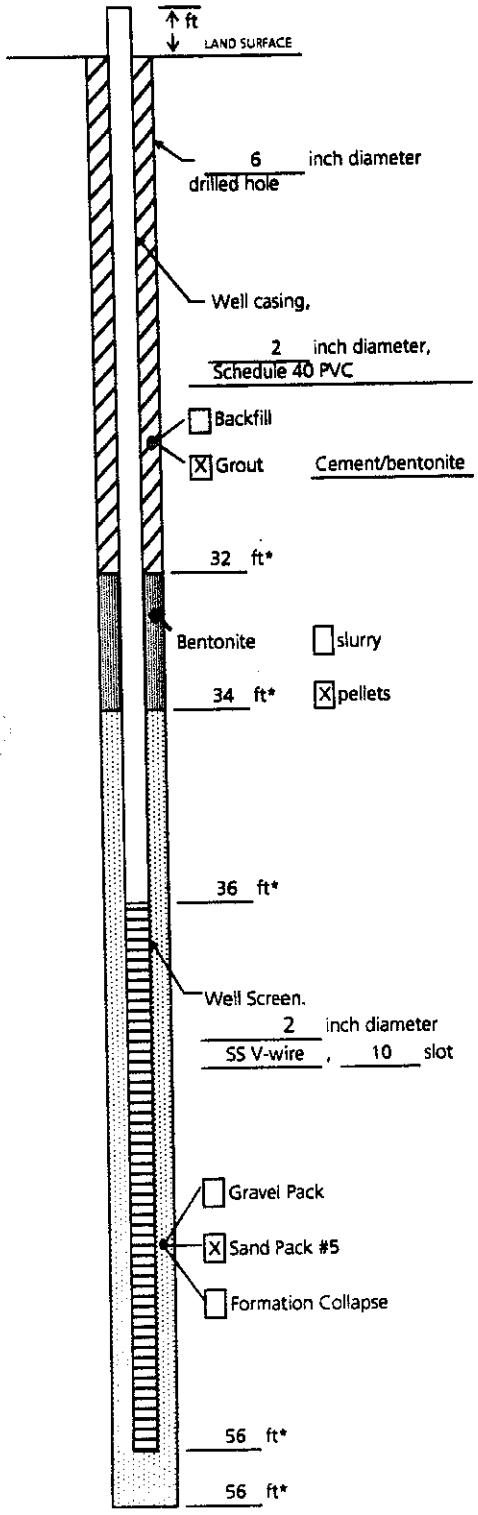
☒ Composite Sample to Lab ■ Grab Sample to Lab ⬚ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: D. O'Mara
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: D. Manzo
Total Depth: 60
Surface Elev.: 723.97
North Coor.: 39°41'21.899"
Begin Drilling: 4/28/05 @ 1448
End Drilling: 4/28/05 @ 1531
Converted to Well: Y Well I.D.: RZ-3UU
East Coor.: 84°13'20.915"
Remarks:
Project No.: OH000294.0007.00008 Datum: Filename: RZ May 2005 Soil Boring

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project OH000294.0007.00008 Well RZ-3UU

Town/City Moraine

County Montgomery State Ohio

Permit No.

Land-Surface (LS) Elevation and Datum:

724.45 feet [X] Surveyed [ ] Estimated

Installation Date(s) 4/28/2005

Drilling Method Rotosonic

Drilling Contractor Prosonic

Drilling Fluid Potable water

(approximately 120 gallons)

Development Technique(s) and Date(s)

Submersible pump (proactive mini-typhoon)

Fluid Loss During Drilling N/A gallons

Water Removed During Development 60 gallons

Static Depth to Water 17.83 feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration 0.50 hours

Yield 2 gpm Date 5/2/2005

Specific Capacity NM gpm/ft

Well Purpose Introduction well

Remarks

Prepared by J. Manzo

ARCADIS

Log of Boring: RZ-3VV

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Soil Class.	Description	Depth to Water
0	N/A	24	0.8		ASPHALT	
				FILL	FILL Damp, pea gravel to coarse gravel with sand	
2	N/A	24	1.4	CL	CLAY Brown, silty clay, medium plasticity, medium hardness, dry to damp	
4	N/A	24	0.4	CL	CLAY Brown, silty clay, medium plasticity, medium hardness, dry to damp	
6	N/A	24	0.1	ML	SILT Gray, clayey silt with fine sand, dry, low plasticity, medium hardness	
8	N/A	24	1.4	ML	SILT Gray, clayey silt with fine sand, dry	
10	N/A	24	0.8	ML	SILT Gray, clayey silt with fine sand, dry	
12						

☒ Composite Sample to Lab ■ Grab Sample to Lab ▨ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: D. O'Mara
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 60
Surface Elev.: 724.17
North Coor.: 39°41'21.751"

Begin Drilling: 4/28/05 @ 9:37
End Drilling: 4/28/05 @ 11:04
Converted to Well: Y Well I.D.: RZ-3VV
East Coor.: 84°13'20.929"

Remarks:

Project No.: OH000294.0007.00008 Datum: Filename: RZ May 2005 Soil Boring

ARCADIS

Log of Boring: RZ-3VV

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
12	N/A	24	0.7				ML	SILT Brown, clayey silt, medium plasticity, medium hardness, dry	
14	N/A	24	1.0				ML	SILT Brown, clayey silt, medium plasticity, medium hardness, dry	
16	N/A	24	1.0				ML	SILT Brown, clayey silt, medium plasticity, medium hardness, dry	
18	N/A	24	0.8				ML	SILT Brown, clayey silt, medium plasticity, medium hardness, dry	
20	N/A	24	1.0				GW	GRAVEL Wet (saturated), coarse grained sand (40%) and gravel (60%), well graded	
22	N/A	24	1.3				GW	GRAVEL Wet (saturated), coarse grained sand (40%) and gravel (60%), well graded	
24									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▨ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: D. O'Mara
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 60
Surface Elev.: 724.17
North Coor.: 39°41'21.751"

Begin Drilling: 4/28/05 @ 9:37
End Drilling: 4/28/05 @ 11:04
Converted to Well: Y Well I.D.: RZ-3VV
East Coor.: 84°13'20.929"

Remarks:

Project No.: OH000294.0007.00008 Datum:

Filename: RZ May 2005 Soil Boring

ARCADIS

Log of Boring: RZ-3VV

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
24	N/A	24	1.1				GW	GRAVEL Wet (saturated), coarse grained sand (40%) and gravel (60%), well graded	
26	N/A	24	1.0				SW	SAND Wet (saturated), fine to coarse grained sand (75%) and gravel (25%), well graded	
28	N/A	24	1.3				SW	SAND Wet (saturated), fine to coarse grained sand (75%) and gravel (25%), well graded	
30	N/A	24	1.9				SW	SAND Wet (saturated), fine to coarse grained sand (75%) and gravel (25%), well graded	
32	N/A	24	1.7				SW	SAND Wet (saturated), fine to coarse grained sand (75%) and gravel (25%), well graded	
34	N/A	24	1.4				SW	SAND Wet (saturated), medium to coarse grained sand (70%) and fine to coarse grained gravel (25%), cobbles visible, well graded	
36									

☒ Composite Sample to Lab ■ Grab Sample to Lab ⬚ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: D. O'Mara
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 60
Surface Elev.: 724.17
North Coor.: 39°41'21.751"

Begin Drilling: 4/28/05 @ 9:37
End Drilling: 4/28/05 @ 11:04
Converted to Well: Y Well I.D.: RZ-3VV
East Coor.: 84°13'20.929"

Remarks:

Project No.: OH000294.0007.00008 Datum: Filename: RZ May 2005 Soil Boring

ARCADIS

Log of Boring: RZ-3VV

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
36	N/A	24	1.7				SW	SAND Wet (saturated), medium to coarse grained sand (70%) and fine to coarse grained gravel (25%), cobbles visible, well graded	
38	N/A	24	1.7				SW	SAND Wet (saturated), medium to coarse grained sand (70%) and fine to coarse grained gravel (25%), cobbles visible, well graded	
40	N/A	24	2.9				SW	SAND Wet (saturated), fine to medium grained sand (80%) with coarse gravel (20%), cobbles visible, well graded	
42	N/A	24	3.2				SP	SAND Wet (saturated), fine grained sand (90%) and gravel (10%), poorly graded, cobbles visible	
44	N/A	24	4.7				SP	SAND Wet (saturated), fine grained sand (90%) and gravel (10%), poorly graded, cobbles visible	
46	N/A	24	4.2				SP	SAND Wet (saturated), fine grained sand (90%) and gravel (10%), poorly graded, cobbles visible	
48									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▨ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: D. O'Mara
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 60
Surface Elev.: 724.17
North Coor.: 39°41'21.751"

Begin Drilling: 4/28/05 @ 9:37
End Drilling: 4/28/05 @ 11:04
Converted to Well: Y Well I.D.: RZ-3VV
East Coor.: 84°13'20.929"

Remarks:

Project No.: OH000294.0007.00008 Datum: Filename: RZ May 2005 Soil Boring

ARCADIS

Log of Boring: RZ-3VV

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
48	N/A	24	3.9				SP	SAND Wet (saturated), fine grained sand (90%) and gravel (10%), poorly graded, cobbles visible	
50	N/A	24	3.8				SW	SAND Fine to coarse grained sand (75%) and gravel (25%), wet (saturated), well graded	
52	N/A	24	3.4				GW	GRAVEL Medium to coarse grained sand (25%) and gravel (75%), cobbles visible, well graded, wet (saturated)	
54	N/A	24	3.4				GW	GRAVEL Medium to coarse grained sand (25%) and gravel (75%), cobbles visible, well graded, wet (saturated)	
							CL	CLAY Gray, silty clay, hard, no plasticity, 10% gravel, till, dry	
56	N/A	24	2.6				CL	CLAY Gray, silty clay, hard, no plasticity, 10% gravel, till, dry	
58	N/A	24	2.1				CL	CLAY Gray, silty clay, hard, no plasticity, 10% gravel, till, dry	
60									

☒ Composite Sample to Lab ■ Grab Sample to Lab ⬚ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: D. O'Mara
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 60
Surface Elev.: 724.17
North Coor.: 39°41'21.751"

Begin Drilling: 4/28/05 @ 9:37
End Drilling: 4/28/05 @ 11:04
Converted to Well: Y Well I.D.: RZ-3VV
East Coor.: 84°13'20.929"

Remarks:

Project No.: OH000294.0007.00008 Datum: Filename: RZ May 2005 Soil Boring

ARCADIS

Log of Boring: RZ-3VV

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
60								End of boring	
62									
64									
66									
68									
70									
72									

☒ Composite Sample to Lab ■ Grab Sample to Lab ☐ Split-Spoon Not Analyzed

Drilling Co.: Prosonic
Driller: D. O'Mara
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: D. Manzo
Total Depth: 60
Surface Elev.: 724.17
North Coor.: 39°41'21.751"

Begin Drilling: 4/28/05 @ 9:37
End Drilling: 4/28/05 @ 11:04
Converted to Well: Y Well I.D.: RZ-3VV
East Coor.: 84°13'20.929"

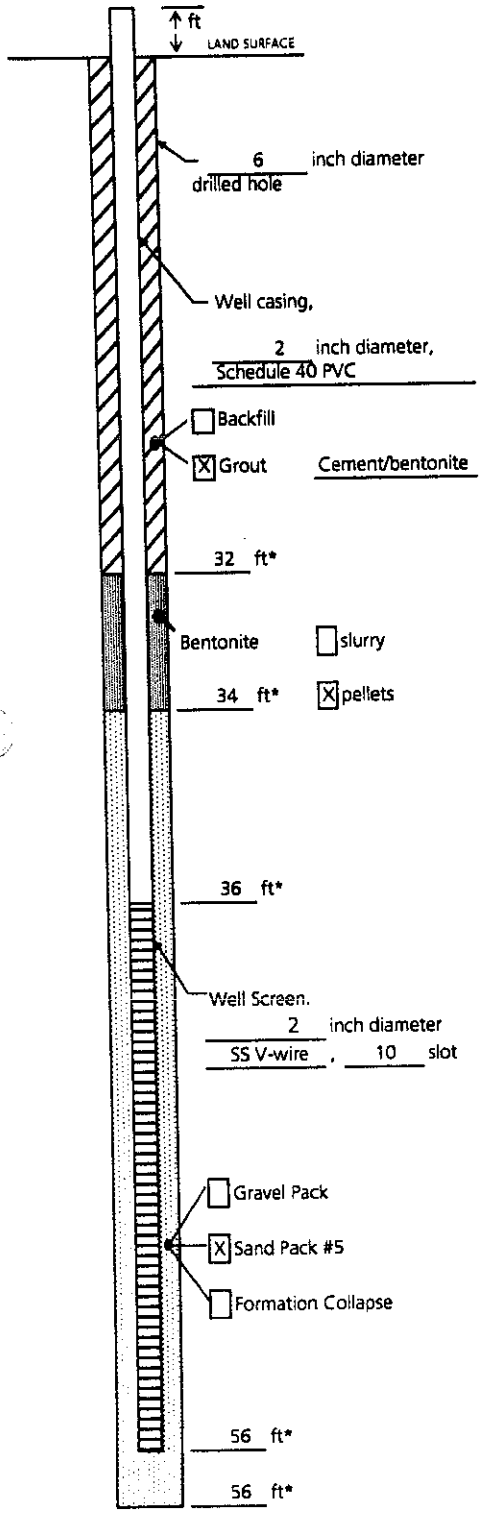
Remarks:

Project No.: OH000294.0007.00008 Datum: Filename: RZ May 2005 Soil Boring

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project OH000294.0007.00008 Well RZ-3VV

Town/City Moraine

County Montgomery State Ohio

Permit No.

Land-Surface (LS) Elevation and Datum:

724.17 feet [X] Surveyed

[ ] Estimated

Installation Date(s) 4/28/2005

Drilling Method Rotosonic

Drilling Contractor Prosonic

Drilling Fluid Potable water

(approximately 120 gallons)

Development Technique(s) and Date(s)

Submersible pump (proactive mini-typhoon)

Fluid Loss During Drilling N/A gallons

Water Removed During Development 60 gallons

Static Depth to Water 17.83 feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration 0.50 hours

Yield 2 gpm Date 5/2/2005

Specific Capacity NM gpm/ft

Well Purpose Introduction well

Remarks

Prepared by J. Manzo

ARCADIS

Log of Boring: RZ-4A

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	N/A	0						No recovery	
2	N/A	24	1.9				CL	SILTY CLAY Black-dark gray, fine-medium gravel (30%), soft, medium plasticity, moist	
4	N/A	24	0.9				CL	Same as above	
6	N/A	24	2.2				SP	SAND Brown, medium-coarse, fine-medium gravel (30%), moist	
8	N/A	24	0.8				SP	Same as above	
10	N/A	24	0.0				SP	Same as above, fine-coarse gravel (30%)	
12									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: T. Fortner
Total Depth: 60
Surface Elev.: 726.146
North Coor.: 1937.34929
Begin Drilling: 7/14/06 @ 1020
End Drilling: 7/14/06 @ 1200
Converted to Well: Y Well I.D.: RZ-4A
East Coor.: 5167.33957
Remarks:

Project No.: OH000294.0009.0004B Datum: TOC Elev. 725.709 Filename: July 2006

ARCADIS

Log of Boring: RZ-4A

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
12	N/A	24	4.1				SP	Same as above	
14	N/A	24	4.0				SP	Same as above	
16	N/A	24	1.2				SP	Same as above	
18	N/A	24	4.1				SP	Same as above	
20	N/A	24	4.3				GP	GRAVEL Cobbles with trace fine-medium sand, dry (mostly dolomite)	
22	N/A	24	5.5				SP	SILTY SAND Brown, fine-medium, fine gravel (40%), poorly graded, wet	▼
24									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: T. Fortner
Total Depth: 60
Surface Elev.: 726.146
North Coor.: 1937.34929

Begin Drilling: 7/14/06 @ 1020
End Drilling: 7/14/06 @ 1200
Converted to Well: Y Well I.D.: RZ-4A
East Coor.: 5167.33957

Remarks:

Project No.: OH000294.0009.0004B Datum: TOC Elev. 725.709 Filename: July 2006

ARCADIS

Log of Boring: RZ-4A

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
24	N/A	24	0.0				SP	Same as above	
26	N/A	24	0.0				GP	GRAVEL Fine, medium-coarse sand (30%), wet	
28	N/A	24	0.0				SP	SAND Brown, medium-coarse, fine to medium gravel (20%), cobbles (5%), poorly graded, wet	
30	N/A	24	0.0				SP	Same as above	
32	N/A	24	0.0				SP	Same as above	
34	N/A	24	0.0				SP	Same as above	
36									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: T. Fortner
Total Depth: 60
Surface Elev.: 726.146
North Coor.: 1937.34929

Begin Drilling: 7/14/06 @ 1020
End Drilling: 7/14/06 @ 1200
Converted to Well: Y Well I.D.: RZ-4A
East Coor.: 5167.33957

Remarks:

Project No.: OH000294.0009.0004B Datum: TOC Elev. 725.709 Filename: July 2006

ARCADIS

Log of Boring: RZ-4A

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
36	N/A	24	0.0				SP	Same as above, fine-medium gravel (30%), no cobbles	
38	N/A	24	0.0				SP	Same as above	
40	N/A	24	0.0				SP	SAND Brown, fine, with some silt, poorly graded, wet	
42	N/A	24	0.9				SP	Same as above	
44	N/A	24	0.0				SP	Same as above	
46	N/A	24	1.9				SP	SAND Brown, medium-coarse, fine-medium gravel (10%), wet	
48									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: T. Fortner
Total Depth: 60
Surface Elev.: 726.146
North Coor.: 1937.34929

Begin Drilling: 7/14/06 @ 1020
End Drilling: 7/14/06 @ 1200
Converted to Well: Y Well I.D.: RZ-4A
East Coor.: 5167.33957

Remarks:

Project No.: OH000294.0009.0004B Datum: TOC Elev. 725.709 Filename: July 2006

ARCADIS

Log of Boring: RZ-4A

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
48	N/A	24	0.1				SP	Same as above	
50	N/A	24	1.7				SP	Same as above, no gravel	
52	N/A	24	1.0				SP	Same as above	
54	N/A	24	2.2				CL	SILTY CLAY Brown, stiff, fine gravel (20%), low plasticity, moist	
56	N/A	24	4.7				SM	SILTY SAND Gray, fine-medium, poorly graded, moist	
58	N/A	24	4.8				SM	Same as above	
60							CL	SILTY CLAY	

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: T. Fortner
Total Depth: 60
Surface Elev.: 726.146
North Coor.: 1937.34929

Begin Drilling: 7/14/06 @ 1020
End Drilling: 7/14/06 @ 1200
Converted to Well: Y Well I.D.: RZ-4A
East Coor.: 5167.33957

Remarks:

Project No.: OH000294.0009.0004B Datum: TOC Elev. 725.709 Filename: July 2006

ARCADIS

Log of Boring: RZ-4A

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
60								Gray, stiff, brittle low plasticity, fine gravel (10-20%), dry End of boring	
62									
64									
66									
68									
70									
72									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: T. Fortner
Total Depth: 60
Surface Elev.: 726.146
North Coor.: 1937.34929

Begin Drilling: 7/14/06 @ 1020
End Drilling: 7/14/06 @ 1200
Converted to Well: Y Well I.D.: RZ-4A
East Coor.: 5167.33957

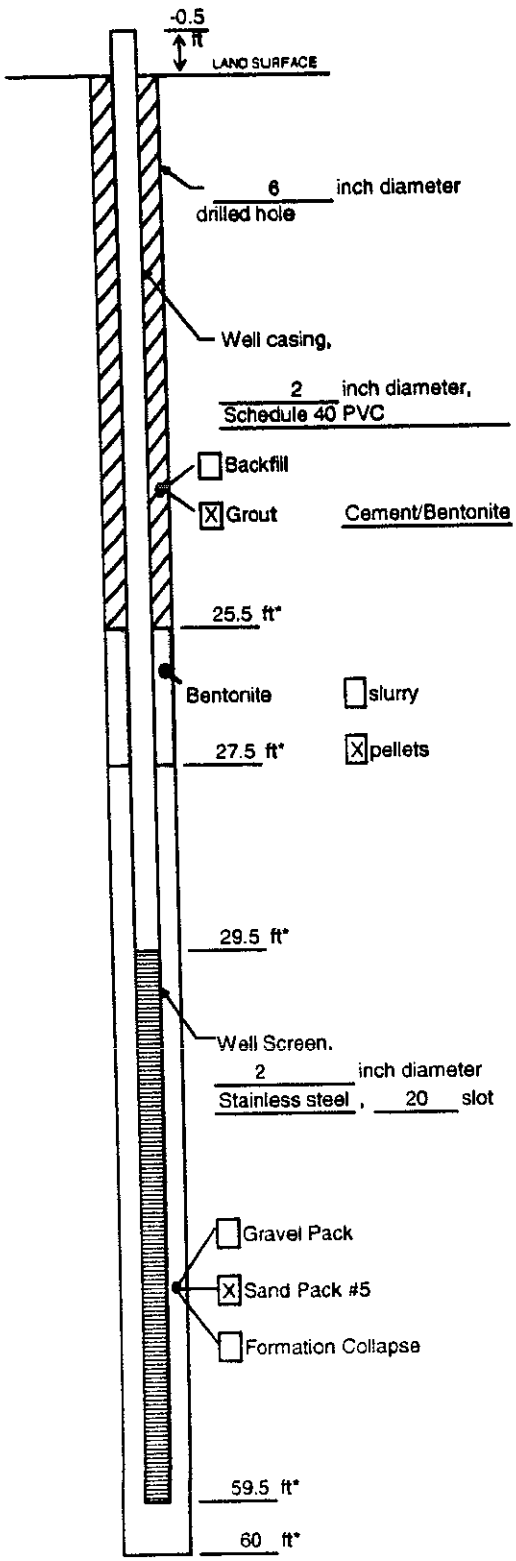
Remarks:

Project No.: OH000294.0009.0004B Datum: TOC Elev. 725.709 Filename: July 2006

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.
* Depth Below Land Surface

Project General Motors Corporation Well RZ-4A

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

726.146 feet [x] Surveyed

[ ] Estimated

Installation Date(s) 7/14/2006

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Pumping - surge with pump 7/28/06

Fluid Loss During Drilling ~150 gallons

Water Removed During Development 210 gallons

Static Depth to Water 19.1 feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration NM hours

Yield NM gpm Date 7/28/06

Specific Capacity NM gpm/ft

Well Purpose Introduction well

Remarks TOC Elevation = 725.709

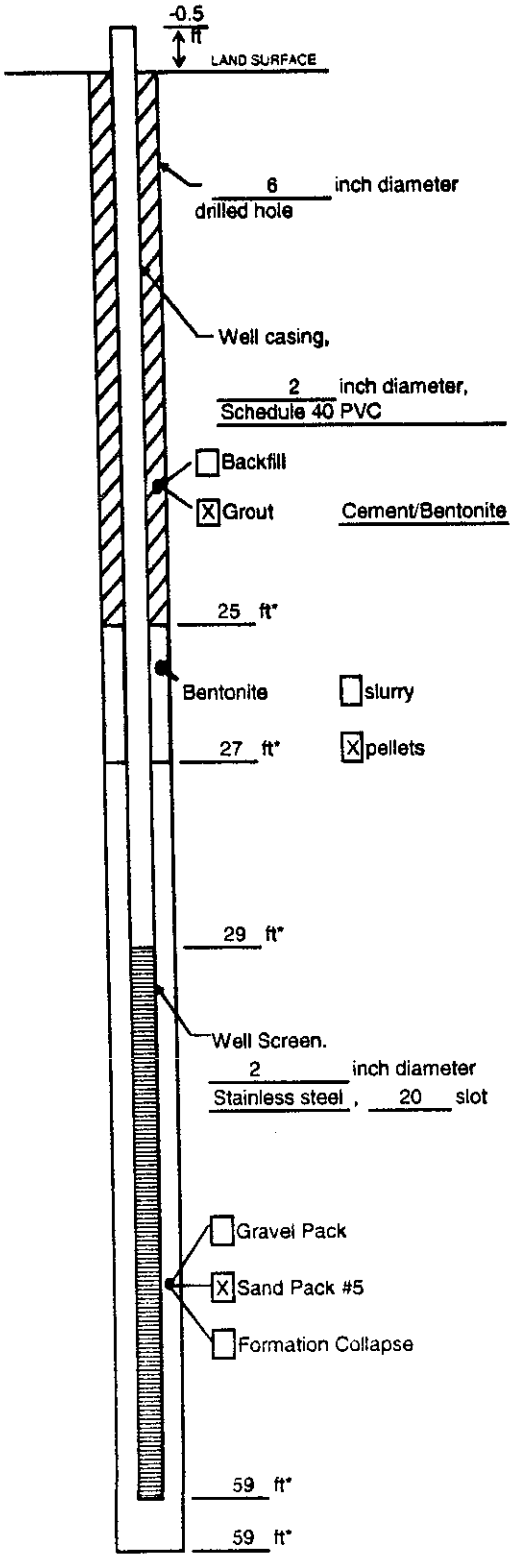
Clear non-turbid

Prepared by C. Catlett

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well RZ-4B

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

726.160 feet [X] Surveyed

[ ] Estimated

Installation Date(s) 7/15/2006

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Pumping - surge with pump 7/28/06

Fluid Loss During Drilling ~150 gallons

Water Removed During Development 240 gallons

Static Depth to Water 19.2 feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration NM hours

Yield NM gpm Date 7/28/06

Specific Capacity NM gpm/ft

Well Purpose Introduction well

Remarks TOC Elevation = 725.767

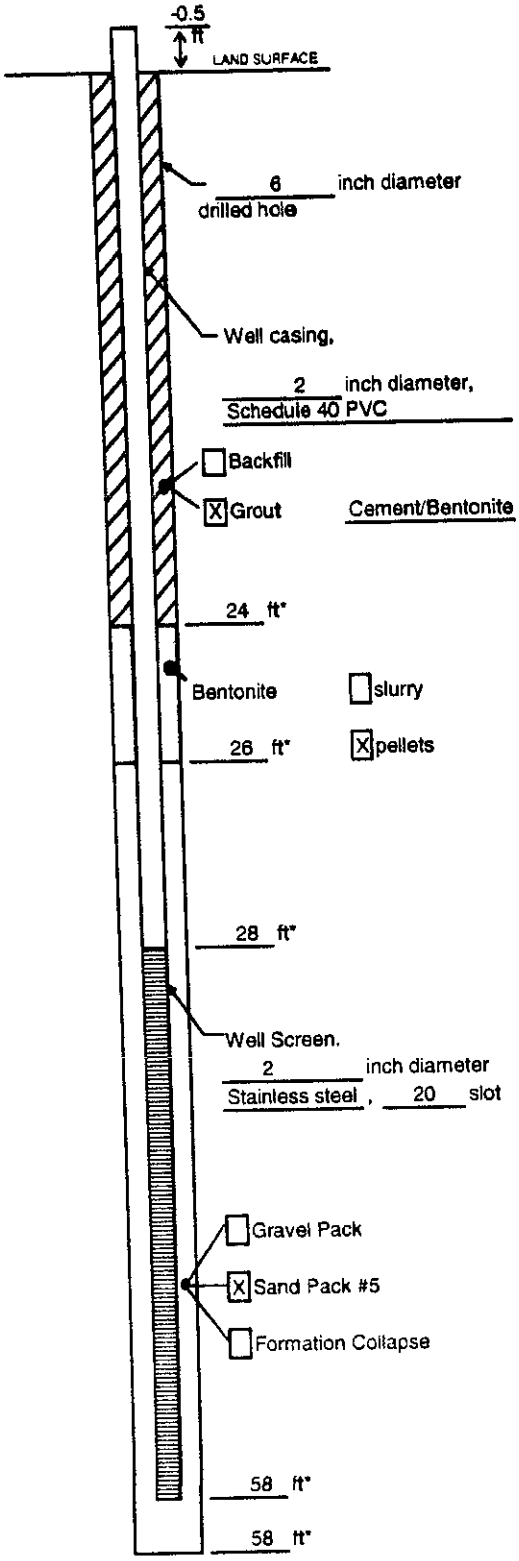
Clear non-turbid

Prepared by C. Catlett

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well RZ-4C

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

727.059 feet [x] Surveyed

[ ] Estimated

Installation Date(s) 7/16/2006

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Pumping - surge with pump 7/28/06

Fluid Loss During Drilling ~150 gallons

Water Removed During Development 240 gallons

Static Depth to Water 20.02 feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration NM hours

Yield NM gpm Date 7/28/06

Specific Capacity NM gpm/ft

Well Purpose Introduction well

Remarks TOC Elevation = 726.598

Clear non-turbid

Prepared by C. Catlett

ARCADIS

Log of Boring: RZ-4D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Soil Class.	Description	Depth to Water
0		0			No recovery	
2	N/A	24	6.1	FILL	FILL Black, silt, gravel, sand, ashbits of wood, glass and metal, dry	
4	N/A	24	0.2	CL	SANDY CLAY Brown, fine, fine-medium gravel (10%), medium plasticity, soft, moist	
6	N/A	24	2.4	CL	Same as above	
8	N/A	24	0.6	SW	SAND/GRAVEL Brown, fine-medium sand, fine-medium gravel, well graded, dry	
10	N/A	24	5.4	CL	SANDY CLAY Brown, fine sand, fine-medium gravel (10%), soft, medium plasticity, moist	
12						

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: T. Fortner
Total Depth: 65
Surface Elev.: 727.549
North Coor.: 1893.66411

Begin Drilling: 7/14/06 @ 1407
End Drilling: 7/14/06 @ 1616
Converted to Well: Y Well I.D.: RZ-4D
East Coor.: 5246.27240

Remarks:

Project No.: OH000294.0009.0004B Datum: TOC Elev. 727.075 Filename: July 2006

ARCADIS

Log of Boring: RZ-4D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
12	N/A	24	7.2				SP	SAND Brown, fine-medium, coarse gravel (5%), poorly graded, dry	
14	N/A	24	8.1				SP	Same as above	
16	N/A	24	0.0				SW	Same as above, fine-medium gravel (10%)	
18	N/A	24	0.0				SW	Same as above	
20	N/A	24	0.0				SW	Same as above	
22	N/A	24	0.0				SW	Same as above, wet	▼
24									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: T. Fortner
Total Depth: 65
Surface Elev.: 727.549
North Coor.: 1893.66411

Begin Drilling: 7/14/06 @ 1407
End Drilling: 7/14/06 @ 1616
Converted to Well: Y Well I.D.: RZ-4D
East Coor.: 5246.27240

Remarks:

Project No.: OH000294.0009.0004B Datum: TOC Elev. 727.075 Filename: July 2006

ARCADIS

Log of Boring: RZ-4D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
24	N/A	24	0.0				SW	Same as above, medium-coarse sand, medium gravel (5%)	
26	N/A	24	0.0				SW	Same as above	
28	N/A	24	0.0				SW	Same as above	
30	N/A	24	0.0				GW	GRAVEL Brown, fine-coarse, coarse sand (20%), well graded, wet	
32	N/A	24	0.0				GW	Same as above	
34	N/A	24	0.0				SW	SAND Brown, medium-coarse, fine gravel (30%), well graded, wet	
36									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: T. Fortner
Total Depth: 65
Surface Elev.: 727.549
North Coor.: 1893.66411

Begin Drilling: 7/14/06 @ 1407
End Drilling: 7/14/06 @ 1616
Converted to Well: Y Well I.D.: RZ-4D
East Coor.: 5246.27240

Remarks:

Project No.: OH000294.0009.0004B Datum: TOC Elev. 727.075 Filename: July 2006

ARCADIS

Log of Boring: RZ-4D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
36	N/A	24	0.0				SW	Same as above	
38	N/A	24	0.0				SM	SILTY SAND Brown, fine, poorly graded, wet	
40	N/A	24	0.0				SW	SAND Brown, medium-coarse, trace medium gravel, well graded, wet	
42	N/A	24	0.0				SW	Same as above	
44	N/A	24	0.0				SW	Same as above	
46	N/A	24	0.0				SW	Same as above	
48									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: T. Fortner
Total Depth: 65
Surface Elev.: 727.549
North Coor.: 1893.66411
Begin Drilling: 7/14/06 @ 1407
End Drilling: 7/14/06 @ 1616
Converted to Well: Y Well I.D.: RZ-4D
East Coor.: 5246.27240
Remarks:

Project No.: OH000294.0009.0004B Datum: TOC Elev. 727.075 Filename: July 2006

ARCADIS

Log of Boring: RZ-4D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
48	N/A	24	0.0				SW	Same as above	
50	N/A	24	0.0				SW	Same as above	
52	N/A	24	0.0				SW	Same as above	
54	N/A	24	0.0				SW	Same as above	
56	N/A	24	0.0				SW	Same as above	
							CL	CLAY Gray, stiff, fine gravel (10%), low plasticity, dry	
58	N/A	24	0.0				CL	Same as above	
60									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: T. Fortner
Total Depth: 65
Surface Elev.: 727.549
North Coor.: 1893.66411
Begin Drilling: 7/14/06 @ 1407
End Drilling: 7/14/06 @ 1616
Converted to Well: Y Well I.D.: RZ-4D
East Coor.: 5246.27240
Remarks:

Project No.: OH000294.0009.0004B Datum: TOC Elev. 727.075 Filename: July 2006

ARCADIS

Log of Boring: RZ-4D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
60	N/A	24	0.0				CL	SANDY CLAY Gray, fine sand, fine gravel (10%), high plasticity, moist	
62	N/A	24	0.0				CL	Same as above	
64	N/A	12	0.0				CL	Same as above	
								End of boring	
66									
68									
70									
72									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: T. Fortner
Total Depth: 65
Surface Elev.: 727.549
North Coor.: 1893.66411

Begin Drilling: 7/14/06 @ 1407
End Drilling: 7/14/06 @ 1616
Converted to Well: Y Well I.D.: RZ-4D
East Coor.: 5246.27240

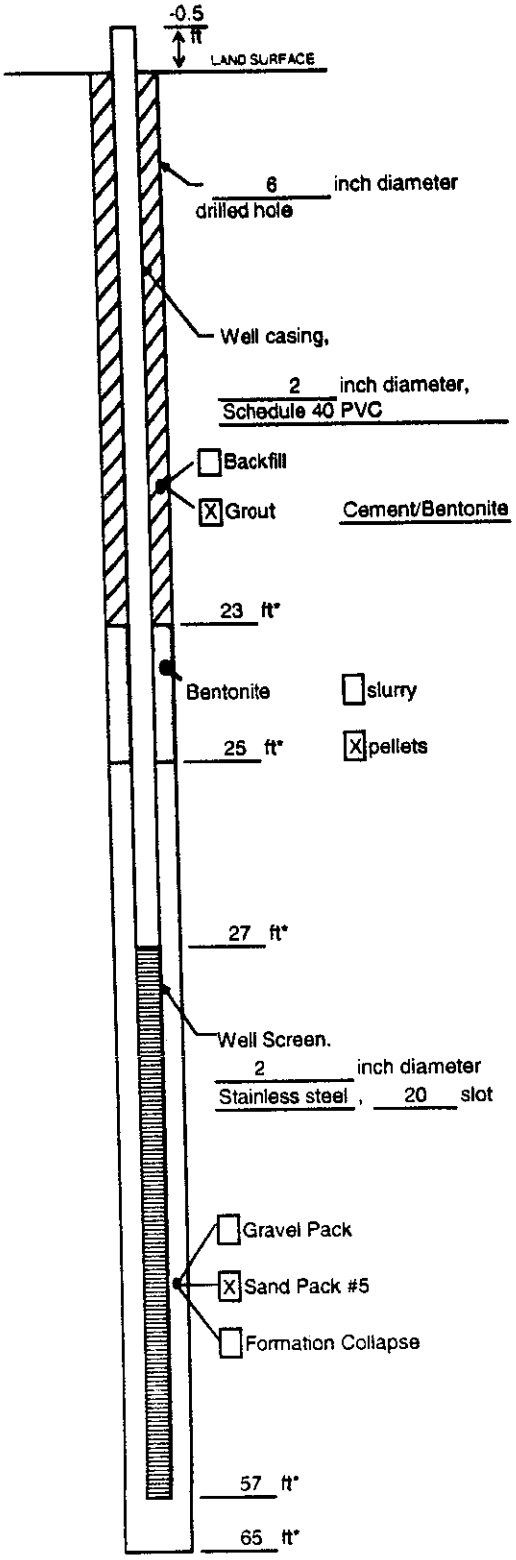
Remarks:

Project No.: OH000294.0009.0004B Datum: TOC Elev. 727.075 Filename: July 2006

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well RZ-4D

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

727.549 feet [X] Surveyed

[ ] Estimated

Installation Date(s) 7/14/2006

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Pumping - surge with pump 7/28/06

Fluid Loss During Drilling ~150 gallons

Water Removed During Development 240 gallons

Static Depth to Water 20.5 feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration NM hours

Yield NM gpm Date 7/28/06

Specific Capacity NM gpm/ft

Well Purpose Introduction well

Remarks TOC Elevation = 727.075

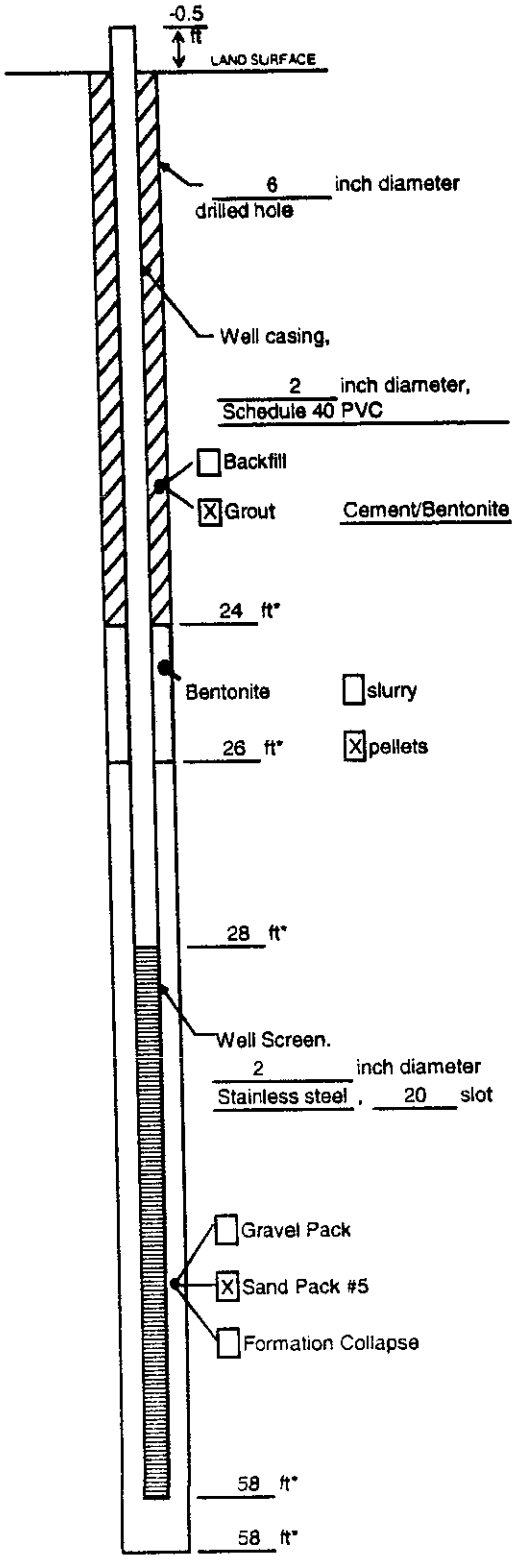
Clear non-turbid

Prepared by C. Catlett

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well RZ-4E

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

727.910 feet [x] Surveyed

[ ] Estimated

Installation Date(s) 7/16/2006

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Pumping - surge with pump 7/28/06

Fluid Loss During Drilling ~150 gallons

Water Removed During Development 210 gallons

Static Depth to Water 20.83 feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration NM hours

Yield NM gpm Date 7/28/06

Specific Capacity NM gpm/ft

Well Purpose Introduction well

Remarks TOC Elevation = 727.399

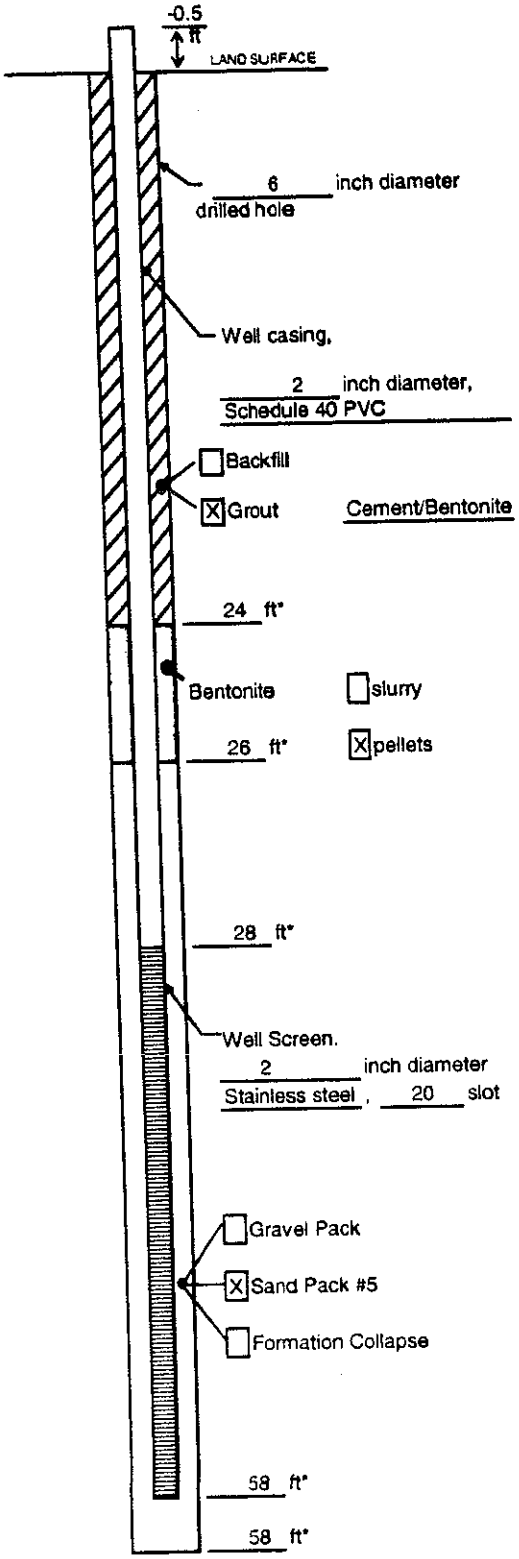
Clear non-turbid

Prepared by C. Catlett

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well RZ-4F

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

728.253 feet [X] Surveyed

[ ] Estimated

Installation Date(s) 7/15/2006

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Pumping - surge with pump 7/27/06

Fluid Loss During Drilling ~150 gallons

Water Removed During Development 240 gallons

Static Depth to Water 21.15 feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration NM hours

Yield NM gpm Date 7/27.06

Specific Capacity NM gpm/ft

Well Purpose Introduction well

Remarks TOC Elevation = 727.739

Clear non-turbid

Prepared by C. Catlett

ARCADIS

Log of Boring: RZ-4G

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Soil Class.	Description
0					No recovery
2	N/A	24	4.5	FILL	FILL Black, silt, sand, gravel, glass, wood, and metal, moist
4	N/A	24	6.1	SW	SAND Black, sand and gravel, loose, wet, odor
6	N/A	24	1.3	CL	SANDY CLAY Grayish-brown, gravel (15%), medium stiff, moist
8	N/A	24	2.1	SW	SAND Yellowish brown, gravel (20%), loose, moist
10	N/A	24	1.6	SW	SAND Brown, medium-coarse, fine-medium gravel (10%), loose, moist
12					

Sample Analysis | Sample Type | Graphic Log | Depth to Water

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: C. Catlett
Total Depth: 60
Surface Elev.: 728.547
North Coor.: 1850.65783

Begin Drilling: 7/15/06 @ 0732
End Drilling: 7/16/06 @ 0840
Converted to Well: Y Well I.D.: RZ-4G
East Coor.: 5324.55440

Remarks:

Project No.: OH000294.0008.00002 Datum: TOC Elev. 728.159 Filename: July 2006

ARCADIS

Log of Boring: RZ-4G

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
12	N/A	24	1.2				SW	Same as above	
14	N/A	24	0.7				SW	Same as above, gravel (15%), moist	
16	N/A	24	0.6				SW	Same as above	
18	N/A	24	0.7				SW	Same as above	
20	N/A	24	0.6				SW	Same as above, gravel (10%)	
22	N/A	24	0.7				SW	Same as above, wet at 24'	
24									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: C. Catlett
Total Depth: 60
Surface Elev.: 728.547
North Coor.: 1850.65783

Begin Drilling: 7/15/06 @ 0732
End Drilling: 7/16/06 @ 0840
Converted to Well: Y Well I.D.: RZ-4G
East Coor.: 5324.55440

Remarks:

Project No.: OH000294.0008.00002 Datum: TOC Elev. 728.159 Filename: July 2006

ARCADIS

Log of Boring: RZ-4G

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
24	N/A	24	0.0				SW	Same as above	
							SW	Same as above	
26	N/A	24	0.0				SW	Same as above	
28	N/A	24	0.0				SW	Same as above	
30	N/A	24	0.0				SW	SAND Brown, medium-coarse, gravel (10%), loose, wet	
32	N/A	24	0.0				SW	Same as above	
34	N/A	24	0.0				SW	Same as above	
36									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: C. Catlett
Total Depth: 60
Surface Elev.: 728.547
North Coor.: 1850.65783

Begin Drilling: 7/15/06 @ 0732
End Drilling: 7/16/06 @ 0840
Converted to Well: Y Well I.D.: RZ-4G
East Coor.: 5324.55440

Remarks:

Project No.: OH000294.0008.00002 Datum: TOC Elev. 728.159 Filename: July 2006

ARCADIS

Log of Boring: RZ-4G

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
36	N/A	24	0.0				SW	Same as above	
38	N/A	24	0.0				SW	Same as above, sand coarse, coarse gravel (50%)	
40	N/A	24	0.0				SW	Same as above	
42	N/A	24	0.0				SW	Same as above, medium-coarse sand, gravel (10%)	
44	N/A	24	0.0				SW	SAND Brown, fine-medium sand, trace gravel, loose, wet	
46	N/A	24	0.0				SW	Same as above	
48									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: C. Catlett
Total Depth: 60
Surface Elev.: 728.547
North Coor.: 1850.65783

Begin Drilling: 7/15/06 @ 0732
End Drilling: 7/16/06 @ 0840
Converted to Well: Y Well I.D.: RZ-4G
East Coor.: 5324.55440

Remarks:

Project No.: OH000294.0008.00002 Datum: TOC Elev. 728.159 Filename: July 2006

ARCADIS

Log of Boring: RZ-4G

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
48	N/A	24	0.0				SW	Same as above	
50	N/A	24	0.0				SW	Same as above	
52	N/A	24	0.0				SW	Same as above	
54	N/A	24	0.0				SM	SILTY SAND Yellowish brown, trace gravel, stiff, very moist	
							CL	SILTY CLAY Gray, little sand, trace gravel, very stiff, low plasticity	
56	N/A	24	0.0				CL	Same as above	
58	N/A	24	0.0				CL	CLAY Gray, silty clay, trace fine gravel, very stiff (till)	
60									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: C. Catlett
Total Depth: 60
Surface Elev.: 728.547
North Coor.: 1850.65783
Begin Drilling: 7/15/06 @ 0732
End Drilling: 7/16/06 @ 0840
Converted to Well: Y Well I.D.: RZ-4G
East Coor.: 5324.55440
Remarks:

Project No.: OH000294.0008.00002 Datum: TOC Elev. 728.159 Filename: July 2006

ARCADIS

Log of Boring: RZ-4G

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
60								End of boring	
62									
64									
66									
68									
70									
72									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

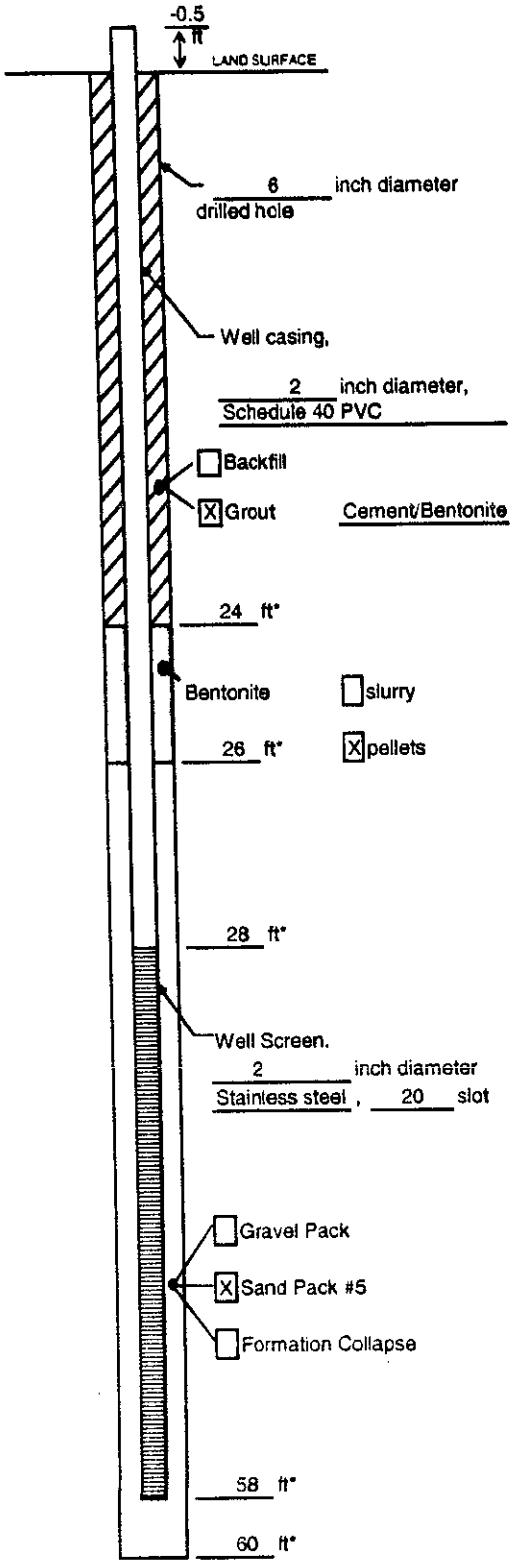
Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: C. Catlett
Total Depth: 60
Surface Elev.: 728.547
North Coor.: 1850.65783
Begin Drilling: 7/15/06 @ 0732
End Drilling: 7/16/06 @ 0840
Converted to Well: Y Well I.D.: RZ-4G
East Coor.: 5324.55440
Remarks:

Project No.: OH000294.0008.00002 Datum: TOC Elev. 728.159 Filename: July 2006

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well RZ-4G

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

728.547 feet [X] Surveyed

[ ] Estimated

Installation Date(s) 7/15/2006

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Pumping - surge with pump 7/27/06

Fluid Loss During Drilling ~150 gallons

Water Removed During Development 240 gallons

Static Depth to Water 21.55 feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration NM hours

Yield NM gpm Date 7/27/06

Specific Capacity NM gpm/ft

Well Purpose Introduction well

Remarks TOC Elevation = 728.159

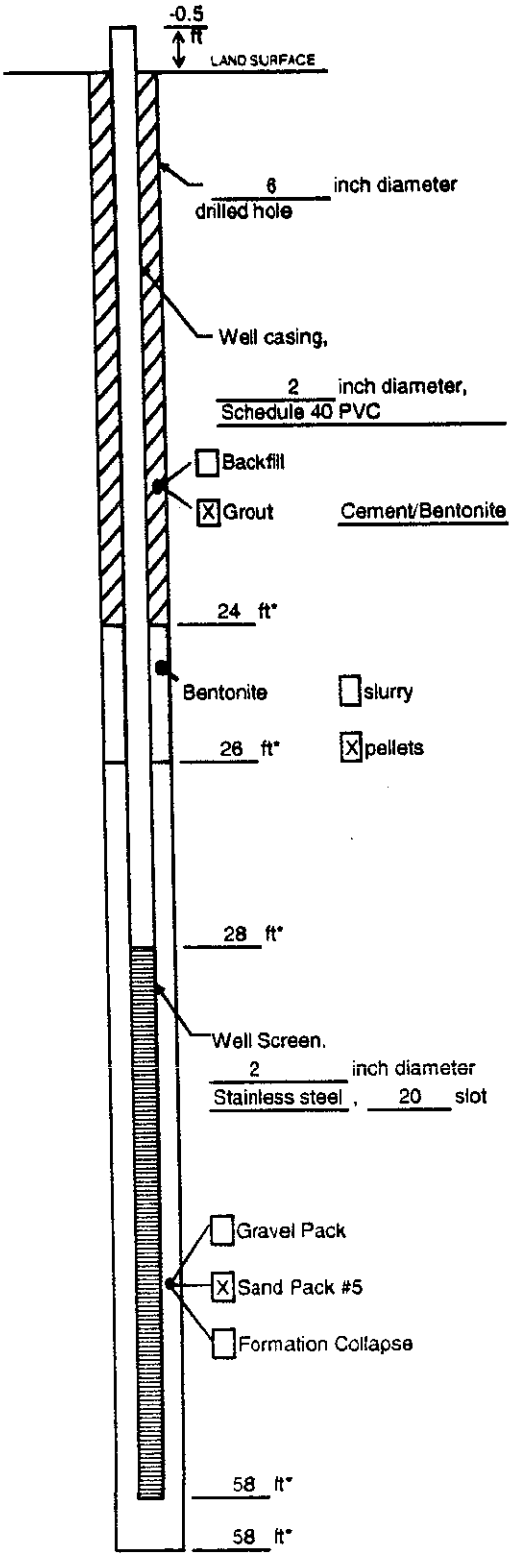
Clear non-turbid

Prepared by C. Catlett

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well RZ-4H

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

NM feet ☐ Surveyed ☐ Estimated

Installation Date(s) 7/15/2006

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Pumping - surge with pump 7/27/06

Fluid Loss During Drilling ~150 gallons

Water Removed During Development 210 gallons

Static Depth to Water 22.17 feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration NM hours

Yield NM gpm Date 7/27/06

Specific Capacity NM gpm/ft

Well Purpose Introduction well

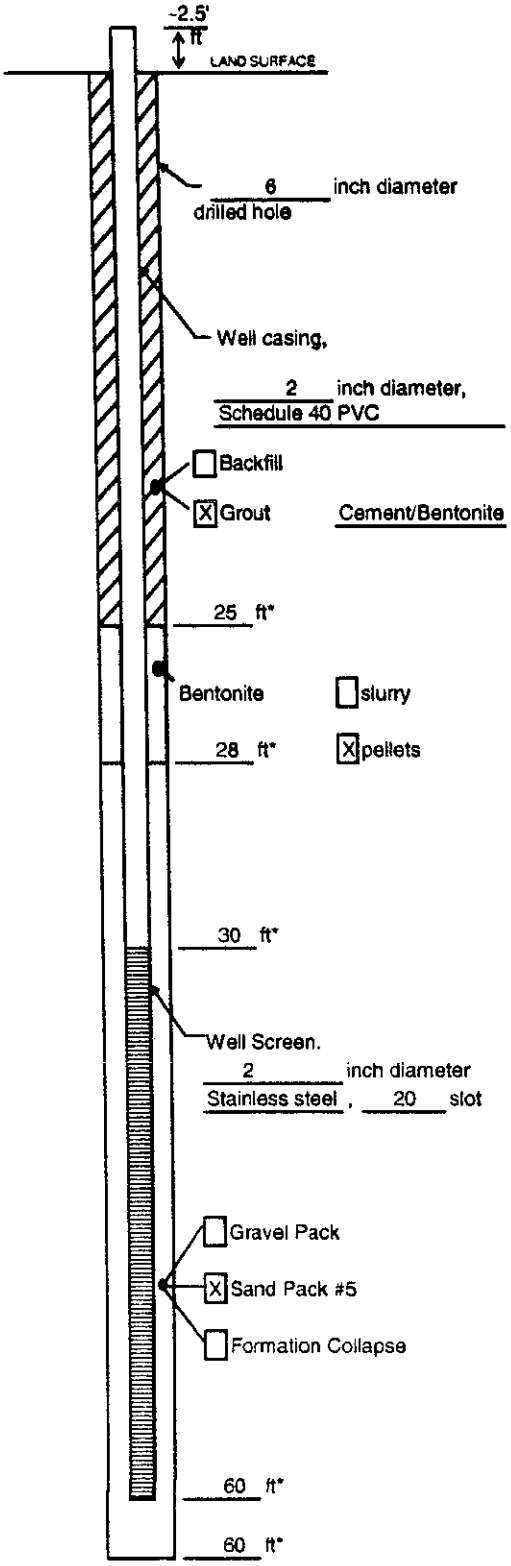
Remarks Clear non-turbid

Prepared by C. Catlett

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well RZ-4I

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

724.428 feet [X] Surveyed

[ ] Estimated

Installation Date(s) 7/17/2006

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Pumping - surge with pump 7/28/06

Fluid Loss During Drilling ~250 gallons

Water Removed During Development 240 gallons

Static Depth to Water 22.3 feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration 1.00 hours

Yield 4 gpm Date 7/28/06

Specific Capacity NM gpm/ft

Well Purpose Introduction well

Remarks TOC Elevation = 728.553

Clear non-turbid

Prepared by J. Manzo

ARCADIS

Log of Boring: RZ-4J

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0								No recovery	
2								No recovery	
4	N/A	24	0.0				SW	SAND Brown, fine-medium, medium-coarse gravel (15%), loose, dry	
6	N/A	24	0.7				SW	SAND Light grayish brown, fine-medium, medium-coarse gravel (15%), loose, dry	
8	N/A	24	0.3				SW	Same as above	
10	N/A	24	2.7				SW	Same as above	
12									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: C. Catlett
Total Depth: 65
Surface Elev.: 724.428
North Coor.: 1690.15438

Begin Drilling: 7/16/06 @ 1635
End Drilling: 7/16/06 @ 1810
Converted to Well: Y Well I.D.: RZ-4J
East Coor.: 4887.95475

Remarks:

Project No.: OH000294.0009.0004B Datum: TOC Elev. 727.965 Filename: July 2006

ARCADIS

Log of Boring: RZ-4J

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
12	N/A	24	2.4				SW	Same as above	
14	N/A	24	5.3				SW	Same as above	
16	N/A	24	5.1				SW	Same as above	
18	N/A	24	5.2				SW	Same as above	
20	N/A	24	2.7				SW	Same as above	
22	N/A	24	1.6				SW	Same as above	
24									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: C. Catlett
Total Depth: 65
Surface Elev.: 724.428
North Coor.: 1690.15438
Begin Drilling: 7/16/06 @ 1635
End Drilling: 7/16/06 @ 1810
Converted to Well: Y Well I.D.: RZ-4J
East Coor.: 4887.95475
Remarks:

Project No.: OH000294.0009.0004B Datum: TOC Elev. 727.965 Filename: July 2006

ARCADIS

Log of Boring: RZ-4J

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
24	N/A	24	4.7				SW	Same as above	
26	N/A	24	3.9				SW	SAND Brown, coarse sand with fine-medium gravel (20%), loose, wet	▼
28	N/A	24	3.3				SW	Same as above	
30	N/A	24	8.7				SW	Same as above	
32	N/A	24	9.4				SW	Same as above	
34	N/A	24	6.6				SP	SAND Brown, medium sand, loose, wet	
36									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: C. Catlett
Total Depth: 65
Surface Elev.: 724.428
North Coor.: 1690.15438

Begin Drilling: 7/16/06 @ 1635
End Drilling: 7/16/06 @ 1810
Converted to Well: Y Well I.D.: RZ-4J
East Coor.: 4887.95475

Remarks:

Project No.: OH000294.0009.0004B Datum: TOC Elev. 727.965 Filename: July 2006

ARCADIS

Log of Boring: RZ-4J

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
36	N/A	24	0.0				SP	Same as above	
38	N/A	24	5.6				SW	SAND Brown, sand and gravel (20%), loose, wet	
40	N/A	24	9.6				SP	SAND Brown, medium sand, loose, wet	
42	N/A	24	0.0				SP	Same as above	
44	N/A	24	6.2				SP	Same as above	
46	N/A	24	0.0				SW	Same as above, gravel (10%)	
48									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: C. Catlett
Total Depth: 65
Surface Elev.: 724.428
North Coor.: 1690.15438

Begin Drilling: 7/16/06 @ 1635
End Drilling: 7/16/06 @ 1810
Converted to Well: Y Well I.D.: RZ-4J
East Coor.: 4887.95475

Remarks:

Project No.: OH000294.0009.0004B Datum: TOC Elev. 727.965 Filename: July 2006

ARCADIS

Log of Boring: RZ-4J

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Soil Class.	Description	Depth to Water
48	N/A	24	5.8	SW	SAND Brown, medium-coarse sand, loose, wet	
50	N/A	24	0.0	SW	SAND Brown, sand with gravel (5-10%), loose, wet	
52	N/A	24	5.8	SW	Same as above	
54	N/A	24	0.0	SW	Same as above	
				ROCK	Boulder	
56				ROCK	Same as above	
58				ROCK	Same as above	
60						

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: C. Catlett
Total Depth: 65
Surface Elev.: 724.428
North Coor.: 1690.15438
Begin Drilling: 7/16/06 @ 1635
End Drilling: 7/16/06 @ 1810
Converted to Well: Y Well I.D.: RZ-4J
East Coor.: 4887.95475
Remarks:
Project No.: OH000294.0009.0004B
Datum: TOC Elev. 727.965
Filename: July 2006

ARCADIS

Log of Boring: RZ-4J

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
60							ROCK	Same as above	
	N/A	12	0.0				CL	SILTY CLAY Gray, little sand, trace gravel, dense	
62	N/A	24	4.1				CL	Same as above	
64	N/A	12	4.0				CL	Same as above	
								End of boring	
66									
68									
70									
72									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

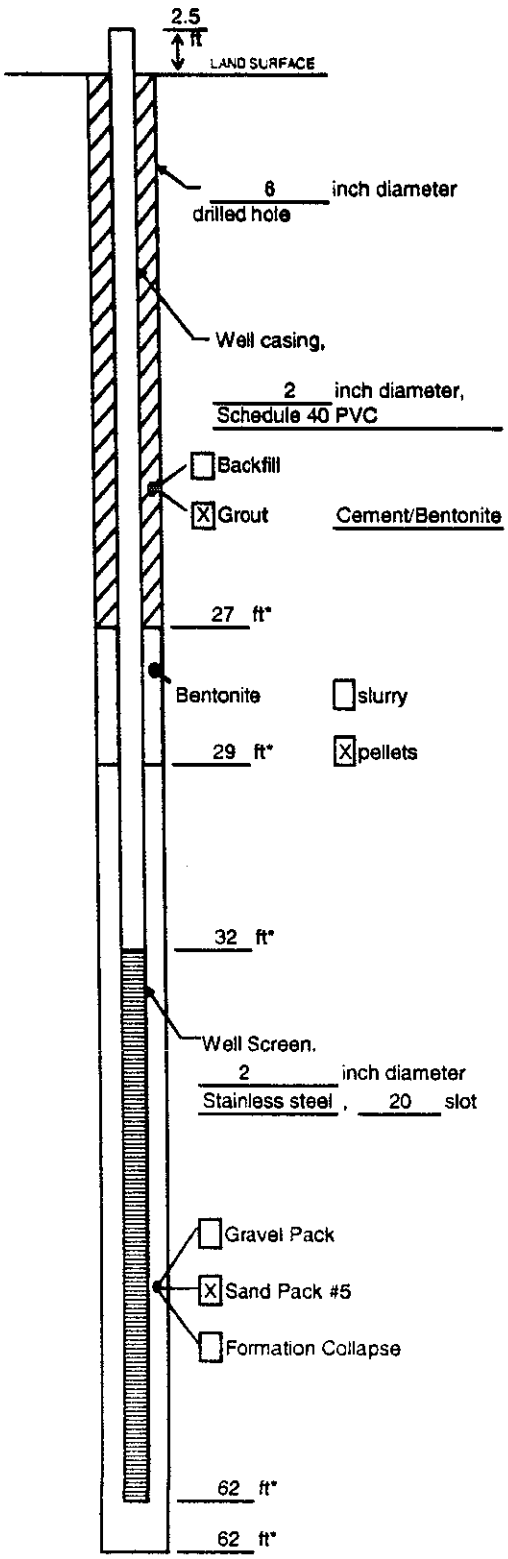
Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: C. Catlett
Total Depth: 65
Surface Elev.: 724.428
North Coor.: 1690.15438
Begin Drilling: 7/16/06 @ 1635
End Drilling: 7/16/06 @ 1810
Converted to Well: Y Well I.D.: RZ-4J
East Coor.: 4887.95475
Remarks:

Project No.: OH000294.0009.0004B Datum: TOC Elev. 727.965 Filename: July 2006

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well RZ-4J

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

724.262 feet [X] Surveyed [ ] Estimated

Installation Date(s) 7/16-7/17/06

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Pumping - surge with pump 7/29/06

Fluid Loss During Drilling ~200 gallons

Water Removed During Development 240 gallons

Static Depth to Water 21.66 feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration 1.00 hours

Yield 4 gpm Date 7/29/06

Specific Capacity NM gpm/ft

Well Purpose Introduction well

Remarks TOC Elevation = 727.965

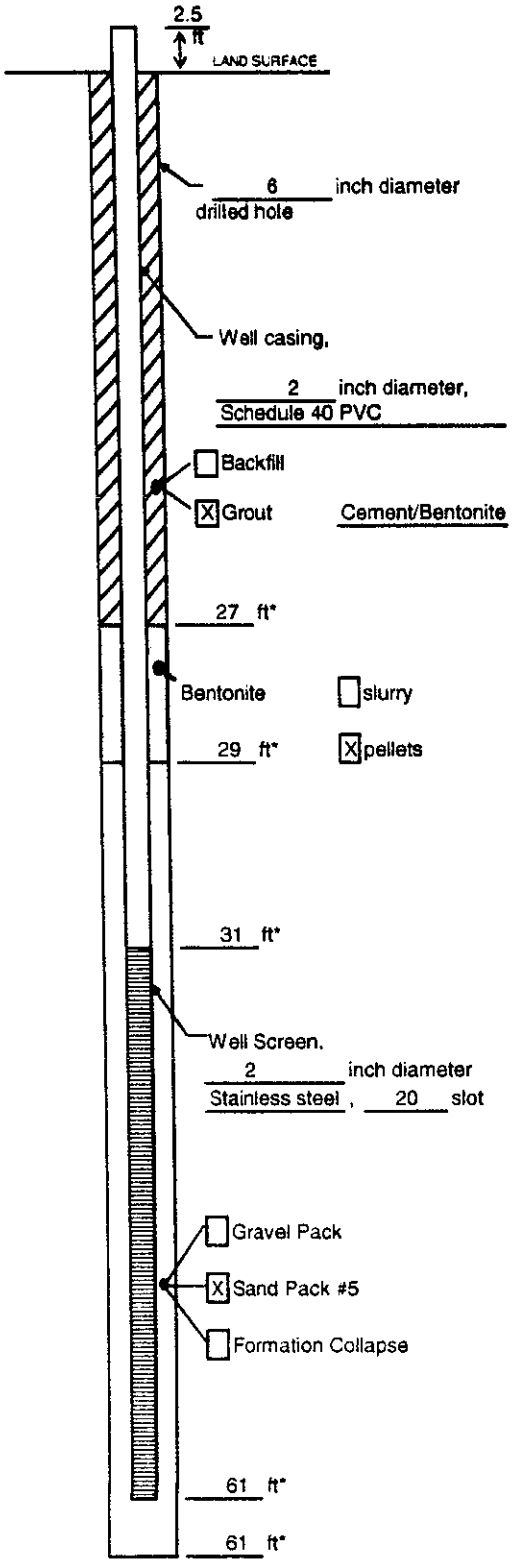
Clear non-turbid

Prepared by J. Manzo

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well RZ-4K

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

724.677 feet [x] Surveyed

[ ] Estimated

Installation Date(s) 7/26/2006

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Pumping - surge with pump 7/29/06

Fluid Loss During Drilling ~200 gallons

Water Removed During Development 240 gallons

Static Depth to Water 21.22 feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration 1.20 hours

Yield 3 gpm Date 7/29/06

Specific Capacity NM gpm/ft

Well Purpose Introduction well

Remarks TOC Elevation = 727.530

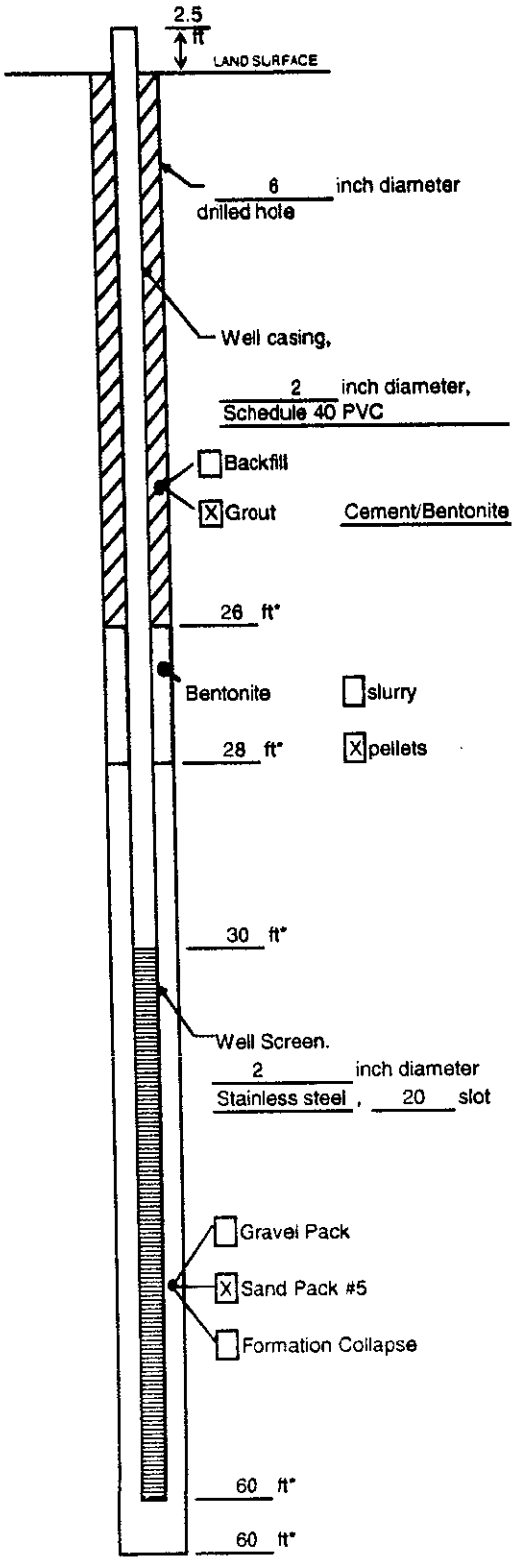
Clear non-turbid

Prepared by T. Fortner

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well RZ-4L

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

725.289 feet [x] Surveyed

[ ] Estimated

Installation Date(s) 7/19/2006

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Pumping - surge with pump 7/29/06

Fluid Loss During Drilling ~200 gallons

Water Removed During Development 240 gallons

Static Depth to Water 21.22 feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration 1.00 hours

Yield 4 gpm Date 7/29/06

Specific Capacity NM gpm/ft

Well Purpose Introduction well

Remarks TOC Elevation = 727.539

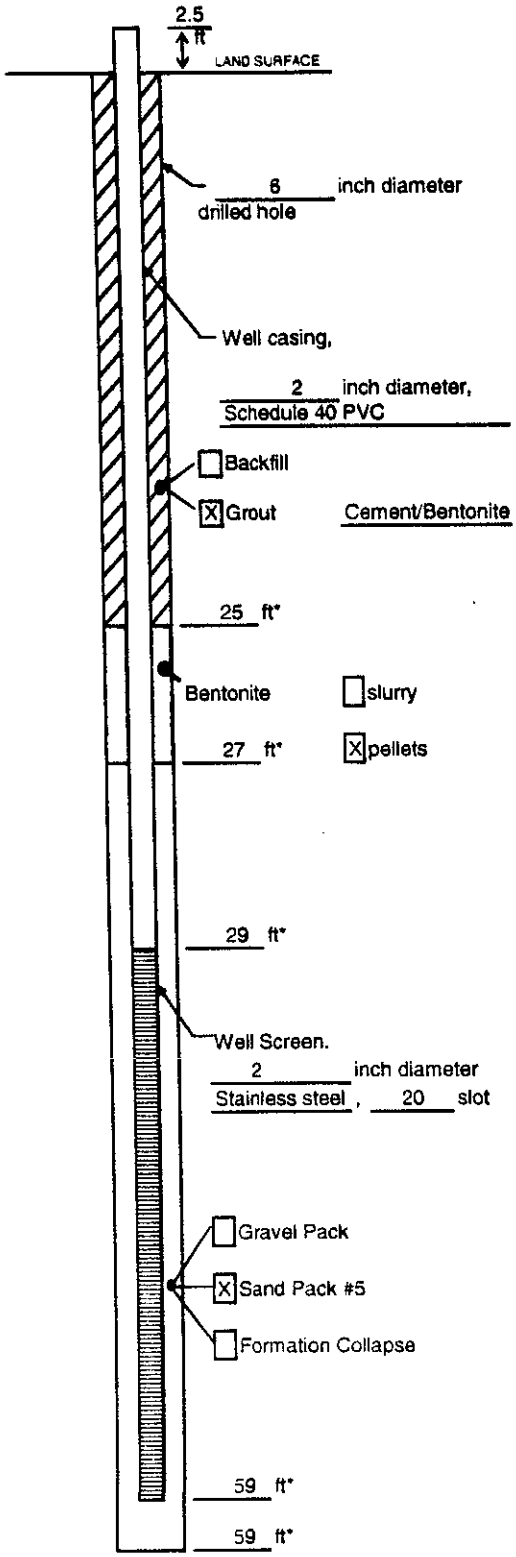
Clear non-turbid

Prepared by T. Fortner

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well RZ-4M

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

725.468 feet [x] Surveyed

[ ] Estimated

Installation Date(s) 7/19/2006

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Pumping - surge with pump 7/29/06

Fluid Loss During Drilling ~200 gallons

Water Removed During Development 240 gallons

Static Depth to Water 20.57 feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration 1.20 hours

Yield 3 gpm Date 7/29/06

Specific Capacity NM gpm/ft

Well Purpose Introduction well

Remarks TOC Elevation = 726.898

Clear non-turbid

Prepared by T. Fortner

ARCADIS

Log of Boring: RZ-4N

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	N/A	24	0.0				ML	CLAYEY SILT Brown, organic rich, gravel (25%), hard, dry	
2	N/A	24	0.0				ML	Same as above	
4	N/A	24	0.0				SM	SILTY SAND Fine-coarse, fine-coarse gravel and cobbles (25%), well graded, dry	
6	N/A	24	0.0				SM	Same as above	
8	N/A	24	0.0				SM	Same as above	
10	N/A	24	0.0				SW	SAND Fine-coarse, fine-coarse gravel (25%), trace cobbles, trace silt, well graded, dry	
12									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: J. Manzo
Total Depth: 60
Surface Elev.: 725.710
North Coor.: 1703.08968

Begin Drilling: 7/17/06 @ 0953
End Drilling: 7/17/06 @ 1109
Converted to Well: Y Well I.D.: RZ-4N
East Coor.: 4987.64606

Remarks:

Project No.: OH000294.0009.0004B Datum: TOC Elev. 726.189 Filename: July 2006

ARCADIS

Log of Boring: RZ-4N

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
12	N/A	24	0.0				SW	Same as above	
14	N/A	24	0.0				SW	Same as above	
16	N/A	12	0.0				SW	Same as above	
18	N/A	12	0.0				SW	Same as above	
20	N/A	12	0.0				SW	Same as above	
22	N/A	12	0.0				SW	Same as above, sand (60%), gravel (40%), dry to slightly moist	
24									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: J. Manzo
Total Depth: 60
Surface Elev.: 725.710
North Coor.: 1703.08968

Begin Drilling: 7/17/06 @ 0953
End Drilling: 7/17/06 @ 1109
Converted to Well: Y Well I.D.: RZ-4N
East Coor.: 4987.64606

Remarks:

Project No.: OH000294.0009.0004B Datum: TOC Elev. 726.189 Filename: July 2006

ARCADIS

Log of Boring: RZ-4N

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
24	N/A	12	0.0				SW	Same as above, wet at 25'	
26	N/A	12	0.0				SW	Same as above	
28	N/A	12	0.0				GW	GRAVEL Fine, coarse sand (40%), trace cobbles, well graded, wet	
30	N/A	12	0.0				GW	Same as above	
32	N/A	12	0.0				GW	Same as above	
34	N/A	8	0.0				GW	Same as above	
36									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: J. Manzo
Total Depth: 60
Surface Elev.: 725.710
North Coor.: 1703.08968

Begin Drilling: 7/17/06 @ 0953
End Drilling: 7/17/06 @ 1109
Converted to Well: Y Well I.D.: RZ-4N
East Coor.: 4987.64606

Remarks:

Project No.: OH000294.0009.0004B Datum: TOC Elev. 726.189 Filename: July 2006

ARCADIS

Log of Boring: RZ-4N

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
36	N/A	8	0.0				SW	Same as above, trace large cobbles	
38	N/A	8	0.0				SW	Same as above	
40	N/A	8	0.0				SW	Same as above	
42	N/A	8	0.0				SW	Same as above	
44	N/A	8	0.0				SW	Same as above	
46	N/A	8	0.0				SW	Same as above	
48									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: J. Manzo
Total Depth: 60
Surface Elev.: 725.710
North Coor.: 1703.08968

Begin Drilling: 7/17/06 @ 0953
End Drilling: 7/17/06 @ 1109
Converted to Well: Y Well I.D.: RZ-4N
East Coor.: 4987.64606

Remarks:

Project No.: OH000294.0009.0004B Datum: TOC Elev. 726.189 Filename: July 2006

ARCADIS

Log of Boring: RZ-4N

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
48	N/A	8	0.0				SW	Same as above	
50	N/A	8	0.0				SW	Same as above	
52	N/A	8	0.0				SW	Same as above	
54	N/A	24	0.0				SW	Same as above	
56	N/A	24	0.0				SW	Same as above	
58	N/A	24	0.0				CL	SILTY CLAY Gray, hard, trace cobbles, gravel (10%), low plasticity, dry	
60									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: J. Manzo
Total Depth: 60
Surface Elev.: 725.710
North Coor.: 1703.08968
Begin Drilling: 7/17/06 @ 0953
End Drilling: 7/17/06 @ 1109
Converted to Well: Y Well I.D.: RZ-4N
East Coor.: 4987.64606
Remarks:

Project No.: OH000294.0009.0004B Datum: TOC Elev. 726.189 Filename: July 2006

ARCADIS

Log of Boring: RZ-4N

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
60								End of boring	
62									
64									
66									
68									
70									
72									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: J. Manzo
Total Depth: 60
Surface Elev.: 725.710
North Coor.: 1703.08968

Begin Drilling: 7/17/06 @ 0953
End Drilling: 7/17/06 @ 1109
Converted to Well: Y Well I.D.: RZ-4N
East Coor.: 4987.64606

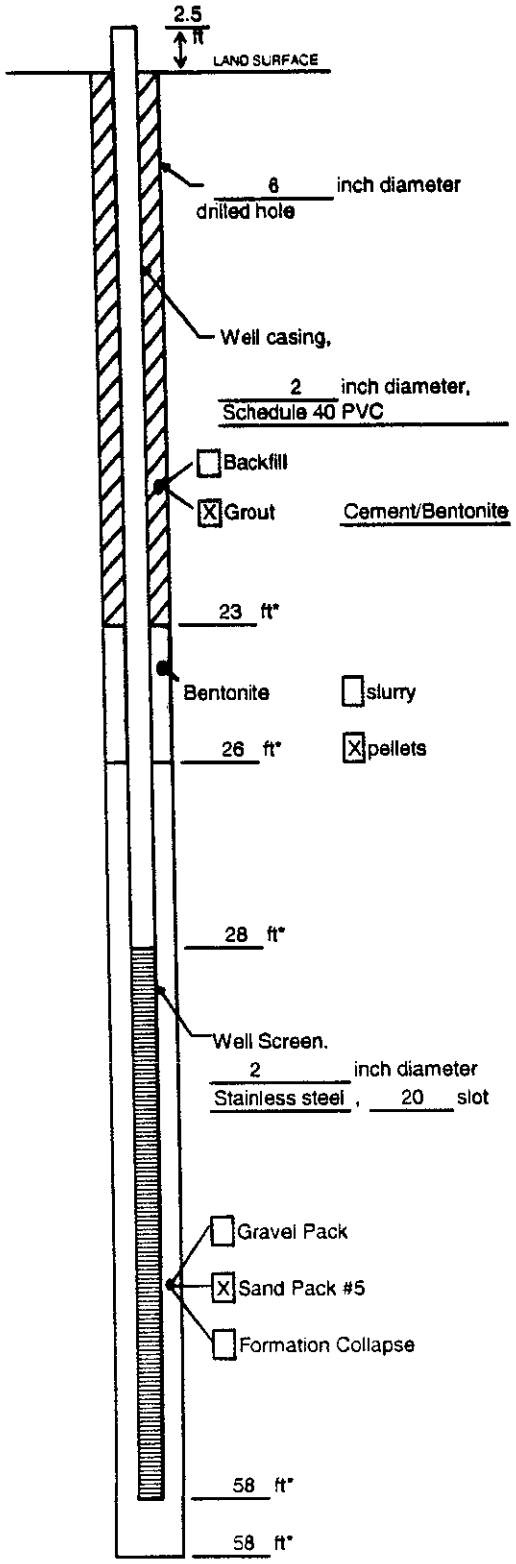
Remarks:

Project No.: OH000294.0009.0004B Datum: TOC Elev. 726.189 Filename: July 2006

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well RZ-4N

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

725.710 feet [x] Surveyed

[ ] Estimated

Installation Date(s) 7/17/2006

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Pumping - surge with pump 7/29/06

Fluid Loss During Drilling ~250 gallons

Water Removed During Development 250 gallons

Static Depth to Water 19.85 feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration 1.10 hours

Yield 4 gpm Date 7/29/06

Specific Capacity NM gpm/ft

Well Purpose Introduction well

Remarks TOC Elevation = 726.189

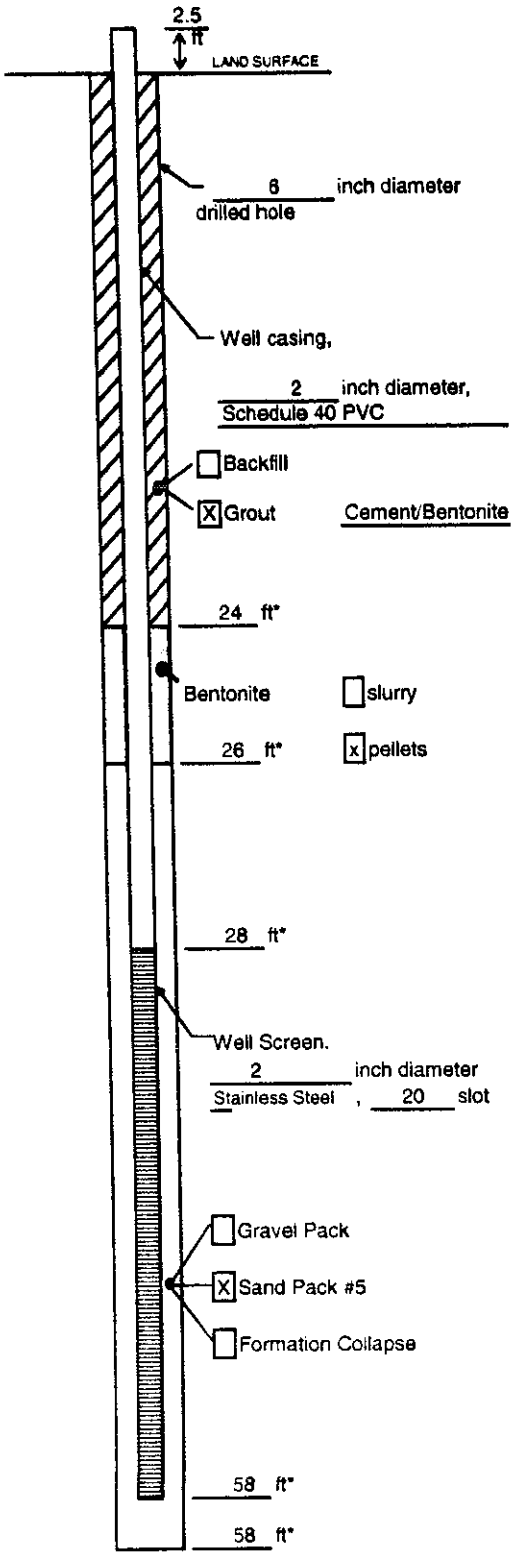
Clear non-turbid

Prepared by J. Manzo

ARCADIS

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project General Motors Corporation Well RZ-4O

Town/City Moraine

County Montgomery State Ohio

Permit No. NA

Land-Surface (LS) Elevation and Datum:

726.356 feet [x] Surveyed

[ ] Estimated

Installation Date(s) 7/18/2006

Drilling Method Rotosonic

Drilling Contractor Boart Longyear

Drilling Fluid Water

Development Technique(s) and Date(s)

Pumping - surge with pump 7/29/06

Fluid Loss During Drilling ~200 gallons

Water Removed During Development 240 gallons

Static Depth to Water 20.12 feet below M.P.

Pumping Depth to Water NM feet below M.P.

Pumping Duration 1.2 hours

Yield 3 gpm Date 7/29/06

Specific Capacity NM gpm/ft

Well Purpose Introduction Well

Remarks TOC Elevation = 726.465

Clear-Non-Turbid

Prepared by T. Fortner

ARCADIS

Section 13

Construction Soil Borings

SB-1 through SB-64
SB-6A
SB-6B
SB-6C
SB-6D
SB-7A
SB-8A
SB-9A
SB-11A
SB-13A

No logs for
SB-21
SB-22
SB-23
SB-31
SB-39
SB-40
SB-47
SB-48
SB-55
SB-56
SB-62

SB-1

SURFACE ELEVATION: 724.8'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	INCH BLOWS PER FT OR CORE REC
0.0'	(FILL) Asphalt				
0.3'	(FILL) Crushed stone base				
2.0'	(ORIGINAL) Dense brown sand and gravel, trace of silt - moist	1A	3.5- 5.0	17-20-29	49
5'	(Becomes very dense at 6.5')	2A	6.5- 8.0	30-42-51	93
10'		3A	9.0-10.5	16-30-39	69
15'		4A	14.0-15.5	14-25-35	60
	Bottom of boring at 15.5'				
20'					
25'					
30'					

METHOD: HOLLOW STEM AUGER

TECHNICIAN: RC-JD

JOB NO.: 25176 (smp)

WATER OBSERVATIONS

INITIAL DEPTH None

COMPLETION DEPTH None

DEPTH AFTER 24 HRS. none

TYPE SAMPLER:

X A. SPLIT SPOON

B.

C. SHELBY TUBE

SB-2

SURFACE ELEVATION: 728.3'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT OR CORE REC.
0.0'	(FILL) Asphalt				
0.3'	(FILL) Concrete				
0.5'	(FILL) Medium dense brown sand and gravel, some silt - moist	1A	3.5- 5.0	3- 9-16	25
5' 4.5'	(ORIGINAL) Medium dense brown sand, and gravel, trace of silt - moist (Becomes very dense at 6.5')	2A	6.5- 8.0	19-31-44	75
10'		3A	9.0-10.5	18-21-40	61
15'		4A	14.0-15.5	19-40-42	82
20'		5A	19.0-20.5	22-40-43	83
25'		6A	24.0-25.0	52-52	104
30'		7A	29.0-30.5	40-60/4"	100+
35'		8A	34.0-35.5	45-55	100
40'		9A	39.0-40.5	55-45/5"	100+
	Bottom of boring at 40.5'				
45'					

METHOD: HOLLOW STEM AUGER

TECHNICIAN: RG-JD

JOB NO.: 25176 (sap)

WATER OBSERVATIONS

INITIAL DEPTH None

COMPLETION DEPTH None

DEPTH AFTER 24 HRS. none

TYPE SAMPLER:

Y A. SPLIT SPOON

___ B.

___ C. SHELBY TUBE

SB-3

SURFACE ELEVATION: 728.3'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Asphalt				
0.3'	(FILL) Brown sand and gravel, trace of silt - moist				
	(Becomes dense at 3.5')	1A	3.5- 5.0	4- 4-43	47
5'					
	(Becomes loose at 6.5')	2A	6.5- 8.0	2- 3- 2	5
9.0'					
10'	(ORIGINAL) Medium dense brown sand and gravel, trace of silt	3A	9.0-10.5	3- 3-16	19
15'	(Becomes very dense at 14.0')	4A	14.0-15.5	20-29-56	85
20'	(Becomes dense at 19.0')	5A	19.0-20.5	7-12-20	32
25'	(Becomes very dense at 24.0')	6A	24.0-25.5	31-42-51	93
	Bottom of boring at 25.5'				
30'					

METHOD: HOLLOW STEM AUGER

TECHNICIAN: RG-JD

JOB NO.: 25176 (smp)

WATER OBSERVATIONS

INITIAL DEPTH None

COMPLETION DEPTH None

DEPTH AFTER 24 HRS none

TYPE SAMPLER:

X A. SPLIT SPOON

___ B.

___ C. SHELBY TUBE

Proj 4990
SB-1

SURFACE ELEVATION: 728.5'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT OR CORE REC
0.0'	(FILL) Asphalt				
0.3'	(FILL) Road base				
0.6'	(FILL) Brown and gray clay, some silt, trace of sand, trace of gravel - moist				
3.0'	(ORIGINAL) Medium dense brown sand and gravel, trace of silt	1A	3.5- 5.0	10- 9-13	22
	(Becomes dense at 6.5')	2A	6.5- 8.0	15-15-17	32
		3A	9.0-10.5	14-17-19	46
	(Becomes very dense at 14.0')	4A	14.0-15.5	21-29-39	68
		5A	19.0-20.5	18-26-29	55
	(Becomes dense at 24.0')	6A	24.0-25.5	21-19-29	48
	(Becomes very dense at 29.0')	7A	29.0-30.5	18-27-51	78
	(Becomes dense at 34.0')	8A	34.0-35.5	17-19-22	46
	Bottom of boring at 35.5'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: RG-JD

JOB NO.: 35276 (smp)

WATER OBSERVATIONS

INITIAL DEPTH: 25.0' (trace)

COMPLETION DEPTH: None

DEPTH AFTER 24 HRS: none

TYPE SAMPLER:

X — A SPLIT SPOON

— B

— C SHELBY TUBE

SB-5

SURFACE ELEVATION: 727.8'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Asphalt				
0.3'	(FILL) Base				
0.6'	(FILL) Brown and gray clay, some silt, trace of sand, trace of gravel - moist	1A	3.5- 5.0	20-14-19	33
3.0'					
4.5'	(FILL) Dense brown sand and gravel, trace of silt - moist				
5'	(ORIGINAL) Dense brown sand and gravel, some cobbles, trace of silt - moist				
	(Becomes very dense at 6.5')	2A	6.5- 7.5	45-55/3"	100+
10'		3A	9.0- 9.5	100/4"	100+
15'		4A	14.0-15.5	28-32-26	58
20'		5A	19.0-20.0	40-70/5"	100+
	Bottom of boring at 20.5'				
25'					
30'					

METHOD: HOLLOW STEM AUGER

TECHNICIAN: RG-JD

JOB NO.: 25176 (smp)

WATER OBSERVATIONS

INITIAL DEPTH: None

COMPLETION DEPTH: None

DEPTH AFTER 24 HRS: none

TYPE SAMPLER:

X A. SPLIT SPOON

___ B.

___ C. SHELBY TUBE

Proj 9990
SB-1

SB-6

SURFACE ELEVATION: 727.9'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Asphalt				
0.2'	(FILL) Concrete				
	(ORIGINAL) Hard brown clay, some silt, some sand, trace of gravel - moist	1A	3.5- 5.0	7-17-20	37
5' 4.5'	Very dense brown sand and gravel, some cobbles, trace of silt - moist	2A	6.5- 8.0	17-23-41	54
10'		3A	9.0-10.5	13-30-31	61
15'		4A	14.0-15.5	22-28-30	58
20'		5A	19.0-20.5	19-69-31/2"	100+
25'		6A	24.0-25.5	27-38-39	77
30'		7A	29.0-30.5	59-21-47	68
	Bottom of boring at 30.5'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: RG-JD

JOB NO.: 25176 (smp)

WATER OBSERVATIONS

INITIAL DEPTH: None

COMPLETION DEPTH: None

DEPTH AFTER 24 HRS none

TYPE SAMPLER:

X A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

F.T.

SURFACE ELEVATION: 728.1'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS PER FT OR CORE REC.
0.0'	(FILL) Asphalt				
0.2'	(FILL) Crushed stone base (Becomes loose at 1.0')	1A	1.0- 2.5	18-12- 3	15
4.0'	(ORIGINAL) hard brown silt, some sand, trace of gravel, trace of cobbles - moist	2A	4.0- 5.5	14-21-21	42
6.5'	Very dense brown sand and gravel, trace of silt - moist (With some cobbles at 7.0')	3A	6.5- 7.5	50-56	106
		4A	9.0-10.5	40-34-43	77
		5A	14.0-15.0	53-46/3"	99+
		6A	19.0-20.0	35-65/4"	100+
		7A	24.0-25.5	36-42-50	92
		8A	29.0-29.5	100	100
32.0'	Very dense gray sand, trace of gravel - moist	9A	34.0-34.5	111	111
38.5'	Very dense gray sand and gravel, trace of silt - moist	10A	38.5-39.5	64-39/3"	103+
	Bottom of boring at 40.0'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: JD-RA-AS

JOB NO.: 25176 (smp)

WATER OBSERVATIONS

INITIAL DEPTH 25.0' (trace)

COMPLETION DEPTH: None

DEPTH AFTER 24 HRS none

TYPE SAMPLER:

X A SPLIT SPOON

B

C SHELBY TUBE

SB-6B

SURFACE ELEVATION: 731.8'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT OR CORE REC.
0.0'	(FILL) Wood floor				
0.2'	(FILL) Concrete				
0.5'	(FILL) Sand and gravel base				
1.0'	(FILL) Very stiff brown silt, some sand, trace of gravel - moist	1A	1.0- 2.5	7- 6-10	16
3.0'	(ORIGINAL) Very dense brown sand and gravel, trace of silt - moist	2A	4.0- 5.5	27-30-38	68
		3A	6.5- 8.0	30-33-34	67
		4A	9.0-10.5	15-30-36	66
	(Becomes dense at 14.0')	5A	14.0-15.5	21-18-17	35
	(Becomes very dense at 19.0')	6A	19.0-20.5	29-38-42	80
		7A	24.0-25.0	65-35/5"	100+
		8A	28.5-30.0	41-44-41	85
	Bottom of boring at 30.0'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: JD-RA-AS

JOB NO.: 25176 (smp)

WATER OBSERVATIONS

INITIAL DEPTH None

COMPLETION DEPTH None

DEPTH AFTER 24 HRS. none

TYPE SAMPLER:

X A. SPLIT SPOON

___ B.

___ C. SHELBY TUBE

SURFACE ELEVATION: 731.8' SB-6C

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS PER FT OR CORE REC.
0.0'	(FILL) Wood				
0.2'					
1.0'	(FILL) Concrete				
	(FILL) Dense brown sand and gravel, some silt - moist	1A	1.0- 2.5	21-18-25	43
5'		2A	3.5- 5.0	10-13-23	36
		3A	6.0- 7.5	22-23-25	48
8.5'	(FILL) Very dense brown sand and gravel, trace of silt - moist	4A	8.5-9.5	36-58	114
10'					
13.0'	(ORIGINAL) Very dense brown sand and gravel, some cobbles, trace of silt - moist	5A	13.5-15.0	20-32-51	83
20'		6A	18.5-19.5	39-61/3"	100+
25'		7A	23.5-24.0	100/1'	100+
30'		8A	28.5-29.5	42-58/5"	100+
		9A	31.0-32.5	46-35-37	72
	Bottom of boring at 32.5'				
35'					

METHOD: HOLLOW STEM AUGER

TECHNICIAN: JD-RA-AS

JOB NO: 25176 (amp)

WATER OBSERVATIONS

INITIAL DEPTH 32.5'

COMPLETION DEPTH 32.5'

DEPTH AFTER 24 HRS 32.5'

TYPE SAMPLER:

Y A. SPLIT SPOON

___ B.

___ C. SHELBY TUBE

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS PER FT OR CORE REC.
0.0'	(FILL) Wood floor				
0.2'	(FILL) Concrete				
1.0'	(FILL) Brown sand and gravel base				
1.5'	(ORIGINAL) Very dense brown sand and gravel, some cobbles, trace of silt - moist	1A	1.0- 2.5	30-35-33	68
5'		2A	4.0- 5.5	31-35-52	87
		3A	6.5- 8.0	45-46-47	93
10'		4A	9.0-10.5	26-28-30	58
15'		5A	14.0-15.5	38-42-47	89
20'	(Becomes dense at 19.0')	6A	19.0-20.5	23-18-28	46
25'	(Becomes very dense at 24.0')	7A	24.0-25.0	44-60/5"	104+
29.5'	Hard brown silt trace of sand, trace of gravel - moist (Continued on next page)	8A	29.0-29.5	100	100
		9A	31.5-33.0	75-80-90	170
	Bottom of boring at 33.0'				
35'					

METHOD: HOLLOW STEM AUGER

TECHNICIAN: JD-RA-AS

JOB NO.: 25176 (smp)

WATER OBSERVATIONS

INITIAL DEPTH None

COMPLETION DEPTH None

DEPTH AFTER 24 HRS none

TYPE SAMPLER:

X A. SPLIT SPOON

___ B.

___ C SHELBY TUBE

SURFACE ELEVATION: 728.2' SB-7

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT OR CORE REC.
0.0'	(FILL) Asphalt				
0.3'	(FILL) Brown silt, some sand, some gravel - moist				
3.0'	(FILL) Very loose brown sand and gravel, some silt - wet	1A	3.5- 5.0	3- 3- 2	5
		2A	6.5- 8.0	2- 2- 3	5
		3A	9.0-10.5	3- 3- 2	5
14.0'	(FILL) Stiff brown clay, some silt, some sand, trace of gravel - moist	4A	14.0-15.5	4- 5- 8	13
17.0'	(ORIGINAL) Very dense brown sand and gravel, trace of silt - moist	5A	19.0-20.5	25-31-47	78
		6A	24.0-25.5	37-38-42	80
28.0'	Hard gray silt, some sand, trace of gravel, trace of clay - moist	7A	29.0-30.0	43-82	125
	Bottom of boring at 30.0'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: RG-JD

JOB NO.: 25176 (smp)

WATER OBSERVATIONS

INITIAL DEPTH 3.0' (light)

COMPLETION DEPTH None

DEPTH AFTER 24 HRS none

TYPE SAMPLER:

X A. SPLIT SPOON

___ B.

___ C. SHELBY TUBE

SB 7A

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	UNC. BLOWS/FT OR CORE REC.
0.0'	(FILL) Asphalt				
0.3'	(FILL) Sand and gravel base				
1.0'	(ORIGINAL) Very dense brown sand and gravel, some silt - moist	1A	1.0- 2.5	18-23-31	54
	(With some cobbles from 3.0')	2A	4.0- 5.0	50-50/4"	100+
		3A	6.5- 8.0	25-32-40	72
		4A	9.0-10.5	20-45-50	95
		5A	14.0-15.5	18-30-47	77
		6A	19.0-20.5	35-47-50	97
		7A	24.0-25.5	29-38-55	93
28.0'	Hard gray silt, some sand, trace of gravel - moist	8A	29.0-29.5	100/4"	100+
	(Continued on next page)	9A	34.0-34.5	100/4"	100+
	Bottom of boring at 40.0'	10A	39.0-40.0	81-19/1"	100+

METHOD: HOLLOW STEM AUGER

TECHNICIAN: JD-RA-AS

JOB NO.: 25176 (smp)

WATER OBSERVATIONS

INITIAL DEPTH None

COMPLETION DEPTH None

DEPTH AFTER 24 HRS none

TYPE SAMPLER:

X A. SPLIT SPOON

B.

C SHELBY TUBE

SURFACE ELEVATION: 729.5'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT OR CORE REC.
0.0'	(FILL) Asphalt				
0.6'	(FILL) Concrete				
	(ORIGINAL) Very dense brown sand and gravel, some cobbles, trace of silt - moist	1A	3.5- 5.0	17-28-44	72
		2A	6.5- 8.0	24-41-45	86
		3A	9.0-10.5	17-28-33	61
		4A	14.0-15.0	55-45/5"	100+
		5A	19.0-20.0	64-36/2"	100+
24.5'	Hard brown silt, some sand and gravel - moist	6A	24.0-25.5	28-30-41	71
27.0'	Very dense brown sand and gravel, some cobbles - moist	7A	29.0-30.0	58-43/3"	100+
32.0'	Hard gray silt, some clay, trace of sand, trace of gravel - moist	8A	34.0-35.0	70-30/3"	100+
40.3'	Very dense gray sand and gravel, trace of silt - moist	9A	39.0-39.5	100/4"	100+
	Bottom of boring at 40.5'				

METHOD: HOLLOW STEM AUGER
TECHNICIAN: RG-JD
JOB NO.: 25176 (sep)

WATER OBSERVATIONS
INITIAL DEPTH: 29.5' (trace)
COMPLETION DEPTH: 37.0'
DEPTH AFTER 24 HRS 37.0'

TYPE SAMPLER:
X A. SPLIT SPOON
___ B.
___ C. SHELBY TUBE

SURFACE ELEVATION: 731.8'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Concrete				
4.0'	(ORIGINAL) Very loose brown sand and gravel, some silt, some cobbles - moist	1A	4.0- 5.5	47- 3- 1	4
	(With 1" to 2" silt seams from 6.0')	2A	6.0- 7.5	1- 1- 1	2
8.5'	Medium dense brown sand and gravel, some silt, some cobbles - moist	3A	8.5-10.0	5- 6-13	19
	(Becomes very dense at 14.0')	4A	14.0-14.5	100	100+
		5A	19.0-19.5	100	100+
	(Becomes dense at 24.0')	6A	24.0-25.5	15-15-26	41
		7A	29.0-30.5	12-18-26	44
	(Becomes very dense at 34.0')	8A	34.0-35.5	22-30-36	66
	Bottom of boring at 35.5'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: RC-JD

JOB NO.: 25176 (smp)

WATER OBSERVATIONS

INITIAL DEPTH None

COMPLETION DEPTH None

DEPTH AFTER 24 HRS none

TYPE SAMPLER:

X A. SPLIT SPOON

___ B.

___ C. SHELBY TUBE

SB - 9A

SURFACE ELEVATION: 731.8'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC
0.0'	(FILL) Concrete				
0.9'					
1.2'	(FILL) Sand and gravel base				
	(ORIGINAL) Very stiff brown clay, some sand, some gravel, some silt - moist	1A	1.0-2.5	9-8-8	16
5'	Bottom of boring at 2.5'				
10'					

METHOD: HOLLOW STEM AUGER

TECHNICIAN: JD-WH

JOB NO.: 25176 (cls)

WATER OBSERVATIONS

INITIAL DEPTH: None

COMPLETION DEPTH: None

DEPTH AFTER 24 HRS. none

TYPE SAMPLER:

X A. SPLIT SPOON

___ B.

___ C. SHELBY TUBE

SB-10

SURFACE ELEVATION: 731.8'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Concrete				
0.7'	Medium dense brown sand and gravel, some silt, trace of cobbles				
		1A	3.5- 5.0	7- 7- 6	13
5'					
	(Becomes dense at 6.5')	2A	6.5- 8.0	12-16-30	46
10'		3A	9.0-10.5	17-20-24	44
15'		4A	14.0-15.5	17-21-29	50
20'	(Becomes very dense at 19.0')	5A	19.0-20.5	27-35-43	78
25'	(Becomes dense at 24.0')	6A	24.0-25.5	20-21-27	48
	(Becomes very dense at 28.5')	7A	28.5-30.0	28-50-50/4"	100+
30'	Bottom of boring at 30.0'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: RG-JD

JOB NO.: 25176 (sup)

WATER OBSERVATIONS

INITIAL DEPTH None

COMPLETION DEPTH None

DEPTH AFTER 24 HRS none

TYPE SAMPLER:

X A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

SB-11

SURFACE ELEVATION: 731.8'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS PER FT OR CORE REC.
0.0'	(FILL) Wood				
0.2'					
1.0'	(FILL) Concrete				
	(FILL) Brown sand and gravel, some silt, some cobbles - moist				
3.0'					
	(ORIGINAL) Stiff brown clay, some silt, some sand, trace of gravel - moist	1A	3.5- 5.0	4- 5- 6	11
5'					
5.5'	Medium dense brown sand and silt, some gravel - moist	2A	6.5- 8.0	5- 7- 9	16
9.0'					
10'	Dense brown sand and gravel, some silt, trace of cobbles - moist	3A	9.0-10.5	15-17-19	36
15'		4A	14.0-15.5	14-19-26	45
20'	(Becomes very dense at 19.0')	5A	19.0-19.5	100/3"	100+
25'		6A	24.0-25.5	40-50-29	79
30'		7A	29.0-30.5	18-27-30	57
33.0'	Hard gray silt, some sand, some clay, trace of gravel - wet	8A	33.5-35.0	11-17-21	38
35'	Bottom of boring at 35.0'				
40'					

METHOD: HOLLOW STEM AUGER

TECHNICIAN: BW-JD

JOB NO.: 25176 (smp)

WATER OBSERVATIONS

INITIAL DEPTH 33.0'

COMPLETION DEPTH 33.0'

DEPTH AFTER 24 HRS 33.0'

TYPE SAMPLER:

X A. SPLIT SPOON

___ B.

___ C. SHELBY TUBE

SB-11A

SURFACE ELEVATION: 731.8'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS / FT. OR CORE REC.
0.0'	(FILL) Wood	1A	1.0-2.5	20-16-9	25
0.3'	(FILL) Concrete				
2.0'	(FILL) Dense gray sand and gravel base - damp				
5'	(ORIGINAL) Very stiff brown clay, some sand, some gravel, trace of silt - moist				
	Bottom of boring at 2.5'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: JD-WH

JOB NO. 25176 (cls)

WATER OBSERVATIONS

INITIAL DEPTH None

COMPLETION DEPTH None

DEPTH AFTER 24 HRS. none

TYPE SAMPLER:

X A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

P.J 4990.
-B-7

SB-12

SURFACE ELEVATION: 731.3'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Wood				
0.2'	(FILL) Concrete				
1.0'	(FILL) Brown silt, some sand, trace of gravel, trace of clay - moist	1C	3.5- 4.5		12"
5'	(Becomes very stiff at 4.5')	1A	4.5- 6.0	20-13-10	23
		2A	5.5- 8.0	4- 7-12	19
10' 10.0'	(Becomes hard at 9.0')	3A	9.0-10.0	17-100/2"	100+
	(ORIGINAL) Very dense brown sand and gravel, some silt, some cobbles - moist				
15'		4A	14.0-15.5	19-27-41	68
		5A	18.5-20.0	21-34-40	74
20'	Bottom of boring at 20.0'				
25'					
30'					

METHOD: HOLLOW STEM AUGER

TECHNICIAN: RG-JD

JOB NO.: 25176 (sap)

WATER OBSERVATIONS

INITIAL DEPTH None

COMPLETION DEPTH None

DEPTH AFTER 24 HRS none

TYPE SAMPLER:

X A. SPLIT SPOON

___ B.

X C. SHELBY TUBE

Proj 4990
SB-12

SB-13

SURFACE ELEVATION: 731.8'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC
0.2'	(FILL) Wood (floor cap)				
1.0'	(FILL) Concrete				
2.0'	(ORIGINAL) Brown sand and gravel, some silt				
4.0'	Brown silt, trace of sand, trace of gravel - moist				
5'		1C	3.5- 4.0		0"
	Dense brown sand and gravel, some silt - moist	1A	4.0- 5.5	14-16-17	33
		2A	6.5- 8.0	20-21-22	43
		3A	8.5-10.0	15-17-21	38
10'					
15'	(Becomes very dense at 14.0')	4A	14.0-15.5	22-28-30	58
20'		5A	19.0-20.5	22-24-29	53
25'		6A	24.0-25.5	27-50-30	80
30'		7A	29.0-30.0	65-35/2"	100+
	Bottom of boring at 30.0'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: RG-JD

JOB NO.: 25176 (sep)

WATER OBSERVATIONS

INITIAL DEPTH None

COMPLETION DEPTH None

DEPTH AFTER 24 HRS none

TYPE SAMPLER:

X A. SPLIT SPOON

___ B

Y C SHELBY TUBE

Proj 4990
SB-13

SB-13A

SURFACE ELEVATION: 731.8'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Wood				
0.2'	(FILL) Concrete				
0.8'	(ORIGINAL) Very stiff brown clay, some sand, some gravel, some silt - moist	1A	1.0-2.5	13-10-10	20
3.5'	(With trace of organic material)	2A	2.5-4.0	10-11-11	22
5'	Medium dense brown sand and gravel - moist				
	Bottom of boring at 4.0'				
10'					
15'					
20'					
25'					
30'					

METHOD: HOLLOW STEM AUGER

TECHNICIAN: JD-WH

JOB NO.: 25176 (sap)

WATER OBSERVATIONS

INITIAL DEPTH: None

COMPLETION DEPTH: None

DEPTH AFTER 24 HRS. none

TYPE SAMPLER:

X A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

Proj 4990
SB-3

SB 14

SURFACE ELEVATION: 731.8'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS PER FT. FOR CORE REC.
0.0'	(FILL) Wood				
1.0'	(FILL) Concrete				
	(ORIGINAL) Medium dense brown sand and gravel, some silt - moist				
5'		1A	4.0- 5.5	4- 9-11	20
		2A	8.5- 8.0	10-10-18	28
9'	(Becomes very dense at 9.0')	3A	9.0-10.0	50-50/4"	100+
14'	(Becomes dense at 14.0')	4A	14.0-15.5	19-20-25	45
19'	(Becomes very dense at 19.0')	5A	19.0-20.5	25-36-27	63
25'		6A	24.0-25.5	29-37-40	77
30'		7A	28.5-30.0	17-29-41	70
	Bottom of boring at 30.0'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: RG-JD

JOB NO.: 25176 (sap)

WATER OBSERVATIONS

INITIAL DEPTH None

COMPLETION DEPTH None

DEPTH AFTER 24 HRS. none

TYPE SAMPLER:

X A. SPLIT SPOON

___ B.

___ C. SHELBY TUBE

Pg 4990
SB-7

SB-15

SURFACE ELEVATION: 725.7

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	Topsoil				
1.0'	Brown clay, some silt, trace of sand, trace of gravel - moist	1C	3.5- 5.5		21"
5'	(Becomes very stiff at 5.5')	1A	5.5- 7.0	5- 7-13	20
9.0'	Very stiff brown sand and silt, bullsliver - moist	2A	9.0-10.5	5- 9-11	20
10'					
13.0'	Brown sand and gravel, trace of silt - moist	3A	14.0-15.5	28-37-50	87
15'	Bottom of boring at 15.5'				
20'					
25'					
30'					

METHOD: HOLLOW STEM AUGER

TECHNICIAN: RG-JD

JOB NO.: 25176 (smp)

WATER OBSERVATIONS

INITIAL DEPTH 10.5' (trace)

COMPLETION DEPTH None

DEPTH AFTER 24 HRS none

TYPE SAMPLER:

X A. SPLIT SPOON

____ B.

X C. SHELBY TUBE

SB-16

SURFACE ELEVATION: 728.6'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Asphalt				
0.3'	(FILL) Road base				
1.3'	(FILL) Black cinders, trace of sand, trace of gravel - moist				
3.0'	(ORIGINAL) Very stiff brown clay, some silt, trace of sand, trace of gravel - moist	1A	3.5- 5.0	5- 8- 9	17
5'					
6.5'	Medium dense brown sand and gravel, trace of silt - moist	2A	6.5- 8.0	9-10-14	24
10'	(Becomes dense at 9.0')	3A	9.0-10.5	9-15-23	38
15'		4A	14.0-15.5	11-11-11	22
	Bottom of boring at 15.5'				
20'					
25'					
30'					

METHOD: HOLLOW STEM AUGER

TECHNICIAN: RG-JD

JOB NO.: 25176 (sap)

WATER OBSERVATIONS

INITIAL DEPTH None

COMPLETION DEPTH None

DEPTH AFTER 24 HRS none

TYPE SAMPLER:

X A. SPLIT SPOON

___ B.

___ C. SHELBY TUBE

SD-17

SURFACE ELEVATION: 726.1'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
	0.0' Asphalt 0.3' Brown sand and gravel, trace of silt - moist				
5'	(Becomes medium dense at 3.5')	1A	3.5- 5.0	4- 4- 5	9
	(Becomes very dense at 6.5')	2A	6.5- 8.0	19-25-30	55
10'		3A	9.0-10.5	27-29-31	60
15'		4A	14.0-15.5	18-29-37	66
	(Trace of cobbles at 16.5')				
20'		5A	19.0-19.5	100	100+
25'		6A*	24.0-24.5	100	100+
30'		7A	29.0-29.5	100/5"	100+
35'		8A	34.0-35.0	46-55	100+
40'		9A	39.0-40.5	27-37-43	80
	Bottom of boring at 40.5'				
45'					
50'					

METHOD: HOLLOW STEM AUGER

TECHNICIAN: RG-JD

JOB NO.: 25176 (sm)

WATER OBSERVATIONS

INITIAL DEPTH None

COMPLETION DEPTH None

DEPTH AFTER 24 HRS none

TYPE SAMPLER:

X A. SPLIT SPOON

___ B.

___ C. SHELBY TUBE

SB-18

SURFACE ELEVATION: 728.1'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Asphalt				
0.3'	(ORIGINAL) Brown sand and gravel, trace of silt				
	(Becomes dense at 3.5')	1A	3.5- 5.0	11-14-16	30
5'		2A	6.5- 8.0	20-18-21	39
10'	(Becomes dense at 9.0')	3A	9.0-10.5	26-22-28	50
15'	(Trace of cobbles at 15.5')	4A	14.0-15.0	49-52	100+
20'		5A	19.0-20.5	20-30-36	66
	Bottom of boring at 20.5'				
25'					
30'					

METHOD: HOLLOW STEM AUGER

TECHNICIAN: RG-JD

JOB NO.: 25176 (sm)

WATER OBSERVATIONS

INITIAL DEPTH None

COMPLETION DEPTH None

DEPTH AFTER 24 HRS. none

TYPE SAMPLER:

X A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

SB-19

SURFACE ELEVATION: 728.1'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Asphalt				
0.3'	(ORIGINAL) Brown sand and gravel, trace of silt - moist				
3.5'	Medium dense brown coarse sand, trace of gravel, trace of silt - moist	1A	3.5- 5.0	12-10- 8	18
5'	(Becomes very dense at 6.5')	2A	6.5- 8.0	11-25-29	54
10'		3A	9.0-10.5	25-22-28	50
15'	(Becomes dense at 14.0')	4A	14.0-15.5	20-18-23	41
	(Cobbles at 17.5')				
20'		5A	19.0-20.5	24-19-21	40
25'	(Becomes very dense at 24.5')	6A	24.0-25.0	35-83	100+
27.0'	Hard brown and gray silt, trace of sand, trace of gravel - moist				
30'		7A	29.0-29.5	100	100+
	Bottom of boring at 29.5'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: RG-JD

JOB NO.: 25176 (sep)

WATER OBSERVATIONS

INITIAL DEPTH None

COMPLETION DEPTH None

DEPTH AFTER 24 HRS none

TYPE SAMPLER:

X A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

SB-20

SURFACE ELEVATION: 728.1'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT OR CORE REC.
0.0'	(FILL) Asphalt				
0.3'	(FILL) Brown clay, some silt, trace of sand, trace of gravel - moist				
3.0'	(ORIGINAL) Medium dense brown coarse sand, trace of gravel, trace of silt - moist	1A	3.5- 5.0	9-10-11	21
5'	(Becomes dense at 6.5')	2A	6.5- 8.0	19-20-43	63
10'		3A	9.0-10.5	21-29-31	60
15'	(Trace of cobbles at 15.0')	4A	14.0-15.0	69-31/3"	100+
20'		5A	19.0-20.0	60-41/3"	100+
	Bottom of boring at 20.0'				
25'					
30'					

METHOD: HOLLOW STEM AUGER

TECHNICIAN: RG-JD

JOB NO.: 25176 (sup)

WATER OBSERVATIONS

INITIAL DEPTH None

COMPLETION DEPTH None

DEPTH AFTER 24 HRS none

TYPE SAMPLER:

X A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

P - Unit

SB-24

SURFACE ELEVATION: 737.5'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS PER FT OR CORE REC
0.0'	(FILL) Topsoil				
1.0'	(FILL) Very stiff brown silt, some sand, trace of gravel - moist	1A	1.0- 2.5	13-14-13	27
4.0'	(FILL) Medium dense brown sand and gravel, some silt - moist	2A	4.0- 5.5	7- 6-10	16
		3A	6.5- 8.0	6- 7- 6	13
		4A	9.0-10.5	5- 6- 6	12
		5A	14.0-15.5	6-19- 9	28
	(Becomes loose at 19.0')	6A	19.0-20.5	6- 5- 3	8
23.5	(ORIGINAL) Very dense gray sand and gravel, trace of silt, trace of cobbles - moist	7A	24.0-25.0	33-85	118
		8A	29.0-30.5	25-52-50/4"	100+
		9A	34.0-35.0	55-46	104
		10A	38.5-40.0	60-40/4"	100+
	Bottom of boring at 40.0'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: JD-RA-AS

JOB NO.: 25176 (sap)

WATER OBSERVATIONS

INITIAL DEPTH: *

COMPLETION DEPTH: None

DEPTH AFTER ____ HRS ____

TYPE SAMPLER:

X A SPLIT SPOON

B

C SHELBY TUBE

SB-25

SURFACE ELEVATION: 735.9'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Asphalt				
0.2'	(ORIGINAL) Brown silt and sand, trace of gravel - moist	1A	1.0-2.5	12-13- 6	19
3.0'	Loose brown sand and gravel, trace of silt - moist	2A	4.0-5.5	30- 6- 4	10
5'	(Becomes medium dense at 6.5')	3A	6.5-8.0	3- 6- 6	12
	(Becomes very dense at 9.0')	4A	9.0-10.5	11-50-40/3"	90+
10'					
15'		5A	14.0-15.5	28-32-30	62
	(Trace of cobbles at 17.5')				
20'		6A	19.0-20.0	35-65	100
25'		7A	24.0-25.0	40-60	100
30'		8A	29.0-29.5	100/2"	100+
	Bottom of boring at 29.5'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: BB-AS

JOB NO.: 25176

WATER OBSERVATIONS

INITIAL DEPTH 12.0'

COMPLETION DEPTH None

DEPTH AFTER 24 HRS None

TYPE SAMPLER:

X A SPLIT SPOON

____ B

____ C SHELBY TUBE

Proj 25176

SB-20

SURFACE ELEVATION: 736.3'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT OR CORE REC.
0.0'	Topsoil				
0.5'	Medium dense brown sand and gravel, some cobbles, trace of silt - moist	1A	1.5-3.0	10-12-10	22
		2A	4.0-5.5	4- 3- 8	11
5'		3A	6.5-8.0	28-18-13	31
		4A	9.0-10.5	19-22-22	44
10'					
		5A	14.0-15.5	17-19-20	39
15'					
	(Becomes very dense at 19.0')	6A	19.0-20.5	24-36-22	58
20'					
		7A	24.0-25.5	34-44-44	88
25'					
		8A	29.0-30.5	22-42-51	93
30'					
31.0'	Hard gray silt, some clay, some sand, trace of gravel - moist	9A	34.0-35.0	44-100	144
35'					
	Bottom of boring at 38.0'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: MC-AS

JOB NO.: 25176

WATER OBSERVATIONS

INITIAL DEPTH 29.0' (trace)

COMPLETION DEPTH None

DEPTH AFTER ____ HRS ____

TYPE SAMPLER:

X A SPLIT SPOON

___ B

___ C SHELBY TUBE

SB-27

SURFACE ELEVATION: 738.8'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Sand and gravel base				
0.5'	(FILL) Medium dense brown sand and gravel, trace of silt - moist	1A	1.0-2.5	6- 7- 7	14
3.0'	(ORIGINAL) Very dense brown sand and gravel, trace of silt - moist	2A	4.0-5.0	64-50	114
5'		3A	6.5-8.0	22-36-25	61
		4A	9.0-10.5	19-36-39	75
10'					
		5A	14.0-15.5	24-26-31	57
15'					
		6A	19.0-20.5	10-22-36	58
20'					
		7A	24.0-25.5	36-36-42	78
25'					
	(Some cobbles 27' to 29')				
		8A	29.0-29.5	100/2"	100"
30'	Bottom of boring at 29.5'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: JD-LS

JOS NO.: 25176

WATER OBSERVATIONS

INITIAL DEPTH: None

COMPLETION DEPTH None

DEPTH AFTER 24 HRS None

TYPE SAMPLER:

X A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

Proj 5000
Sheet SB1

SB-28

SURFACE ELEVATION: 739.7'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Brown sand and gravel, some cinders - moist				
1.5'	(ORIGINAL) Very dense brown sand and gravel, some silt - moist	1A	1.0-2.5	18-36-40	76
5'		2A	4.0-5.5	30-33-31	64
		3A	6.0-8.5	21-36-39	75
10'		4A	9.0-10.5	20-22-31	53
15'		5A	14.0-15.0	65-35/2"	100
20'		6A	19.0-20.0	70-30/2"	100
	(Trace of cobbles at 22.5')				
25'	(Trace of cobbles at 25.0')	7A	24.0-24.5	100/4"	100+
		8A	29.0-29.5	100	100
	Bottom of boring at 29.5'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: BB-RA-AS

JOB NO.: 25176

WATER OBSERVATIONS

INITIAL DEPTH: *

COMPLETION DEPTH: None

DEPTH AFTER 24 HRS: None

TYPE SAMPLER:

X A. SPLIT SPOON

B.

C. SHELBY TUBE

SB-29

SURFACE ELEVATION: 739.3'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Brown sand and gravel, trace of silt				
1.0'	(ORIGINAL) Very stiff brown silt and sand, trace of gravel, trace of clay - moist	1A	1.0- 2.5	8- 8-10	18
3.5'	Dense brown sand and gravel, trace of silt - moist	2A	4.0- 5.5	26-18-27	45
5'	(Becomes very dense at 6.0')	3A	6.0- 8.5	16-28-31	59
10'		4A	9.0-10.5	20-40-40/4"	80+
	(With trace of cobbles at 12.0')				
15'		5A	14.0-15.5	31-27-35	62
20'		6A	19.0-20.5	36-32-32/2"	64+
	(With some cobbles at 23.0')				
25'		7A	24.0-25.5	30-40-30/2"	70+
30'		8A	29.0-30.0	55-45/2"	100+
	Bottom of boring at 30.0'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: BB-RA-AS

JOB NO.: 25176 (cls)

WATER OBSERVATIONS

INITIAL DEPTH **

COMPLETION DEPTH: None

DEPTH AFTER 24 HRS 29.0'

TYPE SAMPLER:

X A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

Pro, Boss

SB-30

SURFACE ELEVATION: 743.4'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	Topsoil				
0.6'	Very stiff brown clay and silt, some sand, trace of gravel - moist	1A	1.0- 2.5	9-10-10	20
5'		2A	4.0- 5.5	10-10-15	25
5.5'	Medium dense brown sand and gravel, trace of silt - moist (Becomes very dense at 6.5')	3A	6.5- 8.0	22-25-27	52
10'		4A	9.0-10.5	28-30-35	65
15'		5A	14.0-15.5	32-40-45	85
	Bottom of boring at 15.5'				
20'					

METHOD: HOLLOW STEM AUGER

TECHNICIAN: JD-LS

JOB NO.: 25176 (cls)

WATER OBSERVATIONS

INITIAL DEPTH: None

COMPLETION DEPTH: None

DEPTH AFTER _____ HRS. _____

TYPE SAMPLER:

X A. SPLIT SPOON

_____ B.

_____ C. SHELBY TUBE

Proj 5000
Sheet 3P.1

SB-32

SURFACE ELEVATION: 737.1'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Concrete				
0.5'	(FILL) Base				
1.0'	(FILL) Hard black organic clay and silt, some sand, trace of gravel - moist	1A	1.5- 3.0	25-15-25	40
5'	(ORIGINAL) Dense brown sand and gravel, trace of silt	2A	4.0- 5.5	15-20-21	41
		3A	6.5- 8.0	11-13-19	32
10'		4A	9.0-10.5	8-13-17	30
15'	(Becomes medium dense at 14.0')	5A	14.0-15.5	13-10-12	22
20'	(Becomes very dense at 19.0')	6A	19.0-20.5	24-30-25	55
25'		7A	24.0-25.5	21-46-53	99
30'		8A	29.0-30.5	21-37-35	72
	Bottom of boring at 30.5'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: MC-LS

JOB NO: 10176 (cls)

WATER OBSERVATIONS

INITIAL DEPTH: None

COMPLETION DEPTH: None

DEPTH AFTER 24 HRS: none

TYPE SAMPLER:

X A SPLIT SPOON

____ B -

____ C SHELBY TUBE

Proj. Co. 2
42 -

SB-33

SURFACE ELEVATION: 737.5'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Concrete				
0.4'	(FILL) Brown sand and gravel, some silt - moist				
1.0'	(ORIGINAL) Hard brown clay and silt, some sand, trace of gravel - moist	1A	1.0- 2.5	25-40-50	90
2.0'	Very dense brown sand and gravel, trace of silt - moist	2A	4.0- 5.5	10-25-40	65
5'		3A	6.5- 7.5	35-65	100
10'		4A	9.0-10.0	45-55	100
	(With trace of cobbles at 12.0')				
15'		5A	14.0-15.0	80-20/1"	100+
20'		6A	19.0-20.0	40-60	100
	(With trace of cobbles at 23.0')				
25'		2A	24.0-24.5	100/1"	100+
29.5'	Very dense brown sand, trace of silt - moist	8A	29.0-30.0	50-70/2"	100+
30'	Bottom of boring at 30.0'				

METHOD: HOLLOW STEM AUGUER

TECHNICIAN: JD-BB

JOB NO.: 25176 (cls)

WATER OBSERVATIONS

INITIAL DEPTH: 15.0' (trace)

COMPLETION DEPTH None

DEPTH AFTER ____ HRS. ____

TYPE SAMPLE:

A. SPLIT SPOON

C. SHELBY TUBE

Proj Spec
Sheet C P51

SB-34

SURFACE ELEVATION: 740.0'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	Topsoil				
0.3'	Very stiff brown clay and silt, some sand, trace of gravel - moist	1A	1.0- 2.5	8-10-15	25
3.0'	Very dense brown sand and gravel, trace of silt - moist	2A	4.0- 5.5	40-40-20/1"	60+
		3A	6.5- 8.0	5-10-45	55
10'		4A	9.0-10.5	25-45-30/2"	75+
15'		5A	14.0-15.0	60-40/3"	100+
20'	(With trace of cobbles at 19.0')	6A	19.0-19.5	100/1"	100+
25'		7A	24.0-25.0	48-52/5"	100+
30'		8A	29.0-30.0	45-55/3"	100+
	Bottom of boring at 30.0'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: JD-BB

JOB NO.: 25176 (smp)

WATER OBSERVATIONS

INITIAL DEPTH: 14.5' (trace)

COMPLETION DEPTH: None

DEPTH AFTER _____ HRS. _____

TYPE SAMPLER:

X A. SPLIT SPOON

_____ B.

_____ C. SHELBY TUBE

SURFACE ELEVATION: 740.8'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	Topsoil				
0.3'	Very stiff black organic silt and clay, some sand, trace of gravel - moist	1A	1.0- 2.5	10-13-13	26
3.5'	Medium dense brown sand and gravel, trace of silt - moist	2A	4.0- 5.5	13-11-11	22
		3A	6.5- 8.0	12-10-13	23
	(Becomes very dense at 9.0')	4A	9.0-10.5	13-31-52	83
		5A	14.0-15.0	50-50	100
	(With trace of cobbles at 18.0')	6A	19.0-20.0	50-50	100
		7A	24.0-25.5	35-65	100
	(With some cobbles at 27.0')	8A	29.0-30.5	40-45-15/1"	60+
		9A	34.0-35.0	50-50/1"	100+
		10A	38.5-40.0	25-25-50/3"	75+
	Bottom of boring at 40.0'				

METHOD: HOLLOW STEM AUGER
TECHNICIAN: BB-AS
JOB NO.: 25176 (sep)

WATER OBSERVATIONS
INITIAL DEPTH 9.0' (trace)
COMPLETION DEPTH None
DEPTH AFTER ____ HRS ____

TYPE SAMPLER:
X A. SPLIT SPOON
___ B.
___ C. SHELBY TUBE

SB-36

SURFACE ELEVATION: 739.7'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	Topsoil				
0.3'	Medium dense brown sand and gravel, trace of silt - moist	1A	1.0- 2.5	14-11- 7	18
5'	(Becomes dense at 4.0')	2A	4.0- 5.5	22-24-25	49
	(Becomes very dense at 6.0')	3A	6.0- 8.5	32-27-30	57
10'	(Becomes dense at 9.5')	4A	9.0-10.5	13-11-16	27
	(With trace of cobbles at 13.0')				
15'	(Becomes very dense at 14.0')	5A	14.0-15.5	27-43-32	75
	(With trace of cobbles at 18.0')				
20'		6A	19.0-20.5	25-43-30	73
25'		7A	24.0-25.5	26-24-30	54
	(With trace of cobbles at 27.0')				
30'		8A	29.0-30.5	29-71	100
	Bottom of boring at 30.0'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: BB-RA-AS

JOB NO.: 25176 (sap)

WATER OBSERVATIONS

INITIAL DEPTH: None

COMPLETION DEPTH: None

DEPTH AFTER 72 HRS. none

TYPE SAMPLER:

X A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

SB-37

SURFACE ELEVATION: 739.8'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	Topsoil				
0.5'	Hard black organic clay and silt, trace of gravel	1A	1.0- 2.5	10-20-29	49
3.5'	Dense brown sand and gravel, trace of silt - moist	2A	4.0- 5.5	18-22-17	39
		3A	6.5- 8.0	15-16-25	41
10'	(Becomes very dense at 9.0')	4A	9.0-10.5	22-23-37	60
	(With trace of cobbles at 13.0')				
15'		5A	14.0-15.0	27-73	100
	(With trace of cobbles at 17.0')				
20'	(Becomes dense at 19.0')	6A	19.0-20.5	27-20-15	35
25'	(Becomes very dense at 24.0')	7A	24.0-24.5	100	100
	(With trace of cobbles at 26.5')				
30'		8A	29.0-30.0	31-69	100
	Bottom of boring at 30.0'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: BB-RA-AS

JOB NO.: 25176 (smp)

WATER OBSERVATIONS

INITIAL DEPTH: *

COMPLETION DEPTH None

DEPTH AFTER: ____ HRS. ____

TYPE SAMPLER:

X A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

Proj 25176
SB-2

SB-33

SURFACE ELEVATION: 744.7'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Topsoil				
0.5'	(FILL) Hard brown silt, some sand, some gravel - moist	1A	1.0- 2.5	29-27-30	57
4.0'	(ORIGINAL) Very stiff brown clay and silt, some sand, trace of gravel - moist	2A	4.0- 5.5	4- 8- 8	16
5' 6.5'	Medium dense brown sand and gravel, trace of silt - moist	3A	6.0- 8.5	14-14-14	28
10'	(Becomes very dense at 9.0')	4A	9.0-10.5	32-34-28	62
		5A	13.5-15.0	16-31-54	85
15'	Bottom of boring at 15.0'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: BB-RA-AS

JOB NO.: 25176 (smp)

WATER OBSERVATIONS

INITIAL DEPTH: None

COMPLETION DEPTH: None

DEPTH AFTER: ____ HRS. ____

TYPE SAMPLER:

X A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

Plan 5000
SB-2

SB-41

SURFACE ELEVATION: 737.5'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Concrete				
0.5'	(ORIGINAL) Dense brown sand and gravel, trace of silt - moist	1A	1.0- 2.5	26-29-19	48
5'	(Becomes medium dense at 4.0')	2A	4.0- 5.5	10-10-15	25
	(Becomes dense at 7.0')	3A	6.5- 8.0	19-27-23	50
10'		4A	9.0-10.5	15-24-33	57
	(With trace of cobbles at 13.0')				
15'		5A	14.0-14.5	100/2"	100+
	(With trace of cobbles at 17.0')				
20'		6A	19.0-20.0	50-50	100
25'		7A	24.0-25.0	56-44	100
30'		8A	28.5-29.5	63-37/2"	100+
	Bottom of boring at 29.5'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: BB-LS-AS

JOB NO.: 25176 (smp)

WATER OBSERVATIONS

INITIAL DEPTH: *

COMPLETION DEPTH: None

DEPTH AFTER: 24 HRS. none

TYPE SAMPLER:

X A. SPLIT SPOON

B.

C. SHELBY TUBE

(1) 5000
SB-2

SB-42

SURFACE ELEVATION: 738.9'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	Topsoil				
0.5'	Very stiff brown organic clay and silt, some sand, trace of gravel - moist	1A	1.0- 2.5	10-11-15	26
4.0'	Medium dense brown sand and gravel, some silt - moist	2A	4.0- 5.5	6- 7- 8	15
	(Becomes very dense at 6.5')	3A	6.5- 8.0	19-24-36	60
10'		4A	9.0-10.5	14-23-29	52
15'		5A	14.0-15.5	30-40-30/2"	70+
	(With trace of cobbles at 18.0')				
20'	(Becomes dense at 19.5')	6A	19.0-20.5	24-17-30	47
	(With trace of cobbles at 23.0')	7A	24.0-25.0	60-40/3"	100+
25'					
	(With trace of cobbles at 28.0')				
30'		8A	29.0-30.0	60-40/1"	100+
35'		9A	34.0-35.0	70-30/3"	100+
40'		10A	39.0-40.0	50-50/3"	100+
	Bottom of boring at 40.0'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: JD-BB-MC

JOB NO.: 25176 (smp)

WATER OBSERVATIONS

INITIAL DEPTH 39.0' (trace)

COMPLETION DEPTH None

DEPTH AFTER 24 HRS. none

TYPE SAMPLER:

X A. SPLIT SPOON

___ B.

___ C. SHELBY TUBE

SB-43

SURFACE ELEVATION: 739.0'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT OR CORE REC.
0.0'	(FILL) Crushed stone base				
0.5'	(ORIGINAL) Medium stiff brown clay and silt and sand, trace of gravel - moist	1A	1.0- 2.5	6- 5- 4	9
3.0'	Dense brown sand and gravel, trace of silt - moist				
5'		2A	4.0- 5.5	14-20-15	35
		3A	6.5- 8.0	17-20-22	42
10'	(Becomes medium dense at 9.0')	4A	9.0-10.5	5- 6- 7	13
15'	(Becomes very dense with trace of cobbles at 14.0')	5A	14.0-15.5	17-22-32	54
20'		6A	19.0-20.5	27-42-33	75
25'		7A	24.0-25.5	29-35-50	85
30'		8A	29.0-30.5	26-32-50	82
	Bottom of boring at 30.5'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: JD-LS

JOB NO.: 25176 (sm)

WATER OBSERVATIONS

INITIAL DEPTH None

COMPLETION DEPTH None

DEPTH AFTER 24 HRS. none

TYPE SAMPLER:

X A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

H-13
SB-2

SB-44

SURFACE ELEVATION: 740.8'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Topsoil				
0.7'	(ORIGINAL) Very stiff black organic silt, some clay, some sand, trace of gravel - moist.	1A	1.0- 2.5	10-10-20	30
5.0'	Dense brown sand and gravel, trace of silt - moist	2A	4.0- 5.5	4-14-36	50
	(Becomes dense at 6.0')	3A	6.0- 8.5	15-19-19	38
10'	(Becomes medium dense at 9.0')	4A	9.0-10.5	8-11-17	28
15'	(Becomes very dense at 14.0')	5A	14.0-15.5	24-36-52	88
	(With trace of cobbles at 16.0')				
	(With some cobbles at 18.0')				
20'		6A	19.0-20.5	18-32-36	68
25'	(With some cobbles at 24.0')	7A	24.0-24.5	100/1"	100+
30'		8A	28.5-30.0	27-47-26/3"	73+
	Bottom of boring at 30.0'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: BB-RA-AS

JOB NO. 25176 (smp)

WATER OBSERVATIONS

INITIAL DEPTH None

COMPLETION DEPTH None

DEPTH AFTER 72 HRS none

TYPE SAMPLER:

X A. SPLIT SPOON

___ B.

___ C. SHELBY TUBE

Fig 5.2.2

SB-45

SURFACE ELEVATION: 740.7'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	Topsoil				
0.7'	Medium dense brown sand and silt, trace of gravel - moist	1A	1.0- 2.5	10-17-10	27
3.5'	Very dense brown sand and gravel, trace of silt - moist	2A	4.0- 5.5	21-36-35	71
5'	(Becomes medium dense at 6.0')	3A	6.0- 8.5	12-12-14	26
10'	(Becomes dense at 9.0')	4A	9.0-10.5	21-20-18	38
	(With trace of cobbles at 12.0')				
15'	(Becomes very dense at 13.5')	5A	13.5-15.0	36-42-22/2"	64+
	Bottom of boring at 15.0'				
20'					
25'					
30'					

METHOD: HOLLOW STEM AUGER

TECHNICIAN: BB-RA-AS

JOB NO.: 25176 (sap)

WATER OBSERVATIONS

INITIAL DEPTH: None

COMPLETION DEPTH: None

DEPTH AFTER _____ HRS. _____

TYPE SAMPLER:

X A. SPLIT SPOON

_____ B.

_____ C. SHELBY TUBE

Proj 25176
SB 2

SB-46

SURFACE ELEVATION: 740.9'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	Topsoil				
0.5'	Very stiff brown clay and silt, some sand, trace of gravel - moist	1A	1.0- 2.5	10- 9-10	19
3.5'	Very dense brown sand and gravel, trace of silt - moist	2A	4.0- 5.5	20-35-50	85
		3A	6.0- 8.5	17-29-29	58
10'		4A	9.0-10.5	21-34-38	72
		5A	13.5-15.0	32-36-32/3"	68+
15'	Bottom of boring at 15.0'				
20'					

METHOD: HOLLOW STEM AUGER

TECHNICIAN: BB-RA-AS

JOB NO.: 25176 (SEP)

WATER OBSERVATIONS

INITIAL DEPTH: None

COMPLETION DEPTH None

DEPTH AFTER _____ HRS _____

TYPE SAMPLER:

X A. SPLIT SPOON

_____ B.

_____ C. SHELBY TUBE

SB-49

SURFACE ELEVATION: 735.7'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Asphalt				
0.1'	(FILL) Concrete				
1.0'	(ORIGINAL) Loose brown sand and silt, some gravel - moist	1A	1.5- 3.0	4- 4- 4	8
5'		2A	4.0- 5.5	3- 3- 3	6
6.5'	Very loose brown brown sand, some silt - moist	3A	6.5- 8.0	1- 1- 1	2
10'	(Becomes loose at 9.0')	4A	9.0-10.5	1- 2- 7	9
15' 15.0'	Dense brown sand and gravel, some silt - moist	5A	14.0-15.5	7-11-20	31
20' 19.0'	Dense brown sand and gravel, trace of silt - moist	6A	19.0-20.5	15-18-20	38
25'		7A	24.0025.5	10-15-15	30
30'		8A	29.0-30.5	10-14-16	30
	Bottom of boring at 30.5'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: MC

JOB NO.: 25176 (smp)

WATER OBSERVATIONS

INITIAL DEPTH None

COMPLETION DEPTH None

DEPTH AFTER ____ HRS ____

TYPE SAMPLER:

X A SPLIT SPOON

B

C SHELBY TUBE

9850

SURFACE ELEVATION: 739.1'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	N-BLOWS PER FT OR CORE REC
0.0'	Topsoil				
0.5'					
1.0'	Brown silt, some sand - moist				
	Hard black organic silt, some clay, some sand - moist	1A	1.0- 2.5	10-20-25	45
3.0'	Loose brown sand and silt, trace of clay - moist				
5'		2A	4.0- 5.5	5- 5- 5	10
6.5'	Medium dense brown sand and gravel, trace of silt - moist	3A	6.5- 8.0	4- 8- 7	15
10'	(Becomes loose at 9.0')	4A	9.0-10.5	1- 3- 4	7
15'	(Becomes very dense at 15.0')	5A	14.0-15.5	17-26-30	56
20'	(Becomes dense at 19.0')	6A	19.0-20.5	17-15-20	35
25'	(Becomes very dense at 24.0')	7A	24.0-25.5	25-36-40	76
30'		8A	29.0-30.5	25-55-50	105
35'		9A	34.0-34.5	50/4"	50
40'		10A	39.0-39.5	100/1"	100
	Bottom of boring at 39.5'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: GD-MC-BB

JOB NO.: 25176 (cls)

WATER OBSERVATIONS

INITIAL DEPTH None

COMPLETION DEPTH None

DEPTH AFTER ____ HRS ____

TYPE SAMPLER:

X A SPLIT SPOON

____ B

____ C SHELBY TUBE

SB-51

SURFACE ELEVATION: 740.6'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT OR CORE REC.
0.0'	Topsoil				
0.5'	Very stiff brown clay and silt, some sand, trace of gravel - moist	1A	1.0- 2.5	12-13-14	27
3.0'	Very dense brown sand and gravel, trace of silt - moist	2A	4.0- 5.5	32-38-21	59
	(Becomes medium dense at 6.5')	3A	6.5- 8.0	12-10-13	23
10'		4A	9.0-10.5	15-13-13	26
	(With trace of cobbles at 12.0')				
15'	(Becomes very dense at 14.0')	5A	14.0-15.5	32-40-40	80
20'		6A	19.0-20.5	28-35-40	75
	(With trace of cobbles at 22.5')				
25'		7A	24.0-25.0	50-53	103+
30'		8A	29.0-30.5	24-30-50	80
	Bottom of boring at 30.5'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: JD-LS

JOB NO.: 25176 (cls)

WATER OBSERVATIONS

INITIAL DEPTH None

COMPLETION DEPTH None

DEPTH AFTER ____ HRS ____

TYPE SAMPLER:

X A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

SB-52

SURFACE ELEVATION: 740.7'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	Topsoil				
0.5'	Very stiff dark brown clay and silt, some sand, trace of gravel - moist	1A	1.0- 2.5	8- 9-10	19
3.0'	Dense brown sand and gravel, trace of silt	2A	4.0- 5.5	14-22-23	45
5'	(Becomes medium dense at 6.5')	3A	6.5- 8.0	10- 7-13	20
10'		4A	9.0-10.5	14-20-15	35
	(With trace of cobbles at 12.0')				
15'	(Becomes very dense at 14.0')	5A	14.0-14.5	100/1"	100+
	(With trace of cobbles at 18.0')				
20'		6A	19.0-19.5	100/3"	100+
25'		7A	24.0-25.5	30-33-40	73
30'		8A	29.0-30.5	35-40-46	86
	Bottom of boring at 30.5'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: JD-LS

JOB NO.: 25176 (smp)

WATER OBSERVATIONS

INITIAL DEPTH None

COMPLETION DEPTH None

DEPTH AFTER ____ HRS ____

TYPE SAMPLER:

X A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

SB-55

SURFACE ELEVATION: 740.3'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS PER FT OR CORE REC.
0.0' / 0.5'	Topsoil				
	Very stiff black organic silt, some clay, some sand - moist	1A	1.0- 2.5	9-10-11	21
3.0'	Dense brown sand and gravel, trace of silt - moist	2A	4.0 5.5	14-13-25	38
5'	(Becomes medium dense at 6.5')	3A	6.5- 8.0	16- 9- 7	16
	(With trace of cobbles at 8.5')				
10'	(Becomes dense at 9.0')	4A	9.0-10.5	10-16-17	33
15'		5A	14.0-15.5	15-16-22	38
	Bottom of boring at 15.5'				
20'					

METHOD: HOLLOW STEM AUGER

TECHNICIAN: JD-LS

JOB NO.: 25176 (s⇨)

WATER OBSERVATIONS

INITIAL DEPTH: None

COMPLETION DEPTH None

DEPTH AFTER _____ HRS. _____

TYPE SAMPLER:

X A. SPLIT SPOON

_____ B

_____ C SHELBY TUBE

SB-54

SURFACE ELEVATION: 740.6'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS PER FT OR CORE REC
0.0'	Topsoil				
0.5'	Very stiff brown silt and clay, some sand, trace of gravel - moist	1A	1.0- 2.5	8- 9-10	19
3.0'	Very dense brown sand and gravel, trace of silt - moist	2A	4.0- 5.5	20-30-42	72
5'		3A	6.5- 8.0	21-27-29	56
10'	(Becomes dense at 9.0')	4A	9.0-10.5	15-18-22	40
15'	(Becomes very dense at 14.0')	5A	14.0-15.5	28-27-36	63
	Bottom of boring at 15.5'				
20'					
25'					

METHOD: HOLLOW STEM AUGER

TECHNICIAN: JD-LS

JOB NO.: 25176 (smp)

WATER OBSERVATIONS

INITIAL DEPTH: None

COMPLETION DEPTH: None

DEPTH AFTER ____ HRS ____

TYPE SAMPLER:

X A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

SB-57

SURFACE ELEVATION: 738.2'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Topsoil				
1.0'	(FILL) Medium dense brown sand and gravel, some silt - moist	1A	1.0- 2.5	15-13- 9	22
4.0'	(FILL) Very soft brown silt and sand, some gravel - moist	2A	4.0- 5.5	3- 2- 1	3
	(Becomes medium stiff at 6.5')	3A	6.5- 8.0	2- 3- 4	7
8.0'	(ORIGINAL) Very dense gray and brown sand and gravel, trace of silt - moist	4A	9.0-10.5	24-27-30	57
	(With trace of cobbles at 12.0')				
15'		5A	14.0-15.5	30-41-32	73
20'		6A	19.0-20.0	45-56	101
	(With some cobbles at 23.0')				
25'		7A	24.0-25.0	46-54	100
		8A	28.5-30.0	29-36-30	66
30'	Bottom of boring at 30.0'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: JD-RA-AS

JOB NO.: 25176 (smp)

WATER OBSERVATIONS

INITIAL DEPTH: *

COMPLETION DEPTH: None

DEPTH AFTER: _____ HRS. _____

TYPE SAMPLER:

X A. SPLIT SPOON

_____ B.

_____ C. SHELBY TUBE

*19.0' (trace); 24.0' (heavy)

SB-58

SURFACE ELEVATION: 737.7'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS PER FT OR CORE REC.
0.0'	(FILL) Topsoil				*
1.0'	(FILL) Dense brown sand and gravel, trace of silt - moist	1A	1.0- 2.5	14-25-17	45
4.0'	(ORIGINAL) Soft brown clay and silt, some sand, trace of gravel - wet	2A	4.0- 5.5	1- 2- 3	5
7.5'	Medium dense brown sand and gravel, trace of silt - damp	3A	6.5- 8.0	5-12-12	24
10'	(Becomes very dense at 9.0')	4A	9.0-10.5	17-30-34	64
15'		5A	14.0-15.5	24-29-24	53
20'		6A	19.0-20.5	17-30-32	62
25'		7A	24.0-25.5	21-29-31	60
30'		8A	28.5-29.5	30-50	110+
	Bottom of boring at 29.5'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: JD-RA-AS

JOB NO.: 25176 (smp)

WATER OBSERVATIONS

INITIAL DEPTH 4.0' (light)

COMPLETION DEPTH: None

DEPTH AFTER: _____ HRS _____

TYPE SAMPLER:

X A. SPLIT SPOON

_____ B.

_____ C. SHELBY TUBE

SB-59

SURFACE ELEVATION: 738.1'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	N" BLOWS /FT OR CORE REC.
0.0'	(FILL) Brown clay, some silt, some sand, trace of gravel (Becomes medium stiff at 1.0')	1A	1.0- 2.5	6- 4- 3	7
5'		2A	4.0- 5.5	2- 3- 4	7
6.5'	(FILL) Medium dense brown sand and gravel, some silt - moist	3A	6.5- 8.0	4- 4-10	14
8.5'	(ORIGINAL) Dense brown sand and gravel, trace of cobbles, trace of silt - moist	4A	9.0-10.5	18-20-30	50
15'	(Becomes very dense at 14.0')	5A	14.0-15.5	26-28-29	57
	(With some cobbles at 17.0')				
20'		6A	19.0-20.5	32-37-40	77
25'		7A	24.0-25.0	50-50/4"	100+
30'		8A	29.0-29.5	100	100+
	(With boulder at 33.0')				
35'		9A	34.0-35.5	28-36-40	76
		10A	38.5-39.5	90-16/1"	106+
40'	Bottom of boring at 39.5'				
45'					

METHOD: HOLLOW STEM AUGER

TECHNICIAN: JD-RA-AS

JOB NO.: 25176 (sm)

WATER OBSERVATIONS

INITIAL DEPTH 19.0' (trace)

COMPLETION DEPTH None

DEPTH AFTER ____ HRS ____

TYPE SAMPLER:

X A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

SB-60

SURFACE ELEVATION: 737.1'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT OR CORE REC.
0.0'	(FILL) Concrete				
0.5'	(FILL) Base				
1.0'	(ORIGINAL) Stiff brown clay and silt, some sand, trace of gravel - moist	1A	1.5- 3.0	8- 6- 7	13
5.0'	Loose brown sand and gravel, trace of silt - moist	2A	4.0- 5.5	6- 3- 6	9
	(Becomes dense at 6.5')	3A	6.5- 8.0	20-26-22	48
10'		4A	9.0-10.5	12-16-21	37
15'	(Becomes very dense at 14.0')	5A	14.0-15.5	42-100-38	138
20'		6A	19.0-20.5	36-29-26	55
25'	(Becomes dense at 24.0'with very heavy cobble layer)	7A	24.0-25.5	20-16-20	36
30'	(Becomes very dense at 29.0')	8A	29.0-29.5	125	125
	Bottom of boring at 29.5'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: MC-LS

JOB NO.: 25176 (cls)

WATER OBSERVATIONS

INITIAL DEPTH .5'(trace)

COMPLETION DEPTH None

DEPTH AFTER 24 HRS none

TYPE SAMPLER:

X A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

SB-61

SURFACE ELEVATION: 736.1'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT OR CORE REC.
0.0'	(FILL) Concrete.				
0.5'	(FILL) Base				
1.0'	(FILL) Very stiff brown clay and silt, some sand, trace of gravel - moist	1A	1.5- 3.9	9- 9-10	19
4.0'	(ORIGINAL) Medium dense brown sand and gravel, trace of silt - moist	2A	4.0- 5.5	11-13-13	26
		3A	6.5- 8.0	15-18-19	37
10'		4A	9.0-10.5	16-23-18	41
15'	(Becomes very dense at 14.0')	5A	14.0-14.5	100	100
20'		6A	19.0-20.5	49-26-26	52
25'	(Becomes dense at 24.0')	7A	24.0-25.5	17-21-23	44
30'	(Becomes very dense at 29.0')	8A	29.0-30.5	29-30-21	51
	Bottom of boring at 30.5'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: MC-LS

JOB NO.: 28178 (c13)

WATER OBSERVATIONS

INITIAL DEPTH 24.0' (trace)

COMPLETION DEPTH None

DEPTH AFTER 24 HRS none

TYPE SAMPLER:

X A SPLIT SPOON

B

C SHELBY TUBE

SURFACE ELEVATION: 739.0'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	NO BLOWS PER FT OR CORE REC.
0.0'	Topsoil				
1.0'	Stiff black organic clay, some silt, some sand, trace of gravel - moist	1A	1.0- 2.5	12- 6- 7	13
5'	(Becomes hard at 4.0')	2A	4.0- 5.5	18-40-32	72
6.0'	Very dense brown sand and gravel, trace of silt - moist	3A	6.5- 8.0	16-32-45	77
10'		4A	9.0-10.5	21-40-45	85
	(With some cobbles at 12.0')				
15'		5A	14.0-15.0	55-50/3"	100+
20'		6A	19.0-20.0	56-50/3"	100+
25'	(With some cobbles at 23'-26')	7A	24.0-24.5	100/4"	100+
30'		8A	29.0-29.5	100/1"	100+
35'		9A	34.0-34.5	100/4"	100+
40'		10A	38.0-39.0	66-67	133
	Bottom of boring at 39.0'				
45'					

METHOD HOLLOW STEM AUGER

TECHNICIAN JD-DR-AS

JOB NO 25176 (cls)

WATER OBSERVATIONS

INITIAL DEPTH None

COMPLETION DEPTH None

DEPTH AFTER 24 HRS none

TYPE SAMPLER:

X A SPLIT SPOON

___ B

___ C SHELBY TUBE

SB-04

SURFACE ELEVATION: 737.0'

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	Topsoil				
0.5'					
2.0'	gravel, trace of clay - moist	1A	1.0- 2.5	11- 7- 4	11
	Medium dense brown sand, trace of gravel, trace of silt - moist	2A	4.0- 5.5	3- 5- 9	14
5'					
6.0'	Very dense brown sand and gravel, trace of silt - moist	3A	6.5- 8.0	43-25-42	67
10'	(With some cobbles at 9.5')	4A	9.0- 9.5	100/4"	100+
15'		5A	14.0-15.0	48-72	120
20'		6A	19.0-20.0	45-90	133
25'		7A	24.0-25.0	52-49	101
		8A	28.5-29.0	100	100+
30'	Bottom of boring at 29.0'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: JD-GR-AS

JOB NO.: 25176 (cls)

WATER OBSERVATIONS

INITIAL DEPTH None

COMPLETION DEPTH None

DEPTH AFTER 24 HRS none

TYPE SAMPLER:

X A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

Proj 5100
DH, 61

Section 14

Wastewater Treatment Facility
Foundation Borings

Boring 5
Boring 7
Boring 8
Boring 10
Boring 26
Boring 32
Boring 33

WASTEWATER TREATMENT FACILITY FOUNDATION BORING

Note: Includes only those borings which encountered fill material in the area of Landfill L-2

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P. O. BOX 249

soil borings *soil evaluation* *foundation investigation* *instrumentation*

BORING NO. 5 JOB NO. 5963 PROJECT DELCO DIVISION-MORAINE WASTE TREATMENT PLANT

Ground Surface (Elev.) 737.8

Datum

CLIENT: General Motors Corporation-Delco Division c/o Hubbell, Roth & Clark

Location: Moraine, Ohio

Started 25 Oct. 1979 Completed 25 Oct. 1979

Driller J. King

HOLLOW STEM AUGERS

ELEV.	DEPTH IN FEET	SAMPLE TYPE	"N"	STRATA CHANGE	SOIL CLASSIFICATION	W.L.	W	γ_d	q_u
			1	1½'	Firm Moist Brown Clay Gravel & Broken Concrete - FILL				
		LS	1		Very Loose Very Moist Highly Organic Black Sand Clay & Rubbish FILL		12' WATER LEVEL 12' AT COMPLETION		
	5		1	5'			21.4	117	-
		LS	2		Very Loose Moist Fine Grey Silty Sand With Light Vegetation - FILL		52.0	72	-
			1	8½'					
		LS	2						
	10		1		Very Loose Very Moist Highly Organic Silty Grey Sand With Layers of High Organic Clay-FILL		55.2	70	-
			1	12'		V			
			1		Very Loose Grey Wet Highly Organic Silty SAND With Layers of Clay & Traces of Wood				
		LS	2				17.8	124	-
	15		2	18'					
			2		Loose Moist Highly Organic Brown Sand Cinders & Wood - FILL				
		LS	3				46.2	87	-
	20		4	21'					
			3		Plastic Moist Brown Silty SWAMP BOTTOM CLAY				
		LS	3				38.9	109	1940
	25		3	26½'					
			34		Dense Moist Brown SAND & GRAVEL With Layers of Cobblestone & Traces of Clay - continued -				
		LS	30				6.4	135	-
	30		32						

"N" - Standard Penetration Resistance
S.S. - 2" O.D. Split Spoon Sample
L.S. - Sectional Liner Sample
S.T. - Shelby Tube Sample
B.S. - Bottle Sample
H.S. - Housel Sample

W - H_2O% of dry weight
γ_d - Natural Density-lbs. cu. ft.
q_u - Unconfined Compression lbs. sq. ft.
W.L. - Water Level

mk

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soil borings *soil evaluation* *foundation investigation* *instrumentation*

BORING NO. 7 JOB NO. 5963

Ground Surface (Elev.) 738.8

Datum

CLIENT: General Motors Corporation-Delco Division c/o Hubbell, Roth & Clark

PROJECT DELCO DIVISION-MORAINE WASTE TREATMENT PLANT

Location: Moraine, Ohio

Started 24 Oct. 1979 Completed 25 Oct. 1979

Driller J. King

HOLLOW STEM AUGERS

ELEV.	DEPTH IN FEET	SAMPLE TYPE	SAMPLE "N"	STRATA CHANGE	SOIL CLASSIFICATION	W.L.	W	γ_d	q_u
		LS	5 2 2	2'	Loose Moist Highly Organic Brown Sand Gravel & Clay - FILL		12' WATER LEVEL 16½' AT COMPLETION		
	5			5'	Loose Moist Fine Grey Silty Sand FILL		38.5	77	-
		LS	3 5 12		Medium Compact Moist Some Organic		12.3	98	-
		LS	12 12 7		Brown Sand & Gravel - FILL		6.4	127	-
				12'		V			
	15	LS	2 2 2		Very Loose Wet Highly Organic Black Sand Gravel & Clay - FILL		22.9	116	1260
	20	LS	5 6 5				15.0	129	2520
				22'					
	25	LS	15 29 30		Dense Moist Brown SAND & GRAVEL With Layers of Cobblestone		9.1	151	-
	30	LS	31 36 32		Boulders & Traces of Clay		10.1	145	-

- continued -

"N" - Standard Penetration Resistance
S.S. - 2" O.D. Split Spoon Sample
L.S. - Sectional Liner Sample
S.T. - Shelby Tube Sample
B.S. - Bottle Sample
H.S. - Housel Sample

W - H_2O% of dry weight
γ_d - Natural Density-lbs. cu. ft.
q_u - Unconfined Compression lbs. sq. ft.
W.L. - Water Level

mk

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MEMBER

soil borings soil evaluation foundation investigation instrumentation

BORING NO. 8 JOB NO. 5963 PROJECT DELCO DIVISION-MORAINE WASTE TREATMENT PLANT

Ground Surface (Elev.) 737.6

Datum

CLIENT: General Motors Corporation-Delco Division c/o Hubbell, Roth & Clark

Location: Moraine, Ohio

Started 22 Oct. 1979 Completed 22 Oct. 1979

Driller J. King

HOLLOW STEM AUGERS

ELEV.	DEPTH IN FEET	SAMPLE TYPE	SAMPLE "N"	STRATA CHANGE	SOIL CLASSIFICATION	W. L.	W	γ_d	q_u
				1'	Loose Moist Brown Sand & Gravel FILL				
								7½' WATER LEVEL	
			3					14' AT COMPLETION	
		LS	4		Loose Moist Fine Grey Silty Sand With High Clay Content - FILL		21.7	87	-
	5		3	5'					
			10						
		LS	18		Compact Moist Brown Sand Gravel & Clay - FILL				
			12	7½'		V	10.2	128	-
			3						
	10	LS	3		Loose Moist Fine Grey Silty Sand FILL		48.8	83	-
			3						
				12'	With Light Clay Content				
			1						
	15	LS	2		Very Loose Wet Fine Grey Silty		25.2	125	1650
			1		Sand With Traces of Clay - FILL				
			1						
		LS	1				31.6	110	970
	20		1						
				23½'					
			10						
	25	LS	26				51.6	98	-
			30		Dense Moist Cement Brown SAND & GRAVEL With Traces of Clay				
			18						
	30	LS	30				6.5	99	-
			50		- continued -				

"N" - Standard Penetration Resistance
S.S. - 2" O.D. Split Spoon Sample
L.S. - Sectional Liner Sample
S.T. - Shelby Tube Sample
B.S. - Bottle Sample
H.S. - Housel Sample

W - H_2O% of dry weight
γ_d - Natural Density-lbs. cu. ft.
q_u - Unconfined Compression lbs. sq. ft.
W.L. - Water Level

mk

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soil borings soil evaluation foundation investigation instrumentation

BORING NO. 10 JOB NO. 5963 PROJECT DELCO DIVISION-MORAINE WASTE TREATMENT PLANT

Ground Surface (Elev.) 738.2

Datum

CLIENT: General Motors Corporation-Delco Division c/o Hubbell, Roth & Clark

Location: Moraine, Ohio

Started 25 Oct. 1979 Completed 25 Oct. 1979

Driller J. King

HOLLOW STEM AUGERS

ELEV.	DEPTH IN FEET	SAMPLE TYPE	"N"	STRATA CHANGE	SOIL CLASSIFICATION	W.L.	W	γ_d	q_u
					Hole Started 4 times to penetrate fill.				
		LS	4 6 7		Firm Moist Brown Clay Gravel & Concrete - FILL		11½' WATER LEVEL 14' AT COMPLETION 13.9	111	1460
	5	LS	6 10 13	5' 7½'	Stiff Moist Brown Clay & Gravel FILL		17.8	143	3300
	10	LS	2 3 2	11½'	Plastic Moist Highly Organic Brown Clay - FILL With Layers of Sand & Gravel	V	13.3	117	-
	15	LS	2 2 2		Very Loose Moist Highly Organic Black Sand Clay & Gravel - FILL With Layers of Rubbish & Odor of Chemical Waste		20.5	120	-
	20	LS	1 2 1	22½'			52.1	109	2140
	25	LS	2 3 4		Plastic Moist Highly Organic Blue CLAY With Layers of Vegetation Possible Fill		46.4	108	2720
	30	LS	30 41 50	27½'	Dense Moist Brown SAND & GRAVEL		8.7	94	-
					- continued -				

"N" - Standard Penetration Resistance
S.S. - 2" O.D. Split Spoon Sample
L.S. - Sectional Liner Sample
S.T. - Shelby Tube Sample
B.S. - Bottle Sample
H.S. - Housel Sample

W - H_2O% of dry weight
γ_d - Natural Density-lbs. cu. ft.
q_u - Unconfined Compression lbs. sq. ft.
W.L - Water Level

mk

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soil borings *soil evaluation* *foundation investigation* *instrumentation*

BORING NO. 26 JOB NO. 5963

PROJECT DELCO DIVISION-MORAINE WASTE TREATMENT PLANT

Ground Surface (Elev.)

Datum

CLIENT: General Motors Corporation-Delco Division c/o Hubbell, Roth & Clark

Location: Moraine, Ohio

Started 8 Nov. 1979 Completed 8 Nov. 1979

Driller J. King

HOLLOW STEM AUGERS

ELEV.	DEPTH IN FEET	SAMPLE TYPE	SAMPLE "N"	STRATA CHANGE	SOIL CLASSIFICATION	W. L.	W	γ_d	q_u
		LS	4 3 2	3'	Plastic Moist Slightly Organic Brn. Clay & Gravel FILL		13' WATER LEVEL 15' AT COMPLETION		
	5	LS	13 16 20	6' 7½'	Loose Moist Slightly Organic Grey Silty Fine Sand FILL Compact Moist Brown Sand & Gravel FILL				
	10	LS	8 10 12	12½'	Medium Compact Moist Slightly Organic Brown Sand & Gravel FILL				
	15	LS	3 6 3			V			
	20	LS	2 2 2	23'	Loose Wet Highly Organic Brown Sand With Clay Wood & Misc. Debris FILL	V			
	25	LS	8 8 12	27½'	Medium Compact Wet Brown SAND & Gravel				
	30	LS	45 70 79	30'	Dense Moist Cemented Brown SAND & Gravel				
					END OF BORING				

"N" - Standard Penetration Resistance
S.S. - 2" O.D. Split Spoon Sample
L.S. - Sectional Liner Sample
S.T. - Shelby Tube Sample
B.S. - Bottle Sample
H.S. - Housel Sample

W - H_2O% of dry weight
γ_d - Natural Density-lbs. cu. ft.
q_u - Unconfined Compression lbs. sq. ft.
W.L. - Water Level

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soil borings *soil evaluation* *foundation investigation* *instrumentation*

BORING NO. 32 JOB NO. 5963

Ground Surface (Elev.)

Datum

PROJECT DELCO DIVISION-MORAINE WASTE TREATMENT PLANT

CLIENT: General Motors Corporation-Delco Division c/o Hubbell, Roth & Clark

Location: Moraine, Ohio

Started 9 Nov. 1979 Completed 9 Nov. 1979

Driller J. King

HOLLOW STEM AUGERS

ELEV.	DEPTH IN FEET	SAMPLE TYPE	SAMPLE "N"	STRATA CHANGE	SOIL CLASSIFICATION	W.L.	W	γ_d	q_u
			4		Firm Moist Slightly Organic Brown Clay & Gravel		NO WATER LEVEL		
			4	2'	FILL				
		LS	4		Loose Moist Slightly Organic Fine Grey Sand				
	5		4	6'	FILL				
		LS	2						
			2		Very Loose Moist Slightly Organic Fine Gravel Sand				
			1						
		LS	2						
	10		2	11'	FILL				
			5		Medium Compact Moist Slightly Organic Brown Sand, Cinders & Gravel				
			7						
		LS	8						
	15			17½'	FILL				
			6		Medium Compact Moist Brown SAND & Gravel				
			10						
		LS	14						
	20			22'					
			16		Dense Moist Cemented Brown SAND & Gravel				
			23						
		LS	40						
	25			26'					
					END OF BORING				
	30								

"N" - Standard Penetration Resistance
S.S. - 2" O.D. Split Spoon Sample
L.S. - Sectional Liner Sample
S.T. - Shelby Tube Sample
B.S. - Bottle Sample

W - H_2O% of dry weight
γ_d - Natural Density-lbs. cu. ft.
q_u - Unconfined Compression lbs. sq. ft.
W.L. - Water Level

TESTING ENGINEERS & CONSULTANTS, INC.

1333 Rochester Road Phone 588-6200 Troy, Michigan 48099

P. O. BOX 249

soil borings *soil evaluation* *foundation investigation* *instrumentation*

BORING NO. 33 JOB NO. 5963

PROJECT DELCO DIVISION-MORAINE WASTE TREATMENT PLANT

Ground Surface (Elev.)

Datum

CLIENT: General Motors Corporation-Delco Division c/o Hubbell, Roth & Clark

Location: Moraine, Ohio

Started 8 Nov. 1979 Completed 8 Nov. 1979

Driller J. King

HOLLOW STEM AUGERS

ELEV.	DEPTH IN FEET	SAMPLE TYPE	"N"	STRATA CHANGE	SOIL CLASSIFICATION	W. L.	W	γ_d	q_u
			2	1½'	Firm Moist Slightly Organic Brown Clay & Gravel FILL		12½' WATER LEVEL 14' AT COMPLETION Medium Volume		
		LS	1 1		Very Loose Moist Grey Silty Fine Sand FILL				
	5	LS	1 1						
			2 1						
		LS	2 2	10½'					
					Loose Moist Highly Organic Grey Sand & Clay FILL	V			
			8			V			
	15	LS	5 4						
			2	18'					
			3						
	20	LS	7	19½'	Plastic Moist Highly Organ. Swamp Bottom CLAY				
					Stiff Moist Slightly Organic Blue Silty CLAY				
				23'					
			17		Dense Moist Cemented Brown				
	25	LS	21	25'	SAND & Gravel				
			30		END OF BORING				
	30								

"N" - Standard Penetration Resistance
S.S. - 2" O.D. Split Spoon Sample
L.S. - Sectional Liner Sample
S.T. - Shelby Tube Sample
B.S. - Bottle Sample
U.S. - Hauser Sample

W - H_2O% of dry weight
γ_d - Natural Density-lbs. cu. ft.
q_u - Unconfined Compression lbs. sq. ft.
W.L. - Water Level

Boring No. ## 33

ARCADIS

Section 15

Truck Assembly Plant Expansion
General Motors Corporation
Moraine, Ohio

B-1 through B-35
B-35a – 5’ south

PSI, Inc.
Record of Subsurface Exploration
Boring: B-1

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: August 8, 1997
Project No.: 123-75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						2" Asphalt
Dark brown clayey SILT. trace Sand. Medium dense. Moist.	2.5'	SS-1	16	4.0	8	
Brown silty SAND. trace Gravel. Medium dense. Moist.	5.0'	SS-2	14		7	
	7.5'	SS-3	23			no recovery
Brown silty SAND. some Gravel and Cobbles. Medium dense to dense. Damp.	10.0'	SS-4	45		2	
	15.0'	SS-5	40		4	
	20.0'	SS-6	33		5	
Brown and gray SAND and GRAVEL. trace Clay. some Cobbles. Dense to very dense. Damp.	25.0'	SS-7	31		5	
	30.0'	SS-8	72		3	

PSI, Inc.

Record of Subsurface Exploaration

Boring: B–1

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: August 8, 1997
Project No.: 123–75065

Description	Depth	Sample	N	Qp	Mc	Remarks
----------continued----------	32.5'					
Brown and gray SAND & GRAVEL. trace Clay. some Cobbles. Dense to very dense. Damp.	35.0'	SS–9	98		5	
	37.5'					
	40.0'	SS–10	49 50/3"		9	▼ on completion
	42.5'					
Brown silty SAND. some Gravel and Cobbles. Very dense. Saturated.	45.0'	SS–11	66		20	
	47.5'					
	50.0'	SS–12	67		12	
	52.5'					
	55.0'	SS–13	82		11	
	57.5'					
	60.0'	SS–14	41 50/4"		9	
End of Boring 60.0'	62.5'					

PSI, Inc.
Record of Subsurface Exploration
Boring: B-2

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: July 10, 1997
Project No.: 123-75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						3" Asphalt
Brown silty SAND. little Gravel. Medium dense to dense. Damp.	2.5'	SS-1	33		4	
	5.0'	SS-2	11		5	
	7.5'	SS-3	23		3	
Brown silty SAND. some Gravel. trace Cobbles. Dense. Damp.	10.0'	SS-4	42		3	dry on completion
Brown SAND. trace Silt. some Gravel and Cobbles. Medium dense to very dense. Damp.	15.0'	SS-5	29		5	
	20.0'	SS-6	33 50/5"		4	
Brown and gray silty SAND. some Gravel and Cobbles. Very dense. Damp.	25.0'	SS-7	70		4	
Brown silty SAND. some Gravel and Cobbles. Very dense. Damp.	30.0'	SS-8	38 50/2"		4	

PSI, Inc.

Record of Subsurface Exploaration

Boring: B–2

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: July 10, 1997
Project No.: 123–75065

Description	Depth	Sample	N	Qp	Mc	Remarks
----------continued----------	32.5'					
Brown silty SAND. some Gravel and Cobbles. Very dense. Damp.	35.0'	SS–9	34 50/11"		4	
	37.5'					
	40.0'	SS–10	50/2"		4	
End of Boring 40.0'						

PSI, Inc.
Record of Subsurface Exploration
Boring: B-3
Page 1 of 2

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: July 10, 1997
Project No.: 123-75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						3" Asphalt
Brown silty SAND. trace Gravel. Medium dense. Damp.	2.5'	SS-1	14		4	
Brown and gray silty SAND. little Gravel. Medium dense to dense. Damp.	5.0'	SS-2	18		4	
	7.5'	SS-3	23		3	
	10.0'	SS-4	32		3	dry on completion
	15.0'	SS-5	29		4	
Gray silty SAND. some Gravel. trace Cobbles. Dense to very Dense. Damp.	20.0'	SS-6	46		3	
	25.0'	SS-7	80		4	
Brown silty SAND and GRAVEL. some Cobbles. Very dense. Damp.	30.0'	SS-8	65		3	Cobbles and boulders below 20.0'

PSI, Inc.

Record of Subsurface Exploaration

Boring: B–3

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: July 10. 1997
Project No.: 123–75065

Description	Depth	Sample	N	Qp	Mc	Remarks
----------continued----------	32.5'					
Brown silty SAND and GRAVEL. some Cobbles. Very dense. Damp.	35.0'	SS–9	24 50/2"		3	
	37.5'					split–spoon sampler refusal
	40.0'	SS–10	50/1"		4	
End of Boring 40.0'						

PSI, Inc.

Record of Subsurface Exploration

Boring: B-4

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: August 28, 1997
Project No.: 123-75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						3" Asphalt
Dark brown silty SAND. trace Clay. little Gravel. Very loose to medium. Moist.	2.5'	SS-1	17	1.5	18	
	5.0'	SS-2	2	0.3	24	
	7.5'	SS-3	4	0.5	26	
	10.0'	SS-4	6	0.5	17	Dry on completion
Brown sandy SILT. trace Clay. some Gravel. Very loose. Moist.	15.0'	SS-5	4		11	
Brown and gray fine to medium SAND. some Gravel. some cobbles below 22' depth. Medium dense to very dense. Damp.	20.0'	SS-6	10		6	
	25.0'	SS-7	61		4	
	30.0'	SS-8	50/1"		3	
End of Boring 30.0'						

Record of Subsurface Exploration
Boring: B-5

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: August 8, 1997
Project No.: 123-75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						3" Asphalt
Brown clayey SILT. some Sand. Medium. Moist.	2.5'	SS-1	8	1.4	13	
	5.0'	SS-2	14		6	dry on completion
Brown SAND and GRAVEL. trace Silt. few cobbles. Dense. Damp.	7.5'	SS-3	34		4	
	10.0'	SS-4	31		5	
	15.0'	SS-5	36		5	
	20.0'	SS-6	54		4	
Brown sandy GRAVEL. trace Silt some Cobbles. Dense to very dense. Damp.	25.0'	SS-7	51		4	
	30.0'	SS-8	38		5	

PSI, Inc.

Record of Subsurface Exploaration

Boring: B–5

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: August 28, 1997
Project No.: 123–75065

Description	Depth	Sample	N	Qp	Mc	Remarks
----------continued----------	32.5'					
Brown sandy GRAVEL. trace Silt. some Cobbles. Dense to very dense. Damp.		SS–9	22		6	
	35.0'					
End of Boring 35.0'						

Record of Subsurface Exploration

Boring: B-6

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: August 29, 1997
Project No.: 123-75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						3.5" Asphalt
Brown fine to medium SAND with some Gravel. trace Silt. Medium dense to dense. Damp.	2.5'	SS-1	14		8	
	5.0'	SS-2	28		6	
	7.5'	SS-3	50		9	
	10.0'	SS-4	57		7	
Brown SAND. trace Silt. some Gravel and Cobbles. Dense to very dense. Damp.	15.0'	SS-5	39		7	
	20.0'	SS-6	49		8	
	25.0'	SS-7	41		8	
	30.0'	SS-8	56		6	

Record of Subsurface Exploaration

Boring: B–6
Page 2 of 2

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: August 29, 1997
Project No.: 123–75065

Description	Depth	Sample	N	Qp	Mc	Remarks
----------continued----------	32.5'					
Brown SAND. trace Silt. some Gravel and cobbles. Dense to very dense. Damp.		SS–9	20			
	35.0'					
Probable boulder layer						
		SS–10	110		6	
	40.0'					
End of Boring 40.0'						

PSI, Inc.

Record of Subsurface Exploration

Boring: B-7

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: September 3, 1997
Project No.: 123-75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						
						3" Asphalt
Black and gray silty SAND. some Gravel and Asphalt. FIL. Medium dense. Damp.	2.5'	SS-1	10		6	
Brown sillty SAND. trace Clay and Gravel. Loose. Moist.	5.0'	SS-2	4		9	
Brown sandy SILT. trace Clay. little Gravel. Very loose to loose. Moist.	7.5'	SS-3	4	1.5	9	dry on completion
	10.0'	SS-4	7	1.0	4	
Brown SAND. some Gravel. trace Silt. Silt layer at 14.0' depth. Loose. Damp.	15.0'	SS-5	9		14	
	20.0'	SS-6	7		3	
	25.0'	SS-7	22		4	
Gray SAND and GRAVEL. some Cobbles. Dense to very dense. Damp.	30.0'	SS-8	72		2	

Record of Subsurface Exploaration

Boring: B–7

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: August 29, 1997
Project No.: 123–75065

Description	Depth	Sample	N	Qp	Mc	Remarks
----------continued----------	32.5'					
Gray SAND and GRAVEL. some Cobbles. Dense to very dense. Damp.	35.0'	SS–9	48		3	
	40.0'	SS–10	53		5	
	45.0'	SS–11	54		5	
Gray clayey SILT. some Sand and Gravel. Hard. Damp.	50.0'	SS–12	92	4.5+	5	
	55.0'	SS–13	80	4.5+	7	
	60.0'	SS–14	72	4.5+	5	
End of Boring 60.0'						

Record of Subsurface Exploration

Boring: B-8

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: July 15, 1997
Project No.: 123-75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						3" Asphalt
Brown silty SAND. some Asphalt. Possible Fill. Medium dense. Damp.	2.5'	SS-1	15		3	
Brown silty SAND and GRAVEL. Medium dense. Damp.	5.0'	SS-2	28		3	
	7.5'	SS-3	13		3	dry on completion
Brown and gray silty SAND. some Gravel. trace Cobbles. Medium dense to dense. Damp.	10.0'	SS-4	20		3	
	15.0'	SS-5	31		5	
Brown SAND and GRAVEL. some Cobbles. Very dense. Damp.	20.0'	SS-6	50/0"			Cobbles and Boulders
End of Boring 21.5' Auger Refusal	25.0'					
	30.0'					

PSI, Inc.
Record of Subsurface Exploration
Boring: B-9
Page 1 of 1

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: July 11, 1997
Project No.: 123-75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						2" Asphalt
Brown to black clayey SAND, some Silt.	2.5'	SS-1	9		14	
Brown silty SAND, trace Clay, little Gravel. Medium dense. Damp.	5.0'	SS-2	20		5	
	7.5'	SS-3	17		3	
Brown and gray silty SAND, some Gravel, trace Cobbles. Medium dense. Damp.	10.0'	SS-4	19		4	dry on completion
	15.0'	SS-5	40		4	
Brown SAND and GRAVEL, some Cobbles, trace Silt. Medium dense to dense. Damp.	20.0'	SS-6	26		5	
	25.0'	SS-7	39		5	Boulders at 25.0'
End of Boring 26.0' Auger Refusal	30.0'					

PSI, Inc.

Record of Subsurface Exploration

Boring: B–10

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: July 11, 1997
Project No.: 123–75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						2" Asphalt
Dark brown sandy SILT. trace Clay and Gravel. Medium dense. Damp.	2.5'	SS–1	10		17.0	
Brown silty SAND. some Gravel. trace Clay. Medium dense. Damp.	5.0'	SS–2	17		5	
	7.5'	SS–3	66/9"		4	dry on completion
Brown silty SAND and GRAVEL. some Cobbles. Very dense. Damp.	10.0'	SS–4	82		6	
	15.0'	SS–5	50/2"		8	
	20.0'	SS–6	50/0"		8	cobbles and boulders below 10.0'
End of Boring 20.0' Auger Refusal Possible Boulder						

PSI, Inc.

Record of Subsurface Exploration

Boring: B-11

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: August 28, 1997
Project No.: 123-75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						
						3" Asphalt
Brown silty SAND. some Gravel. Asphalt and cinders. FILL. Very loose. Moist.	2.5'	SS-1	3		7	
Dark brown sandy SILT. trace Clay. some Gravel. Possible fill. Loose. Moist.	5.0'	SS-2	3	0.5	19	
	7.5'	SS-3	6	0.5	19	dry on completion
	10.0'	SS-4	13	0.9	22	
Brown silty SAND. some Gravel. Medium dense. Moist.	15.0'	SS-5	22		24	
	20.0'	SS-6	32		23	
Brown and gray silty SAND. some Gravel. few Cobbles. Dense to very dense. Damp.	25.0'	SS-7	37		19	
Gray SAND and GRAVEL. some Cobbles. Very dense. Damp.	30.0'	SS-8	59		3	
End of Boring 30.0'						

PSI, Inc.

Record of Subsurface Exploration

Boring: B-12

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: August 28, 1997
Project No.: 123-75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						
Gray crushed limestone base.						3.5" Asphalt
Dark brown clayey SILT. trace Sand. Medium. Moist.	2.5'	SS-1	8	1.3	16	
Brown SAND. some Gravel. trace Silt. Medium dense. Moist.	5.0'	SS-2	16		9	
Brown and gray silty SAND. some Gravel. Medium dense to dense.	7.5'	SS-3	27		5	
	10.0'	SS-4	29		5	dry on completion
	15.0'	SS-5	41		4	
Brown and gray SAND and GRAVEL. some Cobbles. trace Silt. Very dense. Damp.	20.0'	SS-6	60		4	
	25.0'	SS-7	78		3	
Brown fine to medium grained SAND and GRAVEL. Silt. Medium. Dense. Moist.	30.0'	SS-8	26		12	
End of Boring 30.0'						

PSI, Inc.

Record of Subsurface Exploration

Boring: B-13

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: August 28, 1997
Project No.: 123-75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						4" Asphalt
Brown silty SAND. some Gravel. Dense to very dense. Damp.	2.5'	SS-1	40		7	
Trace Cobbles below 8.0' depth.	5.0'	SS-2	21		5	
	7.5'	SS-3	39		4	
	10.0'	SS-4	22		3	dry on completion
Brown and gray silty SAND and GRAVEL. some Cobbles. Dense to very dense. Damp.	15.0'	SS-5	63/9"		13	
	20.0'	SS-6	48		7	
	25.0'	SS-7	39		5	
End of Boring 30.0'	30.0'	SS-8	26		6	

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: September 3, 1997
Project No.: 123–75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						
						3" Asphalt
Gray silty SAND. some Gravel and Asphalt. FILL. Loose. Damp.	2.5'	SS–1	6		2	
Gray sandy SILT. some Gravel. Possible FILL. Soft. Moist.	5.0'	SS–2	4	0.6	9	
Brown sandy SILT. trace Clay and Gravel. Medium. Damp.	7.5'	SS–3	11	1.1	7	dry on completion
	10.0'	SS–4	15		3	
Brown silty SAND. some Gravel. trace Cobbles. Loose to medium dense. Sandy SILT seam at 13.5' to 15.0'	15.0'	SS–5	20		12	
	20.0'	SS–6	8		4	
	25.0'	SS–7	19		2	
Brown and gray SAND and GRAVEL. some Cobbles. Very dense. Moist.						
End of Boring 30.0'	30.0'	SS–8	60		17	

Record of Subsurface Exploration

Boring: B–15

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: July 16, 1997
Project No.: 123–75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						2" Asphalt
Brown silty SAND and GRAVEL. Possible Fill. Very Loose.	2.5'	SS–1	4			no recovery
Brown sandy SILT. little Clay. trace Gravel and Cobbles. Medium dense. Moist.	5.0'	SS–2	14		10	
Brown silty SAND. trace Gravel. Medium dense. Damp.	7.5'	SS–3	15		6	dry on completion
	10.0'	SS–4	22		5	
	15.0'	SS–5	23		3	
Brown silty Sand and GRAVEL. some Cobbles. Very dense. Damp. Boulders possible throughout formation.	20.0'	SS–6	30		4	
	25.0'	SS–7	53		5	
	30.0'	SS–8	63		4	

Record of Subsurface Exploaration

Boring: B-15

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: July 16. 1997
Project No.: 123-75065

Description	Depth	Sample	N	Qp	Mc	Remarks
----------continued----------	32.5'					
Brown silty SAND and GRAVEL. some Cobbles. Very dense. Damp. Boulders possible throughout formation.	35.0'	SS-9	50/1"		4	split-spoon sampler refusal
	37.5'					
	40.0'	SS-10	96/8"		4	
End of Boring 40.0'						

PSI, Inc.

Record of Subsurface Exploration

Boring: B-16

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: July 16, 1997
Project No.: 123-75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						3" Asphalt
Brown sandy SILT. little Clay. Medium dense. Damp.	2.5'	SS-1	13		6	
	5.0'	SS-2	7		4	
Brown silty SAND. some Gravel. Medium dense. Damp.	7.5'	SS-3	16		6	
Brown and gray silty SAND. some Gravel. Medium dense to dense. Damp.	10.0'	SS-4	21		5	dry on completion
	15.0'	SS-5	31		4	
	20.0'	SS-6	36		3	
Brown silty SAND. some Gravel. trace to some Cobbles. Dense to very dense. Damp.	25.0'	SS-7	43		4	
	30.0'	SS-8	56		3	

Record of Subsurface Exploaration

Boring: B–16

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: July 16. 1997
Project No.: 123–75065

Description	Depth	Sample	N	Qp	Mc	Remarks
----------continued----------	32.5'					
Brown silty SAND. some Gravel. trace to some Cobbles. Dense to very dense. Damp.	35.0'	SS–9	63		4	
	37.5'					
	40.0'	SS–10	70		4	
End of Boring 40.0'						

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: July 11, 1997
Project No.: 123-75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						3" Asphalt
Brown and gray clayey SILT. trace Sand and Gravel. Possible Fill. Medium. Moist.	2.5'	SS-1	8	1.9	15	
	5.0'	SS-2	8	1.3	11	
	7.5'	SS-3	18		7	
Brown silty SAND. some Gravel. trace Clay. Medium dense to dense. Damp.	10.0'	SS-4	28		5	dry on completion
	15.0'	SS-5	28		3	
	20.0'	SS-6	24		4	
	25.0'	SS-7	41		5	
Brown silty SAND and GRAVEL. some Cobbles. Very dense. Damp.	30.0'	SS-8	62		4	

PSI, Inc.

Record of Subsurface Exploaration

Boring: B–17

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: July 11, 1997
Project No.: 123–75065

Description	Depth	Sample	N	Qp	Mc	Remarks
----------continued----------	32.5'					
Brown silty SAND and GRAVEL. some Cobbles. Very dense. Damp.		SS–9	88		4	possible boulders below 30' depth
	35.0'					
End of Boring 35.0'						

Record of Subsurface Exploration
Boring: B-18
Page 1 of 1

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: July 29, 1997
Project No.: 123-75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						2.5" Asphalt
Brown clayey SAND. some Silt. little Gravel. Fill. Medium dense. Moist.	2.5'	SS-1	13		16	
Brown clayey SILT. little Sand and Gravel. Fill. Soft. Moist.	5.0'	SS-2	2		70	
	7.5'	SS-3	2		22	
	10.0'	SS-4	3		21	dry on completion
Brown and gray silty SAND. trace Clay. some Gravel. Medium dense to very dense. Moist. Cobbles below 18' depth.	15.0'	SS-5	24		8	
	20.0'	SS-6	63		9	
	25.0'	SS-7	41		7	
	30.0'	SS-8	65		10	
End of Boring 30.0'						

Record of Subsurface Exploration
Boring: B-19

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: August 29, 1997
Project No.: 123-75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						3.5" Asphalt
Brown clayey SILT. some Sand and Gravel. Possible Fill. Medium. Moist.	2.5'	SS-1	10	1.6	11	
	5.0'	SS-2	10	1.7	19	
	7.5'	SS-3	9	1.3	11	
	10.0'	SS-4	18			
Gray SAND and GRAVEL. trace Silt. Medium dense. Moist.						dry on completion
	15.0'	SS-5	24		15	
Gray silty SAND. some Gravel. Medium dense to dense. Damp.	20.0'	SS-6	25		7	
	25.0'	SS-7	22		7	
	30.0'	SS-8	26		8	

PSI, Inc.

Record of Subsurface Exploaration

Boring: B–19

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: August 29, 1997
Project No.: 123–75065

Description	Depth	Sample	N	Qp	Mc	Remarks
----------continued----------	32.5'					
Gray SAND. some Gravel and Cobbles. Trace Silt. Dense. Damp.	35.0'	SS–9	37		12	
	40.0'	SS–10	44		6	
End of Boring 40.0'						

Record of Subsurface Exploration
Boring: B-20

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: August 29, 1997
Project No.: 123-75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						3" Asphalt
Dark brown to black sandy SILT. Little Clay and Gravel. Medium. Moist.	2.5'	SS-1	14	2.1	9	
	5.0'	SS-2	6	1.2	13	
	7.5'	SS-3	11	1.1	11	
	10.0'	SS-4	10	1.4	11	dry on completion
Brown and gray gravelly SAND. trace Silt and Cobbles. Dense to very dense. Damp.	15.0'	SS-5	39		6	
	20.0'	SS-6	49		4	
	25.0'	SS-7	50		7	
	30.0'	SS-8	58		6	
End of Boring 30.0'						

PSI, Inc.
Record of Subsurface Exploration
Boring: B-21
Page 1 of 1

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: September 4, 1997
Project No.: 123-75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						3" Asphalt
Brown silty CLAY. some Sand. trace Gravel. trace Asphalt. FILL. Medium moist.	2.5'	SS-1	8	2	21	
	5.0'	SS-2	26		4	
Gray SAND and GRAVEL. little Silt. trace Cobbles. Medium dense to dense. Damp.	7.5'	SS-3	19		4	
	10.0'	SS-4	42		5	dry on completion
	15.0'	SS-5	25		4	
	20.0'	SS-6	27		4	
	25.0'	SS-7	39		4	
	30.0'	SS-8	35		3	
End of Boring 30.0'						

PSI, Inc.

Record of Subsurface Exploration

Boring: B-22

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: July 24, 1997
Project No.: 123-75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						3" Asphalt
Brown silty CLAY. little Sand. trace Gravel. Possible FILL. Medium to stiff. Moist.	2.5'	SS-1	6	1.5	13	
	5.0'	SS-2	11	2.0	23	
Brown SAND. little Silt. some Gravel. some Cobble seams. Medium dense to dense. Damp.	7.5'	SS-3	13		5	
	10.0'	SS-4	37		4	dry on completion
	15.0'	SS-5	31		5	
	20.0'	SS-6	19		6	
Brown and gray silty SAND. some Gravel and Cobbles. Damp. Dense to very dense.	25.0'	SS-7	56		4	
	30.0'	SS-8	31	8	10	
End of Boring 30.0'						

Record of Subsurface Exploration
Boring: B–23

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: July 24, 1997
Project No.: 123–75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						3" Asphalt
Dark brown to black silty CLAY. trace Sand. FILL. Medium. Moist.	2.5'	SS–1	8		17	
Brown SAND and GRAVEL. trace Silt. Medium dense. Damp.	5.0'	SS–2	13		7	
	7.5'	SS–3	19		5	
	10.0'	SS–4	38		4	
Brown silty SAND. some Gravel and Cobbles. Dense to very dense. Damp.	15.0'	SS–5	59		3	
	20.0'	SS–6	77		2	
	25.0'	SS–7	55		2	
	30.0'	SS–8	39		4	

PSI, Inc.

Record of Subsurface Exploaration

Boring: B–23

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: July 24, 1997
Project No.: 123–75065

Description	Depth	Sample	N	Qp	Mc	Remarks
----------continued----------	32.5'					
Brown silty SAND and GRAVEL. some Cobbles. Very dense. Damp.		SS–9	48		4	
	35.0'					
Brown and gray SAND and GRAVEL. trace Cobbles. some thin silty CLAY seams. Dense. Moist.						▼ on completion
		SS–10	48		8	
	40.0'					
End of Boring 40.0'						

Record of Subsurface Exploration
Boring: B-24

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: July 16, 1997
Project No.: 123-75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						2.5" Asphalt
Dark brown sandy SILT. some Clay. FILL. Very loose to loose. Moist.	2.5'	SS-1	3	3.5	12	
	5.0'	SS-2	7		12	
Brown silty SAND. some Gravel. trace Clay. trace Cobbles with depth. Medium dense to dense. Damp.	7.5'	SS-3	18		7	
	10.0'	SS-4	26		2	dry on completion
	15.0'	SS-5	37		6	
Brown and gray silty SAND and GRAVEL. some Cobbles. Dense to very dense. Damp.	20.0'	SS-6	40		4	
	25.0'	SS-7	60		4	
	30.0'	SS-8	70		4	

Record of Subsurface Exploaration
Boring: B-24

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: July 16, 1997
Project No.: 123-75065

Description	Depth	Sample	N	Qp	Mc	Remarks
----------continued----------	32.5'					
Brown and gray silty SAND and GRAVEL. some Cobbles. Dense to very dense. Damp.	35.0'	SS-9	91/8"		4	
		SS-10	90/8"		4	
	40.0'					
End of Boring 40.0'						

Record of Subsurface Exploration

Boring: B–25

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: July 30, 1997
Project No.: 123–75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						3.5" Asphalt
Brown silty CLAY. trace Sand and Gravel. Possible Fill. Medium. Moist.	2.5'	SS–1	8		13	
		SS–2	9		16	
Brown silty CLAY. some Sand. trace Gravel. Possible Fill. Medium. Damp.	5.0'	SS–3	11		6	
	7.5'	SS–4	30		3	dry on completion
Brown SAND. trace silt. some Gravel. Medium Dense. Damp.	10.0'					
	15.0'	SS–5	29		4	
Brown silty SAND. trace Clay. some Gravel.	20.0'	SS–6	19		6	
Brown and gray silty SAND and GRAVEL. trace Cobbles. Very dense. Damp.	25.0'	SS–7	50		4	
	30.0'	SS–8	61		5	
End of Boring 30.0'						

Record of Subsurface Exploration
Boring: B-26
Page 1 of 1

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: September 4, 1997
Project No.: 123-75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						3" Asphalt
Black sandy SILT. little Clay. trace Gravel. Stiff. Moist.	2.5'	SS-1	12	1.5	23	
	5.0'	SS-2	4		7	
Brown silty SAND. trace to little Gravel. loose to medium dense. Damp.	7.5'	SS-3	20		7	
	10.0'	SS-4	15		5	dry on completion
	15.0'	SS-5	35		4	
Brown and gray gravelly SAND. trace Silt. few Cobbles. Dense. Damp.	20.0'	SS-6	45		6	
	25.0'	SS-7	31		5	
	30.0'	SS-8	40		4	
End of Boring 30.0'						

Record of Subsurface Exploration
Boring: B-27

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: September 4, 1997
Project No.: 123-75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						3" Asphalt
Dark gray to black sandy CLAY. some Silt. Possible Fill. Medium. Moist.	2.5'	SS-1	10	1.6	20	
	5.0'	SS-2	7		7	
Brown silty SAND. some Gravel. Trace to some Cobbles with depth. Loose to dense. Damp.	7.5'	SS-3	32		6	
	10.0'	SS-4	15		8	dry on completion
	15.0'	SS-5	29		8	
	20.0'	SS-6	39		6	
	25.0'	SS-7	34		6	
	30.0'	SS-8	28		46	
Brown gravelly SAND. little Silt. few Cobbles. Dense. Damp.						

Record of Subsurface Exploaration

Boring: B–27

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: September 4, 1997
Project No.: 123–75065

Description	Depth	Sample	N	Qp	Mc	Remarks
----------continued----------	32.5'					
Brown gravelly SAND. little Silt. few Cobbles. Dense. Damp.	35.0'	SS–9	32		7	
	40.0'	SS–10	26		5	
End of Boring 40.0'						

Record of Subsurface Exploration
Boring: B-28
Page 1 of 1

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: September 5, 1997
Project No.: 123-75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						3.5" Asphalt
Dark brown sandy CLAY. some Silt. some Asphalt. FILL. Medium. Moist.	2.5'	SS-1	4	0.6	19	
	5.0'	SS-2	14		5	
Brown and gray silty SAND. some Gravel. Medium dense. Moist.	7.5'	SS-3	20		4	
	10.0'	SS-4	22		5	dry on completion
	15.0'	SS-5	58		4	
Brown and gray gravelly SAND. trace Silt. some Cobbles. Dense to very dense. damp.	20.0'	SS-6	58		4	
	25.0'	SS-7	26		5	
	30.0'	SS-8	65		4	
End of Boring 30.0'						

PSI, Inc.

Record of Subsurface Exploration

Boring: B-29

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: September 9, 1997
Project No.: 123-75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						4" Asphalt
Brown and gray SAND. some Gravel. trace Silt. Medium dense. Damp.	2.5'	SS-1	13		5	
	5.0'	SS-2	30		4	
	7.5'	SS-3	28		5	
	10.0'	SS-4	22	5	5	dry on completion
Brown and gray SAND and GRAVEL. trace Silt. Cobbles at 20.0' Medium dense. Damp.	15.0'	SS-5	15		10	
	20.0'	SS-6	42		11	
	25.0'	SS-7	38		4	
Brown SAND and GRAVEL. some Cobbles. trace Boulderes. trace Silt. Dense to very dense. Damp to moist.	30.0'	SS-8	54		9	

PSI, Inc.

Record of Subsurface Exploaration

Boring: B-29

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: September 9, 1997
Project No.: 123-75065

Description	Depth	Sample	N	Qp	Mc	Remarks
----------continued----------	32.5'					
Brown SAND and GRAVEL. some Cobbles. trace Boulders. trace Silt. Dense to very dense. Damp to moist.	35.0'	SS-9	36		8	
	40.0'	SS-10	38		7	on completion
	45.0'	SS-11	25		9	
	50.0'	SS-12	40		14	
	55.0'	SS-13	31		16	
Boulders at 58.0'						
	60.0'	SS-14	50/0"			
End of Boring 60.0'						

PSI, Inc.

Record of Subsurface Exploration

Boring: B-30

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: September 9, 1997
Project No.: 123-75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						3" Asphalt
Brown silty SAND. some Gravel. Medium dense. Damp.	2.5'	SS-1	11		5	
	5.0'	SS-2	13		4	
	7.5'	SS-3	18		6	
	10.0'	SS-4	26		3	dry on completion
Brown and gray gravelly SAND. trace Silt trace Cobbles. Medium dense to dense. Damp.	15.0'	SS-5	19		5	
	20.0'	SS-6	39		9	
	25.0'	SS-7	23		11	
Cobbles and Boulders at 27.0'	30.0'	SS-8	64/7"		7	
End of Boring 30.0'						

Record of Subsurface Exploration
Boring: B-31

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: August 6, 1997
Project No.: 123-75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						8" Concrete
Brown silty SAND. some Gravel. Medium dense. Damp.	2.5'	SS-1	24		3	
	5.0'	SS-2	20		3	
Brown SAND. little Silt. some Gravel. Trace to some Cobbles with depth. Medium dense to very dense. Damp.	7.5'	SS-3	19		4	
	10.0'	SS-4	35		4	
	15.0'	SS-5	35		5	
	20.0'	SS-6	54		3	
	25.0'	SS-7	28		4	
Brown SAND and GRAVEL. little Silt. Medium Dense. Moist.	30.0'	SS-8	26		10	▼ on completion

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: August 6, 1997
Project No.: 123-75065

Description	Depth	Sample	N	Qp	Mc	Remarks
----------continued----------	32.5'					
Brown SAND and GRAVEL. little Silt. Medium Dense. Moist.		SS-9	30		11	
	35.0'					
End of Boring 35.0'						

Record of Subsurface Exploration
Boring: B-32
Page 1 of 1

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: August 6, 1997
Project No.: 123-75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						8" Concrete
Brown silty SAND. some Gravel. Medium Dense. Damp.	2.5'	SS-1	19		4	
	5.0'	SS-2	19		4	
	7.5'	SS-3	21		4	
	10.0'	SS-4	42		3	dry on completion
Brown SAND and GRAVEL. trace Silt some Cobble layers. Medium Dense to dense. Damp.	15.0'	SS-5	35		4	
	20.0'	SS-6	27		4	
	25.0'	SS-7	38		4	
Brown SAND and GRAVEL. little Silt. Medium Dense. Moist.	30.0'	SS-8	24		4	
End of Boring 30.0'						

Record of Subsurface Exploration
Boring: B-33

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: September 10, 1997
Project No.: 123-75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						
CONCRETE 8"						8" Concrete
	2.5'	SS-1	17		3	
Brown silty SAND. some Gravel. Occasional seams of sandy Silt. Medium dense to dense.	5.0'	SS-2	21		4	
	7.5'	SS-3	27		2	
						dry on completion
	10.0'	SS-4	36		4	
	15.0'	SS-5	28		10	
Brown and gray SAND. some Gravel and Cobbles. Trace Silt. Medium dense to very dense. Damp.	20.0'	SS-6	29		5	
	25.0'	SS-7	46		4	
Brown and gray gravelly SAND. some Cobbles. Trace Silt. Very dense. Damp.	30.0'	SS-8	52		7	

Record of Subsurface Exploration
Boring: B–33

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: September 10, 1997
Project No.: 123–75065

Description	Depth	Sample	N	Qp	Mc	Remarks
----------continued----------	32.5'					
Brown and gray gravelly SAND. some Cobbles. trace Silt. Very dense. Damp.		SS–9	56		8	
	35.0'					
End of Boring 35.0'						

Record of Subsurface Exploration

Boring: B–34
Page 1 of 1

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: September 5, 1997
Project No.: 123–75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						8" Concrete
Dark gray to black clayey SILT. some Sand. trace Gravel. Possible fill. Soft. Moist.	2.5'	SS–1	3	0.7	13	
	5.0'	SS–2	2	0.5	8	
Brown sandy SILT. little Clay. some Gravel. Medium. Moist.	7.5'	SS–3	14	1.5	9	dry on completion
	10.0'	SS–4	9	1.4	13	
Gray SAND. some Gravel. trace Silt. Medium dense. Damp.	15.0'	SS–5	26		4	
Brown SAND and GRAVEL. trace Silt some Cobbles. Dense to very dense. Damp.	20.0'	SS–6	51		6	
	25.0'	SS–7	62		9	
	30.0'	SS–8	40		6	
End of Boring 30.0'						

Record of Subsurface Exploration
Boring: B–35
Page 1 of 1

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: September 5, 1997
Project No.: 123–75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						3" Asphalt
Brown clayey SILT. some Sand. trace Gravel. Possible FILL. Medium. Moist.	2.5'	SS–1	8	1.3	14	
Brown silty SAND. some Gravel. Loose to medium dense. Damp.	5.0'	SS–2	23		7	
	7.5'	SS–3	8		8	
Brown and gray SAND and GRAVEL. few Cobbles. Medium dense. Damp.	10.0'	SS–4	21		14	
Gray sandy GRAVEL. trace Silt. Medium dense. Damp.	15.0'	SS–5	20		6	
Cobbles and boulders at 21.0'	20.0'	SS–6	20		6	
End ofBoring 22.0' Auger Refusal						

Record of Subsurface Exploration
Boring: B–35 a – 5' South
Page 1 of 1

Project Name: Truck Assembly Plant Expansion
Site: General Motors Corporation, Moraine, Ohio

Date of Boring: September 5, 1997
Project No.: 123–75065

Description	Depth	Sample	N	Qp	Mc	Remarks
SURFACE						
Brown silty SAND and GRAVEL.	2.5'	1–AU				
	5.0'					
	7.5'	2–AU				
	10.0'					
		3–AU				
	15.0'					
		4–AU				
	20.0'					
Cobbles and boulders at 21.0'		5–AU				
End ofBoring 22.0' Auger Refusal						

Section 16

Soil Borings at Landfill L-1
Bowser-Morner 1979

Boring No. 1 through No. 10

LOG OF BORING NO. 1

SOIL STUDY IN AREAS OF OLD FILL, NORTH OF SELLARS ROAD AND EAST OF DRYDEN ROAD, MORAINE CITY, OHIO

BORING LOCATION: As shown on boring location plan **DATE STARTED:** 7-17-79

SURFACE ELEVATION: 98.6'* **DATE COMPLETED:** 7-17-79

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Topsoil				
1.0'	(FILL) Very stiff brown and black silt, some sand, trace of gravel, trace of clay, trace of glass, trace of cinders, trace of metal, trace of wood - moist	1A	1.0- 2.5	8-15-13	28
5'	(Becomes medium stiff with wood chips from 4.0' to 5.0')	2A	4.0- 5.5	11- 3- 3	6
9.0'	(ORIGINAL) Dense brown sand and gravel, trace of silt, trace of cobbles - damp	3A	9.0-10.5	13-14-21	35
15'	(Becomes very dense at 14.0')	4A	14.0-15.5	27-39-30	69
20'		5A	19.0-20.5	18-38-40	78
25'		6A	24.0-25.5	19-37-45	82
30'		7A	29.0-29.5	75/3"	75+

(Continued on next page)

METHOD: HOLLOW STEM AUGER
TECHNICIAN: BC-BC
JOB NO.: 25278 (smp)

WATER OBSERVATIONS
INITIAL DEPTH: 43.0' (heavy)
COMPLETION DEPTH: 47.5'
DEPTH AFTER: _____ HRS. _____

TYPE SAMPLER:
X A. SPLIT SPOON
_____ B.
_____ C. SHELBY TUBE

*In reference to assumed elevation of 100.0' for Bench Mark as shown on boring location plan

BOWSER – MORNER
TESTING LABORATORIES, INC.

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LOG OF BORING NO. 1 (Second sheet)

SOIL STUDY IN AREAS OF OLD FILL, NORTH OF SELLARS ROAD AND EAST OF DRYDEN ROAD, MORAINE CITY, OHIO

BORING LOCATION: As shown on boring location plan **DATE STARTED:** 7-17-79

SURFACE ELEVATION: 98.6'* **DATE COMPLETED:** 7-17-79

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
30'	(Continued)				
35'		8A	34.0-35.5	38-52-10/1"	62+
40'		9A	39.0-39.5	100/2"	100+
45'	(Becomes wet at 44.0')	10A	44.0-45.5	30-34-36	70
50' 49.0'	Very dense brown sand, some silt - wet	11A	49.0-50.5	38-30-32	62
	Bottom of boring at 50.5'				
55'					
60'					

METHOD: HOLLOW STEM AUGER

TECHNICIAN: BC-BC

JOB NO.: 25278 (smp)

WATER OBSERVATIONS

INITIAL DEPTH: 43.0' (heavy)

COMPLETION DEPTH: 47.5'

DEPTH AFTER: ____ HRS. ____

TYPE SAMPLER:

X A. SPLIT SPOON

___ B.

___ C. SHELBY TUBE

*In reference to assumed elevation of 100.0' for Bench Mark as shown on boring location plan

BOWSER – MORNER
TESTING LABORATORIES, INC.

LOG OF BORING NO. 2

SOIL STUDY IN AREAS OF OLD FILL, NORTH OF SELLARS ROAD AND EAST OF DRYDEN ROAD, MORAINE CITY, OHIO

BORING LOCATION: As shown on boring location plan **DATE STARTED:** 7-17-79

SURFACE ELEVATION: 102.3'* **DATE COMPLETED:** 7-17-79

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Crushed stone, sand and gravel, steel, wood, wire, paper - dry				
1.0'	(FILL) Very stiff gray silt, some clay, trace of glass, trace of paper, trace of wire, trace of wood, trace of oil, trace of organic material - moist	1A	1.0- 2.5	13-15- 8	23
5'	(Becomes stiff at 4.0')	2A	4.0- 5.5	12- 8- 7	15
10'	(Becomes wet at 9.0')	3A	9.0-10.5	3- 5- 8	13
12.0'	(ORIGINAL) Very dense brown sand and gravel, trace of silt - damp				
15'		4A	14.0-15.5	36-30-34	64
20'	(Becomes dense at 19.0')	5A	19.0-20.5	17-23-25	48
25'	(Becomes very dense at 24.0')	6A	24.0-25.0	63-36/3"	99+
30'		7A	29.0-30.5	30-57-13/2"	70+

(Continued on next page)

METHOD: HOLLOW STEM AUGER

TECHNICIAN: BC-EC

JOB NO.: 25278 (smp)

WATER OBSERVATIONS

INITIAL DEPTH: 9.0' (trace)

COMPLETION DEPTH: 49.0'

DEPTH AFTER: _____ HRS. _____

TYPE SAMPLER:

X A. SPLIT SPOON

_____ B.

_____ C. SHELBY TUBE

*In reference to assumed elevation of 100.0' for Bench Mark as shown on boring location plan

BOWSER – MORNER
TESTING LABORATORIES, INC.

LOG OF BORING NO. 2 (Second sheet)

SOIL STUDY IN AREAS OF OLD FILL, NORTH OF SELLARS ROAD AND EAST OF DRYDEN ROAD, MORAINE CITY, OHIO

BORING LOCATION: As shown on boring location plan **DATE STARTED:** 7-17-79

SURFACE ELEVATION: 102.3'* **DATE COMPLETED:** 7-17-79

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
30'	(Continued)				
34.0'	Hard brown and gray silt, some clay, some sand, trace of gravel - damp	8A	34.0-35.5	26-64-10/1"	74+
35' 37.5'	Very dense brown sand and gravel, trace of silt - damp	9A	39.0-39.5	100	100+
40'					
45'		10A	44.0-45.0	75-25/2"	100+
49.0'					
50'	Hard brown silt and sand, some gravel - moist	11A	49.0-50.0	70-30/3"	100+
	Bottom of boring at 50.0'				
55'					
60'					

METHOD: HOLLOW STEM AUGER

TECHNICIAN: BC-BC

JOB NO.: 25278 (smp)

WATER OBSERVATIONS

INITIAL DEPTH: 9.0' (trace)

COMPLETION DEPTH: 49.0'

DEPTH AFTER: _____ HRS. _____

TYPE SAMPLER:

X A. SPLIT SPOON

_____ B.

_____ C. SHELBY TUBE

*In reference to assumed elevation of 100.0' for Bench Mark as shown on boring location plan

BOWSER – MORNER
TESTING LABORATORIES, INC.

LOG OF BORING NO. 3

SOIL STUDY IN AREAS OF OLD FILL, NORTH OF SELLARS ROAD AND EAST OF DRYDEN ROAD, MORAINE CITY, OHIO

BORING LOCATION: As shown on boring location plan **DATE STARTED:** 7-17-79

SURFACE ELEVATION: 97[illegible]6'* **DATE COMPLETED:** 7-17-79

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Brown sand, some gravel, wood, wire, glass, crushed stone				
1.0'	(FILL) Medium dense brown sand and gravel, some silt - moist	1A	1.0- 2.5	11-12-10	22
4.0'	(ORIGINAL) Stiff brown and gray silt and clay, some sand, trace of gravel - moist	2A	4.0- 5.5	4- 4-10	14
8.0'	Very dense brown sand and gravel, trace of silt - damp	3A	9.0-10.0	60-40/5"	100+
		4A	14.0-15.5	40-45-15/2"	60+
	(With trace of cobbles at 19.0')	5A	19.0-20.0	55-45/5"	100+
	(With trace of cobbles at 24.0')	6A	24.0-25.0	70-30/3"	100+
	(Becomes moist with trace of cobbles at 29.0') (Continued on next page)	7A	29.0-30.0	60-40/4"	100+

METHOD: HOLLOW STEM AUGER

TECHNICIAN: BC-BC

JOB NO.: 25278 (smp)

WATER OBSERVATIONS

INITIAL DEPTH: 34.0' (trace)

COMPLETION DEPTH: 49.5'

DEPTH AFTER: 24 HRS. **

TYPE SAMPLER:

X A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

*In reference to assumed elevation of 100.0' for Bench Mark as shown on boring location plan

**Caved in to 8.0'

BOWSER – MORNER
TESTING LABORATORIES, INC.

315

LOG OF BORING NO. 3 (Second sheet)

SOIL STUDY IN AREAS OF OLD FILL, NORTH OF SELLARS ROAD AND EAST OF DRYDEN ROAD, MORAINE CITY, OHIO

BORING LOCATION: As shown on boring location plan **DATE STARTED:** 7-17-79

SURFACE ELEVATION: 97.6'* **DATE COMPLETED:** 7-17-79

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
30'	(Continued)				
35'		8A	34.0-35.0	45-55	100
40'	(With trace of large cobbles at 39.0')	9A	39.0-40.0	80-20/1"	100+
45'		10A	44.0-45.0	75-25/1"	100+
50' 49.0'	Very dense fine sand and silt, trace of gravel.- wet	11A	49.0-50.0	45-55	100
	Bottom of boring at 50.0'				
55'					
60'					

METHOD: HOLLOW STEM AUGER

TECHNICIAN: BC-BC

JOB NO.: 25278 (smp)

WATER OBSERVATIONS

INITIAL DEPTH: 34.0' (trace)

COMPLETION DEPTH: 49.5'

DEPTH AFTER: 24 HRS. **

TYPE SAMPLER:

X A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

*In reference to assumed elevation of 100.0' for Bench Mark as shown on boring location plan

**Caved in to 8.0'

BOWSER – MORNER
TESTING LABORATORIES, INC.

LOG OF BORING NO. 4

SOIL STUDY IN AREAS OF OLD FILL, NORTH OF SELLARS ROAD AND EAST OF DRYDEN ROAD, MORAINE CITY, OHIO

BORING LOCATION: As shown on boring location plan **DATE STARTED:** 7-16-79

SURFACE ELEVATION: 102.4'* **DATE COMPLETED:** 7-16-79

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Crushed stone sand and silt, some gravel, metal, glass, wire - moist				
1.0'	(FILL) Very stiff dark brown silt, some clay, some sand, trace of gravel, trace of cinders - moist	1A	1.0- 2.5	10- 7-12	19
5' 4.0'	(FILL) Black flyash, wood and slag and trace of silt, trace of cinders - moist	2A	4.0- 5.5	12- 8-11	19
10' 9.0'	(FILL) Stiff gray silt and sand, some clay, trace of gravel, trace of roots - moist	3A	9.0-10.5	4- 5- 8	13
15'	(Becomes hard, with plastic fibers at 14.0')	4A	14.0-15.5	23-33-18	51
20' 19.0'	(FILL) Dense gray sand and gravel, some slag, some concrete fragments - dry	5A	19.0-20.5	14-18-21	39
24.0' 25'	(FILL) Hard gray silt, some gravel, some slag, flyash, and brick	6A	24.0-25.5	6-13-18	31
30' 29.0'	(FILL) Very stiff gray and black silt and sand, some gravel - wet (Continued on next page)	7A	29.0-30.5	11-12-17	29

METHOD: HOLLOW STEM AUGER

TECHNICIAN: BC-BC

JOB NO.: 25278 (smp)

WATER OBSERVATIONS

INITIAL DEPTH: 27.0' (medium)

COMPLETION DEPTH: 46.5'

DEPTH AFTER: ____ HRS. ____

TYPE SAMPLER:

X A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

*In reference to assumed elevation of 100.0' for Bench Mark as shown on boring location plan

BOWSER – MORNER
TESTING LABORATORIES, INC.

2B15

LOG OF BORING NO. 4 (Second sheet)

SOIL STUDY IN AREAS OF OLD FILL, NORTH OF SELLARS ROAD AND EAST OF DRYDEN ROAD, MORAINE CITY, OHIO

BORING LOCATION: As shown on boring location plan **DATE STARTED:** 7-16-79

SURFACE ELEVATION: 102.4'* **DATE COMPLETED:** 7-16-79

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
30'	(Continued)				
34.0'	(ORIGINAL) Very dense gray sand and gravel, some silt - wet (With some leachate from the fill layer above)	8A	34.0-35.5	9-19-38	57
40'	(Becomes moist with trace of silt from 39.0')	9A	39.0-40.0	45-55	100
45'		10A	44.0-44.5	100	100+
49.0'	Very dense brown and gray sand and silt, some gravel - moist	11A	49.0-50.0	85-15/2"	100+
	Bottom of boring at 50.0'				
55'					
60'					

METHOD: HOLLOW STEM AUGER

TECHNICIAN: BC-BC

JOB NO.: 25278 (smp)

WATER OBSERVATIONS

INITIAL DEPTH: 27.0' (medium)

COMPLETION DEPTH: 46.5'

DEPTH AFTER: _____ HRS. _____

TYPE SAMPLER:

X A. SPLIT SPOON

_____ B.

_____ C. SHELBY TUBE

*In reference to assumed elevation of 100.0' for Bench Mark as shown on boring location plan

BOWSER – MORNER
TESTING LABORATORIES, INC.

LOG OF BORING NO. 5

SOIL STUDY IN AREAS OF OLD FILL, NORTH OF SELLARS ROAD AND EAST OF DRYDEN ROAD, MORAINE CITY, OHIO

BORING LOCATION: As shown on boring location plan **DATE STARTED:** 7-12-79

SURFACE ELEVATION: 100.2'* **DATE COMPLETED:** 7-12-79

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Cinders, wood, glass, steel				
1.0'	(FILL) Hard brown and black silt and cinders, some sand, some gravel, trace of wood - damp	1A	1.0- 2.0	60-40	100
4.0'	(FILL) Stiff light gray silt, some sand, hydrated lime (chalk-like)-moist	2A	4.0- 5.5	4- 6- 5	11
6.0'	(FILL) Stiff brown and black silt, some sand, some cinders, trace of clay - moist	3A	9.0-10.5	18- 5- 6	11
	(Becomes medium stiff at 14.0')	4A	14.0-15.5	5- 4- 6	10
17.0'	(FILL) Black tar with tri-chlorethelene solution in liquid form	5A	19.0-20.5	15- 0- 1	1
24.0'	(FILL) Medium dense brown and black fine sand and silt, trace of cinders - moist	6A	24.0-25.5	6- 9- 6	15
29.0'	(FILL) Stiff gray silt, some sand, trace of gravel, trace of roots-moist (Continued on next page)	7A	29.0-30.5	14- 4- 7	11

METHOD: HOLLOW STEM AUGER

TECHNICIAN: BC-BC

JOB NO.: 25278 (smp)

WATER OBSERVATIONS

INITIAL DEPTH: **

COMPLETION DEPTH: 34.0'

DEPTH AFTER: 24 HRS. 15.0'

TYPE SAMPLER:

X A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

*In reference to assumed elevation of 100.0' for Bench Mark as shown on boring location plan

**4.0' (trace); 34.0' (medium)

BOWSER – MORNER TESTING LABORATORIES, INC.

315

LOG OF BORING NO. 5 (Second sheet)

SOIL STUDY IN AREAS OF OLD FILL, NORTH OF SELLARS ROAD AND EAST OF DRYDEN ROAD, MORAINE CITY, OHIO

BORING LOCATION: As shown on boring location plan **DATE STARTED:** 7-12-79

SURFACE ELEVATION: 100.2'* **DATE COMPLETED:** 7-12-79

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
30'	(Continued)				
34.0'	(ORIGINAL) Very dense brown sand and gravel, trace of silt - moist	8A	34.0-35.0	32-68	100
40'		9A	39.0-40.0	60-40	100
45'	(With petroleum residual at 44.0')	10A	44.0-45.0	63-37	100
50'		11A	49.0-49.5	100	100+
	Bottom of boring at 49.5'				
55'					
60'					

METHOD: HOLLOW STEM AUGER

TECHNICIAN: BC-BC

JOB NO.: 25278 (smp)

WATER OBSERVATIONS

INITIAL DEPTH: **

COMPLETION DEPTH: 34.0'

DEPTH AFTER: 24 **HRS.** 15.0'

TYPE SAMPLER:

X A. SPLIT SPOON

___ B.

___ C. SHELBY TUBE

*In reference to assumed elevation of 100.0' for Bench Mark as shown on boring location plan

**4.0' (trace); 34.0' (medium)

BOWSER – MORNER
TESTING LABORATORIES, INC.

LOG OF BORING NO. 6

SOIL STUDY IN AREAS OF OLD FILL, NORTH OF SELLARS ROAD AND EAST OF DRYDEN ROAD, MORAINE CITY, OHIO

BORING LOCATION: As shown on boring location plan **DATE STARTED:** 7-12-79

SURFACE ELEVATION: 98.6'* **DATE COMPLETED:** 7-13-79

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Brown silt, cinders, wood, glass and steel				
1.0'	(FILL) Hard brown and black silt, with wood, wire, gravel, trace of sand - moist	1A	1.0- 2.5	14-21-15	36
5'		2A	4.0- 5.5	13-35-19	54
9.0'	(ORIGINAL) Medium dense brown fine sand, trace of silt - moist	3A	9.0-10.5	8-11-15	26
15'	(Becomes very dense at 14.0')	4A	14.0-15.5	25-53-22	75
19.0'	Very dense brown sand and gravel, some silt, with rock fragments - moist	5A	19.0-20.5	21-49-30	79
25'		6A	24.0-25.5	24-56-20	76
30'	(Becomes wet at 29.0') (Continued on next page)	7A	29.0-30.5	15-49-36	85

METHOD: HOLLOW STEM AUGER

TECHNICIAN: BC-BC

JOB NO.: 25278 (smp)

WATER OBSERVATIONS

INITIAL DEPTH: 47.0' (heavy)

COMPLETION DEPTH: 47.0'

DEPTH AFTER: 24 **HRS.** **

TYPE SAMPLER:

X A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

*In reference to assumed elevation of 100.0' for Bench Mark as shown on boring location plan

**caved in to 17.0'

BOWSER – MORNER
TESTING LABORATORIES, INC.

315

LOG OF BORING NO. 6 (Second sheet)

SOIL STUDY IN AREAS OF OLD FILL, NORTH OF SELLARS ROAD AND EAST OF DRYDEN ROAD, MORAINE CITY, OHIO

BORING LOCATION: As shown on boring location plan **DATE STARTED:** 7-12-79

SURFACE ELEVATION: 98.6'* **DATE COMPLETED:** 7-12-79

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
30'	(Continued)				
35'	(With trace of silt from 34.0')	8A	34.0-34.5	100	100+
40'		9A	39.0-39.5	100	100+
44.0' / 45'	Hard brown silt and sand, some gravel - moist	10A	44.0-44.5	100/4"	100+
47.0'	Very dense brown sand and gravel, some silt - wet	11A	49.0-50.5	22-46-32	78
50'	Bottom of boring at 50.5'				
55'					
60'					

METHOD: HOLLOW STEM AUGER

TECHNICIAN: BC-BC

JOB NO.: 25278 (smp)

WATER OBSERVATIONS

INITIAL DEPTH: 47.0' (heavy)

COMPLETION DEPTH: 47.0

DEPTH AFTER: 24 HRS. **

TYPE SAMPLER:

X A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

*In reference to assumed elevation of 100.0' for Bench Mark as shown on boring location plan

**Caved in to 17.0'

BOWSER – MORNER
TESTING LABORATORIES, INC.

15

LOG OF BORING NO. 7

SOIL STUDY IN AREAS OF OLD FILL, NORTH OF SELLARS ROAD AND EAST OF DRYDEN ROAD, MORAINE CITY, OHIO

BORING LOCATION: As shown on boring location plan **DATE STARTED:** 7-16-79

SURFACE ELEVATION: 99.9'* **DATE COMPLETED:** 7-16-79

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Brown silt and sand and gravel, steel, wire - moist				
1.0'	(FILL) Hard brown silt and sand, some clay, trace of gravel - wet	1A	1.0- 2.5	10-22-18	40
5'	(Becomes stiff and moist at 4.0')	2A	4.0- 5.5	4- 6- 8	14
10'	(Becomes soft at 9.0')	3A	9.0-10.5	2- 2- 2	4
12.5'	(ORIGINAL) Dense brown sand and gravel, trace of silt - damp	4A	14.0-15.5	12-24-23	47
15'					
20'	(Becomes medium dense at 19.0')	5A	19.0-20.5	8- 9-14	23
25'	(Becomes very dense at 24.0')	6A	24.0-25.0	72-28/2"	100+
30'	(Becomes dense and moist at 29.0') (Continued on next page)	7A	29.0-30.5	28-16-17	33

METHOD: HOLLOW STEM AUGER

TECHNICIAN: BC-BC

JOB NO.: 25278 (smp)

WATER OBSERVATIONS

INITIAL DEPTH: **

COMPLETION DEPTH: 47.0'

DEPTH AFTER: 24 HRS. ***

TYPE SAMPLER:

X A. SPLIT SPOON

___ B.

___ C. SHELBY TUBE

*In reference to assumed elevation of 100.0' for Bench Mark as shown on boring location plan

**0u0' (standing water); 1.0' (medium); 12.0'

***Caved in to 14.5'

BOWSER – MORNER
TESTING LABORATORIES, INC.

2B15

LOG OF BORING NO. 7 (Second sheet)

SOIL STUDY IN AREAS OF OLD FILL, NORTH OF SELLARS ROAD AND EAST OF DRYDEN ROAD, MORAINE CITY, OHIO

BORING LOCATION: As shown on boring location plan **DATE STARTED:** 7-16-79

SURFACE ELEVATION: 99.9'* **DATE COMPLETED:** 7-16-79

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
30'	(Continued)				
35'	(Becomes very dense at 34.0')	8A	34.0-35.5	22-34-46	80
40'		9A	39.0-40.5	25-34-34	68
45'	(Becomes wet at 44.0')	10A	44.0-45.0	70-30/2"	100+
50'		11A	49.0-50.0	72-28/2"	100+
	Bottom of boring at 50.0'				
55'					
60'					

METHOD: HOLLOW STEM AUGER

TECHNICIAN: BC-BC

JOB NO.: 25278 (smp)

WATER OBSERVATIONS

INITIAL DEPTH: **

COMPLETION DEPTH: 47.0'

DEPTH AFTER: 24 HRS. ***

TYPE SAMPLER:

X A. SPLIT SPOON

___ B.

___ C. SHELBY TUBE

*In reference to assumed elevation of 100.0' for Bench Mark as shown on boring location plan

**0.0' (standing water); 1.0' (medium); 12.0'

***Caved in to 14.5'

BOWSER – MORNER
TESTING LABORATORIES, INC.

LOG OF BORING NO. 8

SOIL STUDY IN AREAS OF OLD FILL, NORTH OF SELLARS ROAD AND EAST OF DRYDEN ROAD, MORAINE CITY, OHIO

BORING LOCATION: As shown on boring location plan **DATE STARTED:** 7-16-79

SURFACE ELEVATION: 101.1'* **DATE COMPLETED:** 7-16-79

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Brown silt, trace of sand and gravel, with wire, paper, glass and topsoil				
1.0'	(FILL) Medium dense black flyash, some silt - moist	1A	1.0- 2.5	14- 6-16	22
4.0'	(FILL) Very stiff gray and brown silt, some clay, some bricks, some sand, trace of slag and wire - damp	2A	4.0- 5.5	14- 6-12	18
9.0'	(FILL) Medium dense black cinders, some slag	3A	9.0-10.5	10- 6-14	20
14.0'	(FILL) Very soft gray silt, some fine sand, hydrated lime (chalk-like)-wet	4A	14.0-15.5	1- 0- 1	1
19.0'	(FILL) Medium dense black sand and silt, trace of gravel, trace of cinders - moist	5A	19.0-20.5	4- 8- 6	14
24.0'	(FILL) Fiberglass insulation and some black tar - moist	6A	24.0-25.0	15-50/2"	65+
29.0'	(FILL) Hard gray silt and sand, and gravel - wet	7A	29.0-29.5	75/3"	75+

(Continued on next page)

METHOD: HOLLOW STEM AUGER

TECHNICIAN: BC-BC

JOB NO.: 25278 (smp)

WATER OBSERVATIONS

INITIAL DEPTH: 22.0' (heavy)

COMPLETION DEPTH: 48.0'

DEPTH AFTER: 24 HRS. 47.0'

TYPE SAMPLER:

X A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

*In reference to assumed elevation of 100.0' for Bench Mark as shown on boring location plan

BOWSER – MORNER
TESTING LABORATORIES, INC.

315

LOG OF BORING NO. 8 (Second sheet)

SOIL STUDY IN AREAS OF OLD FILL, NORTH OF SELLARS ROAD AND EAST OF DRYDEN ROAD, MORAINE CITY, OHIO

BORING LOCATION: As shown on boring location plan **DATE STARTED:** 7-16-79

SURFACE ELEVATION: 101.1'* **DATE COMPLETED:** 7-16-79

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
30'	(Continued)				
34.0'	(FILL) Very dense gray sand and gravel, some silt, some wood chips - wet	8A	34.0-34.5	100	100+
35'					
37.0'	(ORIGINAL) Very dense brown sand and gravel, trace of silt - moist				
40'		9A	39.0-40.0	85-15/2"	100+
45'		10A	44.0-44.5	100	100+
50'	(Becomes wet at 49.0')	11A	49.0-50.0	75-25/2"	100+
	Bottom of boring at 50.0'				
55'					
60'					

METHOD: HOLLOW STEM AUGER

TECHNICIAN: BC-BC

JOB NO.: 25278 (smp)

WATER OBSERVATIONS

INITIAL DEPTH: 22.0' (heavy)

COMPLETION DEPTH: 48.0'

DEPTH AFTER: 24 HRS. 47.0'

TYPE SAMPLER:

X A. SPLIT SPOON

___ B.

___ C. SHELBY TUBE

*In reference to assumed elevation of 100.0' for Bench Mark as shown on boring location plan

BOWSER – MORNER
TESTING LABORATORIES, INC.

LOG OF BORING NO. 9

SOIL STUDY IN AREAS OF OLD FILL, NORTH OF SELLARS ROAD AND EAST OF DRYDEN ROAD, MORAINE CITY, OHIO

BORING LOCATION: As shown on boring location plan **DATE STARTED:** 7-13-79

SURFACE ELEVATION: 102.0'* **DATE COMPLETED:** 7-13-79

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Brown silt, gravel, steel, brick, wire, glass - dry				
1.0'	(FILL) Hard brown and black silt and sand, some steel, some wood chips, trace of concrete, trace of clay - moist	1A	1.0- 2.0	25-50	75
5' 4.0'	(FILL) Very stiff brown and black silt, some sand, some wood, some clay, wire and paper, trace of gravel - moist	2A	4.0- 5.5	2- 8- 8	16
10' 9.0'	(FILL) Stiff blue and gray silt, some wood chips, some paper - moist	3A	9.0-10.5	4- 8- 5	13
15.0	(ORIGINAL) Medium dense brown sand and gravel, some silt - damp	4A	14.0-15.5	7- 9-11	20
20'	(Becomes very dense with some cobbles at 19.0')	5A	19.0-20.5	8-28-40	68
25'	(With some cobbles at 24.0')	6A	24.0-25.0	45-55	100
30'		7A	29.0-30.0	38-62	100

(Continued on next page)

METHOD: HOLLOW STEM AUGER

TECHNICIAN: BC-BC

JOB NO.: 25278 (smp)

WATER OBSERVATIONS

INITIAL DEPTH: 47.0'

COMPLETION DEPTH: 46.5'

DEPTH AFTER: 24 HRS. 3.0'

TYPE SAMPLER:

X A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

*In reference to assumed elevation of 100.0' for Bench Mark as shown on boring location plan

BOWSER – MORNER
TESTING LABORATORIES, INC.

815

LOG OF BORING NO. 9 (Second sheet)

SOIL STUDY IN AREAS OF OLD FILL, NORTH OF SELLARS ROAD AND EAST OF DRYDEN ROAD, MORAINE CITY, OHIO

BORING LOCATION: As shown on boring location plan **DATE STARTED:** 7-13-79

SURFACE ELEVATION: 102.0'* **DATE COMPLETED:** 7-13-79

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
30'	(Continued)				
35'		8A	34.0-34.5	100/2"	100+
40'	(Becomes moist with some cobbles at 39.0')	9A	39.0-40.0	70-30/3"	100+
45'		10A	44.0-45.0	70-30/2"	100+
50' 49.0'	Hard brown silt, some clay, some sand, trace of gravel - damp	11A	49.0-50.5	28-52-20/2"	72+
	Bottom of boring at 50.5'				
55'					
60'					

METHOD: HOLLOW STEM AUGER

TECHNICIAN: BC-BC

JOB NO.: 25278 (smp)

WATER OBSERVATIONS

INITIAL DEPTH: 47.0'

COMPLETION DEPTH: 46.5'

DEPTH AFTER: 24 HRS. 3.0'

TYPE SAMPLER:

X A. SPLIT SPOON.

____ B.

____ C. SHELBY TUBE

*In reference to assumed elevation of 100.0' for Bench Mark as shown on boring location plan

BOWSER – MORNER
TESTING LABORATORIES, INC.

315

LOG OF BORING NO. 10

SOIL STUDY IN AREAS OF OLD FILL, NORTH OF SELLARS ROAD AND EAST OF DRYDEN ROAD, MORAINE CITY, OHIO

BORING LOCATION: As shown on boring location plan **DATE STARTED:** 7-13-79

SURFACE ELEVATION: 100.6'* **DATE COMPLETED:** 7-13-79

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Brown silt, gravel, steel, wire, bricks, wood, trace of sand - dry				
1.0'	(FILL) Hard gray silt and sand, some gravel, trace of clay, trace of wood chips, trace of glass	1A	1.0- 1.5	80/4"	80+
4.0'	(FILL) Medium stiff gray silt and sand, trace of paper, trace of wood - wet	2A	4.0- 5.5	4- 3- 3	6
9.0'	(FILL) Very soft brown silt and clay, trace of sand - wet	3A	9.0-10.5	1- 1- 1	2
15.0	(ORIGINAL) Medium dense brown sand and gravel, trace of silt - moist	4A	14.0-15.5	4- 7- 8	15
20'	(Becomes dense at 19.0')	5A	19.0-20.5	11-14-16	30
25'	(Becomes very dense at 24.0')	6A	24.0-25.5	20-39-40	79
30'		7A	29.0-29.5	100	100+

(Continued on next page)

METHOD: HOLLOW STEM AUGER

TECHNICIAN: BC-BC

JOB NO.: 25278 (smp)

WATER OBSERVATIONS

INITIAL DEPTH: **

COMPLETION DEPTH: 47.0'

DEPTH AFTER: 24 HRS. 16.0'

TYPE SAMPLER:

X A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

*In reference to assumed elevation of 100.0' for Bench Mark as shown on boring location plan

**9.0' (trace); 34.0' (trace); 47.0' (medium)

BOWSER – MORNER
TESTING LABORATORIES, INC.

315

LOG OF BORING NO. 10 (Second sheet)

SOIL STUDY IN AREAS OF OLD FILL, NORTH OF SELLARS ROAD AND EAST OF DRYDEN ROAD, MORAINE CITY, OHIO

BORING LOCATION: As shown on boring location plan **DATE STARTED:** 7-13-79

SURFACE ELEVATION: 100.6'* **DATE COMPLETED:** 7-13-79

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
30'	(Continued)				
35'		8A	34.0035.0	41-59	100
40'		9A	39.0-40.0	50-50	100
45'		10A	44.0-44.5	100	100 +
50'	(Becomes wet at 49.0')	11A	49.0-50.5	25-50-25/3"	75+
	Bottom of boring at 50.5'				
55'					
60'					

METHOD: HOLLOW STEM AUGER

TECHNICIAN: BC-BC

JOB NO.: 25278 (smp)

WATER OBSERVATIONS

INITIAL DEPTH: **

COMPLETION DEPTH: 47.0'

DEPTH AFTER: 24 **HRS.** 16.0'

TYPE SAMPLER:

X A. SPLIT SPOON

___ B.

___ C. SHELBY TUBE

*In reference to assumed elevation of 100.0' for Bench Mark as shown on boring location plan

**9.0' (trace); 34.0' (trace); 47.0' (medium)

BOWSER – MORNER
TESTING LABORATORIES, INC.

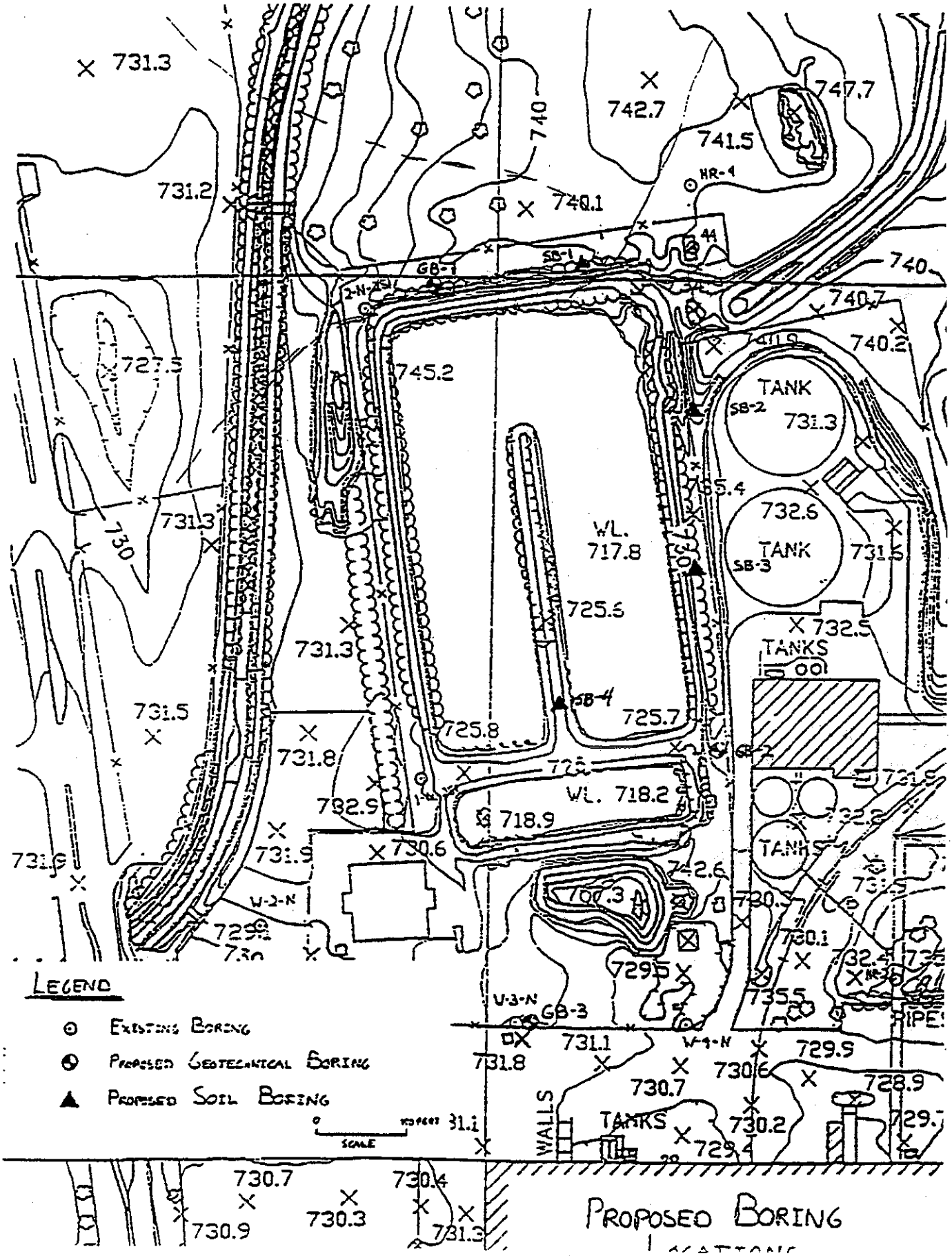
Section 17

North Lagoon Investigation
Soil Borings

GB-1
GB-2
SB-1
SB-2
SB-3
SB-4

GERAGHTY & MILLER, INC.

GERAGHTY & MILLER
ENGINEERS, INC.



GERAGHTY & MILLER, INC.
Ground-Water Consultants

PROJECT NO. CH019.07	BORE HOLE NO. GB-1
PROJECT Harrison Radiator Soil Boring Program	LOCATION Moraine, Ohio
DRILLING CONTRACTOR Bowser-Morner	DRILLING EQUIPMENT Mobile Drill B-61 3¼" H.S.A.
HYDROGEOLOGIST A. G. McCorkle	DRILLER T. Boehmer / K. Boehmer
DATE START / TIME 8/28/89 10:00 am	DATE FINISH / TIME 8/29/89 11:00 am
SURFACE ELEVATION approx. 739.5	TOTAL DEPTH 100.5'
WELL CASING	SCREEN TYPE
LENGTH	SLOT

REMARKS: Borehole abandoned

BORE HOLE LOG

DEPTH (FT.)	SAMPLE (NO.)	BLOW COUNT PER 6 IN.	RECOVERY (FT.)	LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)	GRAPHIC
	1	3-4-12	0.5	TOPSOIL: clay (70-80%); fine-med sand (20-30%); tr. gravel (0-10%); dk. brn. to blk., damp, loose, cohesive		0.0	
5	2	10-9-7	0.5	COBBLES (60%); cs gravel (20%); med-cs sand (20%); tr. fine sand (0-10%); lt. brn., damp, loose, cohesionless, rounded, calcareous		0.1	
10	3	10-10-14	0.6	cs. SAND (40-50%); fine-med sand (30%); fine gravel (20-30%); pebbles (0-10%); silt and v. fine sand (0-10%); med to dk. brwn., damp, slightly cohesive, subrounded, calcareous		0.1	
15	4	30-70/6"	0.8	cs. GRAVEL and PEBBLES (50-60%); fine-med. gravel (20-30%); med. - cs. sand (20-30%); fine sand (0-10%); lt. brn., damp to moist, cohesionless, rounded, calcareous		0.0	
20	5	19-44-50	1.5	med-cs GRAVEL (40-50%); cs. sand and fine gravel (20-30%); fine-med sand (20-30%); pebbles (10-20%); v. fine sand and silt (0-10%); lt. brn. to grey, moist, stiff, cohesionless, rounded, calcareous		0.3	
25	6	25-160-44	1.0	med-cs. GRAVEL (as above).	sample collected with 3-inch split-spoon; analytical sample: VOC, Cd, Cr, Pb.	N/A	
30	7	25-27-44	1.2	med-cs GRAVEL (50-60%); med-cs sand (20-30%); v. fine - fine sand (10-20%); pebbles (10-20%); lt. olive grey, moist, slightly cohesive, rounded, calcareous	water at 31'	0.4	
	8	36-90-97	1.5	cs. GRAVEL and PEBBLES (40-50%); med-cs sand (20-30%); fine-med gravel (20-30%); cobbles (10-20%); fine-med sand (0-10%); v. fine sand (0-10%); lt. grey, water bearing, stiff, cohesionless, well rounded, calcareous	sample collected with 3-inch split-spoon; analytical sample: VOC, Cd., Cr Pb.	N/A	

GERAGHTY & MILLER, INC.
Ground-Water Consultants

PROJECT NO. 0H019.07

BORE HOLE NO. GB-1

PROJECT Harrison Radiator Soil Boring Program

LOCATION Moraine, Ohio

REMARKS Borehole abandoned

DEPTH (FT.)	SAMPLE NO.	BLOW COUNT PER 6 IN.	RECOVERY (FT.)	LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)	GRAPHIC
40	9	156-57-72	0.5	CS. GRAVEL and PEBBLES (40-50%); med-cs sand (20-30%); fine-med gravel (20-30%); cobbles (10-20%); fine-med sand (0-10%); v. fine sand (0-10%); lt. grey, water bearing, stiff, cohesionless, well rounded; calcareous		5.4	
45	10	76-94-106	1.0	cs. GRAVEL and PEBBLES (as above)		0.2	
50	11	36-124-138	1.5	cs. SAND (60-70%); pebbles (10-20%); fine-med sand (10-20%); fine-cs. gravel (10-20%); lt. olive grey, water bearing, v.stiff, cohesionless, rounded, calcareous		0.4	
55	12	44-74-78	1.5	cs. SAND (70-80%); med-cs. gravel (10-20%); fine-med. sand (10-20%); orange-brn. (54'-55')/ med-olive grey (55'-55.5'); water bearing, stiff, cohesionless, well rounded, calcareous		0.6	
60	13	89-167-44	1.5	cs. SAND (as above) tr. CLAY at 60.5'; grey, moist, loose		0.8	
65	14	31-69-75	1.0	med-cs. SAND (70-80%); pebbles (10-20%); fine sand (10-20%); med. olive grey, water bearing, stiff, slightly cohesive, well rounded, calcareous	CLAY layer at 67.5'	0.8	
70	15	89-116/5"	1.0	med-cs SAND (as above) 70.0'-CLAY w/much cs. sand, olive grey, dense, damp. 70.2'-cs. GRAVEL (60-70%); med sand-med gravel (20-30%); tr. silt and clay (10-20%); olive grey, slightly cohesive	penetrometer on clay: >4.5tsf for 3 trials.	0.6	
	16	107-64-84	1.5	sample description next page		0.8	

GERAGHTY & MILLER, INC.
Ground-Water Consultants

PROJECT NO. 0019.07

BORE HOLE NO. GB-1

PROJECT Harrison Radiator Soil Boring Program

LOCATION Moraine, Ohio

REMARKS Borehole abandoned

DEPTH (FT.)	SAMPLE NO.	BLOW COUNT PER 6 IN.	RECOVERY (FT.)	LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)	GRAPHIC
				74-74.5': cs GRAVEL (80-90%); fine-cs. sand (10-20%); silt and v. fine sand (0-10%); lt. olive grey, well rounded, slightly cohesive 74.5-75.5': fine-med SAND (70-80%); cs. sand and olive gravel (10-20%); pebbles and cobbles (10-20%); lt. olive grey, water bearing, well rounded, cohesionless.			
80	17	38-42-57	1.5			0.6	
85	18	3-4-7	1.5	fine-med SAND (as above)		0.1	
90	19	13-42-67	1.5	med-cs. SAND (50-60%); fine-med gravel (10-20%); cs. gravel and pebbles (10-20%); v. fine-fine sand (10-15%); tr clay (0-5%); med olive grey, water bearing, slightly cohesive, subrounded to subangular, calcareous		0.1	
95	20	98-49-56	1.1	med-cs SAND (as above) tr. cobbles		0.3	
100	21	43-39-58	0.0	NO SAMPLE RECOVERED (SAND)		N/A	
				100.5' END OF LOG BOREHOLE GROUTED TO SURFACE WITH 5% BENTONITE-CEMENT GROUT			
105							
110							

GERAGHTY & MILLER, INC.
Ground-Water Consultants

PROJECT NO. OH019.07	BORE HOLE NO. GB-2
PROJECT Harrison Radiator Soil Boring Program	LOCATION Moraine, Ohio
DRILLING CONTRACTOR Bowser-Morner	DRILLING EQUIPMENT Mobile Drill B-61, 3¼-inch H.S.A.
HYDROGEOLOGIST A. G. McCorkle	DRILLER T. Boehmer
DATE START / TIME 8/29/89 3:30 pm	DATE FINISH / TIME 8/30/89 6:30 pm
SURFACE ELEVATION approx. 733.0	TOTAL DEPTH 100.5 feet
WELL CASING	SCREEN TYPE
LENGTH	SLOT

REMARKS: Borehole abandoned

BORE HOLE LOG

DEPTH (FT.)	SAMPLE (NO.)	BLOW COUNT PER 6 IN.	RECOVERY (FT.)	LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)	GRAPHIC
	1	4-6-21	1.0	5" TOPSOIL, then: med-cs GRAVEL (50-60%); fine-med sand (20-30%); cs sand (10-20%); tr cobbles (0-10%); dk olive brn, damp to dry, slightly cohesive, rounded, calcareous (90%)		0.0	
5	2	5-8-5	0.6	CLAY (60-70%); fine-cs sand (10-20%); cs gravel and pebbles (10-20%); tr fine-med gravel (0-10%); tr silt (0-10%); dk olive brn, damp, loose cohesive		0.1	
10	3	5-6-10	0.5	CLAY (as above) except: mottled lt olive grey and brn		0.8	
15	4	20-12-14	0.8	fine-med SAND (40-50%); fine-med gravel (20-30%); cs sand (10-20%); silt and clay (0-10%); mottled lt grey and brn, damp, slightly cohesive, subrounded, calcareous (90%)		1.4	
	5	33-90-104	1.2		sample collected at 17.5' with 3-inch split spoons; analytical sample: VOC, Cr, Cd, Pb.	N/A	
20	6	28-48-44	0.9	fine-med SAND (30-40%); cobbles (20-30%); fine-med gravel (10-20%); cs sand (10-20%); tr silt and clay (0-10%); mottled orange-brn (Fe staining) and grey, damp, slightly cohesive, rounded, calcareous (90%)	water at 24.0 feet	2.6	
25	7	20-30-34	1.5	med-cs SAND (30-40%); cs gravel (30-40%); fine sand (10-20%); pebbles (0-10%); silt and v. fine sand (10-20%); fine-med gravel (0-10%); med brn, water bearing, still, cohesionless, sub to well rounded, calcareous (90%)		1.2	
	8	9-15-31	1.2		Analytical sample at 25.5': VOC, Cr, Cd, Pb.	N/A	
30	9	18-32-38	1.5	med-cs SAND (as above)		0.7	
	10	16-32-38	1.5	sample description next page		1.2	

GERAGHTY & MILLER, INC.
Ground-Water Consultants

PROJECT NO. OH019.07

BORE HOLE NO. GB-2

PROJECT Harrison Radiator Soil Boring Program

LOCATION Moraine, Ohio

REMARKS Borehole abandoned

DEPTH (FT.)	SAMPLE NO.	BLOW COUNT PER 6 IN.	RECOVERY (FT.)	LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)	GRAPHIC
				fine-med SAND (60-70%); cs sand and fine gravel (30-40%); med-gravel (0-10%); silt and v. fine sand (0-10%); med olive brn, water bearing, stiff, subrounded, calcareous (90%)			
40	11	37-43-43	1.5	fine-med SAND (50-60%); cs sand and fine gravel (20-30%); med-cs gravel (10-20%); v. fine sand and silt (0-10%); orange brn (Fe staining), water bearing, stiff, subrounded, calcareous (90%)		0.4	
45	12	29-44-59	1.5	cs GRAVEL and PEBBLES (30-40%); fine-med sand (30-40%); cs sand (10-20%) fine-med gravel (0-10%); silt and v. fine sand (0-10%); med- olive gray, water bearing, stiff, subangular to sub-rounded, calcareous (90%)		0.6	
50	13	17-38-30	1.2	GRAVEL and PEBBLES (as above)		0.2	
55	14	48-68-118	1.5	CLAY (70-80%); cs sand (20%); fine gravel (10%); silt (0-10%); med olive grey, v. stiff, damp	penetrometer >4.5 tsf, 3 trials ATTEMPT TO RECOVER SHELBY TUBE SAMPLES FROM 55.5' and 59.0' FAILED, TUBES CRUSHED	0.4	
60	17	109-200/4"	0.9	CLAY (as above)		N/A	
	18	95-150/4"	1.0	med-cs SAND (50-60%); fine-cs gravel (20-30%); pebbles and cobbles (10-20%); silt and v fine sand (10-20%); med olive grey, v. stiff, wet, slightly cohesive	Samples saved for geotechnical tests. Penetrometer: >4.5 tsf, 3 trials	N/A	
65	19	50-75-107	1.5	med-cs SAND (as above)		0.9	
70	20	38-34-54	1.5	med-cs SAND (40-50%); fine-cs gravel (20-30%); pebbles and cobbles (20-30%); silt and v. fine sand (0-10%); med olive grey, water bearing, stiff, cohesionless, calcareous (90%)		0.3	
	21	7-22-44	1.5	sample description next page		0.7	

GERAGHTY & MILLER, INC.
Ground-Water Consultants

PROJECT NO. OH019.07

BORE HOLE NO. GB-2

PROJECT Harrison Radiator Soil Boring Program

LOCATION Moraine, Ohio

REMARKS Borehole Abandoned

DEPTH (FT.)	SAMPLE NO.	BLOW COUNT PER 6 IN.	RECOVERY (FT.)	LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)	GRAPHIC
				fine-med SAND (80%); v. fine sand (15%); med-cs gravel (5%); med olive grey, water bearing, stiff, cohesionless, calcareous (30%); crystalline (50%)			
80	22	5-21-33	1.2	fine-med SAND (as above)		1.0	
85	23	25-48-72	1.5	fine-med SAND (as above)		1.0	
90	24	11-42-50	1.5	fine-med GRAVEL (30-40%); med-cs sand (20-30%); pebbles (10-20%); v. fine-fine sand (10-20%); med olive grey, water bearing, stiff, cohesionless, rounded, calcareous (90%)		0.4	
95	25	20-72-89	1.5	fine-med GRAVEL (as above)		0.5	
100	26	22-44-45	1.5	fine-med GRAVEL (as above)		0.1	
				100.5 feet END OF LOG BOREHOLE GROUTED TO SURFACE WITH 5% BENTONITE - CEMENT GROUT			
105							
110							

GERAGHTY & MILLER, INC.
Ground-Water Consultants

PROJECT NO. OH019.07	BORE HOLE NO. SB-1
PROJECT Harrison Radiator Soil Boring Program	LOCATION Moraine, Ohio
DRILLING CONTRACTOR Bowser-Morner	DRILLING EQUIPMENT Mobile Drll B-61; 3¼" H.S.A.
HYDROGEOLOGIST A. G. McCorkle	DRILLER T. Boehmer
DATE START / TIME 8/25/89 10:00 am	DATE FINISH / TIME 8/25/89 3:00 pm
SURFACE ELEVATION approx 739.5	TOTAL DEPTH 40.5 ft
WELL CASING	SCREEN TYPE
LENGTH	SLOT

REMARKS: Borehole abandoned

BORE HOLE LOG

DEPTH (FT.)	SAMPLE (NO.)	BLOW COUNT PER 6 IN.	RECOVERY (FT.)	LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)
	1	4-6-9	1.0	3" TOPSOIL, then: CLAY (70-80%); med-cs sand (10-20%); silt (10-20%); tr fine sand (0-10%); reddish brown, damp, loose	change at 2 feet	0.0
5	2	7-13-39	1.2	fine-med SAND (80-90%); cs sand to med gravel (10-20%); lt grey ("salt and pepper") with iron staining, damp, loose		0.0
10	3	24-24-30	0.6	cs SAND (80%); fine-med sand (10%); cs gravel (0-10%); fine-med gravel (0-10%); lt grey with iron staining, damp, cohesionless, sub to well rounded	pebbles and cobbles come up with augers	0.1
15	4	19-40-50	0.9	cs GRAVEL (50%); fine-med sand (30%); silt and v. fine sand (10%); tr cobbles (0-10%); tr clay (0-5%); lt grey and brown (clay), moist, slightly adhesive, sub to well rounded	majority of gravel is calcareous	0.4
20	5	44-26 36	1.0	PEBBLES and COBBLES (40-50%); med-cs sand (20-30%); med-cs gravel (10-20%); v. fine-fine sand (0-10%); lt grey, moist, slightly cohesive, well rounded	majority of gravel is calcareous	
25	6	54-56-56	1.5	cs GRAVEL (50-60%); pebbles and cobbles (20-30%); fine-cs sand (10-20%); tr fine sand (0-10%); lt grey with Fe staining, damp, cohesionless	collected with 3-inch split-spoon, analytical sample: VOC, Cd, Cr, Pb	
30	7	32-48-36	0.9	cs GRAVEL (as above)	water between 31' and 34'	0.4
	8	30-54-100	1.5	sample description next page (34-35.5')		0.1

STRAIGHT & MILLER, INC.
Ground-Water Consultants

PROJECT NO. CH019.07

BORE HOLE NO. SB-1

PROJECT Harrison Radiator Soil Boring Program

LOCATION Moraine, Ohio

REMARKS Borehole abandoned

DEPTH (FT.)	SAMPLE NO.	BLOW COUNT PER 6 IN.	RECOVERY (FT.)	LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)
				cs GRAVEL (50-60%); pebbles and cobbles (10-20%); fine-cs sand (10-20%); v. fine sand and silt (10-20%); tr clay (0-10%); lt brn, water bearing, slightly cohesive, well rounded	sample collected from 34' to 35.5' interval	
40	9	30-54-100	1.5	COBBLES (30%); cs sand (30%); fine-med gravel (20%); cs gravel and pebbles (20% ; v. fine sand (0-10%); lt brn, cohesionless, water bearing, well rounded	sample collected with 3-inch split-spoon; analytical sample: VOC, Cd., Cr, Pb	
				40.5 feet END OF LOG		
45				BOREHOLE GROUTED TO SURFACE WITH 10% BENTONITE - CEMENT GROUT		
50						
55						
60						
65						
70						

GERAGHTY & MILLER, INC.
Ground-Water Consultants

PROJECT NO. OH019.07	BORE HOLE NO. SB-2
PROJECT Harrison Radiator Soil Boring Program	LOCATION Moraine, Ohio
DRILLING CONTRACTOR Bowser-Morner	DRILLING EQUIPMENT Mobile Drill B-61, 3¼-inch H.S.A.
HYDROGEOLOGIST A. G. McCorkle	DRILLER T. Boehmer
DATE START / TIME 8/31/89 7:00 am	DATE FINISH / TIME 8/31/89 10:00 am
SURFACE ELEVATION approx. 736.0	TOTAL DEPTH 33.5'
WELL CASING	SCREEN TYPE
LENGTH	SLOT

REMARKS: Borehole abandoned

BORE HOLE LOG

DEPTH (FT.)	SAMPLE (NO.)	BLOW COUNT PER 6 IN.	RECOVERY (FT.)	LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)
	1	5-18-15	0.5	2" TOPSOIL, then; PEBBLES and COBBLES (50-60%); fine-cs sand (20%); fine-cs gravel (20%); silt and clay (0-10%); dk brn, damp, slightly cohesive		0.0
5	2	9-15-16	0.0	COBBLE (NO SAMPLE RECOVERED)		N/A
10	3	6-9-12	1.2	fine-med SAND (70%); silt and clay (20%); v. fine sand (5%); cs gravel and pebbles (5%); dk olive brn, slightly cohesive, well rounded, damp		0.1
15	4	17-21-15	1.2	med-cs SAND (40%); cs gravel and pebbles (30%); v. fine sand (20%); silt and clay (10%); med grey with Fe staining, damp, stiff, rounded, calcareous (90%)		0.6
20	5	109-99-37	1.5	PEBBLES and COBBLES to 21.0' then: med-cs SAND (as above)	sample collected with 3-inch split-spoon; analytical sample: VOC, Cd, Cr, Pb	N/A
25	6	12-15-12	1.5	med-cs SAND (40%); fine-med gravel (30%); cs gravel (10%); silt and v. fine sand (10%); tr fine sand (0-10%); tr pebbles (0-10%); med olive grey with Fe staining, moist to wet, stiff, slightly cohesive, SA - SR, 70% calc, 30% cryst.	wet at 25.0'	0.3
30	7	20-43-31	1.5	SAND and GRAVEL (as above)		0.4
	8	18-35-46	1.0	med-cs SAND (50%); pebbles (20%); fine-cs gravel (20%); v. fine sand and silt (10%); lt brn, water bearing, stiff, well rounded, calcareous (90%)	sample collected with 3-inch split-spoon; analytical sample: VOC, Cd, Cr, Pb.	N/A
				33.5 feet END OF LOG		
				BOREHOLE GROUTED TO SURFACE WITH 5% BENTONITE - CEMENT GROUT		

GERAGHTY & MILLER, INC.
Ground-Water Consultants

PROJECT NO. OH019.07	BORE HOLE NO. SB-3
PROJECT Harrison Radiator Soil Boring Program	LOCATION Moraine, Ohio
DRILLING CONTRACTOR Bowser-Morner	DRILLING EQUIPMENT Mobile Drill B-61, 3¼ inch H.S.A.
HYDROGEOLOGIST A. G. McCorkle	DRILLER T. Boehmer
DATE START / TIME 8/31/89 10:30 am	DATE FINISH / TIME 8/31/89 2:30 pm
SURFACE ELEVATION approx. 735.5	TOTAL DEPTH 30.5'
WELL CASING	SCREEN TYPE
LENGTH	SLOT

REMARKS Borehole abandoned

BORE HOLE LOG

DEPTH (FT.)	SAMPLE (NO.)	BLOW COUNT PER 6 IN.	RECOVERY (FT.)	LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)	GRAPHIC
	1	7-11-14	1.0	TOPSOIL: CLAY (80%); silt (10-20%); cs gravel and pebbles (0-10%); dk brn, cohesive, damp		0.3	
5	2	18-18-27	1.4	med-cs SAND (60%); fine-cs gravel (30%); v. fine-fine sand (0-10%); pebbles (0-10%); lt grey with Fe staining, damp, slightly cohesive, well rounded		0.0	
10	3	44-34-37	1.5	SAND and GRAVEL (as above)		1.3	
15	4	40-37-43	1.5	SAND and GRAVEL (as above)		0.6	
20	5	70-84-100	1.2	cs SAND (40%); fine-med sand (20%); pebbles (20%); cobbles (0-10%); fine-cs gravel (0-10%); med olive grey, moist to wet, v. stiff, cohesionless, rounded, calcareous (90%)	sample collected with 3-inch split-spoons; analytical sample: VOC, Cd Cr, Pb	N/A	
25	6	20-44-27	1.5	fine-med SAND (30-40%); cs sand and fine gravel (20-30%); v. fine sand (10-20%); pebbles (10-20%); med-cs gravel (0-10%); med olive grey with Fe staining, moist to wet, stiff, slightly cohesive, SA - SR, calcareous (80%)		1.2	
30	7	20-39-27	1.5	SAND and GRAVEL (as above)	sample collected with 3-inch split-spoon; analytical sample: VOC, Cd, Cr, Pb		
				30.5 feet END OF LOG BOREHOLE GROUTED TO SURFACE WITH 5% BENTONITE - CEMENT GROUT			

GERAGHTY & MILLER, INC.
Ground-Water Consultants

PROJECT NO. OH019.07	BORE HOLE NO. SB-4
PROJECT Harrison Radiator Soil Boring Program	LOCATION Moraine, Ohio
DRILLING CONTRACTOR Bowser-Morner	DRILLING EQUIPMENT Mobile Drill B-61, 3¼ inch H.S.A.
HYDROGEOLOGIST A. G. McCorkle	DRILLER T. Boehmer
DATE START / TIME 8/31/89 3:00 pm	DATE FINISH / TIME 9/1/89 9:00 am
SURFACE ELEVATION approx. 725.6	TOTAL DEPTH 26.5'
WELL CASING	SCREEN TYPE
LENGTH	SLOT

REMARKS Borehole abandoned

BORE HOLE LOG

DEPTH (FT.)	SAMPLE (NO.)	BLOW COUNT PER 6 IN.	RECOVERY (FT.)	LITHOLOGIC DESCRIPTION	REMARKS	OVA/PID (PPM)
	1	4-5-10	1.0	1" TOPSOIL, then: CLAY (80%); silt (10-20%); tr gravel (0-10%); dk brn, damp, loose		0.0
5	2	20-29-29	0.8	PEBBLES (40%); fine-med sand (30%); cs sand and fine gravel (10%); med-cs gravel (10%); silt (0-10%); lt olive grey with Fe staining, damp, slightly cohesive, calcareous (90%)		1.0
10	3	4-6-10	1.5	fine-med SAND (80-90%); cs sand (10-20%); med olive brn, loose, moist, subrounded, well sorted, calcareous (?), cohesionless		0.0
15	4	12-20-15	1.5	med-cs SAND (50%); med-cs gravel (20%); pebbles (20%); v. fine-fine sand (0-10%); silt (0-10%); med olive grey with Fe staining, wet, stiff, well rounded, calcareous (90%)		0.2
20	5	19-21-26	1.5	SAND and GRAVEL (as above)		0.2
25	6	36-34-56	1.5	SAND and GRAVEL (as above)	sample collected with 3-inch split-spoon; analytical sample: VOC, Cd, Cr, Pb.	N/A
				26.5 feet END OF LOG		
30				BOREHOLE GROUTED TO SURFACE WITH 5% BENTONITE - CEMENT GROUT		

Section 18

Bowser-Morner Logs 1981

1-N
2-N
1-S
2-S

BORING LOGS AND PIEZOMETRIC LOGS FROM BOWSER-MORNER LABORATORY
REPORT NO. 26098-281, DATED FEBRUARY 19, 1981

LOG OF BORING NO. 1-N (North Lagoon)

SOIL TEST BORINGS AND PIEZOMETER INSTALLATIONS AT WASTE WATER LAGOONS, DELCO AIR CONDITIONING SOUTH PLANT, MORAINE, OHIO

BORING LOCATION: As Shown On Boring Location Plan **DATE STARTED:** 2/11/81

SURFACE ELEVATION: 730.8' **DATE COMPLETED:** 2/11/81

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	Very stiff brown silt, some clay, some sand, trace of gravel - moist	1A	0.0- 1.5	10-12-10	22
3.0'	Medium dense brown sand, some gravel, trace of silt - moist	2A	4.0- 5.5	7- 8-14	22
5'	(Becomes dense at 9.0')	3A	9.0-10.5	16-18-21	39
10'					
14.0'	Very dense brown sand and gravel, trace of silt - moist	4A	14.0-15.5	19-45-36	81
15'					
20'		5A	19.0-20.5	45-23-32	55
25'		6A	24.0-25.5	23-43-40	83
29.0'	(Becomes dense at 29.0')	7A	29.0-30.5	12-17-23	40
30'	(Continued on next page)				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: RG-BCM

JOB NO.: 26098 (11s)

WATER OBSERVATIONS

INITIAL DEPTH: 40.0' (heavy)

COMPLETION DEPTH: 40.0'

DEPTH AFTER: _____ HRS. *

TYPE SAMPLER:

X A. SPLIT SPOON

_____ B.

_____ C. SHELBY TUBE

*See piezometric log sheet

BOWSER – MORNER
TESTING LABORATORIES, INC.

LOG OF BORING NO. 1-N (North Lagoon) (second sheet)

SOIL TEST BORINGS AND PIEZOMETER INSTALLATIONS AT WASTE WATER LAGOONS, DELCO AIR CONDITIONING SOUTH PLANT, MORAINE, OHIO

BORING LOCATION: As Shown On Boring Location Plan **DATE STARTED:** 2/11/81

SURFACE ELEVATION: 730.8' **DATE COMPLETED:** 2/11/81

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
30'	(Continued)				
35'	(Becomes very dense at 34.0')	8A	34.0-35.0	49-51/3"	100+
40'		9A	39.0-40.5	21-30-31	61
45'		10A	44.0-45.5	19-21-36	57
50'		11A	49.0-50.0	44-56	100
	Bottom of boring at 50.0'				
55'					
60'					

METHOD: HOLLOW STEM AUGER
TECHNICIAN: RG-BCM
JOB NO.: 26098 (11s)

WATER OBSERVATIONS
INITIAL DEPTH: 40.0 (heavy)
COMPLETION DEPTH: 40.0'
DEPTH AFTER: ____ HRS. *

TYPE SAMPLER:
X A. SPLIT SPOON
___ B.
___ C. SHELBY TUBE

*See piezometric log sheet

BOWSER – MORNER
TESTING LABORATORIES, INC.

PIEZOMETRIC LOG OF BORING NO. 1-N (North Lagoon)

SOIL TEST BORINGS AND PIEZOMETER INSTALLATIONS AT WASTE WATER LAGOONS, DELCO AIR CONDITIONING SOUTH PLANT, MORAINE, OHIO

BORING LOCATION: As Shown On Boring Location Plan **DATE INSTALLED:** 2/11/81

TOP OF PIPE ELEVATION: 733.3'

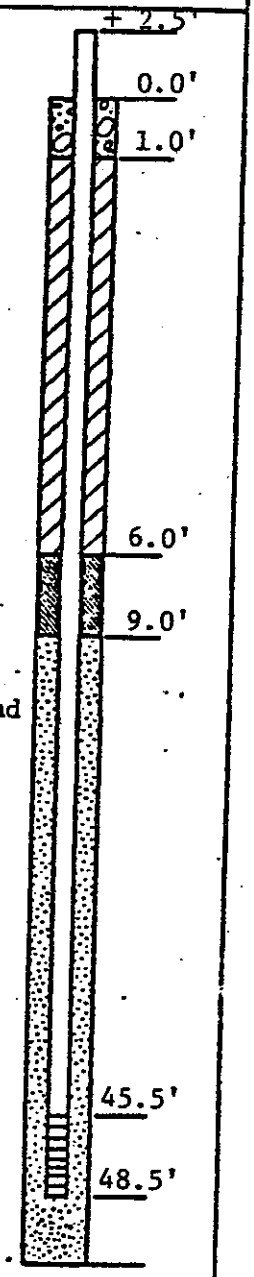
SURFACE ELEVATION: 730.8'

TYPE OF PIEZOMETER: 1 1/4" PVC pipe with 20-slot well screen

DATE	WATER SURFACE DEPTH (FT.)	WATER SURFACE ELEV. (FT.)	REMARKS
2-11	36.3'	694.5'	
2-12	35.4'	695.4'	
2-17	35.8'	695.0'	
2-19	34.7'	696.1'	
3-30	37.0'	696.3'	
4-08	40.6'	692.7'	
4-13	34.4'	698.9'	
4-14	37.5'	695.8'	
4-23	36.3'	697.0'	
4-24	36.5'	696.8'	
4-27	36.5'	696.8'	
5-01	31.6'	701.7'	

INSTALLATION DESCRIPTION

DEPTH	SOIL DESCRIPTION
0.0'	Brown silt
3.0'	Brown sand
14.0'	Brown sand and gravel



TECHNICIAN: RG

NO: 26098 (11s)

GUARD PIPE
FILL
SAND FILTER
BENTONITE PLUG
GROUT

LOG OF BORING NO. 2-N (North Lagoon)

SOIL TEST BORINGS AND PIEZOMETER INSTALLATIONS AT WASTE WATER LAGOONS,
DELCO AIR CONDITIONING SOUTH PLANT, MORAINE, OHIO

BORING LOCATION: As Shown On Boring Location Plan **DATE STARTED:** 2/9/81

SURFACE ELEVATION: 736.3' **DATE COMPLETED:** 2/9/81

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	Brown sand and gravel				
0.3'	Dense brown sand and gravel, trace of silt - moist				
5'		1A	4.0- 5.5	7-14-25	39
9.0'					
10'	Very dense brown sand, some gravel, trace of silt - moist	2A	9.0-10.5	13-18-35	53
14.0'					
15'	Very dense brown sand and gravel, trace of silt - moist	3A	14.0-15.5	16-21-35	56
20'		4A	19.0-20.0	80-20/1"	100+
25'		5A	24.0-25.0	32-65	97
30'		6A	29.0-30.5	20-38-44	82

(Continued on next page)

METHOD: HOLLOW STEM AUGER
TECHNICIAN: RG-BCM
JOB NO.: 26098 (11s)

WATER OBSERVATIONS
INITIAL DEPTH: *
COMPLETION DEPTH: 42.0'
DEPTH AFTER: ____ HRS. **

TYPE SAMPLER:
X A. SPLIT SPOON
___ B.
___ C. SHELBY TUBE

*40.0'(trace); 43.0'(heavy)
**See piezometric log sheet

BOWSER – MORNER
TESTING LABORATORIES, INC.

LOG OF BORING NO. 2-N (North Lagoon)(second sheet)

SOIL TEST BORINGS AND PIEZOMETER INSTALLATIONS AT WASTE WATER LAGOONS,
DELCO AIR CONDITIONING SOUTH PLANT, MORAINE, OHIO

BORING LOCATION: As Shown On Boring Location Plan **DATE STARTED:** 2/9/81

SURFACE ELEVATION: 736.3' **DATE COMPLETED:** 2/9/81

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
30'	(Continued)				
		7A	34.0-34.5	100	100+
35'					
40'		8A	39.0-40.5	30-42-30	72
	(Becomes wet at 43.0')				
45'		9A	44.0-45.0	45-55	100
		10A	49.0-50.0	32-68	100
50'	Bottom of boring at 50.0'				
55'					
60'					

METHOD: HOLLOW STEM AUGER
TECHNICIAN: RG-BCM
JOB NO.: 26098 (11s)

WATER OBSERVATIONS
INITIAL DEPTH: *
COMPLETION DEPTH: 42.0'
DEPTH AFTER: ____ HRS. **

TYPE SAMPLER:
X A. SPLIT SPOON
___ B.
___ C. SHELBY TUBE

*40.0'(trace); 43.0'(heavy)
**See piezometric log sheet

BOWSER – MORNER
TESTING LABORATORIES, INC.

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PIEZOMETRIC LOG OF BORING NO. 2-N (North Lagoon)

SOIL TEST BORINGS AND PIEZOMETER INSTALLATIONS AT WASTE WATER LAGOONS, DELCO AIR CONDITIONING SOUTH PLANT, MORAINE, OHIO

BORING LOCATION: As Shown On Boring Location Plan **DATE INSTALLED:** 2/11/81

TOP OF PIPE ELEVATION: 738.6'

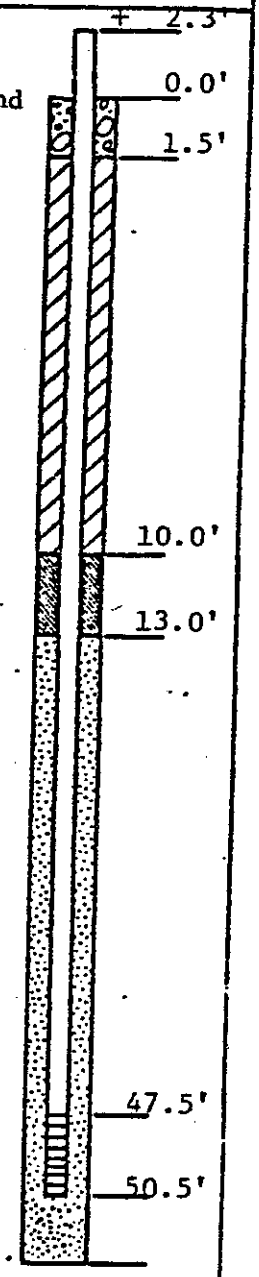
SURFACE ELEVATION: 736.3'

TYPE OF PIEZOMETER: 1 1/4" PVC pipe with 20-slot well screen

DATE	WATER SURFACE DEPTH (FT.)	WATER SURFACE ELEV. (FT.)	REMARKS
2-9	40.5'	695.8'	
2-11	41.1'	695.2'	
2-12	40.2'	696.1'	
2-17	41.1'	695.2'	
2-19	39.9'	696.4'	
3-30	38.0'	700.3'	
4-08	44.5'	693.8'	
4-13	41.1'	697.2'	
4-14	41.8'	696.5'	
4-23	40.8'	697.5'	
4-24	40.8'	697.5'	
4-27	40.8'	697.5'	
5-01	40.7'	697.6'	

INSTALLATION DESCRIPTION

DEPTH	SOIL DESCRIPTION
0.0'	Brown sand and gravel



TECHNICIAN: RG

JOB NO: 26098 (11s)

GUARD PIPE
FILL
SAND FILTER
BENTONITE PLUG
GROUT

LOG OF BORING NO. 1-S (South Lagoon)

SOIL TEST BORINGS AND PIEZOMETER INSTALLATIONS AT WASTE WATER LAGOONS, DELCO AIR CONDITIONING SOUTH PLANT, MORAINE, OHIO

BORING LOCATION: As Shown On Boring Location Plan **DATE STARTED:** 2/12/81

SURFACE ELEVATION: 724.6' **DATE COMPLETED:** 2/12/81

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	(FILL) Sand and gravel				
0.5'	(FILL) Very dense brown sand and gravel, some silt - moist	1A	0.0- 0.5	100/5"	100+
5'	(Becomes loose with trace of cobble at 4.0')	2A	4.0- 5.5	7- 6- 4	10
9.0'	(FILL) Very loose brown sand and silt, some gravel - moist	3A	9.0-10.5	3- 2- 2	4
10' 15.0'	(ORIGINAL) Very dense brown sand and gravel, trace of silt - moist	4A	14.0-15.5	14-21-33	54
20'		5A	19.0-20.0	38-62	100
25'		6A	24.0-25.0	65-35	100
29.0' 30'	Very dense brown sand, trace of gravel - moist (Continued on next page)	7A	29.0-30.5	30-33-37	70

METHOD: HOLLOW STEM AUGER

TECHNICIAN: RG-BC

JOB NO.: 26098 (11s)

WATER OBSERVATIONS

INITIAL DEPTH: 38.5' (heavy)

COMPLETION DEPTH: 39.8'

DEPTH AFTER: _____ HRS. *

TYPE SAMPLER:

X A. SPLIT SPOON

_____ B.

_____ C. SHELBY TUBE

*See piezometric log sheet

BOWSER – MORNER
TESTING LABORATORIES, INC.

LOG OF BORING NO. 1-S (South Lagoon) (second sheet)

SOIL TEST BORINGS AND PIEZOMETER INSTALLATIONS AT WASTE WATER LAGOONS, DELCO AIR CONDITIONING SOUTH PLANT, MORAINE, OHIO

BORING LOCATION: As Shown On Boring Location Plan **DATE STARTED:** 2/12/81

SURFACE ELEVATION: 724.6' **DATE COMPLETED:** 2/12/81

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
30'	(Continued)				
33.0'	Very dense brown sand and gravel, trace of silt - damp	8A	34.0-35.0	40-60	100
35'					
38.5'	Very dense brown sand, trace of gravel - wet	9A	39.0-40.5	28-35-37	72
40'					
44.0'	Very dense brown sand and gravel, trace of silt - wet	10A	44.0-44.5	100	100+
45'		11A	49.0-49.5	100	100+
50'	Bottom of boring at 49.5'				
55'					
60'					

METHOD: HOLLOW STEM AUGER

TECHNICIAN: RG-BC

JOB NO.: 26098 (11s)

WATER OBSERVATIONS

INITIAL DEPTH: 38.5' (heavy)

COMPLETION DEPTH: 39.8'

DEPTH AFTER: _____ HRS. *

TYPE SAMPLER:

X A. SPLIT SPOON

_____ B.

_____ C. SHELBY TUBE

*See piezometric log sheet

BOWSER – MORNER
TESTING LABORATORIES, INC.

PIEZOMETRIC LOG OF BORING NO. 1-S (South Lagoon)

SOIL TEST BORINGS AND PIEZOMETER INSTALLATIONS AT WASTE WATER LAGOONS, DELCO AIR CONDITIONING SOUTH PLANT, MORAINE, OHIO

BORING LOCATION: As Shown On Boring Location Plan **DATE INSTALLED:** 2-12-81

TOP OF PIPE ELEVATION: 727.1'

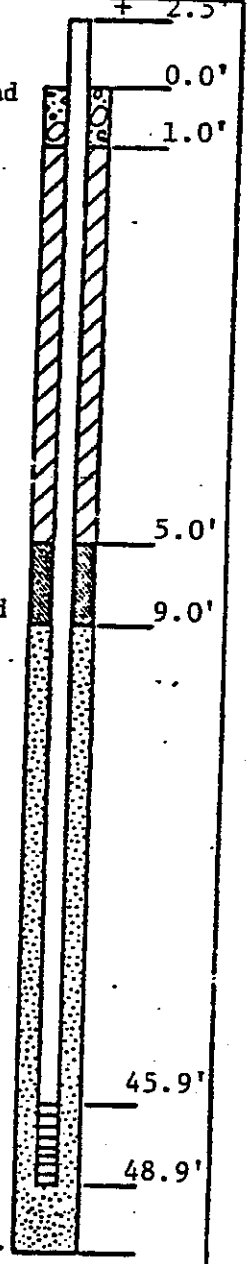
SURFACE ELEVATION: 724.6'

TYPE OF PIEZOMETER: 1 1/4" PVC pipe with 20-slot well screen

DATE	WATER SURFACE DEPTH (FT.)	WATER SURFACE ELEV. (FT.)	REMARKS
2-12	39.8'	684.8'	
2-17	35.8'	688.8'	
2-19	34.8'	689.8'	
3-30	36.0'	691.1'	
4-08	44.7'	682.4'	
4-13	36.9'	690.2'	
4-14	36.2'	690.9'	
4-23	35.2'	691.9'	
4-24	35.3'	691.8'	
4-27	35.3'	691.8'	
5-01	35.2'	691.8'	

INSTALLATION DESCRIPTION

DEPTH	SOIL DESCRIPTION
0.0'	Brown sand and gravel (fill)
9.0'	Brown sand and silt (fill)
15.0'	Brown sand & gravel (original)



TECHNICIAN: RG

NO: 26098 (11s)

GUARD PIPE
FILL
SAND FILTER
BENTONITE PLUG
GROUT

LOG OF BORING NO. 2-S (South Lagoon)

SOIL TEST BORINGS AND PIEZOMETER INSTALLATIONS AT WASTE WATER LAGOONS, DELCO AIR CONDITIONING SOUTH PLANT, MORAINE, OHIO

BORING LOCATION: As Shown On Boring Location Plan **DATE STARTED:** 2/17/81

SURFACE ELEVATION: 726.2' **DATE COMPLETED:** 2/17/81

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
0.0'	Topsoil				
1.0'	Medium dense brown sand and silt, trace of clay - moist	1A	1.0- 2.5	3- 4- 7	11
4.0'	Very dense brown sand and gravel, trace of silt - damp (With trace of cobbles from 4.0' to 10.0')	2A	4.0- 5.0	40-60/5"	100+
5'					
10'		3A	9.0-10.5	30-41-30/3'	71+
	(Becomes moist at 14.0')				
15'		4A	14.0-15.5	21-32-47	79
20'		5A	19.0-20.5	21-30-34	64
		6A	24.0-25.0	64-36/3"	100+
25'					
30'		7A	29.0-30.5	21-20-32	52

(Continued on next page)

METHOD: HOLLOW STEM AUGER

TECHNICIAN: BB-BCM

JOB NO.: 26098 (11s)

WATER OBSERVATIONS

INITIAL DEPTH: *

COMPLETION DEPTH: 37.5'

DEPTH AFTER: ____ HRS. **

TYPE SAMPLER:

X A. SPLIT SPOON

____ B.

____ C. SHELBY TUBE

*24.0'(trace); 36.0'(heavy)

**See piezometric log sheet

BOWSER – MORNER
TESTING LABORATORIES, INC.

LOG OF BORING NO. 2-S (South Lagoon) (second sheet)

SOIL TEST BORINGS AND PIEZOMETER INSTALLATIONS AT WASTE WATER LAGOONS, DELCO AIR CONDITIONING SOUTH PLANT, MORAINE, OHIO

BORING LOCATION: As Shown On Boring Location Plan **DATE STARTED:** 2/17/81

SURFACE ELEVATION: 726.2' **DATE COMPLETED:** 2/17/81

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6" ON SAMPLER	"N" BLOWS /FT. OR CORE REC.
30'	(Continued)				
35'		8A	34.0-35.0	60-40/2"	100+
40'	(Becomes dense and wet at 39.0')	9A	39.0-40.5	15-19-31	50
42.0'	Very dense brown sand, trace of silt, trace of gravel - wet				
45'		10A	44.0-45.5	18-25-31	56
50'		11A	49.0-50.5	26-31-30	61
55'		12A	54.0-55.5	40-35-25/2"	60+
59.0' 60'	Very dense brown sand, some gravel, trace of silt - wet	13A	59.0-60.5	31-40-40	80
	Bottom of boring at 60.5'				

METHOD: HOLLOW STEM AUGER

TECHNICIAN: BB-BC

JOB NO.: 2609 8 (11s)

WATER OBSERVATIONS

INITIAL DEPTH: *

COMPLETION DEPTH: 37.5'

DEPTH AFTER: ____ HRS. **

TYPE SAMPLER:

X A. SPLIT SPOON

___ B.

___ C. SHELBY TUBE

*24.0' (trace); 36.0' (heavy)

**See piezometric log sheet

BOWSER – MORNER
TESTING LABORATORIES, INC.

PIEZOMETRIC LOG OF BORING NO. 2-S (South Lagoon)

SOIL TEST BORINGS AND PIEZOMETER INSTALLATIONS AT WASTE WATER LAGOONS, DELCO AIR CONDITIONING SOUTH PLANT, MORAINE, OHIO

BORING LOCATION: As Shown On Boring Location Plan **DATE INSTALLED:** 2-17-81

TOP OF PIPE ELEVATION: 728.2'

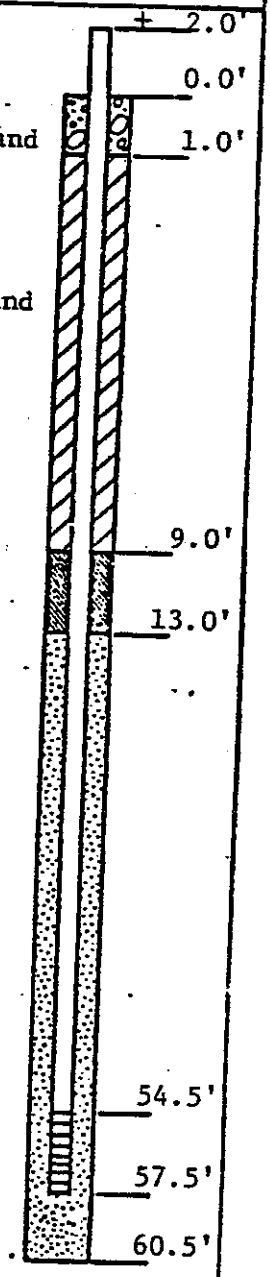
SURFACE ELEVATION: 726.2'

TYPE OF PIEZOMETER: 1 1/4" PVC pipe with 20-slot well screen

DATE	WATER SURFACE DEPTH (FT.)	WATER SURFACE ELEV. (FT.)	REMARKS
2-17	37.5'	688.7'	
2-19	36.7'	689.5'	
3-30	40.0'	688.2'	
4-08	41.8'	686.4'	
4-13	39.2'	689.0'	
4-14	38.2'	690.0'	
4-23	37.7'	690.5'	
4-24	37.7'	690.5'	
4-27	37.6'	690.6'	
5-01	37.6'	690.6'	

INSTALLATION DESCRIPTION

DEPTH	SOIL DESCRIPTION
0.0	Topsoil
1.0	Brown sand and silt
4.0	Brown sand and gravel
42.0	Brown sand



TECHNICIAN: BB-BC

NO: 26098 (11s)

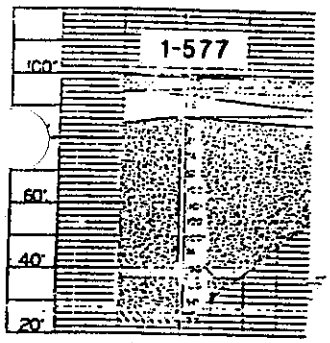
GUARD PIPE

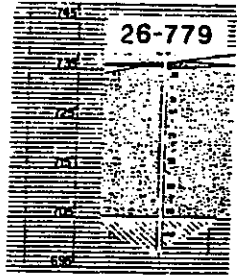
FILL

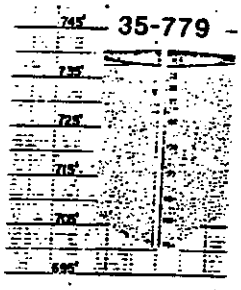
SAND FILTER

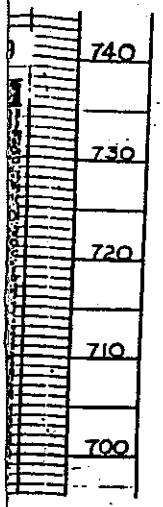
BENTONITE PLUG

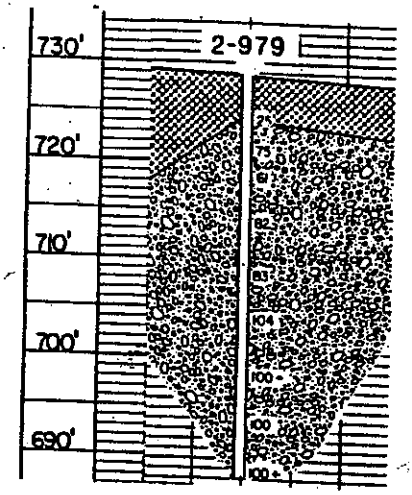
GROUT

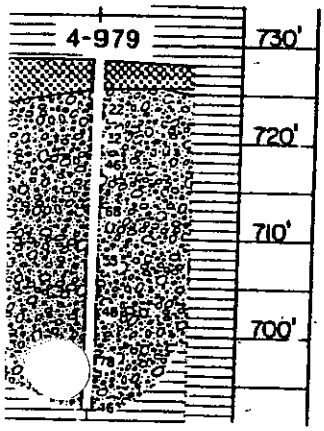


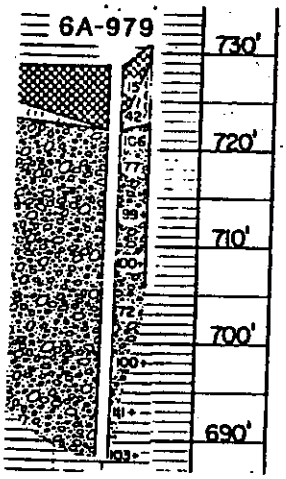


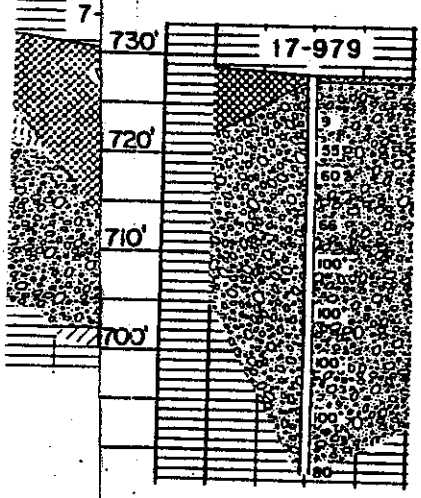


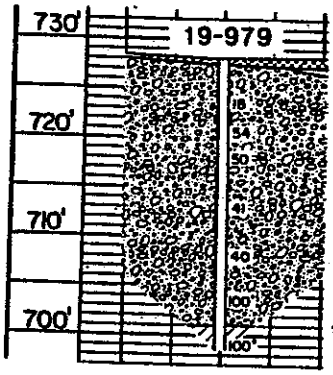


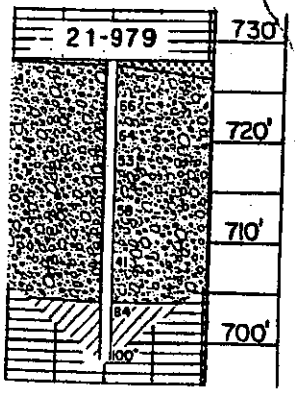


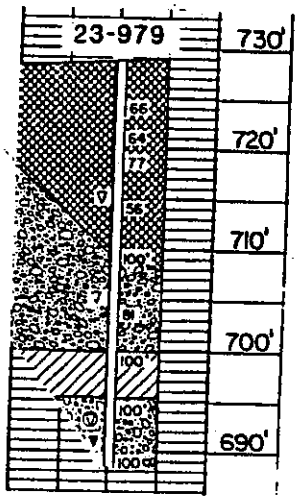












LEGEND

- TOPSOIL
- FILL
- ALLUVIUM
- SAND AND GRAVEL
- GRAY AND BROWN TIL

REVISIONS

BY / DATE

BOWSER - MORNER

DAYTON • TOLEDO • MAYSVILLE, KY.

PREVIOUS BORING SOIL PROFILES

DRAWN BY NLP	DATE 5/4/81	DELCO AIR CONDITIONING PLANT, SOUTH MORAINE, OHIO
APPROVED BY	DATE	
SCALE GRAPHIC	FIGURE 3	PROJECT NO. 26100

ARCADIS

Section 19

Geraghty & Miller Boring Logs

EA1-BH01, EA2-BH01
BDG-DP1 TO 19
BD15-DP1 TO DP3
AST-BH1 TO BH2
OH-B1 TO BH20
BKG-BH01 TO BH14
T10-BH01A TO BH01C
T11-BH01 TO BH03
WPSA-BH01 TO BH07
T5/6-BH01 TO BH02
LWB-BH01
FA-BH01 TO BH02
L1-GS01-02WT TO GS05
L2-GS01-02WT TO GS03
L3-GS01-02WT TO GS03
DD-GS01-05SD TO GS02

EA-1-BH01 & EA2-BH01

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: EA1-BH01

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Description
0				*No recovery – moved location 1 foot to east and started again.
	6-11-14-17	1.0	10.0	***FILL:*** 0-2 ft; silt and gravel, trace of clay, dry, hard, dark brown, roots, gravelly, limestone at bottom of spoon.
	6-16-10-13	1.5	68.0	***FILL:*** 2-4 ft; sand and gravel, dark brown, trace clay dry, loose, fine to coarse gravel, sub-round to sub-angular, poorly sorted.
5	17-15-6-13	1.33	68.0	***FILL:*** 4-6 ft; clay, sandy (20%); dry, brown, slightly plastic, hard.
	6-10-10-6	1.58	115.0	***FILL:*** 6-8 ft; sand and gravel, brown, dry, fine to coarse, poorly sorted, sub-round, color change at 7', darker brown.
	10-22 24-34	1.33	50.0	***FILL:*** 8-9 ft; clay, brown, very sandy (~50%) and gravelly, dry.
10				***FILL:*** 9-10 ft; sand and gravel, some clay, dry, brown, fine to coarse gravel, poorly sorted, sub-round.
	47-50/2	0.25	5.8	***SAND (with gravel):*** 10-12 ft; brown, dry, medium gray, moderately sorted, with 20-30% gravel, loose, sub-round. (Poor Recovery)
	9-10-40-48	1.0	9.0	***SAND & GRAVEL:*** 12-14 ft; fine to coarse gravel, loose, dry, poorly sorted, sub-round, brown, native soil.
15				BOTTOM OF HOLE 14.0 ft.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drillers
Geologist: S. Clouse
Begin Drilling: 08/28/97
Driller: Cord/Conrad
Total Depth: 14.0
End Drilling: 08/28/97
Drilling Method: Hollow-Stem Auger
Surface Elev.:
Converted to Well: No
Drilling Fluid: None
Datum:
Well Name:
Remarks:
West Coor.:
South Coor.:

OH0294.001.002

Disk: GM (1); File: EA1-BH01; (rev: 10/28/97)

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: EA2-BH01

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
0						***ASPHALT:*** 0–0.2 ft.
	5-14-20-30	0.5	9.4			***FILL:*** 0.2–3 ft; sand and gravel, gray, poorly sorted, sub-round, loose, fine to coarse grain, dry.
	25-15-50/2	0.5	6.4			***REFUSAL:*** 3–4 ft; will move 3' to North of location.
5	7-20-30-35	0.5	25.0			***FILL:*** 4–6 ft; sand and gravel poorly sorted, fine to cobble size, brown, dry, round to sub-round.
	21-27-23-11	0.5	68.0			***FILL:*** 6–8 ft; sand and gravel, same as above.
	1-6	0.75	4.0			***FILL:*** 8–10 ft; clay brown, moist, plastic with some gravel, last 3" asphalt, moist.
10	0	50/3	NR			***REFUSAL:*** 10–12 ft; No Recovery.
	4-3-4-1	1.25	4.5			***FILL:*** 12–14 ft: –3" asphalt, slightly moist to wet. –10" sand and gravel, poorly sorted, moist to wet, fine to coarse gravel. –2" clay, brown, hard, plastic, moist, with 30% gravel and sand, coarse, gray.

■ Sample to Lab ▯▯ Sample Not Analyzed

Drilling Co.: Belasco Drillers
Geologist: S. Clouse
Begin Drilling: 08/28/97
Driller: Cord/Conrad
Total Depth: 24.0
End Drilling: 08/28/97
Drilling Method: Hollow-Stem Auger
Surface Elev.:
Converted to Well: No
Drilling Fluid: None
Datum:
Well Name:
Remarks:
West Coor.:
South Coor.:

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: EA2-BH01

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
14	10-9-12-8	0	NR			***NO RECOVERY:*** 14-16 ft.
	24-7-13-13	0.17	4.0			***FILL:*** 16-18 ft; sand and gravel, gray, dry, loose, sub-round to sub-angular, poorly sorted, fine to coarse, gray.
						NO RECOVERY: 18-20 ft.
19	15-20-30-15	0	NR			
	26-6-19-9	0.42	1.0			***SAND & GRAVEL:*** 20-22 ft; looks like native soil, fine to coarse grain, dry, brown, loose, sub-round, poorly sorted. (Drilling Easier).
	15-32-50/4	1.0	3.2			***SAND & GRAVEL:*** 22-24 ft; same as above.
24						BOTTOM OF HOLE 24.0 ft.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drillers
Driller: Cord/Conrad
Drilling Method: Hollow-Stem Auger
Drilling Fluid: None
Remarks:

Geologist: S. Clouse
Total Depth: 24.0
Surface Elev.:
Datum:
West Coor.:

Begin Drilling: 08/28/97
End Drilling: 08/28/97
Converted to Well: No
Well Name:
South Coor.:

OH0294.001.002

Disk: GM (1); File: EA2-BH01; (rev: 10/28/97)

BDG-DP1 to 19

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: BDG-DP1

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
0	N/A	0	N/A			***NO RECOVERY:*** 0–4 ft.
5	N/A	2.0	0			***CLAY, GRAVEL & SAND:*** 4–8 ft; sand (fine to medium) 30%; gravel (fine to medium) 30%; silt/clay 40%; moderate yellowish brown, moist, loose–pliable.
10						BOTTOM OF HOLE 8.0 ft.

■ Sample to Lab ◫ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Wade/Ray
Drilling Method: Direct Push
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 8.0
Surface Elev.: 729.4619
Datum: Mean Sea Level
North Coor.: 2403.11022

Begin Drilling: 02/19/98
End Drilling: 02/19/98
Converted to Well: No
Well Name:
East Coor.: 8064.08994

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: BDG-DP2

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
0	N/A	0.5	0			***CLAY & SILT:*** 0-4 ft; silt and clay 90%; gravel (fine), 10%; moderate yellowish brown, wet, pliable.
5	N/A	3.5	0			***CLAY & SILT:*** 4-8 ft; silt and clay 60%; gravel (fine to coarse) 20%; sand (fine to coarse) 20%; dark yellowish brown, wet, pliable, loose.
10						BOTTOM OF HOLE 8.0 ft.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Wade/Ray
Drilling Method: Direct Push
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 8.0
Surface Elev.:
Datum:
North Coor.:

Begin Drilling: 02/18/98
End Drilling: 02/18/98
Converted to Well: No
Well Name:
East Coor.:

OH000284.0001.0002

F:/APPS/GT3/GMCRI/BDG-DP2 (Rev:5/18/98)

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: BDG-DP3

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
0	N/A	1.5	0			***GRAVEL & SAND:*** 0–4 ft; gravel 50% (coarse); sand 40% (fine to coarse); silt and clay 10%; dusky yellowish brown, slightly moist, loose.
5	N/A	2.0	0			***CLAY & SILT:*** 4–8 ft; silt and clay 70%; sand 30% (fine to medium); dusky yellowish brown, slightly moist, pliable.
10						BOTTOM OF HOLE 8.0 ft.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Wade/Ray
Drilling Method: Direct Push
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 8.0
Surface Elev.: 729.3107
Datum: Mean Sea Level
North Coor.: 2447.27921

Begin Drilling: 02/17/98
End Drilling: 02/17/98
Converted to Well: No
Well Name:
East Coor.: 6370.29528

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: BDG-DP4

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
0	N/A	3.0	0			***CLAY & SILT:*** 0-4 ft; silt and clay 90%; gravel 10% (coarse); moderate yellowish brown, moist, pliable.
5	N/A	3.0	0			***CLAY & SILT:*** 4-8 ft; silt and clay 60%; sand 20% (fine to coarse); gravel 20% (fine to coarse); dark yellowish brown, slightly moist, pliable.
						BOTTOM OF HOLE 8.0 ft.
10						

■ Sample to Lab ◧ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Wade/Ray
Drilling Method: Direct Push
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 8.0
Surface Elev.: 729.2791
Datum: Mean Sea Level
North Coor.: 2324.60440

Begin Drilling: 02/17/98
End Drilling: 02/17/98
Converted to Well: No
Well Name:
East Coor.: 6336.47745

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: BDG-DP5

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
0	N/A	3.0	0			***CLAY & SILT:*** 0-4 ft; silt and clay 70%; gravel 30% (medium to coarse); dark yellowish brown, moist, pliable.
5	N/A	2.0	0			***CLAY & SILT:*** 4-8 ft; silt and clay 70%; sand 20% (fine to medium); gravel 10% (fine); moderate yellowish brown, moist, pliable.
10						BOTTOM OF HOLE 8.0 ft.

■ Sample to Lab ◫ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Wade/Ray
Drilling Method: Direct Push
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 8.0
Surface Elev.: 729.0853
Datum: Mean Sea Level
North Coor.: 2308.25622

Begin Drilling: 02/18/98
End Drilling: 02/18/98
Converted to Well: No
Well Name:
East Coor.: 6213.92937

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: BDG-DP6

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
0	N/A	2.0	0			***CLAY & SILT:*** 0-4 ft: silt and clay 90%; sand 10% (fine to medium), moderate yellowish brown, slightly damp, pliable.
5	N/A	1.5	0			***GRAVEL & SAND:*** 4-8 ft: gravel 50% (medium to coarse); sand 30% (fine to coarse); silt and clay 20%; moderate yellowish brown, damp to wet, loose/pliable.
						BOTTOM OF HOLE 8.0 ft.
10						

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Wade/Ray
Drilling Method: Direct Push
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 8.0
Surface Elev.: 729.2783
Datum: Mean Sea Level
North Coor.: 2303.65699

Begin Drilling: 02/17/98
End Drilling: 02/17/98
Converted to Well: No
Well Name:
East Coor.: 8335.91285

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: BDG-DP7

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
0	N/A	1.5	0			***CLAY & SILT:*** 0–4 ft; silt and clay 90%; gravel 10% (medium); moderate yellowish brown, damp, pliable.
5	N/A	2.0	0			***CLAY & SILT:*** 4–8 ft; SAME AS ABOVE.
						BOTTOM OF HOLE 8.0 ft.
10						

■ Sample to Lab ◧ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Wade/Ray
Drilling Method: Direct Push
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 8.0
Surface Elev.: 729.2792
Datum: Mean Sea Level
North Coor.: 2306.51814

Begin Drilling: 02/17/98
End Drilling: 02/17/98
Converted to Well: No
Well Name:
East Coor.: 6367.99687

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: BDG-DP8

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
0	N/A	2.0	0			***GRAVEL & SAND:*** 0–4 ft; sand 70% (fine to coarse); gravel 30% (fine to coarse); moderate yellowish brown, moist, loose.
5	N/A	2.0	0			***GRAVEL & SAND:*** 4–8 ft; SAME AS ABOVE.
						BOTTOM OF HOLE 8.0 ft.
10						

■ Sample to Lab ◫ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Wade/Ray
Drilling Method: Direct Push
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 8.0
Surface Elev.: 729.2562
Datum: Mean Sea Level
North Coor.: 2241.13094

Begin Drilling: 02/18/98
End Drilling: 02/18/98
Converted to Well: No
Well Name:
East Coor.: 6002.68047

OH000294.0001.0002

F:/APPS/GT3/GMCRI/BDG-DP8 (Rev:5/18/98)

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: BDG-DP9

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
0	N/A	3.0	0			***CLAY & SILT:*** 0–4 ft; silt and clay 60%; sand 20% (fine to coarse); gravel 20% (fine to coarse); moderate yellowish brown, moist, pliable.
5	N/A	2.0	0			***CLAY & SILT:*** 4–8 ft; SAME AS ABOVE.
10						BOTTOM OF HOLE 8.0 ft.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Wade/Ray
Drilling Method: Direct Push
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 8.0
Surface Elev.: 729.3417
Datum: Mean Sea Level
North Coor.: 2198.64205

Begin Drilling: 02/18/98
End Drilling: 02/18/98
Converted to Well: No
Well Name:
East Coor.: 6224.14754

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: BDG-DP10

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
0	N/A	2.0	0			***CLAY & SILT:*** 0-4 ft; silt and clay 60%; sand 40% (fine to coarse); moderate yellowish brown, damp, pliable.
5	N/A	2.0	0			***CLAY & SILT:*** 4-8 ft; SAME AS ABOVE.
						BOTTOM OF HOLE 8.0 ft.
10						

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Wade/Ray
Drilling Method: Direct Push
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 8.0
Surface Elev.: 729.3227
Datum: Mean Sea Level
North Coor.: 2244.83481

Begin Drilling: 02/17/98
End Drilling: 02/17/98
Converted to Well: No
Well Name:
East Coor.: 8336.69841

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: BDG-DP11

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
0	N/A	2.0	0			***CLAY & SILT:*** 0–4 ft; silt and clay 80%; sand 20% (fine to medium); moderate yellowish brown, moist, pliable
5	N/A	2.0	0			***SAND:*** 4–8 ft; sand 60% (fine to coarse); gravel 10% (fine to medium); silt and clay 30%; dark yellowish brown, wet, pliable.
10						BOTTOM OF HOLE 8.0 ft.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Wade/Ray
Drilling Method: Direct Push
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 8.0
Surface Elev.: 728.2953
Datum: Mean Sea Level
North Coor.: 2185.44454

Begin Drilling: 02/17/98
End Drilling: 02/17/98
Converted to Well: No
Well Name:
East Coor.: 6336.22690

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: BDG-DP12

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
0	N/A	1.5	0			***CLAY & SILT:*** 0-4 ft; silt and clay 90%; sand 10% (fine); dark yellowish brown, moist, pliable.
5	N/A	3.0	0			***CLAY & SILT:*** 4-8 ft; SAME AS ABOVE.
10						BOTTOM OF HOLE 8.0 ft.

■ Sample to Lab ◫ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Wade/Ray
Drilling Method: Direct Push
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 8.0
Surface Elev.: 729.3048
Datum: Mean Sea Level
North Coor.: 2168.23853

Begin Drilling: 02/17/98
End Drilling: 02/17/98
Converted to Well: No
Well Name:
East Coor.: 6359.16523

OH000284.0001.0002

F:/APPS/GT3/GMCRI/BDG-DP12 (Rev:5/18/98)

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: BDG-DP13

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
0	N/A	2.0	0			***CLAY & SILT:*** 0-4 ft; silt and clay 60%; sand 20% (fine to medium); gravel 20% (fine to medium); dark yellowish brown, moist, pliable, very slight black and orange stains; black particles at top 4".
5	N/A	2.0	0			***CLAY & SILT:*** 4-8 ft; silt and clay 80%; sand 10% (fine to medium); gravel 10% (fine to coarse); dark yellowish brown, moist, pliable.
10						BOTTOM OF HOLE 8.0 ft.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Wade/Ray
Drilling Method: Direct Push
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 8.0
Surface Elev.: 729.2391
Datum: Mean Sea Level
North Coor.: 2089.83542

Begin Drilling: 02/19/98
End Drilling: 02/19/98
Converted to Well: No
Well Name:
East Coor.: 6024.14404

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: BDG-DP14

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
0	N/A	2.0	0			***SAND:*** 0–4 ft; sand 60% (fine to coarse); gravel 20% (fine to medium); silt and clay 20%; dusky yellowish brown, moist, loose. (Includes coal-like fragments, very dark in color compared to other depths)
5	N/A	2.5	0			***CLAY & SILT:*** 4–8 ft; silt and clay 70%; sand 20% (fine to coarse); gravel 10% (fine); dark-dusky yellowish brown, moist, pliable.
10						BOTTOM OF HOLE 8.0 ft.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Wade/Ray
Drilling Method: Direct Push
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 8.0
Surface Elev.: 729.4668
Datum: Mean Sea Level
North Coor.: 1930.82830

Begin Drilling: 02/18/98
End Drilling: 02/18/98
Converted to Well: No
Well Name:
East Coor.: 6050.94853

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: BDG-DP15

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
0	N/A	2.0	0			***CLAY & SILT:*** 0-4 ft; silt and clay 60%; sand 20% (fine to medium); gravel 20% (fine to medium); moderate brown to dusky yellowish brown, moist, cohesive. Considerable blackness, possible staining.
5	N/A	3.5	0			***CLAY & SILT:*** 4-8 ft; silt and clay 70%; sand 30% (fine to medium); dark yellowish brown, moist, cohesive. Some black staining toward top of interval (~4 ")
10						BOTTOM OF HOLE 8.0 ft.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Wade/Ray
Drilling Method: Direct Push
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 8.0
Surface Elev.: 729.3930
Datum: Mean Sea Level
North Coor.: 1927.70141

Begin Drilling: 02/19/98
End Drilling: 02/19/98
Converted to Well: No
Well Name:
East Coor.: 8166.77222

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: BDG-DP16

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
0	N/A	2.0	0			***CLAY & SILT:*** 0-4 ft; silt and clay 60%; sand 30% (fine to medium); gravel 10% (fine to medium); dark yellowish brown, moist, pliable, some dark staining, and black crumbly particles.
5	N/A	2.5	0			***CLAY & SILT:*** 4-8 ft; SAME AS ABOVE, except no black crumbly particles.
10						BOTTOM OF HOLE 8.0 ft.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Wade/Ray
Drilling Method: Direct Push
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 8.0
Surface Elev.: 729.1928
Datum: Mean Sea Level
North Coor.: 1936.82799

Begin Drilling: 02/19/98
End Drilling: 02/19/98
Converted to Well: No
Well Name: 6
East Coor.: 6277.32627

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: BDG-DP17

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
0	N/A	2.0	0			***CLAY & SILT:*** 0–4 ft; silt and clay 90%; gravel 10% (fine); dark yellowish brown, moist, pliable.
5	N/A	2.0	0			***GRAVEL & SAND:*** 4–8 ft; sand 50% (fine to medium); gravel 30% (fine to coarse); silt and clay 20%; moderate yellowish brown, moist, loose.
10						BOTTOM OF HOLE 8.0 ft.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Wade/Ray
Drilling Method: Direct Push
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 8.0
Surface Elev.: 724.5194
Datum: Mean Sea Level
North Coor.: 1794.19922

Begin Drilling: 02/18/98
End Drilling: 02/18/98
Converted to Well: No
Well Name:
East Coor.: 6040.16097

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: BDG-DP18

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
0	N/A	2.0	0			***SAND:*** 0-4 ft: sand 80% (fine to medium); gravel 10% (fine to medium); silt and clay 10%; dark yellowish brown, damp, loose.
5	N/A	2.0	0			***SAND:*** 4-8 ft: SAME AS ABOVE.
10						BOTTOM OF HOLE 8.0 ft.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Wade/Ray
Drilling Method: Direct Push
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 8.0
Surface Elev.: 724.8746
Datum: Mean Sea level
North Coor.: 1795.28986

Begin Drilling: 02/18/98
End Drilling: 02/18/98
Converted to Well: No
Well Name:
East Coor.: 6265.28682

OH000294.0001.0002

F:/APPS/GT3/GMCRI/BDG-DP18 (Rev:5/18/98)

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Log of Boring: BDG-DP19

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
0						***SAND:*** 0-4 ft: sand 70% (fine to medium); gravel 20% (fine to medium); silt and clay 10%; moderate yellowish brown, damp, loose.
	N/A	2.0	0			
						SAND: 4-8 ft: SAME AS ABOVE.
5						
	N/A	3.0	0			
						BOTTOM OF HOLE 8.0 ft.
10						

■ Sample to Lab ◫ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Wade/Ray
Drilling Method: Direct Push
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 8.0
Surface Elev.: 724.4834
Datum: Mean Sea Level
North Coor.: 1794.37774

Begin Drilling: 02/18/98
End Drilling: 02/18/98
Converted to Well: No
Well Name:
East Coor.: 6309.10035

BD15-DP1 to DP3

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: BD15-DP1

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
0	N/A	1.0	0			***GRAVEL & SAND:*** 0-4 ft; sand 40% (fine to coarse); gravel 50% (fine to medium); silt and clay 10%; moderate yellowish brown, damp, loose.
5	N/A	2.0	0			***GRAVEL:*** 4-8 ft; gravel 80% (medium); sand 15% (fine); silt and clay 5%; moderate yellowish brown, damp, very loose.
10						BOTTOM OF HOLE 8.0 ft.

■ Sample to Lab ◧ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Wade/Ray
Drilling Method: Direct Push
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 8.0
Surface Elev.: 724.6781
Datum: Mean Sea Level
North Coor.: 1612.28681

Begin Drilling: 02/19/98
End Drilling: 02/19/98
Converted to Well: No
Well Name:
East Coor.: 6082.19378

OH000294.0001.0002

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Environmental Services

Log of Boring: BD15-DP2

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
0	N/A	2.0	0			***GRAVEL & SAND:*** 0-4 ft; sand 30% (fine to medium); gravel 30% (fine to coarse); silt and clay 40%; moderate to dark yellowish brown, moist, loose to cohesive.
5	N/A	3.0	0			***SAND:*** 4-8 ft; sand 70% (fine to medium); gravel 20% (medium to coarse); silt and clay 10%; moderate yellowish brown, slightly moist, very loose.
10						BOTTOM OF HOLE 8.0 ft.

■ Sample to Lab ◧ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Wade/Ray
Drilling Method: Direct Push
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 8.0
Surface Elev.: 724.5368
Datum: Mean Sea Level
North Coor.: 1597.89979

Begin Drilling: 02/19/98
End Drilling: 02/19/98
Converted to Well: No
Well Name:
East Coor.: 6079.49321

OH000294.0001.0002

F:/APPS/GT3/GMCRI/BD15-DP2 (Rev:5/18/98)

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Log of Boring: BD15-DP3

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
0	N/A	3.0	0			***CLAY & SILT:*** 0-4 ft; silt and clay 60%; sand 20% (fine to medium); gravel 20% (fine to medium); moderate-dark yellowish brown, moist, loose to pliable. Some possible staining and very black portions (1-2").
5	N/A	2.0	0			***GRAVEL & SAND:*** 4-8 ft; sand 60% (fine to medium); gravel 30% (medium to coarse); silt and clay 10%; moderate yellowish brown, slightly moist, very loose. Some very black particles (5%) similar to that in (0-4').
						BOTTOM OF HOLE 8.0 ft.
10						

■ Sample to Lab ▯▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Wade/Ray
Drilling Method: Direct Push
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 8.0
Surface Elev.: 724.6666
Datum: Mean Sea Level
North Coor.: 1585.71541

Begin Drilling: 02/19/98
End Drilling: 02/19/98
Converted to Well: No
Well Name:
East Coor.: 6083.41104

OH000294.0001.0002

F:/APPS/GT3/GMCRI/BD15-DP3 (Rev:5/18/98)

AST-BH1 to BH2

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: AST-BH1

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
0	3-4-4-7	1.5	0	■		***CLAY & SILT:*** 0–2 ft; silt and clay 70%; sand 15% (fine to medium); gravel 15% (fine to coarse); moderate yellowish brown, moist, pliable, some mottling and black staining.
	5-5-6-8	1.5	0			***CLAY & SILT:*** 2–4 ft; silt and clay 80%; sand 20% (fine to medium); moderate yellowish brown, moist, pliable.
5	5-8-8-12	1.5	0			***CLAY & SILT:*** 4–6 ft; silt and clay 70%; sand 15% (fine to medium); gravel 15% (fine to coarse); moderate yellowish brown, moist, pliable, some black staining.
	10-12-18-18	1.5	0			***CLAY & SILT:*** 6–8 ft; silt and clay 80%; sand 20% (fine to medium); gravel 20% (fine to coarse); moderate yellowish brown–gray, moist, loose to pliable.
	20-23-35-40	1.3	0			***CLAY & SILT:*** 8–10 ft; SAME AS ABOVE.
10	30-45-50/3"	0.8	0			***GRAVEL & SAND:*** 10–12 ft; sand 50% (fine to medium); gravel 40% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	20-21-18-35	1.0	0			***GRAVEL & SAND:*** 12–14 ft; sand 60% (fine to medium); gravel 40% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Geologist: W.J. Ferguson
Begin Drilling: 02/19/98
Driller: Dave/Russ
Total Depth: 24.0
End Drilling: 02/19/98
Drilling Method: Hollow Stem Auger
Surface Elev.: 724.6108
Converted to Well: No
Drilling Fluid: None
Datum: Mean Sea Level
Well Name:
Remarks:
North Coor.: 1512.24875
East Coor.: 5956.79270

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: AST-BH1

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
14	23-45-60/5"	1.0	0			***GRAVEL & SAND:*** 14–16 ft; sand 40% (fine to medium); gravel 50% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	25-18-23-28	1.3	0			***GRAVEL & SAND:*** 16–18 ft; sand 40% (fine to medium); gravel 50% (fine to coarse); silt and clay 10%; moderate yellowish brown–pale yellowish brown, moist, loose.
19	30-18-12-20	0.6	0			***GRAVEL & SAND:*** 18–20 ft; sand 50% (fine to medium); gravel and rock 50%, rock pieces have moderate pink color to gray color; moderate yellowish brown, moist, loose.
	21-30-20-31	1.0	0			***GRAVEL & SAND:*** 20–22 ft; sand 50% (fine to medium); gravel 40% (fine to medium); silt and clay 10%; moderate yellowish brown, very damp, loose–cohesive.
	10-35-25-38	1.0	0			***GRAVEL & SAND:*** 22–24 ft; SAME AS ABOVE, except very wet.
24						BOTTOM OF HOLE 24.0 ft.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Dave/Russ
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 24.0
Surface Elev.: 724.8108
Datum: Mean Sea Level
North Coor.: 1512.24875

Begin Drilling: 02/19/98
End Drilling: 02/19/98
Converted to Well: No
Well Name:
East Coor.: 5956.79270

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: AST-BH2

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
0	3-3-5-5	1.5	0	■		***CLAY & SILT:*** 0-2 ft; silt and clay 70%; sand 15% (fine to medium); gravel 15% (fine to medium); moderate yellowish brown, moist, pliable, some black and orange staining.
	4-5-5-8	0.1	0	■		***CLAY & SILT:*** 2-4 ft; SAME AS ABOVE, very little recovery.
5	1-3-5-8	0.1	0			***CLAY, SAND, & SILT:*** 4-6 ft; silt and clay 50%; sand 50% (fine to medium); dark yellowish brown, very wet.
	1'-2-3	1.2	0			***CLAY & SILT:*** 6-8 ft; silt and clay 60%; sand 40% (fine to medium); dark yellowish brown, wet, pliable.
	3-6-8-7	0.2	0			***CLAY & SILT:*** 8-10 ft; SAME AS ABOVE.
10	3-6-8-9	1.5	0			***SAND:*** 10-12 ft; sand 80% (fine to medium); silt and clay 20%; moderate yellowish brown, moist, loose.
	4-8-28-38	1.0	0			***SAND:*** 12-14 ft; SAME AS ABOVE.

■ Sample to Lab ◧ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Dave/Russ
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 24.0
Surface Elev.: 724.2162
Datum: Mean Sea Level
North Coor.: 1451.28631

Begin Drilling: 02/19/98
End Drilling: 02/19/98
Converted to Well: No
Well Name:
East Coor.: 5982.59774

OH000294.0001.0002

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Log of Boring: AST-BH2

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
14	8-21-28-30	1.0	0			***GRAVEL & SAND:*** 14-16 ft; sand 50% (fine to medium); gravel 40% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.
	13-48-40-30	1.0	0			***GRAVEL & SAND:*** 16-18 ft; sand 50% (fine to coarse); gravel 40% (fine to coarse); silt and clay 10%; moderate-pale yellowish brown, moist, loose.
19	25-40-80/4"	0.5	0			***GRAVEL & SAND:*** 18-20 ft; sand 40% (fine to coarse); gravel 50%; silt and clay 10%; moderate yellowish brown-light gray, moist, loose, some orange staining.
	20-21-25-22	1.0	0			***GRAVEL & SAND:*** 20-22 ft; sand 40% (fine to coarse); gravel 40% (fine to medium); silt and clay 20%; moderate yellowish brown, very moist, loose-cohesive.
	5-13-17-25	1.0	0			***GRAVEL & SAND:*** 22-24 ft; SAME AS ABOVE, except very moist to wet.
24						BOTTOM OF HOLE 24.0 ft.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Dave/Russ
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 24.0
Surface Elev.: 724.2162
Datum: Mean Sea Level
North Coor.: 1451.28631

Begin Drilling: 02/19/98
End Drilling: 02/19/98
Converted to Well: No
Well Name:
East Coor.: 5982.59774

OH000294.0001.0002

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OH-BH1 to BH20

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH1

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
0	9-17-27-34	1.5	0			***GRAVEL & SAND:*** 0-2 ft; gravel 50% (fine to very coarse); sand 40% (fine to medium); silt and clay 10%; moderate yellowish brown and light gray, very slightly moist, loose.
	23-25-30-10	1.2	2.0			***GRAVEL & SAND:*** 2-4 ft; SAME AS ABOVE.
5	21-29-30-35	1.5	0			***GRAVEL & SAND:*** 4-6 ft; SAME AS ABOVE, except now moist.
	16-20-37-25	1.5	4.0			***GRAVEL & SAND:*** 6-8 ft; sand 60% (fine to medium); gravel 30% (fine to medium) silt and clay 10%; moderate yellowish brown to light gray, moist, loose.
	10-20-30-35	1.2	3.0			***GRAVEL & SAND:*** 8-10 ft; sand 40% (fine to medium); gravel 50% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
10	15-18-16-28	1.5	0			***GRAVEL & SAND:*** 10-12 ft; sand 60% (fine to medium); gravel 30% (fine to medium); silt and clay 10%; moderate to yellowish brown, moist, loose.
	20-18-16-16	0.8	3.0			***GRAVEL & SAND:*** 4-6 ft; SAME AS ABOVE.
15	7-10-17-35	1.8	4.0			***SAND:*** 14-16 ft; sand 85% (fine to medium); gravel 5% (fine); silt and clay 10%; moderate to dark yellowish brown, moist, loose.
	16-14-19-30	1.5	2.0			***GRAVEL & SAND:*** 16-18 ft; sand 40% (fine to medium); gravel 50% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.

■ Sample to Lab ◫ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Dave/Russ
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 32.0
Surface Elev.: 736.3303
Datum: Mean Sea Level
North Coor.: 5866.95245

Begin Drilling: 02/23/98
End Drilling: 02/23/98
Converted to Well: No
Well Name:
East Coor.: 8014.07818

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH1

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
18	13-24-35-25	1.5	3.0			***GRAVEL & SAND:*** 18-20 ft; sand 30% (fine to medium); gravel 60% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.
	8-20-50/5"	1.0	2.0			***GRAVEL & SAND:*** 20-22 ft; SAME AS ABOVE.
23	10-25-30-28	1.5	2.0			***GRAVEL & SAND:*** 22-24 ft; sand 30% (fine to medium); gravel 60% (fine to medium); silt and clay 10%; moderate-pale yellowish brown, very moist, loose.
	45-50/3"	0.4	0.5			***GRAVEL & SAND:*** 24-26 ft; gravel 60% (fine to medium); sand 30% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.
	14-15-22-45	1.5	3.0			***GRAVEL & SAND:*** 26-28 ft; sand 70% (fine to medium); gravel 20% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.
28	23-38-32-38	1.5	3.0	■		***GRAVEL & SAND:*** 28-30 ft; sand 60% (fine to coarse); gravel 30% (fine to medium); silt and clay 10%; moderate yellowish brown, very moist, loose-cohesive.
	15-18-29-35	1.5	1.0			***GRAVEL & SAND:*** 30-32 ft; SAME AS ABOVE, but wet.
33						BOTTOM OF HOLE 32.0 ft.

■ Sample to Lab ◧ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Dave/Russ
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 32.0
Surface Elev.: 738.3303
Datum: Mean Sea Level
North Coor.: 5866.95245

Begin Drilling: 02/23/98
End Drilling: 02/23/98
Converted to Well: No
Well Name:
East Coor.: 6014.07818

OH000294.0001.0002

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ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH2

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
0						***ASPHALT:*** 0-1 ft.
	7-8-3-3	1.0	0			***GRAVEL & SAND:*** 1-3 ft; sand 40% (fine to medium); gravel 40% (fine to medium); silt and clay 20%; moderate yellowish brown, moist, loose-cohesive.
	7-4-8-15	0.9	0			***GRAVEL & SAND:*** 3-5 ft; SAME AS ABOVE.
5	5-13-35-45	0.8	0			***GRAVEL & SAND:*** 5-7 ft; SAME AS ABOVE.
	12-24-36-30	1.0	0			***GRAVEL & SAND:*** 7-9 ft; SAME AS ABOVE.
10	16-30-35-35	1.0	0			***GRAVEL & SAND:*** 9-11 ft; SAME AS ABOVE.
	17-25-25-24	1.0	0			***GRAVEL & SAND:*** 11-13 ft; sand 40% (fine to medium); gravel 50% (fine to very coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	12-32-34-36	1.0	0			***GRAVEL & SAND:*** 13-15 ft; SAME AS ABOVE.
15	47-27-25-24	N/A	0			***GRAVEL & SAND:*** 14-16 ft; gravel 60% (fine to medium); sand 30% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.
	12-24-18-17	1.0	0			***GRAVEL & SAND:*** 17-19 ft; gravel 50% (fine to medium); sand 40% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.

■ Sample to Lab ◧ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Dave/Russ
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 31.0
Surface Elev.: 735.1401
Datum: Mean Sea Level
North Coor.: 5697.71195

Begin Drilling: 02/20/98
End Drilling: 02/20/98
Converted to Well: No
Well Name:
East Coor.: 5971.76229

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH2

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
19	33-28-26-23	0.5	0			***GRAVEL & SAND:*** 19-21 ft; gravel 70% (very coarse); sand 20% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.
	17-20-30-40	0.75	0			***GRAVEL & SAND:*** 21-23 ft; SAME AS ABOVE.
24	17-25-50/5"	0.75	0			***GRAVEL & SAND:*** 23-25 ft; sand 60% (fine to medium); gravel 30% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.
	32-40-50/4"	0.9	0			***GRAVEL & SAND:*** 25-27 ft; sand 40% (fine to medium); gravel 50% (fine to coarse); silt and clay 10%; moderate yellowish brown-orange brown, moist, loose.
	48-47-50/5	0.1	0			***GRAVEL & SAND:*** 27-29 ft; sand 50% (fine to medium); gravel 30% (fine to medium); silt and clay 20%; moderate yellowish brown, moist, cohesive.
29	20-30 50/5"	0.1	0			***GRAVEL & SAND:*** 29-31 ft; SAME AS ABOVE, except moist to wet.
						BOTTOM OF HOLE 31.0 ft.
34						

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Dave/Russ
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 31.0
Surface Elev.: 735.1401
Datum: Mean Sea Level
North Coor.: 5897.71195

Begin Drilling: 02/20/98
End Drilling: 02/20/98
Converted to Well: No
Well Name:
East Coor.: 5971.76229

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH3

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
0	12-25-28-15	1.2	0	■		***GRAVEL & SAND:*** 0-2 ft; sand 40% (fine to medium); gravel 50% (fine to very coarse); silt and clay 10%; moderate yellowish brown to light gray, very moist, loose.
	12-11-11-22	1.2	1.0			***SAND:*** 2-4 ft; sand 75% (fine to medium); gravel 15% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.
5	22-50/11"	0.4	0			***SAND:*** 4-6 ft; SAME AS ABOVE.
	15-18-25-36	1.3	0.5			***GRAVEL & SAND:*** 6-8 ft; sand 40% (fine to medium); gravel 50% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	18-25-35-31	1.0	0.5			***GRAVEL & SAND:*** 8-10 ft; sand 40% (fine to medium); gravel 50% (fine to very coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
10	12-14-17-29	1.2	1.0			***GRAVEL & SAND:*** 10-12 ft; SAME AS ABOVE.
	20-22-28-28	1.2	1.0			***GRAVEL & SAND:*** 12-14 ft; SAME AS ABOVE.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Dave/Russ
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 26.0
Surface Elev.: 734.8044
Datum: Mean Sea Level
North Coor.: 5865.36216

Begin Drilling: 02/23/98
End Drilling: 02/23/98
Converted to Well: No
Well Name:
East Coor.: 6140.19178

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH3

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
14	16-20-30-38	1.5	1.0			***GRAVEL & SAND:*** 14-16 ft; sand 50% (fine to medium); gravel 40% (fine to very coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	10-25-31-40	1.0	0.5			***GRAVEL & SAND:*** 16-18 ft; SAME AS ABOVE.
19	13-30-31-38	1.2	0.5			***GRAVEL & SAND:*** 18-20 ft; sand 40% (fine to coarse); gravel 50% (fine to very coarse); silt and clay 10%; moderate yellowish brown to light gray, moist, loose.
	40-42-50/3"	1.0	0.5			***GRAVEL & SAND:*** 20-22 ft; sand 40% (fine to coarse); gravel 50% (fine to very coarse); silt and clay 10%; dark yellowish brown, moist, loose.
	18-14-18-20	1.0	0.5			***CLAY & SILT:*** 22-24 ft; silt and clay 80%; sand 20% (fine to medium); gravel 20% (fine to very coarse); moderate yellowish brown to light gray, very moist, loose-cohesive.
24	12-18-21-35	1.3	0.5			***CLAY & SILT:*** 24-26 ft; silt and clay 70%; sand 15% (fine); gravel 15% (fine); moderate yellowish brown, very moist to wet, cohesive.
						BOTTOM OF HOLE 26.0 ft.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Dave/Russ
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 26.0
Surface Elev.: 734.8044
Datum: Mean Sea Level
North Coor.: 5665.36216

Begin Drilling: 02/23/98
End Drilling: 02/23/98
Converted to Well: No
Well Name:
East Coor.: 8140.19178

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH4

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
0	22-18-29-35	1.0	0			***GRAVEL & SAND:*** 0-2 ft; sand 60% (fine to medium); gravel 30% (fine to medium); silt and clay 10%; moderate yellowish brown to light gray, moist, loose.
	16-9-5-17	1.3	0			***GRAVEL & SAND:*** 2-4 ft; sand 60% (fine to medium); gravel 20% (fine to medium); silt and clay 20%; moderate yellowish brown, moist, loose-cohesive.
5	14-12-8-11	1.3	1.0			***SAND:*** 4-6 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	12-16-23-28	1.5	1.0			***SAND:*** 6-8 ft; SAME AS ABOVE.
	48-50/4"	0.7	0			***GRAVEL & SAND:*** 8-10 ft; sand 60% (fine to medium); gravel 30% (fine to very coarse); silt and clay 10%; moderate yellowish brown to light gray, slightly moist, loose.
10	25-30-28-15	1.2	0			***GRAVEL & SAND:*** 10-12 ft; sand 50% (fine to medium); gravel 40% (fine to medium); silt and clay 10%; moderate yellowish brown, slightly moist, loose.
	10-18-15-25	1.0	0.5			***GRAVEL & SAND:*** 12-14 ft; gravel 60% (fine to medium); sand 30% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Dave/Russ
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 28.0
Surface Elev.: 729.8784
Datum: Mean Sea Level
North Coor.: 5174.76492

Begin Drilling: 02/23/98
End Drilling: 02/23/98
Converted to Well: No
Well Name:
East Coor.: 6009.44632

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH4

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	(ppm)	Sample	Graphic Log	Description
14	25-21-35-35	1.0	0.5			***SAND:*** 14-16 ft; sand 70% (fine to medium); gravel 20% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose-cohesive.
	50/3"	0.2	0.5			***GRAVEL & SAND:*** 16-18 ft; sand 40% (fine to medium); gravel 50% (fine to very coarse); silt and clay 10%; moderate yellowish brown to light gray, moist, loose.
19	35-37-21-25	1.3	0.5			***GRAVEL & SAND:*** 18-20 ft; sand 60% (fine to coarse); gravel 30% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.
	13-27-32-35	1.5	1.0			***GRAVEL & SAND:*** 20-22 ft; SAME AS ABOVE.
	11-27-35-30	1.5	0.5	■		***SILTY GRAVEL & SAND:*** 22-24 ft; sand 30% (fine to medium); gravel 40% (fine to medium); silt and clay 30%; moderate yellowish brown, very moist, loose-cohesive.
24	18-45-40-35	2.0	0.5	■		***SILTY GRAVEL & SAND:*** 24-26 ft; sand 50% (fine to medium); gravel 25% (fine to medium); silt and clay 25%; moderate yellowish brown, wet, cohesive.
						BOTTOM OF HOLE 26.0 ft.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Dave/Russ
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 26.0
Surface Elev.: 729.8784
Datum: Mean Sea Level
North Coor.: 5174.76492

Begin Drilling: 02/23/98
End Drilling: 02/23/98
Converted to Well: No
Well Name:
East Coor.: 6009.44632

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH5

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
0	6-13-19-22	1.0	0	■		***SAND & GRAVEL:*** 0-2 ft; sand 50% (fine to medium); gravel 40% (fine to coarse); silt and clay 10%; moderate yellowish brown to dark yellowish brown, moist, loose.
	8-16-16-12	1.0	0			***SAND & GRAVEL:*** 2-4 ft; SAME AS ABOVE.
5	9-12-13-12	1.0	0.5			***SAND & GRAVEL:*** 4-6 ft; sand 60% (fine to medium); gravel 30% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.
	10-11-21-29	1.2	1.0			***SAND & GRAVEL:*** 6-8 ft; sand 70% (fine to coarse); gravel 20% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.
	10-13-21-29	1.5	1.5			***SAND & GRAVEL:*** 8-10 ft; sand 70% (fine to coarse); gravel 20% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.
10	20-17-13-22	1.0	2.0			***SAND & GRAVEL:*** 10-12 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	24-36-24-37	1.0	2.0			***SAND & GRAVEL:*** 12-14 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
15	24-53-36-24	1.2	1.0			***SAND & GRAVEL:*** 14-16 ft; sand 60% (fine to coarse); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 36.0
Surface Elev.: 734.7921
Datum: Mean Sea Level
North Coor.: 5629.74918

Begin Drilling: 08/14/98
End Drilling: 08/14/98
Converted to Well: No
Well Name:
East Coor.: 6038.35587

OH000294.0001.0002

G:/GMOTORS/GMCFRI/GTGS/OH-BH5 (Rev:12/18/

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH5

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
16	11-11-13-19	0.8	1.0			***SAND & GRAVEL:*** 16-18 ft; sand 60% (fine to coarse); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	26-35-50	1.0	3.0			***SAND & GRAVEL:*** 18-20 ft; sand 60% (fine to coarse); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
21	17-27-50	1.0	3.0			***SAND & GRAVEL:*** 20-22 ft; sand 60% (fine to coarse); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	27-17-50	1.0	2.0			***SAND & GRAVEL:*** 22-24 ft; sand 60% (fine to medium); gravel 30% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.
	0-10-21-38	0.8	3.2			***SAND & GRAVEL:*** 24-26 ft; sand 70% (fine to coarse); gravel 20% (fine); silt and clay 10%; moderate yellowish brown, moist, loose.
26	27-28-38-38	1.0	0.5			***SAND & GRAVEL:*** 26-28 ft; sand 70% (fine to coarse); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, wet, loose.
	7-6-7-6	0.7	0.5			***SAND & GRAVEL:*** 28-30 ft; sand 60% (fine to medium); gravel 30% (fine to medium); silt and clay 10%; moderate yellowish brown, wet, loose.
31	21-25-27-20	1.2	7.5			***SAND:*** 30-32 ft; sand 25% (medium to coarse); sand 50% (fine); gravel 15% (fine); silt and clay 10%; moderate yellowish brown except gray in fine sand on bottom 4 inches, wet, loose-cohesive, 3mm layer of black staining in fine sand ~6" above bottom.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 38.0
Surface Elev.: 734.7921
Datum: Mean Sea Level
North Coor.: 5629.74918

Begin Drilling: 08/14/98
End Drilling: 08/14/98
Converted to Well: No
Well Name:
East Coor.: 6038.35587

OH000294.0001.0002

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ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH5

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
32		1.3	8.0			***SAND & GRAVEL:*** 32–33.5 ft; sand 80% (fine to medium); gravel 10% (fine to coarse); silt and clay 10%; dark yellowish brown, wet, loose.
						SILT & CLAY: 33.5–34 ft; silt and clay 80%; sand 20% (fine); dark yellowish brown, very moist to wet, pliable.
	10-17-15-18	1.2	4.5			***SAND & GRAVEL:*** 34–36 ft; sand 75% (fine to coarse); gravel 10% (coarse); silt and clay 15%; dark yellowish brown and gray, wet, loose–pliable.
						SAND: 36–37.5 ft; sand 80% (fine to coarse); gravel 5% (fine); silt and clay 15%; gray, wet, loose–cohesive.
37	7-12-15-18	1.8	13.0/4.0			***TILL:*** 37.5–38 ft; silt and clay 80%; gravel 10% (fine); sand 10% (fine); gray, slightly moist, very cohesive.
						TOTAL DEPTH: 38 ft.
42						
47						

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 38.0
Surface Elev.: 734.7921
Datum: Mean Sea Level
North Coor.: 5629.74918

Begin Drilling: 08/14/98
End Drilling: 08/14/98
Converted to Well: No
Well Name:
East Coor.: 6038.35587

ARCADIS GERAGHTY & MILLER

Soil/Sediment/Sludge Sampling Log

Project/

Site Location: RFI/General Motors Corporation, Moraine, Ohio

Date: 8/14/98

Project No.: OH000294.0001.00002

Sample No.: OH-BH5-2/SL

Coded Replicate No.:

Time Sampling Began: 9:00

Time Sampling Ended: 9:02

Sampling Method and Material: 2' Stainless steel split-spoon

From	To	Soil/Sediment/Sludge Description
		See lithologic log

OTHER (OVA; HNu; etc.): 0 ppm

Constituents Sampled	Container Description	Preservative
Soil - VOCs 8240 shortlist	4 oz glass jar	Cool

Remarks:

Sample Personnel: W. Ferguson

ARCADIS GERAGHTY & MILLER

Soil/Sediment/Sludge Sampling Log

Project/

Site Location: RFI/General Motors Corporation, Moraine, Ohio

Date: 8/14/98

Project No.: OH000294.0001.00002

Sample No.: OH-BH5-20/SL

Coded Replicate No.:

Time Sampling Began: 10:30

Time Sampling Ended: 10:33

Sampling Method and Material: 2' Stainless steel split-spoon

From	To	Soil/Sediment/Sludge Description
		See lithologic log

OTHER (OVA; HNu; etc.): 3.0 ppm

Constituents Sampled	Container Description	Preservative
Soil - VOCs 8240 shortlist	4 oz glass jar	Cool

Remarks:

Sample Personnel: W. Ferguson

ARCADIS GERAGHTY & MILLER

Soil/Sediment/Sludge Sampling Log

Project/		Date	8/14/98
Site Location	RFI/General Motors Corporation, Moraine, Ohio	Project No.	OH000294.0001.00002
Sample No.	OH-BH5-26/SL	Coded Replicate No.	
Time Sampling Began	10:55	Time Sampling Ended	11:30

Sampling Method and Material: 2' Stainless steel split-spoon and hydropunch

From	To	Soil/Sediment/Sludge Description
		See lithologic log

OTHER (OVA; HNu; etc.) 3.2 ppm

Constituents Sampled	Container Description	Preservative
Soil - VOCs 8240 shortlist	4 oz glass jar	Cool
HP - VOCs 8240 shortlist	3-40 ml glass vials	HCl, Cool

Remarks: Took hydropunch OH-BH5-37/HP (time 11:30) description: brown, very turbid

Sample Personnel: W. Ferguson

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH6

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
0	9-11-11-8	1.5	4.5	■		***SAND & GRAVEL:*** 0-2 ft; sand 70% (fine to coarse); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose, contained also 2 inches very black odorous sand and gravel near middle of spoon.
	12-11-18-18	0.75	1.5	■		***SAND & GRAVEL:*** 2-4 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
5	17-28-50/4"	0.75	1.5	■		***SAND & GRAVEL:*** 4-6 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; light to moderate yellowish brown, moist, loose.
	18-38-28-50	1.0	4.5	■		***SAND & GRAVEL:*** 6-8 ft; sand 70% (fine to coarse); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	17-19-15-10	0.25	4.5	■		***SAND & GRAVEL:*** 8-10 ft; sand 60% (fine to medium); gravel 30% (coarse); silt and clay 10%; moderate yellowish brown to light gray, moist, loose.
10	10-31-49-39	1.0	2.0	▯		***SAND & GRAVEL:*** 10-12 ft; sand 70% (fine to coarse); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, very moist, loose-cohesive.
	26-26-42-32	1.5	4.0	▯		***SAND & GRAVEL:*** 12-14 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Geologist: W.J. Ferguson
Total Depth: 32
Surface Elev.: 732.3313
Datum: Mean Sea Level
Begin Drilling: 08/12/98
End Drilling: 08/12/98
Converted to Well: No
Well Name:
Remarks:
North Coor.: 5524.47665
East Coor.: 6024.49274

OH000294.0001.0002

I:/GMOTORS/GMCRI/GTGS/OH-BH6 (12/18/98)

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH6

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
14	12-17-28-25	1.8	2.5			***SAND & GRAVEL:*** 14-16 ft; sand 75% (fine to coarse); gravel 15% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.
	10-16-22-28	1.0	3.0			***SAND & GRAVEL:*** 16-18 ft; sand 70% (fine to coarse); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown to light gray, moist, loose-cohesive.
19	16-32-50	0.75	3.5			***SAND & GRAVEL:*** 18-20 ft; sand 75% (fine to coarse); gravel 15% (fine to medium); silt and clay 10%; moderate yellowish brown to light gray, moist, loose.
	11-37-36-35	1.0	4.5			***SAND & GRAVEL:*** 20-22 ft; sand 60% (fine to coarse); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown to light gray, moist, loose.
	16-20 25-28	1.2	7.0			***SAND & GRAVEL:*** 22-24 ft; sand 75% (fine to medium); gravel 15% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
24	4-15-14-13	1.0	1.5			***SAND & GRAVEL:*** 24-26 ft; sand 80% (fine to coarse); gravel 10% (fine); silt and clay 10%; moderate yellowish brown, wet, loose-cohesive.
	25-31-30-28	1.2	0.5			***SAND & GRAVEL:*** 26-28 ft; sand 70% (fine to coarse); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, wet, loose-cohesive.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 32
Surface Elev.: 732.3313
Datum: Mean Sea Level
North Coor.: 5524.47665

Begin Drilling: 08/12/98
End Drilling: 08/12/98
Converted to Well: No
Well Name:
East Coor.: 6024.49274

OH000294.0001.0002

I:/GMOTORS/GMCRI/GTGS/OH-BH6 (12/18/98)

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH6

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
28	6-16-21-18	1.2	22.0			***SAND:*** 28-30 ft; sand 85% (fine to medium); gravel 5% (medium); silt and clay 10%; moderate yellowish brown except for bottom 5 inches where color is dark gray to black and odorous; no visible separate phase or sheen, wet, loose.
	6-15-20-50	2.0				30-31.5 ft.: completely stained black
					× × × ×	***TILL:*** 31.5-32 ft; silt and clay 90%; sand 5% (fine); gravel 5% (fine); dark gray with some black and orange staining; very moist, very cohesive.
33						***TOTAL DEPTH:*** 32 ft.
38						

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Geologist: W.J. Ferguson
Total Depth: 32
Surface Elev.: 732.3313
Datum: Mean Sea Level
Begin Drilling: 08/12/98
End Drilling: 08/12/98
Converted to Well: No
Well Name:
Remarks:
North Coor.: 5524.47665
East Coor.: 6024.49274

OH000294.0001.0002

I:/GMOTORS/GMCRI/GTGS/OH-BH6 (12/18/98)

ARCADIS GERAGHTY & MILLER

Soil/Sediment/Sludge Sampling Log

Project/
Site Location: RFI/General Motors Corporation, Moraine, Ohio

Date: 8/12/98
Project No.: OH000294.0001.00002

Sample No.: OH-BH6-2/SL
Coded Replicate No.: DUP60

Time Sampling Began: 9:50
Time Sampling Ended: 10:00

Sampling Method and Material: 2' Stainless steel split-spoon

From	To	Soil/Sediment/Sludge Description
		See lithologic log

OTHER (OVA; HNu; etc.): 4.5 ppm

Constituents Sampled	Container Description	Preservative
Soil - VOCs 8240 shortlist	4 oz glass jar	Cool

Remarks: DUP60: (time 9:55) - OHBH6-2/SL RB37: (time 9:00) prior to OHBH6-2/SL

Sample Personnel: W. Ferguson

ARCADIS GERAGHTY & MILLER

Soil/Sediment/Sludge Sampling Log

Project/		Date	8/12/98
Site Location	RFI/General Motors Corporation, Moraine, Ohio	Project No.	OH000294.0001.00002
Sample No.	OH-8H6-8/SL	Coded Replicate No.	
Time Sampling Began	11:00	Time Sampling Ended	11:02

Sampling Method and Material: 2' Stainless steel split-spoon

From	To	Soil/Sediment/Sludge Description
		See lithologic log

OTHER (OVA; HNu; etc.) 4.5 ppm

Constituents Sampled	Container Description	Preservative
Soil - VOCs 8240 shortlist	4 oz glass jar	Cool

Remarks

Sample Personnel: W. Ferguson

ARCADIS GERAGHTY & MILLER

Soil/Sediment/Sludge Sampling Log

Project/		Date	8/12/98
Site Location	RFI/General Motors Corporation, Moraine, Ohio	Project No.	OH000294.0001.00002
Sample No.	OH-BH6-24/SL	Coded Replicate No.	
Time Sampling Began	11:40	Time Sampling Ended	14:00

Sampling Method and Material: 2' Stainless steel split-spoon and hydropunch

From	To	Soil/Sediment/Sludge Description
		See lithologic log

OTHER (OVA; HNu; etc.) 7 ppm

Constituents Sampled	Container Description	Preservative
Soil - VOCs 8240 shortlist	4 oz glass jar	Cool
HP - VOCs 8240 shortlist	3-40 ml glass vials	HCl, Cool

Remarks: MS102: OH-BH6-24SL (time 11:40) MSD102: OH-BH6-24SL (time 11:40)
Took hydropunch OH-BH6-31.5/HP (time 14:00) description: moderately turbid; brown

Sample Personnel: W. Ferguson

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH7

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
0						***CONCRETE:*** 0-0.5 ft;
	8-80	1.0	0.5	■		***SAND & GRAVEL:*** 0.5-2 ft; sand 50% (fine to coarse); gravel 40% (fine to coarse); silt and clay 10%; light yellowish brown to light gray, moist, loose.
	8-26-39-46	2.0	0			***SAND & GRAVEL:*** 2-4 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown to light gray, moist, loose, slight orange staining.
5	25-50/3"	.5	0.5			***SAND & GRAVEL:*** 4-6 ft; same as above except no staining
	15-34-30-37	1.0	1.0			***SAND & GRAVEL:*** 6-8 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	7-18-34-37	1.5	2.0			***SAND & GRAVEL:*** 8-10 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown to light gray, moist, loose.
10	15-25-35-37	1.5	7.0			***SAND & GRAVEL:*** 10-12 ft; sand 40% (fine to medium); gravel 50% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	20-21-44-28	1.0	3.0			***SAND & GRAVEL:*** 12-14 ft; sand 70% (fine to coarse); gravel 20% (fine to coarse); silt and clay 10%; moderate to light yellowish brown, moist, loose.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 31.5
Surface Elev.: 730.0450
Datum: Mean Sea Level
North Coor.: 5283.81666

Begin Drilling: 08/10/98
End Drilling: 08/10/98
Converted to Well: No
Well Name:
East Coor.: 6017.83429

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH7

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
14	17-25-28-30	1.5	8.0			***SAND & GRAVEL:*** 14-16 ft; sand 60% (fine to medium); gravel 30% (fine to medium); silt and clay 10%; moderate yellowish brown to light gray, moist, loose.
	23-26-28-30	1.2	8.0			***SAND & GRAVEL:*** 16-18 ft; sand 60% (fine to coarse); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown to light gray, moist, loose.
19	48-29-25-38	1.2	19.0			***SAND & GRAVEL:*** 18-20 ft; sand 70% (fine to coarse); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown to light gray, moist, loose.
	2-12-17-19	1.1	10.0			***SAND & GRAVEL:*** 20-22 ft; sand 70% (fine to coarse); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, very moist, loose.
	10-12-15-20	1.5	2.0			***SAND & GRAVEL:*** 22-24 ft; sand 75% (medium to coarse); gravel 15% (fine to coarse); silt and clay 10%; dark yellowish brown, very moist to wet, loose.
24	5-25-31-14	1.5	0			***SAND & GRAVEL:*** 24-26 ft; sand 40% (fine to coarse); gravel 50% (fine to coarse); silt and clay 10%; moderate yellowish brown, wet, loose to cohesive.
	12-17-24-36	1.2	8.0			***SAND & GRAVEL:*** 26-28 ft; sand 75% (fine to medium); gravel 10% (fine to medium); silt and clay 15%; moderate yellowish brown, wet, slightly cohesive.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Geologist: W.J. Ferguson
Begin Drilling: 08/10/98
Driller: Ray/Mike
Total Depth: 31.5
End Drilling: 08/10/98
Drilling Method: Hollow Stem Auger
Surface Elev.: 730.0450
Converted to Well: No
Drilling Fluid: None
Datum: Mean Sea Level
Well Name:
Remarks:
North Coor.: 5283.81666
East Coor.: 6017.83429

OH000294.0001.0002

F:/APP/GT3/GMCRI/OH-BH7 (Rev:12/07/98)

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH7

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
28						
	5-12-8-27	1.5	1.0			***SAND:*** 28-30 ft; sand 70% (fine to medium); gravel 10% (fine to medium); silt and clay 20%; moderate yellowish brown, wet, slightly cohesive.
						SAND: 30-30.5 ft; sand 80% (fine to medium); silt and clay 10%; moderate yellowish brown, wet, semi cohesive.
	18-53-127	1.5	4.0 0.0			***TILL:*** 30.5-31.5 ft; silt and clay 80%; gravel 20% (fine to medium); dark gray; moist, very cohesive.
						TOTAL DEPTH: 31.5 ft;
33						
38						

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 31.5
Surface Elev.: 730.0450
Datum: Mean Sea Level
North Coor.: 5283.81666

Begin Drilling: 08/10/98
End Drilling: 08/10/98
Converted to Well: No
Well Name:
East Coor.: 6017.83429

ARCADIS GERAGHTY & MILLER

Soil/Sediment/Sludge Sampling Log

Project/		Date	8/10/98
Site Location	RFI/General Motors Corporation, Moraine, Ohio	Project No.	OH000294.0001.00002
Sample No.	OH-BH7-2/SL	Coded Replicate No.	
Time Sampling Began	14:33	Time Sampling Ended	14:35

Sampling Method and Material: 2' Stainless steel split-spoon

From	To	Soil/Sediment/Sludge Description
		See lithologic log

OTHER (OVA; HNu; etc.) 0.5 ppm

Constituents Sampled	Container Description	Preservative
Soil - VOCs 8240 shortlist	4 oz glass jar	Cool

Remarks

Sample Personnel: W. Ferguson

ARCADIS GERAGHTY & MILLER

Soil/Sediment/Sludge Sampling Log

Project/		Date	8/10/98
Site Location	RFI/General Motors Corporation, Moraine, Ohio	Project No.	OH000294.0001.00002
Sample No.	OH-BH7-20/SL	Coded Replicate No.	
Time Sampling Began	16:00	Time Sampling Ended	16:02

Sampling Method and Material: 2' Stainless steel split-spoon

From	To	Soil/Sediment/Sludge Description
		See lithologic log

OTHER (OVA; HNu; etc.) 19 ppm

Constituents Sampled	Container Description	Preservative
Soil - VOCs 8240 shortlist	4 oz glass jar	Cool

Remarks

Sample Personnel: W. Ferguson

ARCADIS GERAGHTY & MILLER

Soil/Sediment/Sludge Sampling Log

Project/		Date	8/10/98
Site Location	RFI/General Motors Corporation, Moraine, Ohio	Project No.	OH000294.0001.00002
Sample No.	OH-BH7-24/SL	Coded Replicate No.	
Time Sampling Began	16:20	Time Sampling Ended	9:00 (8/11/98)

Sampling Method and Material: 2' Stainless steel split-spoon and hydropunch

From	To	Soil/Sediment/Sludge Description
		See lithologic log

OTHER (OVA; HNu; etc.) 2 ppm

Constituents Sampled	Container Description	Preservative
Soil - VOCs 8240 shortlist	4 oz glass jar	Cool
HP - VOCs 8240 shortlist	3-40 ml glass vials	HCl, Cool

Remarks: Took hydropunch OHBH-7-30/HP (time 9:00) taken with bailer after 3 tries with hydropunch. Last HP was left in overnight. Still no water. Bailer was 1/3 full. Very turbid and silty.

Sample Personnel: W. Ferguson

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH8

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
0						***ASPHALT:*** 0–0.25 ft.
	8-10-8	1.0	0.5			***SAND & GRAVEL:*** 0.25–2 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; medium to dark yellowish brown, moist, loose.
	8-15-25-33	12.0	4.5			***SAND & GRAVEL:*** 2–4 ft; sand 70% (fine to medium); gravel 15% (fine to medium); silt and clay 15%; moderate yellowish brown, moist, loose, very slight black staining near 4 ft.
5	9-13-12-8	0.5	8.0			***SAND & GRAVEL:*** 4–6 ft; sand 60% (fine to medium); gravel 30% (fine to very coarse); silt and clay 10%; dark yellowish brown to light gray, moist, loose.
	6-9-8-8	0.7	1.0			***SAND & GRAVEL:*** 6–8 ft; sand 60% (fine to medium); gravel 25% (fine); silt and clay 15%; dark yellowish brown, moist, loose–semi pliable.
	6-13-16-16	1.0	11.0			***SAND & GRAVEL:*** 8–10 ft; sand 60% (fine to medium); gravel 30% (medium to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
10	19-19-27-29	0.5	2.0			***SAND & GRAVEL:*** 10–12 ft; sand 65% (fine to medium); gravel 20% (fine to coarse); silt and clay 15%; dark yellowish brown, moist, slightly cohesive.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Scott/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 38.0
Surface Elev.: 735.6513
Datum: Mean Sea Level
North Coor.: 5749.14810

Begin Drilling: 08/18/98
End Drilling: 08/18/98
Converted to Well: No
Well Name:
East Coor.: 6005.94093

OH000294.0001.0002

I:/GMOTORS/GMCRI/GTGS/OH-BH8 (12/18/98)

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH8

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
12	10-13-23-33	1.5	12.0	■		***SAND & GRAVEL:*** 12-14 ft; sand 50% (fine to coarse); gravel 40% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose, one spot ~3mm of slight black staining.
	11-8-21-19	0.7	11.0	■		***SAND & GRAVEL:*** 14-16 ft; sand 60% (fine); sand 10% (medium); gravel 20% (fine); silt and clay 10%; moderate yellowish brown, moist, loose.
17	13-19-19-16	1.2	13.0	■		***SAND & GRAVEL:*** 16-18 ft; sand 70% (fine to medium); gravel 20% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.
	7-12-8-8	1.3	10.0			***SAND:*** 18-20 ft; sand 75% (fine to medium); gravel 15% (fine); silt and clay 10%; moderate yellowish brown, moist, loose.
	32-27-25-32-	1.0	9.5			***SAND & GRAVEL:*** 20-22 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; light yellowish brown to light gray, moist, loose; trace dark orange staining.
22	13-33 23-6	1.0	11.5			***SAND & GRAVEL:*** 22-24 ft; sand 40% (fine to medium); gravel 50% (very coarse); silt and clay 10%; light yellowish brown with slight orange staining, moist, loose.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Scott/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 38.0
Surface Elev.: 735.6513
Datum: Mean Sea Level
North Coor.: 5749.14810

Begin Drilling: 08/18/98
End Drilling: 08/18/98
Converted to Well: No
Well Name:
East Coor.: 6005.94093

OH000294.0001.0002

I:/GMOTORS/GMCRI/GTGS/OH-BH8 (12/18/98)

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH8

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
24						
	6-8-7-15	2.0	1.0			***TILL:*** 24-25 ft; silt and clay 80%, gravel 15% (fine); sand 5% (fine); light yellowish brown, moist, cohesive.
						TILL: 25-26 ft; same as above except dark gray.
	9-11-18-40	2.0	1.0			***SILT & CLAY:*** 26-26.5 ft; sand 15% (fine to medium); gravel 10% (fine); silt and clay 75%; moderate yellowish brown, slightly moist, cohesive-pliable.
						TILL: 26.5-27.8 ft; sand 5% (fine); gravel 15% (fine); silt and clay 80%; moderate yellowish brown to gray, slightly moist, cohesive.
						SAND & GRAVEL: 27.8-28.0 ft; sand 30% (fine to medium); gravel 40%; silt and clay 30%; moderate yellowish brown, moist, loose.
29	10-20-22-15	1.2	2.0			***SAND & GRAVEL:*** 28.0-30.0 ft; sand 70% (fine to coarse); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, wet, loose.
	8-19-25-27	1.5	9.5			***SAND:*** 30-32.0 ft; sand 60% (fine); sand 20% (medium to coarse); gravel 10% (fine to coarse); silt and clay 10%; moderate yellowish brown, wet, loose.
	28-26-36-35	1.5	5.0			***SAND & GRAVEL:*** 32-34 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, wet, loose-cohesive.
34						
	9-17-40-40	2.0	4.0			***SAND & GRAVEL:*** 34-36 ft; sand 60% (fine to coarse); gravel 30% (fine to very coarse); silt and clay 10%; moderate yellowish brown except for much black staining on last 3-4 inches, wet, loose.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Geologist: W.J. Ferguson
Begin Drilling: 08/18/98
Driller: Scott/Mike
Total Depth: 38.0
End Drilling: 08/18/98
Drilling Method: Hollow Stem Auger
Surface Elev.: 735.6513
Converted to Well: No
Drilling Fluid: None
Datum: Mean Sea Level
Well Name:
Remarks:
North Coor.: 5749.14810
East Coor.: 6005.94093

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH8

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
36	10-28-31-50	1.5	1.0			***SAND & GRAVEL:*** 36-37.8 ft; sand 60% (fine to coarse); gravel 30% (fine to coarse); silt and clay 10%; gray with much black staining, slight odor, wet, loose.
						TILL: 37.8-38.0 ft; silt and clay 80%; gravel 15% (fine); sand 5% (fine); moderate yellowish brown; slightly moist, very cohesive.
						TOTAL DEPTH: 38.0 ft.
41						
46						

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Scott/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 38.0
Surface Elev.: 735.6513
Datum: Mean Sea Level
North Coor.: 5749.14810

Begin Drilling: 08/18/98
End Drilling: 08/18/98
Converted to Well: No
Well Name:
East Coor.: 6005.94093

OH000294.0001.0002

I:/GMOTORS/GMCRI/GTGS/OH-BH8 (12/18/98)

ARCADIS GERAGHTY & MILLER

Soil/Sediment/Sludge Sampling Log

Project/		Date	8/18/98
Site Location	RFI/General Motors Corporation, Moraine, Ohio	Project No.	OH000294.0001.00002
Sample No.	OH-BH8-2/SL	Coded Replicate No.	
Time Sampling Began	8:50	Time Sampling Ended	8:52

Sampling Method and Material: 2' Stainless steel split-spoon

From	To	Soil/Sediment/Sludge Description
		See lithologic log

OTHER (OVA; HNu; etc.) 0.5 ppm

Constituents Sampled	Container Description	Preservative
Soil - VOCs 8240 shortlist	4 oz glass jar	Cool

Remarks

Sample Personnel: W. Ferguson

ARCADIS GERAGHTY & MILLER

Soil/Sediment/Sludge Sampling Log

Project/		Date	8/18/98
Site Location	RFI/General Motors Corporation, Moraine, Ohio	Project No.	OH000294.0001.00002
Sample No.	OH-BH8-18/SL	Coded Replicate No.	
Time Sampling Began	9:15	Time Sampling Ended	9:18

Sampling Method and Material: 2' Stainless steel split-spoon

From	To	Soil/Sediment/Sludge Description
		See lithologic log

OTHER (OVA; HNu; etc.) 13.0 ppm

Constituents Sampled	Container Description	Preservative
Soil - VOCs 8240 shortlist	4 oz glass jar	Cool

Remarks

Sample Personnel: W. Ferguson

ARCADIS GERAGHTY & MILLER

Soil/Sediment/Sludge Sampling Log

Project/		Date	8/18/98
Site Location	RFI/General Motors Corporation, Moraine, Ohio	Project No.	OH000294.0001.00002
Sample No.	OH-8H8-28/SL	Coded Replicate No.	
Time Sampling Began	11:45	Time Sampling Ended	14:00

Sampling Method and Material: 2" Stainless steel split spoon and hydropunch

From	To	Soil/Sediment/Sludge Description
		See lithologic log

OTHER (OVA; HNu; etc.) 0.5 ppm

Constituents Sampled	Container Description	Preservative
Soil - VOCs 8240 shortlist	4 oz glass jar	Cool
HP - VOCs 8240 shortlist	3-40 ml glass vials	HCl, Cool

Remarks: Took hydropunch OH-BH-8-38/HP (time 14:00) description: light gray, very turbid

Sample Personnel: W. Ferguson

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH9

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
0						***CONCRETE:*** 0–0.5 ft.
	2-8-14	1.2	0	■		***SAND & GRAVEL:*** 0.5–2 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; light to moderate yellowish brown, slightly moist, loose.
	9-18-17-29	1.3	0			***SAND & GRAVEL:*** 2–4 ft; sand 70% (fine to coarse); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, slight moist, loose.
5	8-15-22-27	1.5	0			***SAND & GRAVEL:*** 4–6 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; light to moderate yellowish brown, slightly moist, loose.
	10-13-19-23	1.6	0			***SAND & GRAVEL:*** 6–8 ft; sand 70% (fine to coarse); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown with light gray, slightly moist, loose.
	9-19-24-30	1.4	0			***SAND & GRAVEL:*** 8–10 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown with light gray, slightly moist, loose.
10	11-15-18-20	0.4	0			***SAND & GRAVEL:*** 10–12 ft; sand 50% (fine to medium); gravel 40% (medium to coarse); silt and clay 10%; light yellowish brown to light gray, slightly moist, loose.
	6-40-50/5"	0.4	0			***SAND & GRAVEL:*** 12–14 ft; sand 60% (fine to medium); gravel 30% (medium to coarse); silt and clay 10%; moderate yellowish brown, slightly moist, loose.
15	3-17-32-21	1.5	0			***SAND & GRAVEL:*** 14–16 ft; sand 60% (fine to coarse); gravel 30% (fine to coarse); silt and clay 10%; light to moderate yellowish brown, slightly moist, loose.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Scott/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None

Geologist: W.J. Ferguson
Total Depth: 38.0
Surface Elev.: 737.6163
Datum: Mean Sea Level

Begin Drilling: 08/19/98
End Drilling: 08/19/98
Converted to Well: No
Well Name:

Remarks:
North Coor.: 6001.62750
East Coor.: 5994.23062

OH000294.0001.0002

I:/GMOTORS/GMCRI/GTGS/OH-BH9 (12/18/98)

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH9

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
16	8-8-6-27	1.4	0			***SAND:*** 16-18 ft; sand 80% (fine to medium); gravel 10% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose-cohesive.
	7-12-30-28	1.4	0			***SAND & GRAVEL:*** 18-20 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; light yellowish brown to light gray; slightly moist, loose.
21	9-29-38-50	1.8	0			***SAND & GRAVEL:*** 20-22 ft; sand 60% (fine to coarse); gravel 30% (fine to coarse); silt and clay 10%; light to moderate yellowish brown, moist, loose-cohesive.
	12-36-41-49	1.8	0			***SAND & GRAVEL:*** 22-24 ft; sand 60% (fine to coarse); gravel 30% (fine to very coarse); silt and clay 10%; moderate yellowish brown to light gray, slightly moist, loose.
	12-31-38-42	1.7	0			***SAND & GRAVEL:*** 24-26 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; light yellowish brown to light gray, moist, loose-cohesive.
26	16-40-50	1.2	0			***SAND & GRAVEL:*** 26-28 ft; sand 70% (fine to coarse); gravel 20% (fine to medium); silt and clay 10%; light yellowish brown with slight orange staining, moist, loose.
	22-38-39-34	1.7	0			***SAND & GRAVEL:*** 28-30 ft; sand 70% (fine to coarse); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, very moist, loose-cohesive.
31	12-17-20-20	1.2	0			***SAND & GRAVEL:*** 30-32 ft; sand 70% (fine to coarse); gravel 20% (fine to medium); silt and clay 10%; dark yellowish brown, very wet, loose.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Geologist: W.J. Ferguson
Begin Drilling: 08/19/98
Driller: Scott/Mike
Total Depth: 38.0
End Drilling: 08/19/98
Drilling Method: Hollow Stem Auger
Surface Elev.: 737.8163
Converted to Well: No
Drilling Fluid: None
Datum: Mean Sea Level
Well Name:
Remarks:
North Coor.: 6001.62750
East Coor.: 5994.23062

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH9

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
32	3-16-25-31	1.2	0			***SAND & GRAVEL:*** 32-34 ft; sand 75% (fine to coarse); gravel 15% (fine); silt and clay 10%; dark yellowish brown, wet, loose-cohesive.
	17-22-52	1.5	0			***SAND & GRAVEL:*** 34-36 ft; sand 80% (fine to medium); gravel 10% (coarse); silt and clay 10%; dark yellowish brown, wet, loose.
37	25-50-49-50/4"	2.0	0			***SAND & GRAVEL:*** 36-37.7 ft; sand 80% (fine to medium); gravel 10% (fine); silt and clay 10%; dark yellowish brown, wet, loose.
						TILL: 37.7-38 ft; sand 5% (fine); gravel 15% (fine); silt and clay 80%; moderate yellowish brown, slightly moist, very cohesive.
						TOTAL DEPTH: 38 ft;
42						
47						

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Scott/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Geologist: W.J. Ferguson
Total Depth: 38.0
Surface Elev.: 737.6163
Datum: Mean Sea Level
Begin Drilling: 08/19/98
End Drilling: 08/19/98
Converted to Well: No
Well Name:
Remarks:
North Coor.: 6001.62750
East Coor.: 5994.23062

ARCADIS GERAGHTY & MILLER

Soil/Sediment/Sludge Sampling Log

Project/		Date	8/19/98
Site Location	RFI/General Motors Corporation, Moraine, Ohio	Project No.	OH000294.0001.00002
Sample No.	OH-BH9-2/SL	Coded Replicate No.	
Time Sampling Began	10:13	Time Sampling Ended	10:15

Sampling Method and Material: 2' Stainless steel split-spoon

From	To	Soil/Sediment/Sludge Description
		See lithologic log

OTHER (OVA; HNu; etc.) 0 ppm

Constituents Sampled	Container Description	Preservative
Soil - VOCs 8240 shortlist	4 oz glass jar	Cool

Remarks

Sample Personnel W. Ferguson

ARCADIS GERAGHTY & MILLER

Soil/Sediment/Sludge Sampling Log

Project/		Date	8/19/98
Site Location	RFI/General Motors Corporation, Moraine, Ohio	Project No.	OH000294.0001.00002
Sample No.	OH-BH9-30/SL	Coded Replicate No.	DUP 62
Time Sampling Began	11:55	Time Sampling Ended	14:55

Sampling Method and Material: 2" Stainless steel split-spoon and hydropunch

From	To	Soil/Sediment/Sludge Description
		See lithologic log

OTHER (OVA; HNu; etc.) 0 ppm

Constituents Sampled	Container Description	Preservative
Soil - VOCs 8240 shortlist	4 oz glass jar	Cool
HP - VOCs 8240 shortlist	3-40 ml glass vials	HCl, Cool

Remarks: Took hydropunch OH-BH9-38/HP (time 14:45); DUP 63 (time 14:50). RB40 taken before HP at 12:50; MS105 (time 14:55) For soil: Took RB39 prior to OHBH9-30/SL at 11:10. Took MSD104 at 12:02; MS104 at 12:00 DUP62 (time 11:55)

Sample Personnel: W. Ferguson

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH10

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
0						***ASPHALT:*** 0–0.25 ft.
	6-17-16	1.0	2.0			***SAND & GRAVEL:*** 0.25–2 ft; sand 40% (fine to medium); gravel 50% (fine to coarse); silt and clay 10%; light brown to light gray, slightly moist, loose.
	6-20-23-18	1.5	4.0			***SAND & GRAVEL:*** 2–4 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, slightly moist, loose.
5	16-27-50	1.5	2.5			***SAND & GRAVEL:*** 4–6 ft; sand 50% (fine to medium); gravel 40% (fine to coarse); silt and clay 10%; moderate yellowish brown to light gray, slightly moist, loose.
	18-22-26-40	1.5	10.0			***SAND & GRAVEL:*** 6–8 ft; sand 50% (fine to medium); gravel 40% (fine to coarse); silt and clay 10%; moderate yellowish brown, slightly moist, loose.
	11-15-22-27	0.8	5.0			***SAND & GRAVEL:*** 8–10 ft; sand 50% (fine to medium); gravel 40% (fine to coarse); silt and clay 10%; moderate yellowish brown with light gray, slightly moist, loose.
10	14-18-20-30	1.0	9.5			***SAND & GRAVEL:*** 10–12 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown to light gray, slightly moist, loose.
	29-50/5"	0.7	3.0			***SAND & GRAVEL:*** 12–14 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; light to moderate yellowish brown, slightly moist, loose.
15	22-25-32-25	1.3	14.0			***SAND & GRAVEL:*** 14–16 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; light to moderate yellowish brown, slightly moist, loose.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Geologist: W.J. Ferguson
Begin Drilling: 08/18/98
Driller: Scott/Mike
Total Depth: 35.0
End Drilling: 08/18/98
Drilling Method: Hollow Stem Auger
Surface Elev.: 736.4667
Converted to Well: No
Drilling Fluid: None
Datum: Mean Sea Level
Well Name:
Remarks:
North Coor.: 5708.84730
East Coor.: 5911.85073

OH000294.0001.0002

I:/GMOTORS/GMCRI/GTGS/OH-BH10 (12/18/98)

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH10

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
16	15-20-21-30	1.2	3.5			***SAND & GRAVEL:*** 16-18 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose-cohesive.
	15-20-21-30	1.8	12.5			***SAND & GRAVEL:*** 18-20 ft; sand 70% (fine to medium); gravel 20% (fine to medium); silt and clay 10%; moderate yellowish brown with trace dark orange and black staining; slightly moist, loose.
21	12-22-25-50	0.8	3.0			***SAND & GRAVEL:*** 20-22 ft; sand 50% (fine to coarse); gravel 40% (fine to coarse); silt and clay 10%; light yellowish brown to light gray, moist, loose-cohesive.
	27-31-44-38	1.2	2.5			***SAND & GRAVEL:*** 22-24 ft; sand 60% (fine to coarse); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, very moist, loose-cohesive.
	24-40-50/5"	1.2	4.5			***SAND & GRAVEL:*** 24-26 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; light yellowish brown, very moist, loose-cohesive; trace orange staining.
26	18-20-50/4"	0.8	17.0			***SAND & GRAVEL:*** 26-28 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	2-18-18-20	1.0	3.5			***SAND & GRAVEL:*** 28-30 ft; sand 70% (fine to coarse); gravel 20% (fine to medium); silt and clay 10%; moderate yellowish brown, very wet, loose.
31	18-24-27-28	1.0	2.5			***SAND & GRAVEL:*** 30-32 ft; sand 70% (fine to coarse); gravel 20% (fine); silt and clay 10%; moderate yellowish brown, wet, loose-cohesive.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Scott/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 35.0
Surface Elev.: 736.4667
Datum: Mean Sea Level
North Coor.: 5708.64730

Begin Drilling: 08/18/98
End Drilling: 08/18/98
Converted to Well: No
Well Name:
East Coor.: 5911.95073

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH10

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
32	4-10-50	1.2	3.5			***SAND:*** 32–34 ft; sand 85% (fine to medium); gravel 5% (fine); silt and clay 10%; moderate yellowish brown, wet, loose–cohesive.
	5-50	0.8	0.0		× × × × × × × × ×	***TILL:*** 34–35 ft; sand 5% (fine); gravel 15% (fine); silt and clay 80%; moderate yellowish brown, slightly moist, very cohesive.
						TOTAL DEPTH: 35 ft;
37						
42						
47						

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Scott/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 35.0
Surface Elev.: 736.4667
Datum: Mean Sea Level
North Coor.: 5708.84730

Begin Drilling: 08/18/98
End Drilling: 08/18/98
Converted to Well: No
Well Name:
East Coor.: 5911.95073

OH000284.0001.0002

I:/GMOTORS/GMCRI/GTGS/OH-BH10 (12/18/98)

ARCADIS GERAGHTY & MILLER

Soil/Sediment/Sludge Sampling Log

Project/ Site Location	RFI/General Motors Corporation, Moraine, Ohio	Date	8/18/98
		Project No.	OH000294.0001.00002
Sample No.	OH-BH10-28/SL	Coded Replicate No.	
Time Sampling Began	18:15	Time Sampling Ended	9:00 (8/19/98)

Sampling Method and Material: 2" Stainless steel split-spoon and hydropunch

From	To	Soil/Sediment/Sludge Description
		See lithologic log

OTHER (OVA; HNu; etc.) 17.0 ppm

Constituents Sampled	Container Description	Preservative
Soil - VOCs 8240 shortlist	4 oz glass jar	Cool
HP - VOCs 8240 shortlist	3-40 ml glass vials	HCl, Cool

Remarks: Took hydropunch OH-BH10-34/HP (time 9:00) on 8/19/98

Sample Personnel: W. Ferguson

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH2A

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
0						***ASPHALT:*** 0–0.25 ft.
	6-5-7	0.5	1.0			***SAND & GRAVEL:*** 0.25–2 ft; sand 70% (fine to medium); gravel 20% (fine to medium); silt and clay 10%; dark yellowish brown, moist, loose.
	5-2-3-20	1.0	1.5			***SAND:*** 2–4 ft; sand 80% (fine to medium); gravel 10% (fine); silt and clay 10%, moderate yellowish brown, moist, loose.
5	33-9-9-12	1.3	4.0			***SAND:*** 4–6 ft; sand 75% (fine to medium); gravel 15% (fine); silt and clay 10%; moderate yellowish brown, moist, loose.
	16-24-23-38	1.0	3.0			***SAND & GRAVEL:*** 6–8 ft; sand 70% (fine to coarse); gravel 20% (fine to medium); silt and clay 10%; light yellowish brown to light gray, moist, loose.
	3-14-16-20	2.0	2.5			***SAND & GRAVEL:*** 8–10 ft; sand 60% (fine to coarse); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
10	14-24-31-13	1.5	3.0			***SAND & GRAVEL:*** 10–12 ft; sand 50% (fine to coarse); gravel 40% (fine to coarse); silt and clay 10%; light to moderate yellowish brown, moist, loose.
	5-18-27-15	1.5	16.0			***SAND & GRAVEL:*** 12–14 ft; sand 50% (fine to medium); gravel 40% (medium to coarse); silt and clay 10%; light yellowish brown, moist, loose.
15	7-18-7-7	1.2	4.0			***SAND & GRAVEL:*** 14–16 ft; sand 60% (fine to coarse); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, very moist, loose.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 38.0
Surface Elev.: 735.1980
Datum: Mean Sea Level
North Coor.: 5698.93706

Begin Drilling: 11/02/98
End Drilling: 11/02/98
Converted to Well: No
Well Name:
East Coor.: 5977.19145

OH000294.0001.0002

I:/GMOTORS/GMCRI/GTGS/OH-BH2A (12/18/98)

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH2A

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
16	16-15-19-12	1.3	6.0			***SAND & GRAVEL:*** 16-18 ft; sand 60% (fine to coarse); gravel 30% (fine to coarse); silt and clay 10%; light yellowish brown, moist, loose.
	38-25-28-25	0.3	4.0			***SAND & GRAVEL:*** 18-20 ft; sand 50% (fine to medium); gravel 40% (coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
21	28-26-24-23	1.7	4.0			***SAND & GRAVEL:*** 20-22 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; light yellowish brown to light gray, moist, loose.
	4-20-12-30	1.5	6.5			***SAND & GRAVEL:*** 22-24 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	46-44-35-29	1.5	9.0			***SAND & GRAVEL:*** 24-26 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown to light gray, moist, loose.
26	7-21-37-22	1.3	<0.5			***SAND & GRAVEL:*** 26-28 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, very moist, loose.
	2-11-11-21	1.5	16.0			***SAND & GRAVEL:*** 28-30 ft; sand 80% (fine to medium); gravel 10% (fine); silt and clay 10%; moderate yellowish brown with slight orange staining, wet, loose.
31	18-21-21-22	1.5	35.0			***SAND & GRAVEL:*** 30-32 ft; sand 60% (fine to medium); gravel 20% (fine to medium); silt and clay 20%; moderate yellowish brown with some black staining, wet, loose-semi-cohesive.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Geologist: W.J. Ferguson
Begin Drilling: 11/02/98
Driller: Ray/Mike
Total Depth: 38.0
End Drilling: 11/02/98
Drilling Method: Hollow Stem Auger
Surface Elev.: 735.1980
Converted to Well: No
Drilling Fluid: None
Datum: Mean Sea Level
Well Name:
Remarks:
North Coor.: 5698.93706
East Coor.: 5977.19145

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH2A

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
32	1-10-15-20	1.0	30.0			***SAND & GRAVEL:*** 32-34 ft; sand 70% (fine to medium); gravel 20% (fine); silt and clay 10%; dark yellowish brown with significant black staining, wet, loose-semicohesive, odor.
	1-5-20-24	1.5	140.0			***SAND & GRAVEL:*** 34-36 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; gray with much black staining, strong odor, wet, loose.
37	7-24-33-50	2.0	300.0/15.0			***SAND & GRAVEL:*** 36-37 ft; sand 70% (fine to coarse); gravel 20% (fine to medium); silt and clay 10%; dark yellowish brown, wet, loose.
						TILL: 37-38 ft; silt and clay 85%, gravel 10% (fine); sand 5% (fine); dark gray, slightly moist, very cohesive.
						TOTAL DEPTH: 38 ft.
42						
47						

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 38.0
Surface Elev.: 735.1980
Datum: Mean Sea Level
North Coor.: 5698.93706

Begin Drilling: 11/02/98
End Drilling: 11/02/98
Converted to Well: No
Well Name:
East Coor.: 5977.19145

OH000294.0001.0002

I:/GMOTORS/GMCRI/GTGS/OH-BH2A (12/16/98)

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH3A

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
0						***CONCRETE:*** 0–0.5 ft.
	7–13–17	1.5	<0.5			***SAND & GRAVEL:*** 0.5–2 ft; sand 60% (fine to medium), gravel 30% (fine to very coarse); silt and clay 10%; moderate yellowish brown to light gray, moist, loose.
	10–13–13–10	2.0	<0.5			***SAND:*** 2–4 ft; sand 80% (fine) gravel 10% (fine); silt and clay 10%; moderate yellowish brown, moist, loose.
5	4–8–21–19	2.0	<0.5			***SAND:*** 4–6 ft; SAME AS ABOVE.
	6–19–30–38	0.8	<0.5			***SAND & GRAVEL:*** 6–8 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	13–20–24–30	1.6	1.0			***SAND & GRAVEL:*** 8–10 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; light to moderate yellowish brown, moist, loose.
10	9–27–27–22	0.8	<0.5			***SAND & GRAVEL:*** 10–12 ft; sand 60% (fine to medium); gravel 30% (fine to medium); silt and clay 10%; light to moderate yellowish brown, moist, loose.
	9–13–20–20	1.5	0.8			***SAND & GRAVEL:*** 12–14 ft; sand 70% (fine to coarse); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
15	6–20–25–18	1.4	0.5			***SAND & GRAVEL:*** 14–16 ft; sand 50% (fine to medium); gravel 40% (fine to coarse); silt and clay 10%; moderate yellowish brown to light gray, moist, loose.
	11–40–30–18	1.5	0.5			***SAND & GRAVEL:*** 16–18 ft; sand 70% (fine to medium); gravel 20% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Geologist: W.J. Ferguson
Begin Drilling: 11/06/98
Driller: Ray/Mike
Total Depth: 32.0
End Drilling: 11/06/98
Drilling Method: Hollow Stem Auger
Surface Elev.: 734.8986
Converted to Well: No
Drilling Fluid: None
Datum: Mean Sea Level
Well Name:
Remarks:
North Coor.: 5659.87374
East Coor.: 6144.76092

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH3A

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
18	24-25-30-38	0.7	1.5			***SAND & GRAVEL:*** 18-20 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	32-50/5"	0.7	2.5			***SAND & GRAVEL:*** 20-22 ft; sand 60% (fine to medium); gravel 30% (fine to very coarse); silt and clay 10%; moderate yellowish brown, very moist, loose.
23	27-44-27-22	2.0	1.5			***SAND & GRAVEL:*** 22-24 ft; sand 70% (fine to medium); gravel 20% (fine to medium); silt and clay 10%; light yellowish brown to light gray, moist, loose.
	7-15-19-19	1.6	0.5			***SAND:*** 24-26 ft; sand 80% (fine); gravel 10% (fine); silt and clay 10%; moderate yellowish brown, moist, semi-cohesive.
	20-50/4"	0.5	1.5			***SAND:*** 26-28 ft; sand 80% (fine); gravel 10% (fine); silt and clay 10%; moderate to dark yellowish brown, very moist, semi-cohesive.
28	12-39-50/4"	1.1	1.0			***SAND:*** 28-30 ft; SAME AS ABOVE but wet.
	60-50/3"	1.0	<0.5			***TILL:*** 30-32 ft; silt and clay 75%; gravel 15% (fine); sand 10% (fine); dark gray, slightly moist, very cohesive.
33						***TOTAL DEPTH:*** 32 ft.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 32.0
Surface Elev.: 734.8966
Datum: Mean Sea Level
North Coor.: 5659.87374

Begin Drilling: 11/06/98
End Drilling: 11/06/98
Converted to Well: No
Well Name:
East Coor.: 6144.76092

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH11

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
0						***CONCRETE:*** 0-0.5 ft;
	5-9-8-5	0.3	<0.5	■		***SAND & GRAVEL:*** 0.5-2 ft; sand 50% (fine to medium); gravel 40% (fine); silt and clay 10%; moderate yellowish brown, very moist, loose.
	6-7-5-8	1.2	4.0			***SAND & GRAVEL:*** 2-4 ft; sand 40% (fine to medium); gravel 50% (fine); silt and clay 10%; moderate yellowish brown, moist, loose.
5	10-15-14-25	1.0	2.0			***SAND & GRAVEL:*** 4-6 ft; sand 50% (fine to coarse); gravel 40% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.
	8-15-25-39	1.2	3.0			***SAND & GRAVEL:*** 6-8 ft; sand 70% (fine to medium); gravel 20% (fine); silt and clay 10%; moderate yellowish brown, moist, loose.
	25-25-22-14	1.0	4.5			***SAND & GRAVEL:*** 8-10 ft; sand 60% (fine to medium); gravel 30% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.
10	7-19-28-37	1.3	8.0			***SAND & GRAVEL:*** 10-12 ft; sand 70% (fine to medium); gravel 20% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.
	10-22-25-23	1.5	5.5			***SAND & GRAVEL:*** 12-14 ft; sand 60% (fine to medium); gravel 30% (fine); silt and clay 10%; moderate yellowish brown, moist, loose.
15	20-28-20-21	1.2	3.0			***SAND & GRAVEL:*** 14-16 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; light to moderate yellowish brown, moist, loose.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Geologist: W.J. Ferguson
Total Depth: 34.0
Surface Elev.: 731.4519
Datum: Mean Sea Level
Begin Drilling: 11/03/98
End Drilling: 11/03/98
Converted to Well: No
Well Name:
Remarks:
North Coor.: 5391.78704
East Coor.: 5968.40268

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH11

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
16	5-14-14-16	1.3	3.0			***SAND & GRAVEL:*** 16-18 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	15-22-28-33	1.2	10.0			***SAND & GRAVEL:*** 18-20 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
21	4-14-23-26	1.1	4.0			***SAND & GRAVEL:*** 20-22 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	4-27-37-11	1.0	5.0			***SAND & GRAVEL:*** 22-24 ft; sand 60% (fine to medium); gravel 30% (medium to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	14-10-10-16	1.3	2.0			***SAND & GRAVEL:*** 24-26 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, very moist, loose.
26	4-13-50/4"	1.0	4.0			***SAND & GRAVEL:*** 26-28 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, very moist-wet, loose, one area of black staining approximately 1-inch thick.
	9-24-34-38	2.0	5.0			***SAND & GRAVEL:*** 28-30 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, wet, loose.
31	9-24-54-50/4"	2.0	11.0			***SAND & GRAVEL:*** 30-32 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; dark yellowish brown, wet, loose-cohesive.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Geologist: W.J. Ferguson
Total Depth: 34.0
Surface Elev.: 731.4519
Datum: Mean Sea Level
Begin Drilling: 11/03/98
End Drilling: 11/03/98
Converted to Well: No
Well Name:
Remarks:
North Coor.: 5391.78704
East Coor.: 5968.40268

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH11

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
32	17-28 50/4"	1.5	2.0/ 1.0			***SAND & GRAVEL:*** 32-33.5 ft; sand 70% (fine to coarse); gravel 20% (fine to coarse); silt and clay 10%; dark yellowish brown, wet, loose.
						TILL: 33.5-34 ft; silt and clay 80%; gravel 15% (fine); sand 5% (fine); dark gray, slightly moist, very cohesive.
						TOTAL DEPTH: 34 ft.
37						
42						
47						

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 34.0
Surface Elev.: 731.4519
Datum: Mean Sea Level
North Coor.: 5391.78704

Begin Drilling: 11/03/98
End Drilling: 11/03/98
Converted to Well: No
Well Name:
East Coor.: 5968.40268

OH000294.0001.0002

I:/GMOTORS/GMCRI/GTGS/OH-BH11 (12/18/98)

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH12

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
0						***CONCRETE:*** 0-0.5 ft;
	10-30 50/4"	1.0	<0.5	■		***SAND & GRAVEL:*** 0.5-2 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; dark yellowish brown to light gray; moist, loose.
	15-22-25-27	2.0	0.5			***SAND & GRAVEL:*** 2-4 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%, moderate yellowish brown, moist, loose.
5	19-20 20-18	2.0	0.7			***SAND & GRAVEL:*** 4-6 ft; sand 70% (fine to coarse); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	15-25-27-42	1.1	2.0			***SAND & GRAVEL:*** 6-8 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	50-50/4"	0.8	0.7			***SAND & GRAVEL:*** 8-10 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
10	9-8-11-13	1.8	1.0			***SAND & GRAVEL:*** 10-12 ft; sand 60% (fine to coarse); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, very moist, loose.
	4-24-28-23	1.5	6.5	■		***SAND & GRAVEL:*** 12-14 ft; sand 70% (fine to medium); gravel 20% (fine to medium); silt and clay 10%; dark yellowish brown, moist, loose.
15	10-17-17-20	0.5	0.5			***SAND:*** 14-16 ft; sand 80% (fine to medium); gravel 10% (fine); silt and clay 10%; dark yellowish brown, moist, loose.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 34.0
Surface Elev.: 733.4085
Datum: Mean Sea Level
North Coor.: 5571.67255

Begin Drilling: 11/06/98
End Drilling: 11/06/98
Converted to Well: No
Well Name:
East Coor.: 5936.19339

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH12

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
16						
	3-10-22-28	1.2	1.7			***SAND & GRAVEL:*** 16-18 ft; sand 70% (fine to coarse); gravel 20% (fine to medium); silt and clay 10%; dark yellowish brown, moist, loose.
	7-13-8-7	0.9	1.8			***SAND & GRAVEL:*** 18-20 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
21	13-32-32-35	1.5	2.0			***SAND & GRAVEL:*** 20-22 ft; sand 50% (fine to medium); gravel 40% (fine to very coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	20-50/4"	0.8	1.5			***SAND & GRAVEL:*** 22-24 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	12-15-20-30	1.3	2.0			***SAND & GRAVEL:*** 24-26 ft; sand 70% (fine to coarse); gravel 20% (fine to coarse); silt and clay 10%; dark yellowish brown, moist, loose.
26	11-44-32-33	1.5	0.7			***SAND:*** 26-28 ft; sand 80% (fine to medium); gravel 10% (fine); silt and clay 10%; dark yellowish brown, moist, loose-semicohesive.
	1-11-38-29	1.7	0.6			***SAND & GRAVEL:*** 28-30 ft; sand 70% (fine to medium); gravel 20% (fine to medium); silt and clay 10%; dark yellowish brown, wet, loose-semicohesive.
31	1-17-15-16	1.8	0.5			***SAND:*** 30-32 ft; sand 80% (fine to medium); gravel 10% (fine); silt and clay 10%; dark yellowish brown, wet, loose-semicohesive, 1/2-inch staining.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Geologist: W.J. Ferguson
Total Depth: 34.0
Surface Elev.: 733.4085
Datum: Mean Sea Level
Begin Drilling: 11/06/98
End Drilling: 11/06/98
Converted to Well: No
Well Name:
Remarks:
North Coor.: 5571.67255
East Coor.: 5936.19339

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH12

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
32	17-25-35-51	2.0	8.0			***SAND:*** 32-33.5 ft; sand 80% (fine to medium); gravel 10% (fine); silt and clay 10%; moderate yellowish brown and dark gray, much staining and odor, wet, loose.
						TILL: 33.5-34 ft; silt and clay 75%, gravel 15% (fine to medium); sand 5% (fine); dark yellowish brown to dark gray, slightly moist, cohesive.
						TOTAL DEPTH: 34 ft.
37						
42						
47						

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Geologist: W.J. Ferguson
Begin Drilling: 11/06/98
Driller: Ray/Mike
Total Depth: 34.0
End Drilling: 11/06/98
Drilling Method: Hollow Stem Auger
Surface Elev.: 733.4085
Converted to Well: No
Drilling Fluid: None
Datum: Mean Sea Level
Well Name:
Remarks:
North Coor.: 5571.67255
East Coor.: 5936.19339

OH000294.0001.0002

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ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH13

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
0						***CONCRETE:*** 0-0.5 ft;
	7-21-20	0.5	0.0			***SAND & GRAVEL:*** 0.5-2 ft; sand 50% (fine to medium); gravel 40% (fine to coarse); silt and clay 10%; moderate yellowish brown to light gray; very moist, loose.
	13-39-30-29	0.8	0.0			***SAND & GRAVEL:*** 2-4 ft; sand 50% (fine to medium); gravel 40% (fine to very coarse); silt and clay 10%, moderate yellowish brown, moist, loose.
5	9-32-50	1.0	0.0			***SAND & GRAVEL:*** 4-6 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	32-50-	0.5	0.0			***SAND & GRAVEL:*** 6-8 ft; sand 50% (fine to medium); gravel 40% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	9-12-15-22	2.0	0.0			***SAND & GRAVEL:*** 8-10 ft; sand 70% (fine to medium); gravel 20% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.
10	15-42-50	1.2	0.0			***SAND & GRAVEL:*** 10-12 ft; sand 70% (fine to coarse); gravel 20% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.
	32-39-50	1.2	0.0			***SAND & GRAVEL:*** 12-14 ft; sand 60% (fine to coarse); gravel 30% (fine to coarse); silt and clay 10%; light yellowish brown with some dark orange staining, moist, loose.
15	38-37-31-28	1.1	0.0			***SAND & GRAVEL:*** 14-16 ft; sand 60% (fine to coarse); gravel 30% (fine to coarse); silt and clay 10%; light yellowish brown, moist, loose.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Geologist: W.J. Ferguson
Begin Drilling: 11/10/98
Driller: Ray/Mike
Total Depth: 28.0
End Drilling: 11/10/98
Drilling Method: Hollow Stem Auger
Surface Elev.: 731.4436
Converted to Well: No
Drilling Fluid: None
Datum: Mean Sea Level
Well Name:
Remarks:
North Coor.: 5493.17656
East Coor.: 6158.19856

OH000294.0001.0002

I:/GMOTORS/GMCRI/GTGS/OH-BH13 (12/18/98)

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH13

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
16	13-31-30-31	1.1	0.0			***SAND & GRAVEL:*** 16-18 ft; sand 60% (fine to medium); gravel 30% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.
	50/3"	0.2	0.0			***GRAVEL:*** 18-20 ft; coarse, light gray, moist, loose.
21	13-37-50	1.2	2.0			***SAND:*** 20-22 ft; sand 80% (fine to medium); gravel 10% (fine); silt and clay 10%; moderate yellowish brown, moist, loose.
	20-25-30-42	0.9	1.5			***SAND:*** 22-24 ft; SAME AS ABOVE.
	5-13-10-15	1.5	0.5			***SAND:*** 24-26 ft; sand 80% (fine to medium); gravel 5% (fine); silt and clay 15%; dark yellowish brown, very moist-wet, loose.
26	7-24-50	1.2	0.5/0.0			***SAND & GRAVEL:*** 26-27.75 ft; sand 70% (fine to medium); gravel 20% (fine); silt and clay 10%; moderate yellowish brown, wet, loose.
						TILL: 27.75-28 ft; silt and clay 85%, gravel 10% (fine); sand 5% (fine); dark gray, slightly moist, very cohesive.
						TOTAL DEPTH: 28 ft.
31						

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 28.0
Surface Elev.: 731.4436
Datum: Mean Sea Level
North Coor.: 5493.17656

Begin Drilling: 11/10/98
End Drilling: 11/10/98
Converted to Well: No
Well Name:
East Coor.: 6158.19856

OH000294.0001.0002

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ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH14

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
0						**CONCRETE:** 0-0.5 ft.
	5-12-13	0.8	0.0	■		**SAND & GRAVEL:** 0.5-2 ft; sand 40% (fine to medium); gravel 50% (fine to coarse); silt and clay 10%; moderate yellowish brown; very moist, loose.
	15-18-22-17	1.0	0.0			**SAND & GRAVEL:** 2-4 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%, light yellowish brown, moist, loose.
5	15-20-31-33	0.9	0.0			**SAND & GRAVEL:** 4-6 ft; sand 60% (fine to coarse); gravel 30% (fine to medium); silt and clay 10%; light yellowish brown, wet, loose.
	21-16-36-45	1.0	0.0			**SAND & GRAVEL:** 6-8 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; light yellowish brown, moist, loose.
	9-25-26-23	1.5	0.0			**SAND & GRAVEL:** 8-10 ft; sand 60% (fine to coarse); gravel 30% (fine to coarse); silt and clay 10%; light to moderate yellowish brown, moist, loose.
10	40-50	1.0	0.0			**SAND & GRAVEL:** 10-12 ft; sand 70% (fine to coarse); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	6-16-32-40	1.0	0.0			**SAND & GRAVEL:** 12-14 ft; sand 70% (fine to coarse); gravel 20% (fine to coarse); silt and clay 10%; light to moderate yellowish brown, moist, loose.
15	34-41-50	1.0	0.0			**SAND & GRAVEL:** 14-16 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; light yellowish brown to light gray, moist, loose.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 33.0
Surface Elev.: 728.6029
Datum: Mean Sea Level
North Coor.: 5224.70217

Begin Drilling: 11/10/98
End Drilling: 11/10/98
Converted to Well: No
Well Name:
East Coor.: 6150.61651

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH14

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
16	12-50-40-50/4"	1.0	0.0			***SAND & GRAVEL:*** 16-18 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; light to moderate yellowish brown, moist, loose.
	20-50	0.2	0.0			***SAND & GRAVEL:*** 18-20 ft; sand 30% (fine to medium); gravel 60% (fine to coarse); silt and clay 10%; light to moderate yellowish brown, moist, loose.
21	50/0"	0	0.0			***NO RECOVERY:*** 20-22 ft;
	11-15-27-37	1.1	0.0	■		***SAND & GRAVEL:*** 22-24 ft; sand 60% (fine to medium); gravel 20% (fine to medium); silt and clay 20%; moderate to dark yellowish brown, very moist-wet, loose to cohesive.
	45-28-17-28	2.0	0.0			***SAND & GRAVEL:*** 24-26 ft; sand 70% (fine to medium); gravel 20% (fine); silt and clay 10%; moderate to dark yellowish brown, wet, loose.
26	51-25-38-38	1.3	0.0			***SAND & GRAVEL:*** 26-28 ft; sand 70% (fine to medium); gravel 20% (fine to medium); silt and clay 10%; dark yellowish brown, wet, loose.
	50-50	0.8	0.0			***SAND & GRAVEL:*** 28-30 ft; sand 70% (fine to medium); gravel 20% (fine); silt and clay 10%; dark yellowish brown, wet, loose.
31	22-38-29-100	0.8	0.0			***SAND:*** 30-32 ft; sand 80% (fine to medium); gravel 10% (fine); silt and clay 10%; dark yellowish brown, wet, loose.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Geologist: W.J. Ferguson
Begin Drilling: 11/10/98
Driller: Ray/Mike
Total Depth: 33.0
End Drilling: 11/10/98
Drilling Method: Hollow Stem Auger
Surface Elev.: 728.6029
Converted to Well: No
Drilling Fluid: None
Datum: Mean Sea Level
Well Name:
Remarks:
North Coor.: 5224.70217
East Coor.: 6150.61651

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH14

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
32	150/8"	0.7	0.0/ 0.0			***SAND & GRAVEL:*** 32–32.5 ft; sand 70% (fine to medium); gravel 20% (fine); silt and clay 10%; dark yellowish brown, wet, loose.
						TILL: 32.5–33 ft; silt and clay 80%, gravel 15% (fine); sand 5% (fine); dark gray, slightly moist, very cohesive.
						TOTAL DEPTH: 33 ft.
37						
42						
47						

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 33.0
Surface Elev.: 728.6029
Datum: Mean Sea Level
North Coor.: 5224.70217

Begin Drilling: 11/10/98
End Drilling: 11/10/98
Converted to Well: No
Well Name:
East Coor.: 6150.61851

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH15

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
0						***ASPHALT:*** 0–0.25 ft.
	34-47-39	1.5	<0.5	■		***SAND & GRAVEL:*** 0.25–2 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; light gray to dark yellowish brown; moist, loose, 1" black staining.
	10-20-24-24	1.5	1.5			***SAND & GRAVEL:*** 2–4 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%, moderate to dark yellowish brown, moist, loose, slight black staining.
5	10-9-10-8	1.0	1.0			***SAND & GRAVEL:*** 4–6 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; dark yellowish brown, moist, loose.
	1-4-4-11	1.7	0.0			***SAND:*** 6–8 ft; sand 60% (fine); silt 30%; gravel 10% (fine); moderate yellowish brown, wet (very moist), cohesive.
	1-7-7-40	1.5	1.0			***SAND & GRAVEL:*** 8–10 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
10	16-34-27-33-	1.3	1.3			***SAND & GRAVEL:*** 10–12 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Geologist: W.J. Ferguson
Total Depth: 42.0
Surface Elev.: 731.4147
Datum: Mean Sea Level
Begin Drilling: 11/04/98
End Drilling: 11/05/98
Converted to Well: No
Well Name:
Remarks:
North Coor.: 5230.67889
East Coor.: 5930.43428

OH000294.0001.0002

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ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH15

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
12	15-24 28-30	1.5	2.0			***SAND & GRAVEL:*** 12-14 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	9-16- 13-17	1.0	1.5			***SAND & GRAVEL:*** 14-16 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
17	5-17- 20-21	1.3	3.5			***SAND & GRAVEL:*** 16-18 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; dark yellowish brown, moist, loose.
	14-22- 35-41	1.0	1.0			***SAND & GRAVEL:*** 18-20 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; dark yellowish brown, moist, loose.
	10-15- 15-15	1.7	2.5			***SAND & GRAVEL:*** 20-22 ft; sand 70% (fine to medium); gravel 20% (fine to medium); silt and clay 10%; dark yellowish brown, moist, loose.
22	1-12- 15-15-	1.5	2.0			***SAND & GRAVEL:*** 22-24 ft; sand 70% (fine to medium); gravel 20% (fine); silt and clay 10%; dark yellowish brown, moist, loose.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Geologist: W.J. Ferguson
Begin Drilling: 11/04/98
Driller: Ray/Mike
Total Depth: 42.0
End Drilling: 11/05/98
Drilling Method: Hollow Stem Auger
Surface Elev.: 731.4147
Converted to Well: No
Drilling Fluid: None
Datum: Mean Sea Level
Well Name:
Remarks:
North Coor.: 5230.67889
East Coor.: 5930.43428

OH000294.0001.0002

I:/GMOTORS/GMCFRI/GTGS/OH-BH15 (12/18/98)

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH15

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
24	12-17-13-35	0.9	1.5	■		***SAND & GRAVEL:*** 24-26 ft; sand 70% (fine to coarse); gravel 20% (fine to coarse); silt and clay 10%; dark yellowish brown, very moist, loose.
	3-10-12-12	1.0	0.7			***SAND & GRAVEL:*** 26-28 ft; sand 50% (fine to coarse); gravel 40% (fine to coarse); silt and clay 10%; dark yellowish brown, wet, loose.
29	11-15-14-16	1.5	<0.5			***SAND & GRAVEL:*** 28-30 ft; sand 30% (fine); gravel 40% (fine); silt 30%; dark yellowish brown, wet, loose, looks like till but sandy and wet.
	3-16-19-18	1.5	<0.5			***SAND & GRAVEL:*** 30-32 ft; sand 40% (fine to medium); gravel 35% (fine to medium); silt and clay 25%; dark yellowish brown, wet, pliable.
	5-13-30-21	1.0	<0.5			***SAND & GRAVEL:*** 32-34 ft; sand 70% (fine to medium); gravel 20% (fine to medium); silt and clay 10%; dark yellowish brown, wet, loose.
34	11-5-11-17	1.0	<0.5			***SAND & GRAVEL:*** 34-36 ft; sand 70% (fine to coarse), gravel 20% (fine to coarse); silt and clay 20%; moderate yellowish brown, wet, loose.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Geologist: W.J. Ferguson
Begin Drilling: 11/04/98
Driller: Ray/Mike
Total Depth: 42.0
End Drilling: 11/05/98
Drilling Method: Hollow Stem Auger
Surface Elev.: 731.4147
Converted to Well: No
Drilling Fluid: None
Datum: Mean Sea Level
Well Name:
Remarks:
North Coor.: 5230.67889
East Coor.: 5930.43428

OH000294.0001.0002

I:/GMOTORS/GMCFRI/GTGS/OH-BH15 (12/18/98)

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH15

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
36	15-20 17-19	1.5	<0.5			***SAND & GRAVEL:*** 36-38 ft; sand 60% (fine to medium); gravel 20% (fine); silt and clay 20%; moderate to dark yellowish brown with some dark orange staining, wet, cohesive.
	12-14- 15-10	1.5	<0.5			***SAND & GRAVEL:*** 38-40 ft; sand 70% (fine to medium); gravel 20% (fine); silt and clay 10%; dark yellowish brown, wet, loose-semicohesive.
41	1-11- 15-14	2.0	0.5/ 0.5			***SAND & GRAVEL:*** 40-41.75 ft; sand 70% (fine to coarse); gravel 20% (fine to medium); silt and clay 10%; dark yellowish brown, wet, loose.
						TILL: 41.75-42 ft; silt and clay 70%, gravel 20% (fine); sand 10% (fine); dark gray, slightly moist, very cohesive.
						TOTAL DEPTH: 42 ft.
46						

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 42.0
Surface Elev.: 731.4147
Datum: Mean Sea Level
North Coor.: 5230.67889

Begin Drilling: 11/04/98
End Drilling: 11/05/98
Converted to Well: No
Well Name:
East Coor.: 5930.43428

OH000294.0001.0002

I:/GMOTORS/GMCFRI/GTGS/OH-BH15 (12/18/98)

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH16

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
0	3-5-8-8	0.5	0.0	■		***SAND & GRAVEL:*** 0-2 ft; sand 60% (fine to medium); gravel 20% (fine to medium); silt and clay 20%; dark brown, some black, moist, loose.
	3-5-7-710	0.8	0.0	■		***SAND & GRAVEL:*** 2-4 ft; same as above.
5	1-8-6-6	0.8	0.0	■		***SAND & GRAVEL:*** 4-6 ft; same as above.
	1-7-8-11	1.2	0.0	■		***SAND & GRAVEL:*** 6-8 ft; sand 50% (fine to medium); gravel 30%; silt and clay 20%; dark yellowish brown, very moist, loose-cohesive.
	4-10-11-12	0.2	0.0	■		***SAND & GRAVEL:*** 8-10 ft; sand 60% (fine to medium); gravel 20% (fine to medium); silt and clay 20%; dark brown, moist, cohesive.
10	2-2-3-7	0				***NO RECOVERY:*** 10-12 ft;
	2-4-6-6	0.7	0.0	▯		***SAND:*** 12-14 ft; sand 70% (fine to medium); gravel 10% (fine); silt and clay 20%; dark gray, very moist, pliable-cohesive.
						SAND: 14-16 ft; same as above.
15	1-3-3-7	0.7	0.0	▯		

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 62.0
Surface Elev.: 734.7903
Datum: Mean Sea Level
North Coor.: 5780.02132

Begin Drilling: 11/12/98
End Drilling: 11/12/98
Converted to Well: No
Well Name:
East Coor.: 5759.87716

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH16

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
16	12-31-42	1.5	0.0			***SAND:*** 16-18 ft; sand 60% (fine); gravel 10% (fine); silt and clay 30%; dark gray, very moist, cohesive.
	10-12-21-33	1.2	0.0			***SAND & GRAVEL:*** 18-20 ft; sand 40% (fine to medium); gravel 50% (fine to coarse); silt and clay 10%; light yellowish brown, moist, loose.
21	50	0.2	0.0			***SAND & GRAVEL:*** 20-22 ft; sand 50% (fine to medium); gravel 40% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	40-50	0.5	0.0			***SAND & GRAVEL:*** 22-24 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	37-50	0.8	0.0			***SAND & GRAVEL:*** 24-26 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
26	9-50	0.7	0.0			***SAND & GRAVEL:*** 26-28 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	12-29-50	1.2	0.0	■		***SAND & GRAVEL:*** 28-30 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, very moist, loose.
31	20-33-50	0.8	0.0			***SAND & GRAVEL:*** 30-32 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, wet, loose.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 62.0
Surface Elev.: 734.7803
Datum: Mean Sea Level
North Coor.: 5780.02132

Begin Drilling: 11/12/98
End Drilling: 11/12/98
Converted to Well: No
Well Name:
East Coor.: 5759.87716

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH16

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
32	25-50-21-50	1.8	0.0			***SAND & GRAVEL:*** 32-34 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, wet, loose.
	30-32-50-50	2.0	0.0			***SAND & GRAVEL:*** 34-36 ft; sand 70% (fine to coarse), gravel 20% (fine to medium); silt and clay 10%; moderate to dark yellowish brown, wet, loose.
37	20-50	0.3	0.0			***SAND:*** 36-38 ft; sand 85% (fine); gravel 5% (fine); silt and clay 10%; moderate yellowish brown, wet, loose.
	50-50	1.0	0.0			***SAND:*** 38-40 ft; sand 85% (fine to medium); gravel 5% (fine); silt and clay 10%; dark yellowish brown, wet, loose.
	100	0.5	0.0			***SAND:*** 40-42 ft; same as above.
42	50	1.0	0.0			***SAND:*** 42-44 ft; same as above.
	50-50	0.6	0.0			***SAND:*** 44-46 ft; same as above.
47	50-50	0.7	0.0			***SAND:*** 46-48 ft; same as above.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Geologist: W.J. Ferguson
Total Depth: 62.0
Surface Elev.: 734.7903
Datum: Mean Sea Level
Begin Drilling: 11/12/98
End Drilling: 11/12/98
Converted to Well: No
Well Name:
Remarks:
North Coor.: 5780.02132
East Coor.: 5759.87716

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH16

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
48	50-50	1.0	0.0			***SAND:*** 48-50 ft; sand 80% (fine); gravel 10% (fine); silt and clay 10%; dark yellowish brown, wet, loose.
	73	0.8	0.0			***SAND:*** 50-52 ft; same as above.
53	70	0				***NO RECOVERY:*** 52-54 ft.
	50-50	1.0	0.0			***SAND & GRAVEL:*** 54-56 ft; sand 60% (fine to medium), gravel 30% (fine to coarse); silt and clay 10%; dark yellowish brown, wet, loose-slightly cohesive.
	19-50	1.0	0.0			***SAND & GRAVEL:*** 56-58 ft; sand 70% (fine to medium), gravel 20% (fine to coarse); silt and clay 10%; dark yellowish brown, wet, loose.
58	50	0.5	0.0			***SAND:*** 58-60 ft; sand 85% (fine to medium); gravel 5% (fine); silt and clay 10%; dark yellowish brown, wet, loose.
	70	1.0	0.0			***SAND:*** 60-61.75 ft; same as above.
63						***TILL:*** 61.75-62 ft; silt and clay 85%; gravel 10% (fine); sand 5% (fine); dark gray, slightly moist, very cohesive.
						TOTAL DEPTH: 62 ft.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Geologist: W.J. Ferguson
Total Depth: 62.0
Surface Elev.: 734.7903
Datum: Mean Sea Level
Begin Drilling: 11/12/98
End Drilling: 11/12/98
Converted to Well: No
Well Name:
Remarks:
North Coor.: 5780.02132
East Coor.: 5759.87716

OH000294.0001.0002

I:/GMOTORS/GMCFRI/GTGS/OH-BH16 (1/05/99)

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH17

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
0	4-50	1.2	0.0	■		***SAND & GRAVEL:*** 0-2 ft; sand 60% (fine to medium); gravel 30% (fine to medium); silt and clay 10%; light to dark yellowish brown, some black, moist, loose.
	7-13-7-10	0.7	0.0	■		***SAND & GRAVEL:*** 2-4 ft; sand 70% (fine to medium); gravel 20% (fine); silt and clay 10%; moderate yellowish brown, moist, loose.
5	17-50	0.2	0.0	■		***SAND & GRAVEL:*** 4-6 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; dark yellowish brown, moist, loose.
	5-10-13	0.9	0.0	■		***SAND:*** 6-8 ft; sand 80% (fine to medium); gravel 10% (fine to medium); silt and clay 10%; moderate yellowish brown and black, moist, loose.
	1-4-6-7	1.2	0.0	■		***SAND & GRAVEL:*** 8-10 ft; sand 50% (fine to medium); gravel 20% (fine to medium); silt and clay 30%; dark yellowish brown with some orange staining, moist, loose-pliable.
10	3-5-8-6	0		▯		***NO RECOVERY:*** 10-12 ft;
	26-7-7-12	0.2	0.0	■		***SAND & GRAVEL:*** 12-14 ft; sand 50% (fine to medium); gravel 20% (coarse); silt and clay 30%; dark yellowish brown, moist, pliable.
15	5-7-9-7	0.3	0.0	■		***SAND& GRAVEL:*** 14-16 ft; same as above.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 58.0
Surface Elev.: 734.9285
Datum: Mean Sea Level
North Coor.: 5576.83790

Begin Drilling: 11/13/98
End Drilling: 11/13/98
Converted to Well: No
Well Name:
East Coor.: 5750.78051

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH17

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
16	3-2-7-17	1.5	0.0			***CLAY:*** 16-18 ft; silt and clay 70%; sand 20% (fine to medium); gravel 10% (fine); medium gray, pliable to cohesive, doesn't look like upper clay till.
	8-23-34-28	1.0	0.0			***SAND & GRAVEL:*** 18-20 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; light orangish brown, moist, loose.
21	11-37-25-44	1.2	0.0			***SAND & GRAVEL:*** 20-22 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; light yellowish brown, moist, loose.
	18-24-50	1.0	0.0			***SAND & GRAVEL:*** 22-24 ft; sand 60% (fine to medium); gravel 20% (fine); silt and clay 20%; moderate yellowish brown, moist, loose-cohesive.
	38-50	0.8	0.0			***SAND & GRAVEL:*** 24-26 ft; sand 50% (fine to medium); gravel 40% (coarse); silt and clay 10%; light yellowish brown, moist, loose.
26	37-50	1.0	0.0			***SAND & GRAVEL:*** 26-28 ft; sand 70% (fine to medium); gravel 20% (fine to medium); silt and clay 10%; light yellowish brown, moist, loose.
	50	0.5	0.5			***SAND & GRAVEL:*** 28-30 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; light yellowish brown, moist, loose.
31	50-20	1.7	0.0			***SAND & GRAVEL:*** 30-32 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, wet, loose-cohesive.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 58.0
Surface Elev.: 734.9285
Datum: Mean Sea Level
North Coor.: 5576.83790

Begin Drilling: 11/13/98
End Drilling: 11/13/98
Converted to Well: No
Well Name:
East Coor.: 5750.78051

OH000294.0001.0002

I:/GMOTORS/GMCFRI/GTGS/OH-BH17 (12/18/98)

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH17

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
32	100	1.5	0.0			***SAND & GRAVEL:*** 32–34 ft; sand 50% (fine to medium); gravel 40% (fine to coarse); silt and clay 10%; moderate yellowish brown, wet, loose.
	9–94	1.0	0.0			***SAND & GRAVEL:*** 34–36 ft; sand 70% (fine to medium), gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown with slight orange staining, wet, loose.
37	50	0.5	<0.5			***SAND & GRAVEL:*** 36–38 ft; sand 70% (fine to medium); gravel 20% (fine); silt and clay 10%; moderate yellowish brown, wet, loose.
	50	0.7	0.0			***SAND & GRAVEL:*** 38–40 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, wet, loose.
	16–10–20–17	1.1	0.0			***SAND & GRAVEL:*** 40–42 ft; sand 70% (fine to medium); gravel 20% (fine); silt and clay 10%; dark yellowish brown, wet, loose.
42	27–50	1.1	0.0			***SAND & GRAVEL:*** 42–44 ft; sand 70% (fine to medium); gravel 20% (fine); silt and clay 10%; dark yellowish brown, wet, loose.
	15–43–50	1.5	0.0			***SAND & GRAVEL:*** 44–46 ft; sand 60% (fine to coarse); gravel 30% (fine to coarse); silt and clay 10%; dark yellowish brown, wet, loose.
						NO RECOVERY: 46–48 ft.
47	50	0				

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 58.0
Surface Elev.: 734.9285
Datum: Mean Sea Level
North Coor.: 5576.83790

Begin Drilling: 11/13/98
End Drilling: 11/13/98
Converted to Well: No
Well Name:
East Coor.: 5750.78051

OH000294.0001.0002

I:/GMOTORS/GMCFRI/GTGS/OH-BH17 (12/18/98)

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH17

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
48	27-49-28-47	2.0	0.0			***SAND & GRAVEL:*** 48–50 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; dark yellowish brown, wet, loose.
	8-35-27-50	1.5	0.0			***SAND:*** 50–52 ft; sand 80% (fine to coarse); gravel 10% (fine); silt and clay 10%; dark yellowish brown, wet, loose.
						SAND: 52–54 ft; same as above.
53	27-29-50	1.5	0.0			
	20-29-50	1.2	0.0			***SAND & GRAVEL:*** 54–56 ft; sand 70% (fine to coarse), gravel 20% (fine to coarse); silt and clay 10%; dark yellowish brown, wet, loose.
						SAND & GRAVEL: 56–57 ft; same as above.
	20-27-50	1.5	0.0			***TILL:*** 57–58 ft; silt and clay 85%; gravel 10% (fine); sand 5% (fine); dark gray, slightly moist, very cohesive.
58						***TOTAL DEPTH:*** 58 ft.
63						

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 58.0
Surface Elev.: 734.9285
Datum: Mean Sea Level
North Coor.: 5576.83790

Begin Drilling: 11/13/98
End Drilling: 11/13/98
Converted to Well: No
Well Name:
East Coor.: 5750.78051

OH000294.0001.0002

I:/GMOTORS/GMCFRI/GTGS/OH-BH17 (12/18/98)

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH18

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
0						***ASPHALT:*** 0–0.25 ft.
	6-17-19	0.7	1.0			***SAND & GRAVEL:*** 0.25–2 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; light yellowish brown to light gray, slightly moist, loose.
	14-32 37-26	1.0	2.5			***SAND & GRAVEL:*** 2–4 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, slightly moist, loose.
5	10-15-7-13	1.0	5.5			***SAND & GRAVEL:*** 4–6 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	4-10-7-10	1.7	3.0			***SAND:*** 6–8 ft; sand 80% (fine to medium); gravel 10% (fine); silt and clay 10%; moderate yellowish brown, moist, loose.
	2-19-23-20	1.1	4.5			***SAND & GRAVEL:*** 8–10 ft; sand 60% (fine to medium); gravel 30% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.
10	14-23-14-7	1.0	2.0			***SAND & GRAVEL:*** 10–12 ft; sand 60% (fine to medium); gravel 30% (coarse); silt and clay 10%; light yellowish brown, moist, loose.
	15-21-23-24	1.0	2.0			***SAND & GRAVEL:*** 12–14 ft; sand 70% (fine to medium); gravel 20% (coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
15	8-10-26-31	1.2	2.0			***SAND & GRAVEL:*** 14–16 ft; sand 50% (fine to medium); gravel 40% (fine to coarse); silt and clay 10%; light yellowish brown to light gray, moist, loose.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 36.0
Surface Elev.: 737.6973
Datum: Mean Sea Level
North Coor.: 6118.38181

Begin Drilling: 11/04/98
End Drilling: 11/04/98
Converted to Well: No
Well Name:
East Coor.: 6082.64607

OH000294.0001.0002

I:/GMOTORS/GMCFRI/GTGS/OH-BH18 (12/18/98)

ARCADIS Geraghty & Miller
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Log of Boring: OH-BH18

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
16	19-26-25-20	1.7	4.0			***SAND & GRAVEL:*** 16-18 ft; sand 60% (fine to coarse) gravel 30% (fine to coarse); silt and clay (10%), light yellowish brown, moist, loose.
	20-28-32-50	2.0	3.0			***SAND & GRAVEL:*** 18-20 ft; sand 70% (fine to medium); gravel 20% (fine to medium); silt and clay 10%; light yellowish brown, moist, loose.
21	29-50/5"	0.6	1.0			***SAND & GRAVEL:*** 20-22 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; light yellowish brown, moist, loose.
	6-17-10-13	1.5	2.5			***SAND:*** 22-24 ft; sand 90% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.
	8-17-29-37	1.7	1.0			***SAND & GRAVEL:*** 24-26 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; light yellowish brown and light gray, moist, loose, 1" of black staining.
26	22-41-50	1.5	1.0			***SAND & GRAVEL:*** 26-28 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; light yellowish brown, moist, loose.
	29-50	0.8	1.0			***SAND & GRAVEL:*** 28-30 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; light yellowish brown, moist, loose.
31	10-21-14-8	1.3	0.5			***SAND & GRAVEL:*** 30-32 ft; sand 60% (fine to coarse); gravel 30% (fine to coarse); silt and clay 10%; moderate to dark yellowish brown, moist, loose, wet at 31'.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Geologist: W.J. Ferguson
Begin Drilling: 11/04/98
Driller: Ray/Mike
Total Depth: 36.0
End Drilling: 11/04/98
Drilling Method: Hollow Stem Auger
Surface Elev.: 737.6973
Converted to Well: No
Drilling Fluid: None
Datum: Mean Sea Level
Well Name:
Remarks:
North Coor.: 6118.38181
East Coor.: 6082.64607

OH000294.0001.0002

I:/GMOTORS/GMCFRI/GTGS/OH-BH18 (12/18/98)

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH18

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
32	7-20-18-29	1.5	0.0			***SAND & GRAVEL:*** 32–34 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, wet, loose.
	18-18-20-50	1.5	0.0/0.0			***SAND & GRAVEL:*** 34–35.5 ft; sand 70% (fine to coarse), gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, wet, loose–cohesive.
						TILL: 35.5–36 ft; silt and clay 80%; gravel 15% (fine); sand 5% (fine); dark gray, slightly moist, very cohesive.
37						***TOTAL DEPTH:*** 36 ft.
42						
47						

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 36.0
Surface Elev.: 737.6973
Datum: Mean Sea Level
North Coor.: 8118.38181

Begin Drilling: 11/04/98
End Drilling: 11/04/98
Converted to Well: No
Well Name:
East Coor.: 6082.64607

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH19

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
0	10-14-18-12	2.0	<0.5	■		***SAND & GRAVEL:*** 0-2 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, slightly moist, loose.
	12-15-23-35	2.0	0.0	■		***SAND & GRAVEL:*** 2-4 ft; sand 70% (fine to medium); gravel 20% (fine to medium); silt and clay 10%; light to moderate yellowish brown, slightly moist, loose.
5	12-27-20-43	2.0	0.0	■		***SAND & GRAVEL:*** 4-6 ft; sand 60% (fine to medium); gravel 30% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.
	11-11-16-29	1.7	0.0	■		***SAND:*** 6-8 ft; sand 80% (fine to medium); gravel 10% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.
	10-20-25-30	2.0	0.0	■		***SAND & GRAVEL:*** 8-10 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
10	22-34-24-23	1.0	0.0	■		***SAND & GRAVEL:*** 10-12 ft; sand 50% (fine to medium); gravel 40% (fine to coarse); silt and clay 10%; moderate yellowish brown to light gray, moist, loose.
	10-14-12-22	1.4	0.0	■		***SAND & GRAVEL:*** 12-14 ft; sand 60% (fine to medium); gravel 30% (fine to very coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
15	16-22-17-23	1.8	0.0	■		***SAND & GRAVEL:*** 14-16 ft; sand 50% (fine to medium); gravel 40% (fine to very coarse); silt and clay 10%; moderate yellowish brown to light gray, moist, loose.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Geologist: W.J. Ferguson
Total Depth: 36.0
Surface Elev.: 738.5345
Datum: Mean Sea Level
Begin Drilling: 11/09/98
End Drilling: 11/09/98
Converted to Well: No
Well Name:
Remarks:
North Coor.: 6338.98524
East Coor.: 8089.95636

OH000294.0001.0002

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH19

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
16	7-11-10-8	1.7	0.0			***SAND & GRAVEL:*** 16-18 ft; sand 70% (fine to medium) gravel 20% (fine to coarse); silt and clay (10%), light to moderate yellowish brown, moist, loose.
	7-12-15-22	1.3	0.0			***SAND & GRAVEL:*** 18-20 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; dark yellowish brown with some dark orange staining, moist, loose.
21	13-26-23-24	1.7	0.0			***SAND & GRAVEL:*** 20-22 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; light yellowish brown, moist, loose.
	9-14-18-24	1.5	0.0			***SAND & GRAVEL:*** 22-24 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	2-7-13-17	1.5	0.0			***SAND:*** 24-26 ft; sand 80% (fine to coarse); gravel 10% (fine); silt and clay 10%; moderate to dark yellowish brown, moist, loose.
26	2-18-34-38	1.3	0.0			***SAND & GRAVEL:*** 26-28 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; light to moderate yellowish brown, moist, loose.
	16-42-50	1.2	0.0			***SAND & GRAVEL:*** 28-30 ft; sand 60% (fine to medium); gravel 20% (fine to coarse); silt and clay 20%; moderate yellowish brown, moist, loose.
31	18-25-24-36	1.6	0.0			***SAND & GRAVEL:*** 30-32 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; dark yellowish brown, very moist, loose-semicohesive.

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Geologist: W.J. Ferguson
Total Depth: 36.0
Surface Elev.: 738.5345
Datum: Mean Sea Level
Begin Drilling: 11/09/98
End Drilling: 11/09/98
Converted to Well: No
Well Name:
Remarks:
North Coor.: 6338.98524
East Coor.: 6089.95636

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH19

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
32	5-16-25-20	1.2	0.0			***SAND & GRAVEL:*** 32-34 ft; sand 60% (fine to coarse); gravel 30% (fine to coarse); silt and clay 10%; dark yellowish brown, wet, loose.
	20-47-50/4"	1.5	0.0/0.0			***SAND & GRAVEL:*** 34-35 ft; sand 70% (fine to medium), gravel 20% (fine to medium); silt and clay 10%; dark yellowish brown, wet, loose.
						TILL: 35-36 ft; silt and clay 85%; gravel 10% (fine); sand 5% (fine); dark yellowish brown to dark gray, slightly moist, very cohesive.
37						***TOTAL DEPTH:*** 36 ft.
42						
47						

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 36.0
Surface Elev.: 738.5345
Datum: Mean Sea Level
North Coor.: 6338.98524

Begin Drilling: 11/09/98
End Drilling: 11/09/98
Converted to Well: No
Well Name:
East Coor.: 6089.95636

OH000294.0001.0002

I:/GMOTORS/GMCFRI/GTGS/OH-BH19 (12/18/98)

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH20

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
0	3-10-10-15	1.2	0.0	■		***SAND & GRAVEL:*** 0-2 ft; sand 60% (fine to medium); gravel 20% (fine to medium); silt and clay 20%; dark brown, moist, cohesive.
	6-11-11-14	1.5	0.0	■		***SAND & GRAVEL:*** 2-4 ft; same as above.
5	9-23-22-23	0.8	0.0	■		***SAND & GRAVEL:*** 4-6 ft; sand 50% (fine to medium); gravel 40% (fine to coarse); silt and clay 10%; light gray, moist, loose.
	22-24-40-30	0.7	0.0	■		***SAND & GRAVEL:*** 6-8 ft; same as above.
	16-50	0.5	0.0	■		***SAND & GRAVEL:*** 8-10 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown to light gray, moist, loose.
10	5-23-18-19	1.0	0.0	■		***SAND & GRAVEL:*** 10-12 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; dark yellowish brown, moist, loose.
	3-13-14-22	1.5	0.0	■		***SAND & GRAVEL:*** 12-14 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; dark yellowish brown, moist, loose.
15	2-9-31-31	1.5	0.0	■		***SAND:*** 14-16 ft; sand 80% (fine to medium); gravel 10% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.

■ Sample to Lab ▯▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 38.0
Surface Elev.: 740.3458
Datum: Mean Sea Level
North Coor.: 6695.86139

Begin Drilling: 11/11/98
End Drilling: 11/11/98
Converted to Well: No
Well Name:
East Coor.: 6042.45580

OH000294.0001.0002

I:/GMOTORS/GMCFRI/GTGS/OH-BH20 (12/18/98)

ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH20

GENERAL MOTORS — Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
16	15-17-50	1.0	0.0			***SAND & GRAVEL:*** 16-18 ft; sand 70% (fine to medium) gravel 20% (fine to medium); silt and clay (10%); moderate yellowish brown, moist, loose.
	20-38-39-37	1.7	0.0			***SAND & GRAVEL:*** 18-20 ft; sand 60% (fine to medium); gravel 30% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
21	14-35-50	0.9	0.0			***SAND & GRAVEL:*** 20-22 ft; sand 70% (fine to medium); gravel 20% (fine to coarse); silt and clay 10%; moderate yellowish brown, moist, loose.
	8-38-28-42	1.5	0.0			***SAND & GRAVEL:*** 22-24 ft; sand 70% (fine to medium); gravel 20% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.
	11-38-33-28	1.2	0.0			***SAND & GRAVEL:*** 24-26 ft; sand 70% (fine to medium); gravel 20% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.
26	8-18-43-50	1.5	0.0			***SAND:*** 26-28 ft; sand 80% (fine to medium); gravel 10% (fine); silt and clay 10%; dark yellowish brown, moist, loose.
	8-32-33-50	1.2	0.0			***SAND & GRAVEL:*** 28-30 ft; sand 70% (fine to medium); gravel 20% (fine to medium); silt and clay 10%; moderate yellowish brown, moist, loose.
31	36-48-50	0.5	0.0			***SAND & GRAVEL:*** 30-32 ft; sand 70% (fine to medium); gravel 20% (fine); silt and clay 10%; dark yellowish brown, moist, loose.

■ Sample to Lab ▯▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 38.0
Surface Elev.: 740.3458
Datum: Mean Sea Level
North Coor.: 6695.86139

Begin Drilling: 11/11/98
End Drilling: 11/11/98
Converted to Well: No
Well Name:
East Coor.: 6042.45580

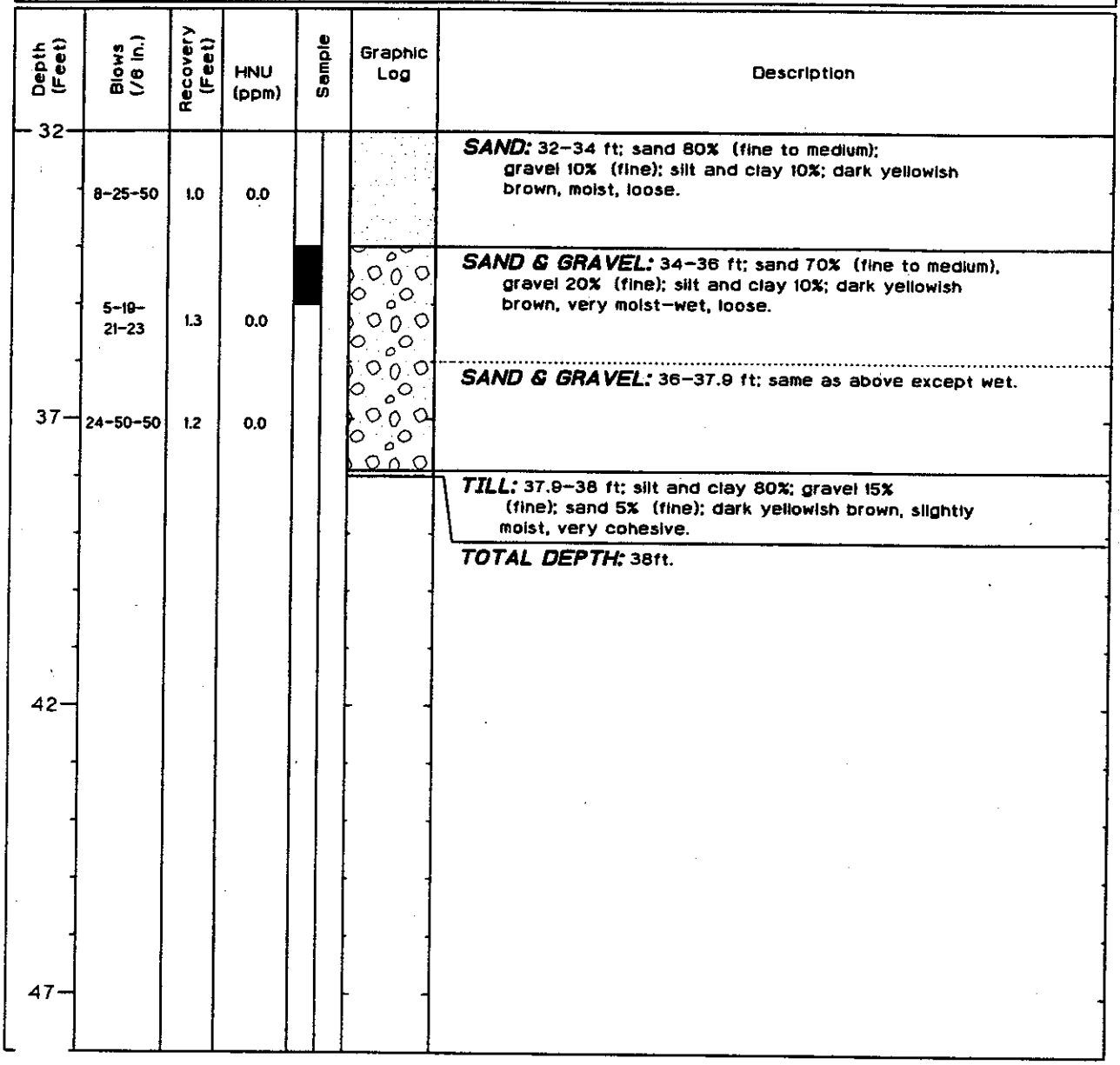
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ARCADIS Geraghty & Miller
Environmental Services

Log of Boring: OH-BH20

GENERAL MOTORS — Moraine, Ohio



■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: Ray/Mike
Drilling Method: Hollow Stem Auger
Drilling Fluid: None
Remarks:

Geologist: W.J. Ferguson
Total Depth: 38.0
Surface Elev.: 740.3458
Datum: Mean Sea Level
North Coor.: 6695.86139

Begin Drilling: 11/11/98
End Drilling: 11/11/98
Converted to Well: No
Well Name:
East Coor.: 6042.45580

OH000294.0001.0002

I:/GMOTORS/GMCFRI/GTGS/OH-BH20 (12/18/98)

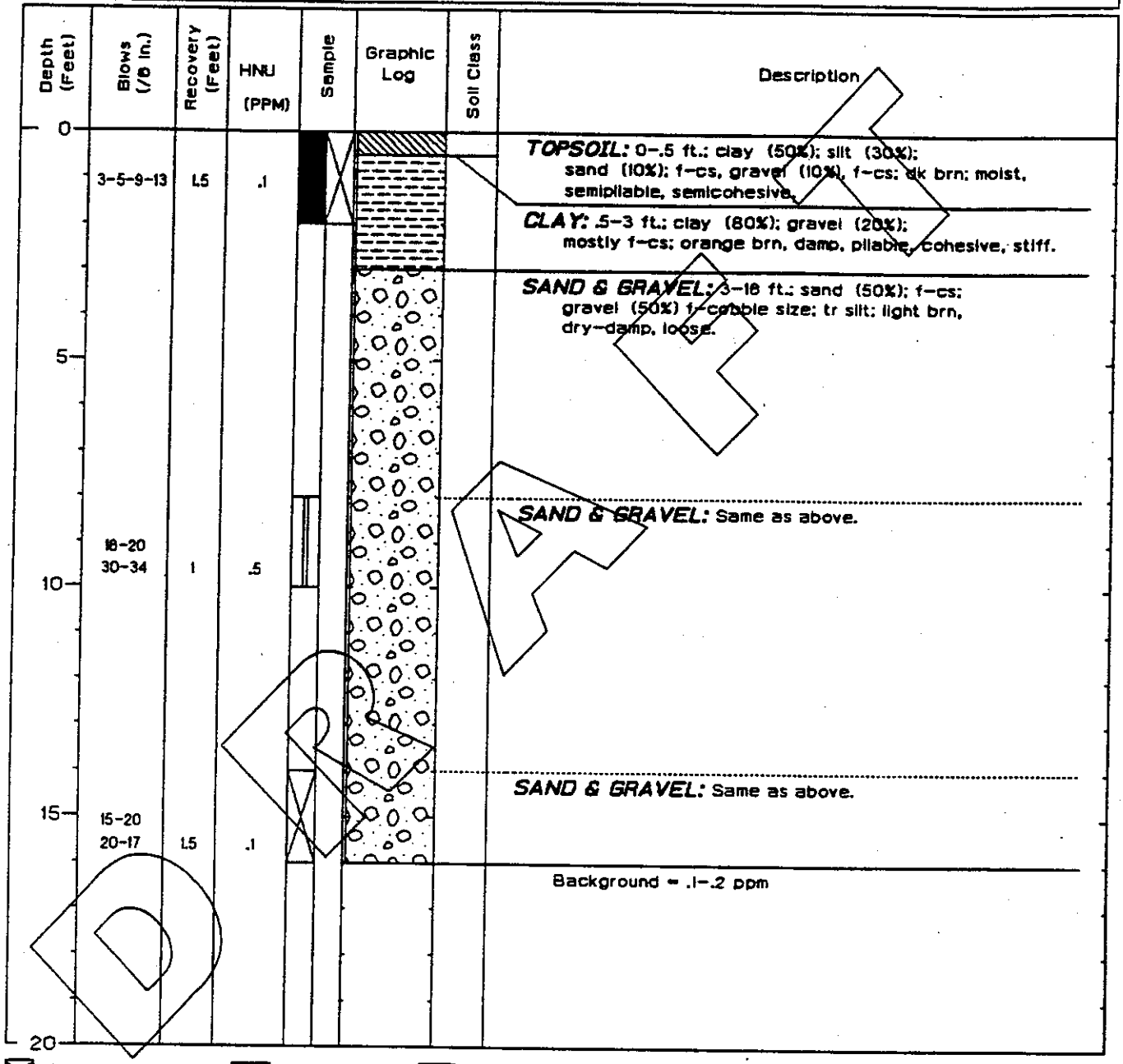
BKG-BH01 to BH14

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: BKG-BH01

HARRISON RFI

Moraine, Ohio



☒ Composite to Lab ■ VOC to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Belasco
Driller: G. Mayle
Drilling Method: HSA 4 1/4"
Drilling Fluid: None
Remarks:

Geologist: R. Astle
Total Depth: 18
Surface Elev.:
Datum: Feet, MSL
West Coor.:

Begin Drilling: 11/06/92
End Drilling: 11/06/92
Converted to Well: No
Well Name:
South Coor.:

OH019.12

harrison

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 1 of 2

Site Location Moraine, Ohio

Sample No. BKG-BH01-02SL Coded/ Replicate No. _____ Date 11-6-92

Weather Cloudy, 40sF Time Sampling Began 9:30 a.m. Time Sampling Completed 9:40 a.m.

Sampling Method and Material 3" diameter split spoon

Grab ____ Composite X

From	To	Soil/Sediment Description
0	2	Clay; some silt; some gravel, f-cs; little sand, f-cs; dk brown to orange brn, damp to moist, pliable, cohesive.

Other (OVA; HNU; etc.) HNU in spoon = .1 ppm. Background = .1 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice
TCL SVOCs/PCBs/Pesticides	4 oz glass jar	Ice
TAL Metals & Cyanide	16 oz glass jar	Ice

Remarks

Sampling Personnel R. Astle

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 2 of 2

Site Location Moraine, Ohio

Sample No. BKG-BH01-16SL Coded/ Replicate No. _____ Date 11-6-92

Weather Cloudy, 40sF Time Sampling Began 10:50 a.m. Time Sampling Completed 11:00 a.m.

Sampling Method and Material 2" diameter split spoon

Grab ____ Composite X

From	To	Soil/Sediment Description
14	16	Sand (50%), f-cs; gravel (50%), f-cobble size; silt (10%); tr silt; lt brn, dry-damp, loose.

Other (OVA; HNU; etc.) HNU in spoon = .1 ppm. Background = 1.1 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TAL Metals & Cyanide	16 oz glass jar	Ice

Remarks

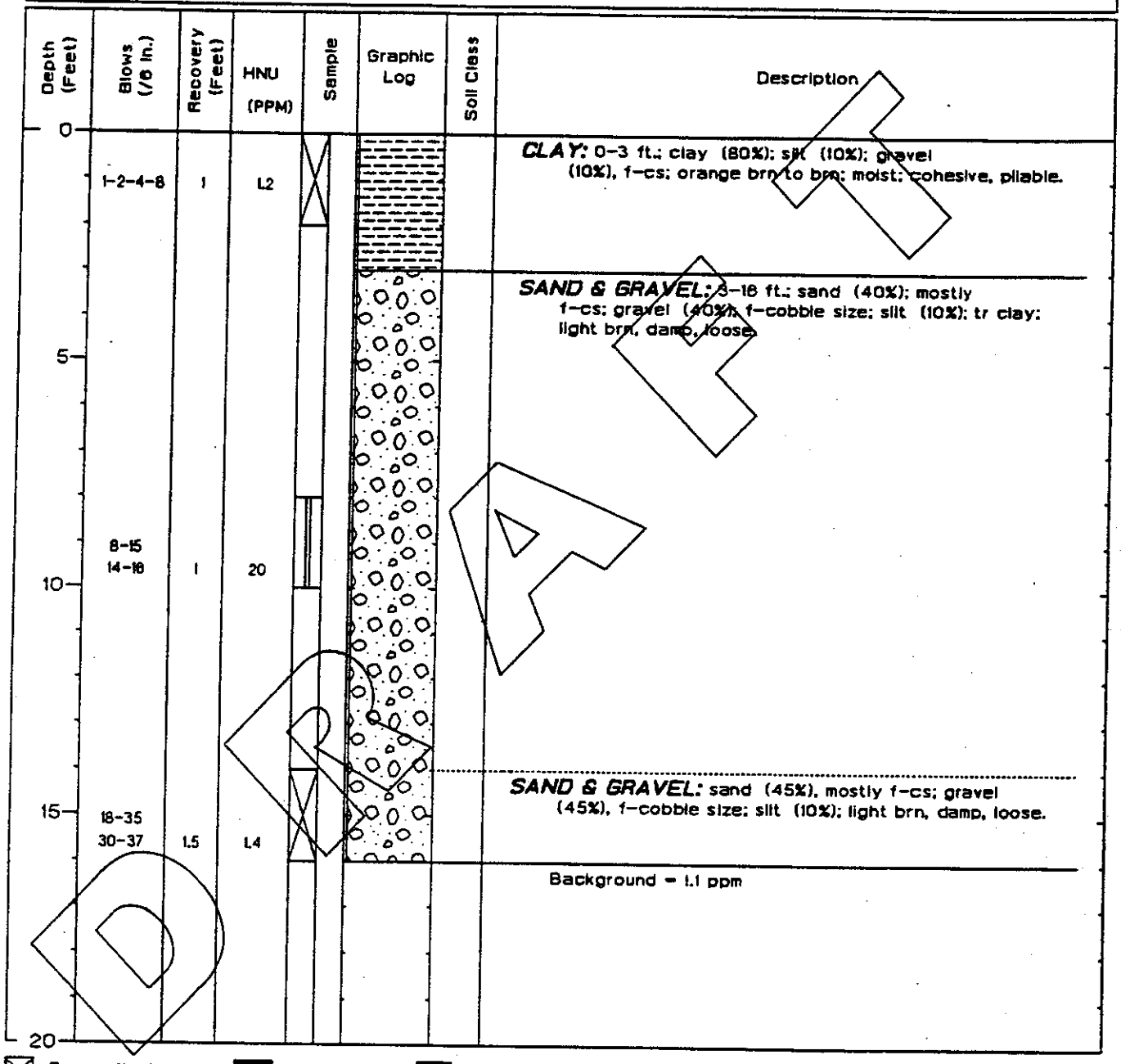
Sampling Personnel R. Astle

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: BKG-BH02

HARRISON RFI

Moraine, Ohio



☒ Composite to Lab ■ VOC to Lab ▥ Split-Spoon Not Analyzed

Page 1 of 1

Drilling Co.: Belasco
Driller: G. Mayle
Drilling Method: HSA 4 1/4"
Drilling Fluid: None
Remarks:

Geologist: R. Astle
Total Depth: 18
Surface Elev.:
Datum: Feet, MSL
West Coor.:

Begin Drilling: 11/08/92
End Drilling: 11/08/92
Converted to Well: No
Well Name:
South Coor.:

OH019.12

harrison

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 1 of 2

Site Location Moraine, Ohio

Sample No. BKG-BH02-02SL Coded/ Replicate No. _____ Date 11-5-92

Weather Cloudy, 40sF Time Sampling Began 3:00 p.m. Time Sampling Completed 4:00 p.m.

Sampling Method and Material 2" diameter split spoon

Grab X Composite ____

From	To	Soil/Sediment Description
0	2	Clay (80%); silt (10%); gravel (10%), f-cs; orange brn to brn, moist, cohesive, pliable.

Other (OVA; HNU; etc.) HNU in spoon = 1.2 ppm. Background = 1.1 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TAL Metals	16 oz glass jar	Ice

Remarks _____

Sampling Personnel R. Astle

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 2 of 2

Site Location Moraine, Ohio

Sample No. BKG-BH02-16SL Coded/ Replicate No. _____ Date 11-5-92

Weather Cloudy, 40sF Time Sampling Began 3:00 p.m. Time Sampling Completed 4:00 p.m.

Sampling Method and Material 3" diameter split spoon

Grab ____ Composite X

From	To	Soil/Sediment Description
14	16	Sand (45%), mostly fine-cs; gravel (45%), f-cs; silt (10%); light brown, damp, loose.

Other (OVA; HNU; etc.) HNU in spoon = 1.4 ppm. Background = 1.1 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice
TAL Metals	16 oz glass jar	Ice

Remarks

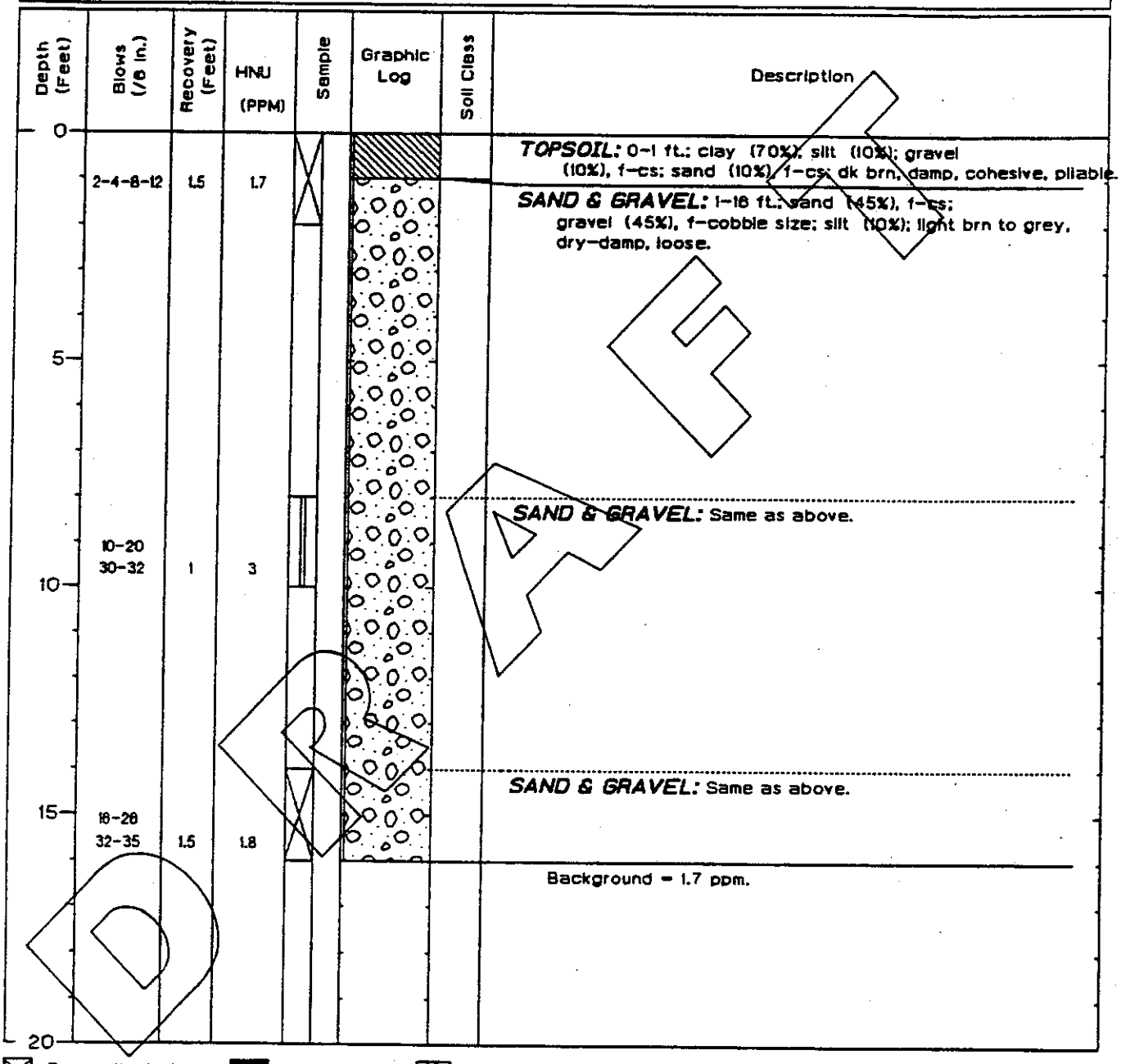
Sampling Personnel R. Astle

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: BKG-BH03

HARRISON RFI

Moraine, Ohio



☒ Composite to Lab ■ VOC to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Belasco
Driller: G. Mayle
Drilling Method: HSA 4 1/4"
Drilling Fluid: None
Remarks:

Geologist: R. Astle
Total Depth: 18
Surface Elev.:
Datum: Feet, MSL
West Coor.:

Begin Drilling: 11/10/92
End Drilling: 11/10/92
Converted to Well: No
Well Name:
South Coor.:

OH019.12

harrison

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 1 of 2

Site Location Moraine, Ohio

Sample No. BKG-BH03-02SL Coded/ Replicate No. _____ Date 11-10-92

Weather Rain, 50sF Time Sampling Began 2:00 p.m. Time Sampling Completed 2:10 p.m.

Sampling Method and Material 2" diameter split spoon

Grab ____ Composite X

From	To	Soil/Sediment Description
0	2	Clay; sand, f-cs; gravel, f-cs; little silt; dk brown to light brown, damp, cohesive, pliable to loose, crumbly.

Other (OVA; HNU; etc.) HNU = 1.7 ppm in spoon. Background = 1.7 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TAL Metals, TOC, CEC	16 oz glass jar	Ice
Bulk Density, Particle Size	5 gallon bucket	--
Moisture Content	1 liter glass jar	--
Porosity	Shelby tube	--

Remarks _____

Sampling Personnel R. Astle

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 2 of 2

Site Location Moraine, Ohio

Sample No. BKG-BH03-16SL Coded/ Replicate No. _____ Date 11-10-92

Weather Rain, 50sF Time Sampling Began 3:20 p.m. Time Sampling Completed 3:30 p.m.

Sampling Method and Material 2" diameter split spoon

Grab ____ Composite X

From	To	Soil/Sediment Description
14	16	Sand, f-cs; gravel, f-cs; little silt; light brown-gray, damp, loose.

Other (OVA; HNU; etc.) HNU = 1.8 ppm. Background HNU = 1.7 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TAL Metals, TOC, CEC	16 oz glass jar	Ice
Bulk Density, Particle Size	5 gallon bucket	--
Moisture Content	1 liter glass jar	--

Remarks Shelby tube refusal.

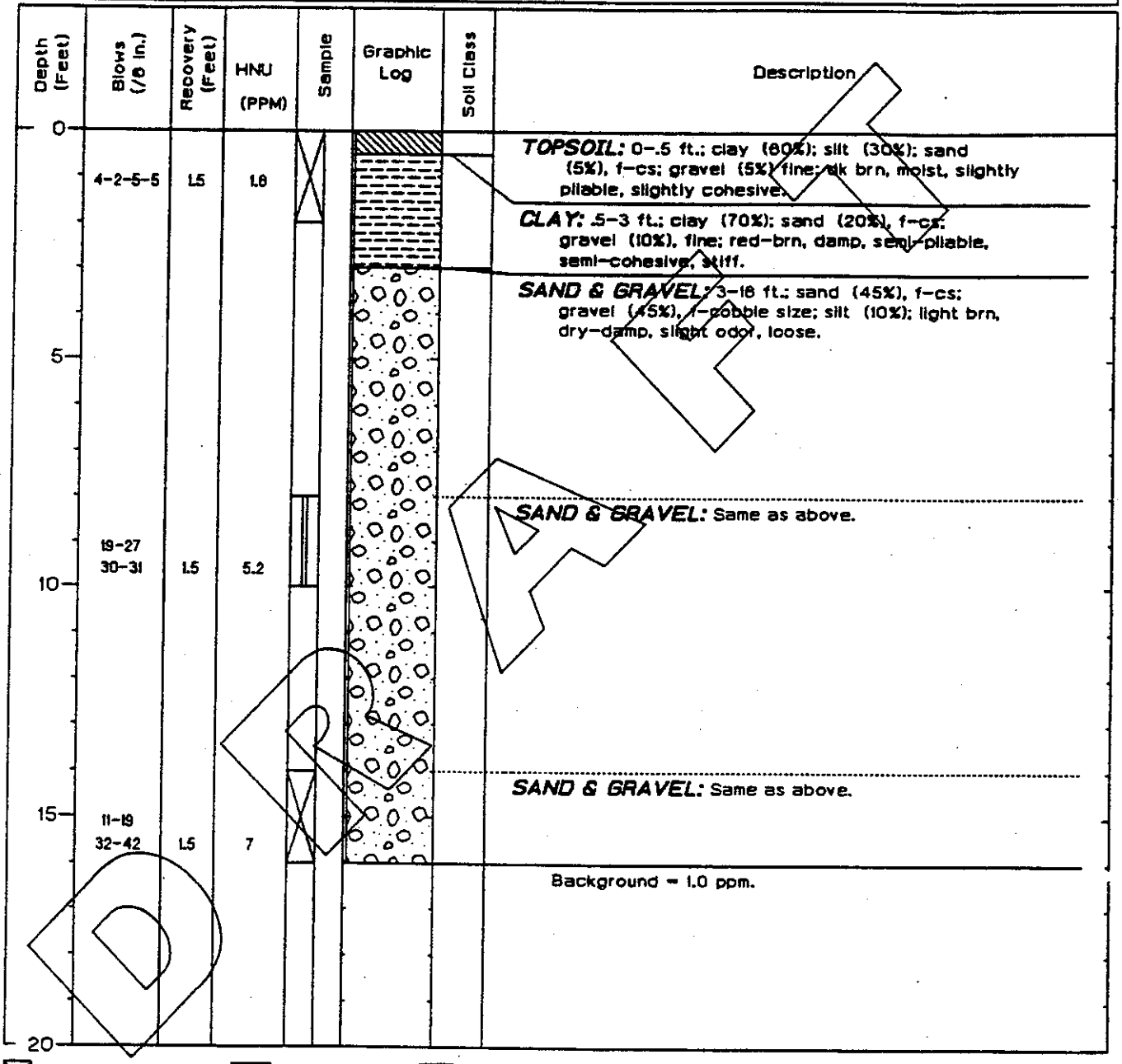
Sampling Personnel R. Astle

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: BKG-BH04

HARRISON RFI

Moraine, Ohio



☒ Composite to Lab ■ VOC to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Belasco
Driller: G. Mayle
Drilling Method: HSA 4 1/4"
Drilling Fluid: None
Remarks:

Geologist: R. Astle
Total Depth: 18
Surface Elev.:
Datum: Feet, MSL
West Coor.:

Begin Drilling: 11/05/92
End Drilling: 11/05/92
Converted to Well: No
Well Name:
South Coor.:

OH019.12

harrison

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 1 of 2

Site Location Moraine, Ohio

Sample No. BKG-BH04-02SL Coded/ Replicate No. _____ Date 11-5-92

Weather Cloudy, 40sF Time Sampling Began 4:30 p.m. Time Sampling Completed 5:30 p.m.

Sampling Method and Material 2" diameter split spoon

Grab X Composite ____

From	To	Soil/Sediment Description
0	2	Clay; little silt; little sand, f-cs; little gravel, f-cs; red brown to dk brn, damp to moist, semipliable, semicohesive.

Other (OVA; HNU; etc.) HNU in spoon = 1.6 ppm. Background = 1.0 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TAL Metals	16 oz glass jar	Ice

Remarks

Sampling Personnel R. Astle

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 2 of 2

Site Location Moraine, Ohio

Sample No. BKG-BH04-16SL Coded/ Replicate No. _____ Date 11-5-92

Weather Cloudy, 40sF Time Sampling Began 4:30 p.m. Time Sampling Completed 5:30 p.m.

Sampling Method and Material 2" diameter split spoon

Grab X Composite ____

From	To	Soil/Sediment Description
14	16	Sand (40%), f-cs; gravel (40%), f-cobble size; silt (10%); tr clay, lt brn, dry-damp, sl odor, loose.

Other (OVA; HNU; etc.) HNU in spoon = 5.2 ppm. Background = 1.0 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TAL Metals	16 oz glass jar	Ice

Remarks _____

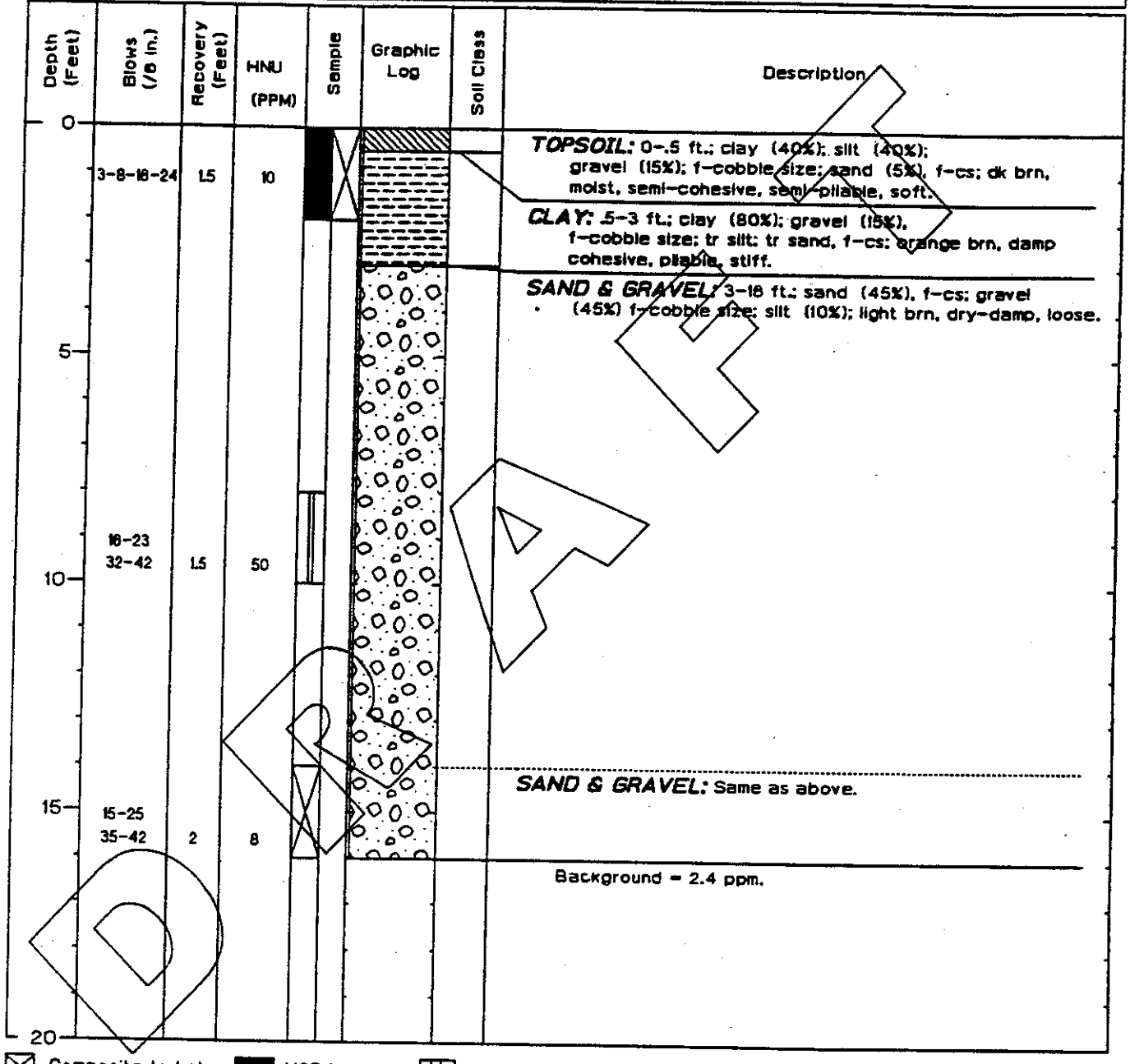
Sampling Personnel R. Astle

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: BKG-BH05

HARRISON RFI

Moraine, Ohio



☒ Composite to Lab ■ VOC to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Belasco
Driller: G. Mayle
Drilling Method: HSA 4 1/4"
Drilling Fluid: None
Remarks:

Geologist: R. Astle
Total Depth: 18
Surface Elev.:
Datum: Feet, MSL
West Coor.:

Begin Drilling: 11/08/92
End Drilling: 11/08/92
Converted to Well: No
Well Name:
South Coor.:

OH019.12

harrison

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 1 of 2

Site Location Moraine, Ohio

Sample No. BKG-BH05-02SL Coded/ Replicate No. _____ Date 11-6-92

Weather Cloudy, 40sF Time Sampling Began 11:50 a.m. Time Sampling Completed 12:00 p.m.

Sampling Method and Material 3" diameter split spoon

Grab ____ Composite X

From	To	Soil/Sediment Description
0	2	Clay; silt; little gravel, f-cs; little sand, f-cs; dk brown to orange brown, moist-damp, pliable, cohesive.

Other (OVA; HNU; etc.) HNU in spoon = 10 ppm. Background = 2.4 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice
TCL SVOCs, TCL PCB/Pest.	4 oz glass jar	Ice
TAL Metals/Cyanide	16 oz glass jar	Ice

Remarks

Sampling Personnel R. Astle

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 2 of 2

Site Location Moraine, Ohio

Sample No. BKG-BH05-16SL Coded/ Replicate No. _____ Date 11-6-92

Weather Cloudy, 40sF Time Sampling Began 12:50 p.m. Time Sampling Completed 1:00 p.m.

Sampling Method and Material 2" diameter split spoon

Grab ____ Composite X

From	To	Soil/Sediment Description
14	16	Sand (45%), f-cs; gravel (45%), f-cobble size; silt (10%); lt brn, dry-damp, loose.

Other (OVA; HNU; etc.) HNU in spoon = 8 ppm. Background = 2.4 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TAL Metals & Cyanide	16 oz glass jar	Ice

Remarks

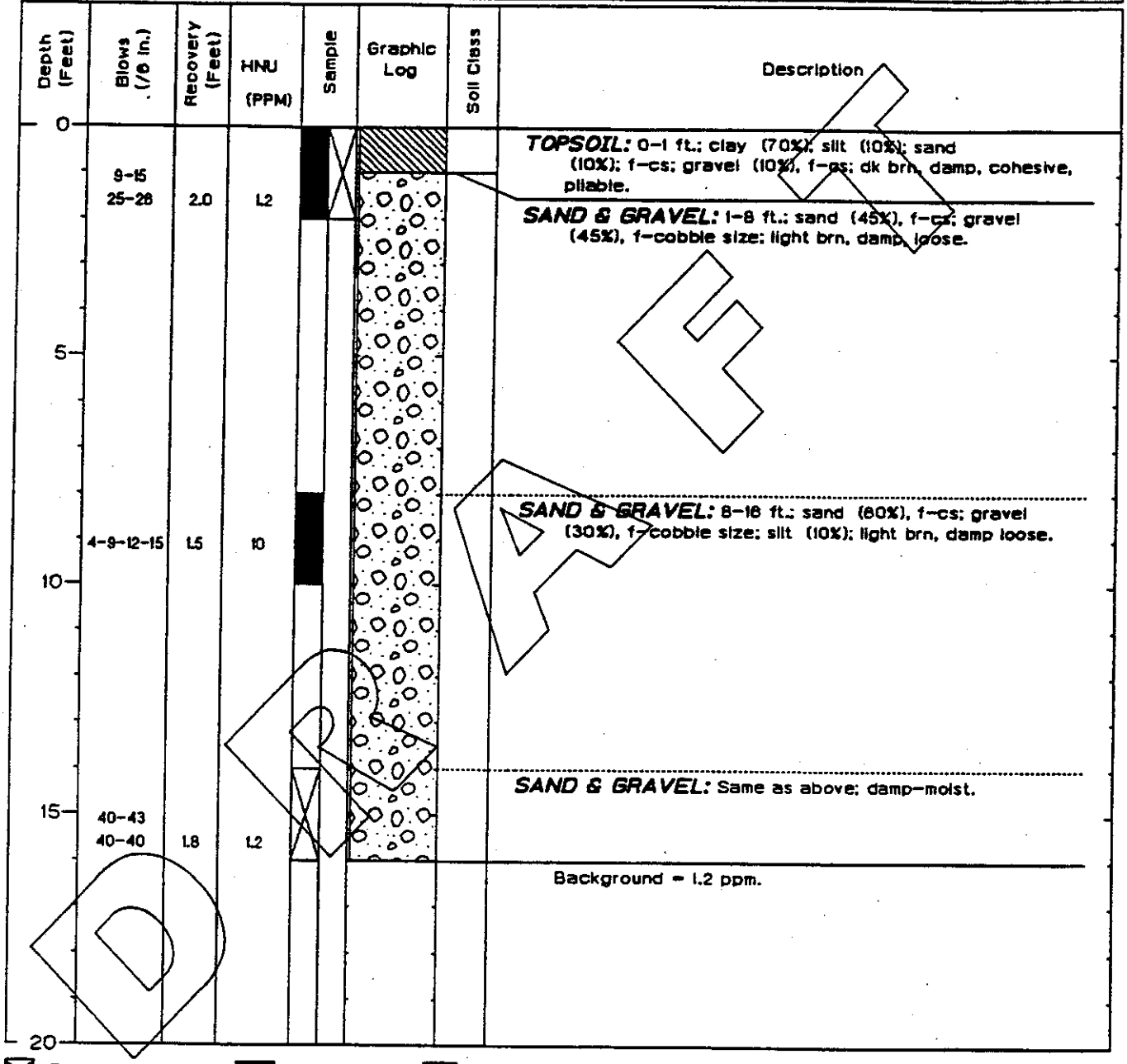
Sampling Personnel R. Astle

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: BKG-BH06

HARRISON RFI

Moraine, Ohio



☒ Composite to Lab ■ VOC to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Belasco
Driller: G. Mayle
Drilling Method: HSA 4 1/4"
Drilling Fluid: None
Remarks:

Geologist: R. Astle
Total Depth: 16
Surface Elev.:
Datum: Feet, MSL
West Coor.:

Begin Drilling: 11/09/92
End Drilling: 11/09/92
Converted to Well: No
Well Name:
South Coor.:

OH019.12

harrison

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 1 of 3

Site Location Moraine, Ohio

Sample No. BKG-BH06-02SL Coded/ Replicate No. DUP-3 Date 11-9-92

Weather Cloudy, 40sF Time Sampling Began 3:20 p.m. Time Sampling Completed 3:30 p.m.

Sampling Method and Material 3" diameter split spoon

Grab ____ Composite X

From	To	Soil/Sediment Description
0	2	Clay; little silt; dk brown, damp, cohesive, pliable; sand, f-cs; gravel, f-cs; light brown to gray, damp, loose.

Other (OVA; HNU; etc.) HNU in spoon = 1.2 ppm. Background = 1.2 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice
TCL SVOCs, PCB/Pest.	4 oz glass jar	Ice
TAL Metals & Cyanide	16 oz glass jar	Ice

Remarks

Sampling Personnel R. Astle

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 2 of 3

Site Location Moraine, Ohio

Sample No. BKG-BH06-10SL Coded/ Replicate No. _____ Date 11-9-92

Weather Cloudy, 40s F Time Sampling Began 3:30 p.m. Time Sampling Completed 3:40 p.m.

Sampling Method and Material 2" diameter split spoon

Grab ____ Composite X

From	To	Soil/Sediment Description
8	10	Sand, f-cs; gravel, f-cs; little silt; light brown, damp, loose.

Other (OVA; HNU; etc.) HNU in spoon = 10 ppm. Background = 1.2 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice

Remarks

Sampling Personnel R. Astle

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 3 of 3

Site Location Moraine, Ohio

Sample No. BKG-BH06-16SL Coded/ Replicate No. DUP-4 Date 11-9-92

Weather Cloudy, 40sF Time Sampling Began 3:50 p.m. Time Sampling Completed 4:00 p.m.

Sampling Method and Material 3" diameter split spoon

Grab ____ Composite X

From	To	Soil/Sediment Description
14	16	Sand, f-cs; gravel, f-cs; little silt; light brown to gray; damp, loose.

Other (OVA; HNU; etc.) HNU in spoon = 1.2 ppm. Background = 1.2 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TAL Metals & Cyanide	16 oz glass jar	Ice

Remarks

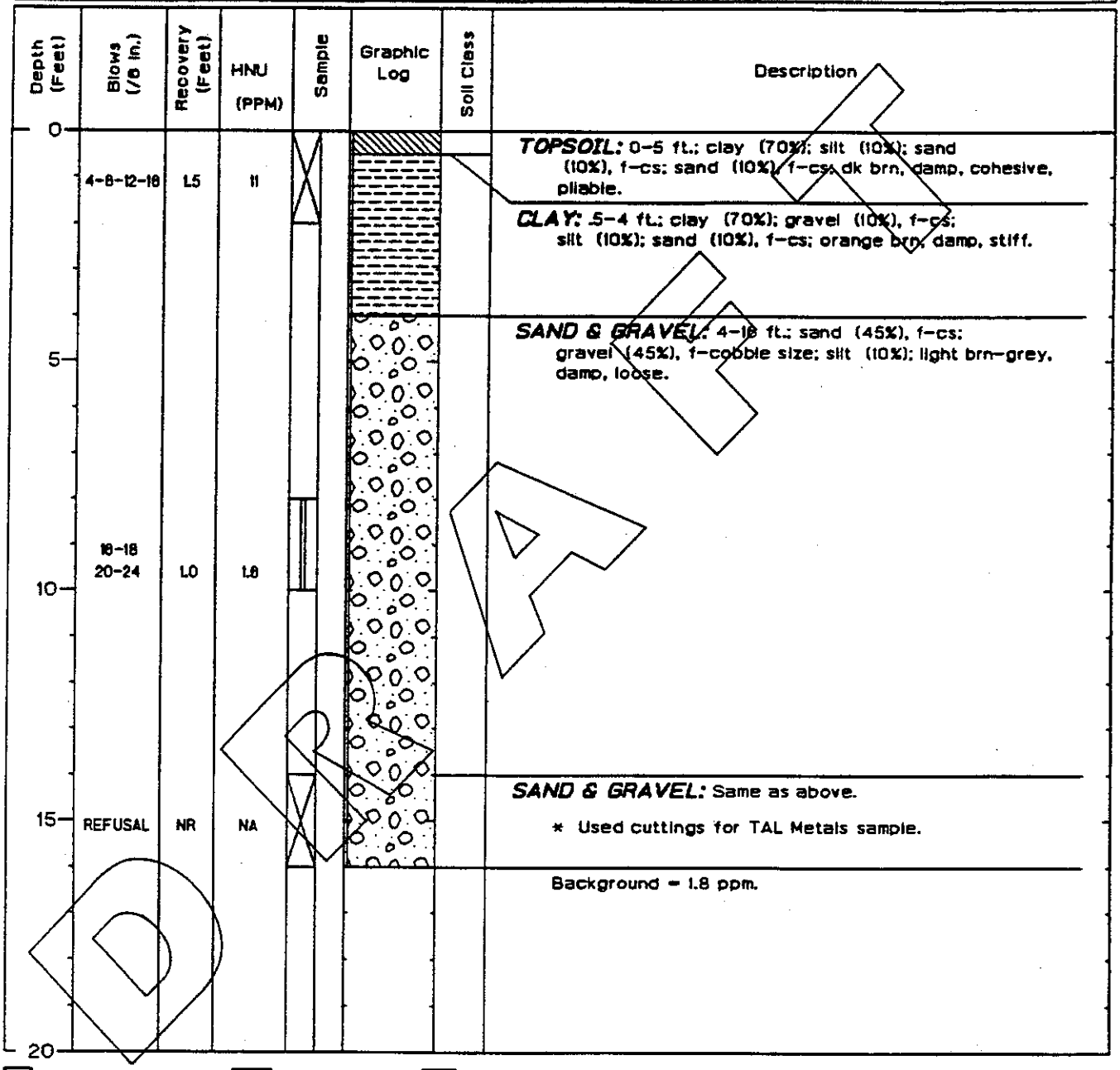
Sampling Personnel R. Astle

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: BKG-BH07

HARRISON RFI

Moraine, Ohio



☒ Composite to Lab ■ VOC to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Belasco
Driller: G. Mayle
Drilling Method: HSA 4 1/4"
Drilling Fluid: None
Remarks:

Geologist: R. Astle
Total Depth: 18
Surface Elev.:
Datum: Feet, MSL
West Coor.:

Begin Drilling: 11/10/92
End Drilling: 11/10/92
Converted to Well: No
Well Name:
South Coor.:

OH019.12

harrison

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 1 of 2

Site Location Moraine, Ohio

Sample No. BKG-BH07-02SL Coded/ Replicate No. DUP-5 Date 11-10-92

Weather Rain, 50sF Time Sampling Began 11:30 a.m. Time Sampling Completed 11:40 a.m.

Sampling Method and Material 2" diameter split spoon

Grab ____ Composite X

From	To	Soil/Sediment Description
0	2	Clay; little silt, little sand, f-cs; little gravel, f-cs; dk brn to orange brown, damp, semicohesive, semipliable.

Other (OVA; HNU; etc.) HNU = 11 ppm in spoon. Background = 2.2 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TAL Metals, TOC, CEC	16 oz glass jar	Ice
Bulk Density, Particle Size	5 gallon bucket	--
Moisture Content	1 liter glass jar	--
Porosity	Shelby tube	--

Remarks

Sampling Personnel R. Astle

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 2 of 2

Site Location Moraine, Ohio

Sample No. BKG-BH07-16SL Coded/ Replicate No. _____ Date 11-10-92

Weather Rain, 50sF Time Sampling Began 1:20 p.m. Time Sampling Completed 1:30 p.m.

Sampling Method and Material 2" diameter split spoon

Grab ____ Composite X

From	To	Soil/Sediment Description
14	16	Sand, f-cs; gravel, f-cs; little silt; light brown, damp, loose.

Other (OVA; HNU; etc.) NA - spoon refused.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TAL Metals, TOC, CEC	16 oz glass jar	Ice
Bulk Density, Particle Size	5 gallon bucket	--
Moisture Content	1 liter glass jar	--

Remarks Used drill cutting for sample. Split spoon & shelby tube refusal.

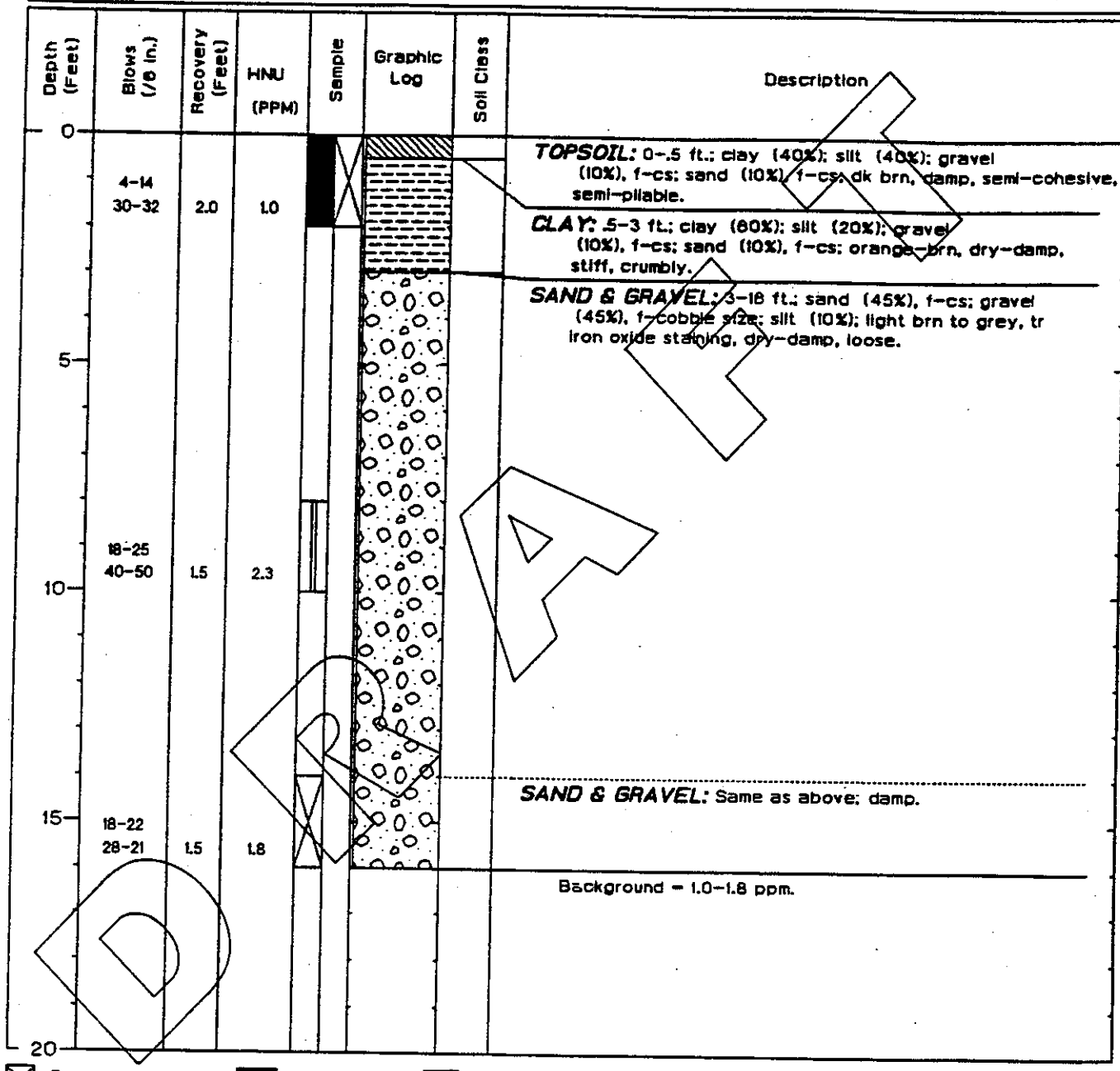
Sampling Personnel R. Astle

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: BKG-BH08

HARRISON RFI

Moraine, Ohio



FAX

☒ Composite to Lab ■ VOC to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Belasco
Driller: G. Mayle
Drilling Method: HSA 4 1/4"
Drilling Fluid: None
Remarks:

Geologist: R. Astle
Total Depth: 18
Surface Elev.:
Datum: Feet, MSL
West Coor.:

Begin Drilling: 11/09/92
End Drilling: 11/09/92
Converted to Well: No
Well Name:
South Coor.:

OH019.12

harrison

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 1 of 2

Site Location Moraine, Ohio

Sample No. BKG-BH08-02SL Coded/ Replicate No. _____ Date 11-9-92

Weather Cloudy, 40sF Time Sampling Began 3:20 p.m. Time Sampling Completed 3:30 p.m.

Sampling Method and Material 3" diameter split spoon

Grab ____ Composite X

From	To	Soil/Sediment Description
0	2	Clay; Silt; little sand, f-cs; little gravel, f-cs; dk brn to orange brown, damp, semi-cohesive; semipliable.

Other (OVA; HNU; etc.) HNU in spoon = 1 ppm. Background = 1 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice
TCL SVOCs & PCB/Pest.	4 oz glass jar	Ice
TAL Metals & Cyanide	16 oz glass jar	Ice

Remarks OEPA split TAL metals sample.

Sampling Personnel R. Astle

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 2 of 2

Site Location Moraine, Ohio

Sample No. BKG-BH08-16SL Coded/ Replicate No. _____ Date 11-9-92

Weather Cloudy, 40sF Time Sampling Began 1:35 p.m. Time Sampling Completed 1:45 p.m.

Sampling Method and Material 3" diameter split spoon

Grab ____ Composite X

From	To	Soil/Sediment Description
14	16	Sand, f-cs; gravel, f-cs; little silt; light brown to gray; damp, loose.

Other (OVA; HNU; etc.) HNU in spoon = 1.8 ppm. Background = 1.3 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TAL Metals & Cyanide	16 oz glass jar	Ice

Remarks OEPA split TAL metals sample.

Sampling Personnel R. Astle

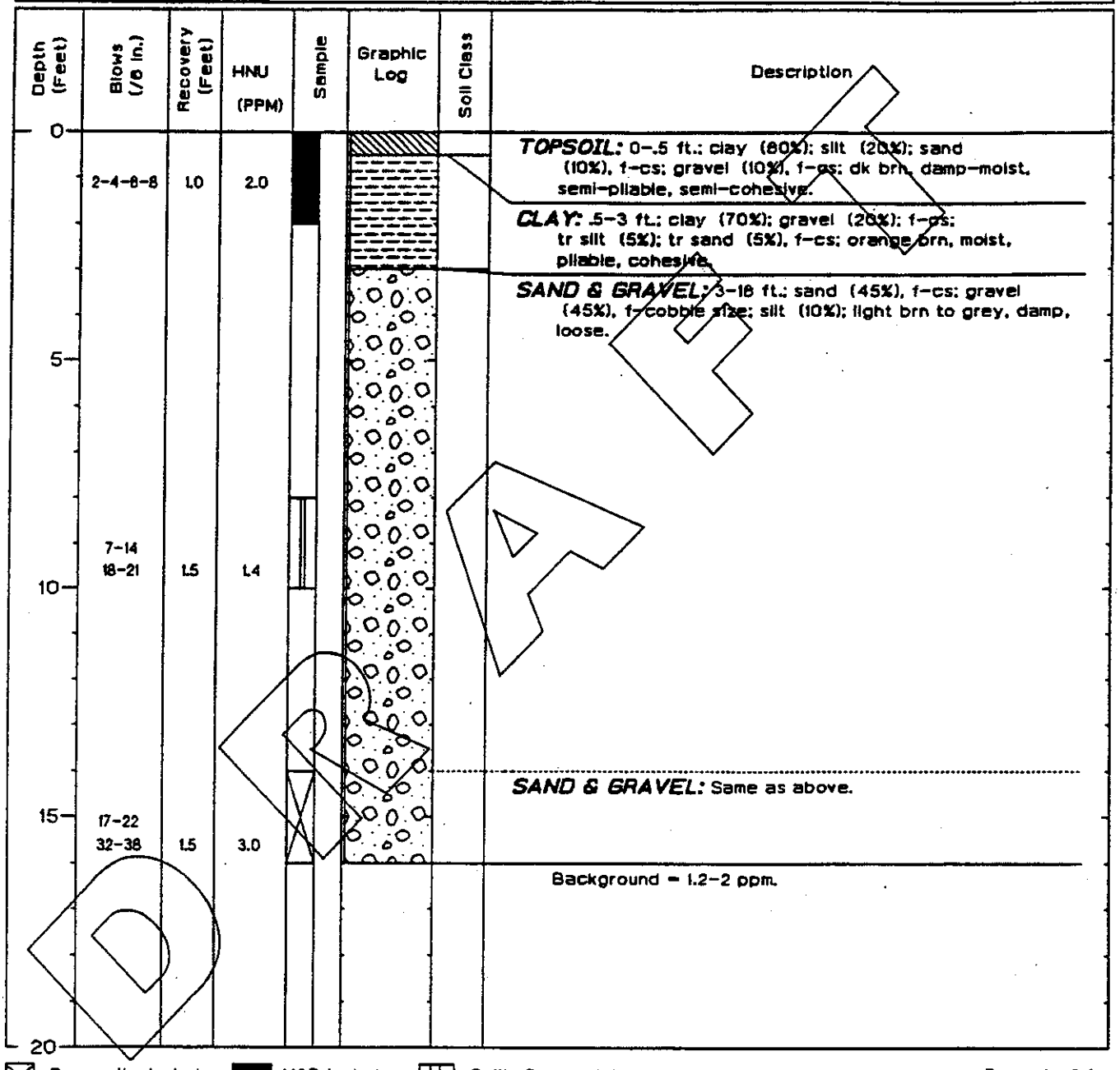
DRAFT

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: BKG-BH09

HARRISON RFI

Moraine, Ohio



DRAFT

☒ Composite to Lab ■ VOC to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Belasco
Driller: G. Mayle
Drilling Method: HSA 4 1/4"
Drilling Fluid: None
Remarks:

Geologist: R. Astle
Total Depth: 18
Surface Elev.:
Datum: Feet, MSL
West Coor.:

Begin Drilling: 11/09/92
End Drilling: 11/09/92
Converted to Well: No
Well Name:
South Coor.:

OH019.12

harrison

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 1 of 2

Site Location Moraine, Ohio

Sample No. BKG-BH09-02SL Coded/ Replicate No. _____ Date 11-9-92

Weather Cloudy, 40sF Time Sampling Began 1:50 p.m. Time Sampling Completed 2:00 p.m.

Sampling Method and Material 3" diameter split spoon

Grab ____ Composite X

From	To	Soil/Sediment Description
0	2	Clay; little silt; little sand, f-cs; little gravel, f-cs; dk brn to orange brn, damp-moist, pliable, cohesive.

Other (OVA; HNU; etc.) HNU in spoon = 2 ppm. Background = 2 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice
TCL SVOCs & PCB/Pest.	4 oz glass jar	Ice
TAL Metals & Cyanide	16 oz glass jar	Ice

Remarks MS/MSD sample.

Sampling Personnel R. Astle

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 2 of 2

Site Location Moraine, Ohio

Sample No. BKG-BH09-16SL Coded/ Replicate No. _____ Date 11-9-92

Weather Cloudy, 40sF Time Sampling Began 2:40 p.m. Time Sampling Completed 2:50 p.m.

Sampling Method and Material 2" diameter split spoon

Grab ____ Composite X

From	To	Soil/Sediment Description
14	16	Sand, f-cs; gravel, f-cs; little silt; light brown to dk gray; damp; loose.

Other (OVA; HNU; etc.) HNU in spoon = 3 ppm. Background = 2 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TAL Metals & Cyanide	16 oz glass jar	Ice

Remarks _____

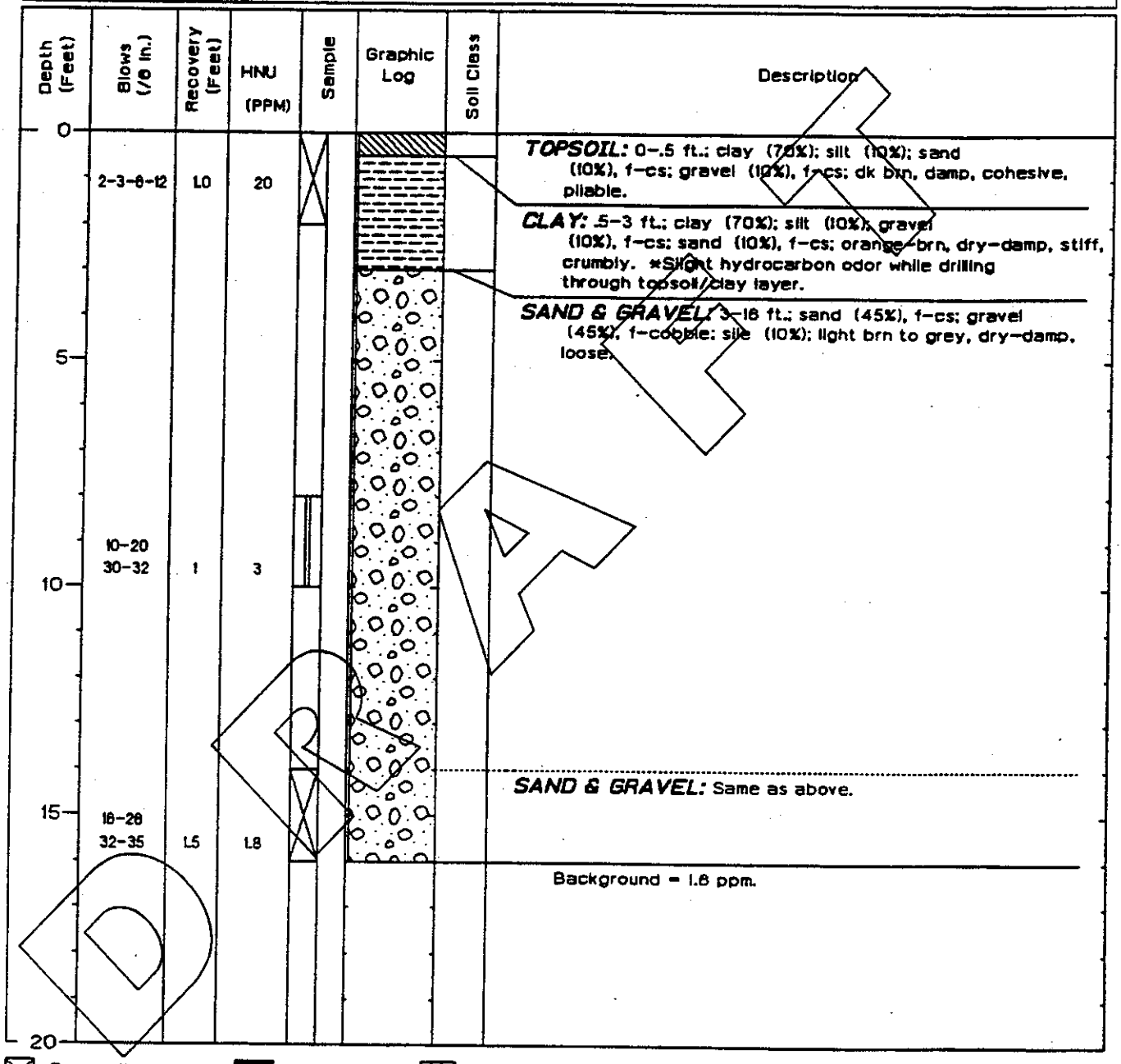
Sampling Personnel R. Astle

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: BKG-BH10

HARRISON RFI

Moraine, Ohio



☒ Composite to Lab ■ VOC to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Belasco
Driller: G. Mayle
Drilling Method: HSA 4 1/4"
Drilling Fluid: None
Remarks:

Geologist: R. Astle
Total Depth: 16
Surface Elev.:
Datum: Feet, MSL
West Coor.:

Begin Drilling: 11/10/92
End Drilling: 11/10/92
Converted to Well: No
Well Name:
South Coor.:

OH019.12

harrison

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 1 of 2

Site Location Moraine, Ohio

Sample No. BKG-BH10-02SL Coded/ Replicate No. _____ Date 11-10-92

Weather Rain, 50sF Time Sampling Began 4:00 p.m. Time Sampling Completed 4:10 p.m.

Sampling Method and Material 2" diameter split spoon

Grab ____ Composite X

From	To	Soil/Sediment Description
0	2	Clay; little silt, little sand, f-cs; little gravel, f-cs; dk brn to orange brown, damp, semipliable; semicohesive.

Other (OVA; HNU; etc.) HNU = 20 ppm in spoon. Slight hydrocarbon odor while breaking through clay layer.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TAL Metals, TOC, CEC	16 oz glass jar	Ice
Bulk Density, Particle Size	5 gallon bucket	--
Moisture Content	1 liter glass jar	--
Porosity	Shelby tube	--

Remarks HNU = 1.6 ppm for background.

Sampling Personnel R. Astle

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 2 of 2

Site Location Moraine, Ohio

Sample No. BKG-BH10-16SL Coded/ Replicate No. _____ Date 11-10-92

Weather Rain, 50sF Time Sampling Began 5:20 p.m. Time Sampling Completed 5:30 p.m.

Sampling Method and Material 2" diameter split spoon

Grab ____ Composite X

From	To	Soil/Sediment Description
14	16	Sand, f-cs; gravel, f-cs; little silt; light brown to gray, damp, loose.

Other (OVA; HNU; etc.) HNU in spoon = 1.8 ppm. Background = 1.6 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TAL Metals, TOC, CEC	16 oz glass jar	Ice
Bulk Density, Particle Size	5 gallon bucket	--
Moisture Content	1 liter glass jar	--

Remarks Shelby tube refusal.

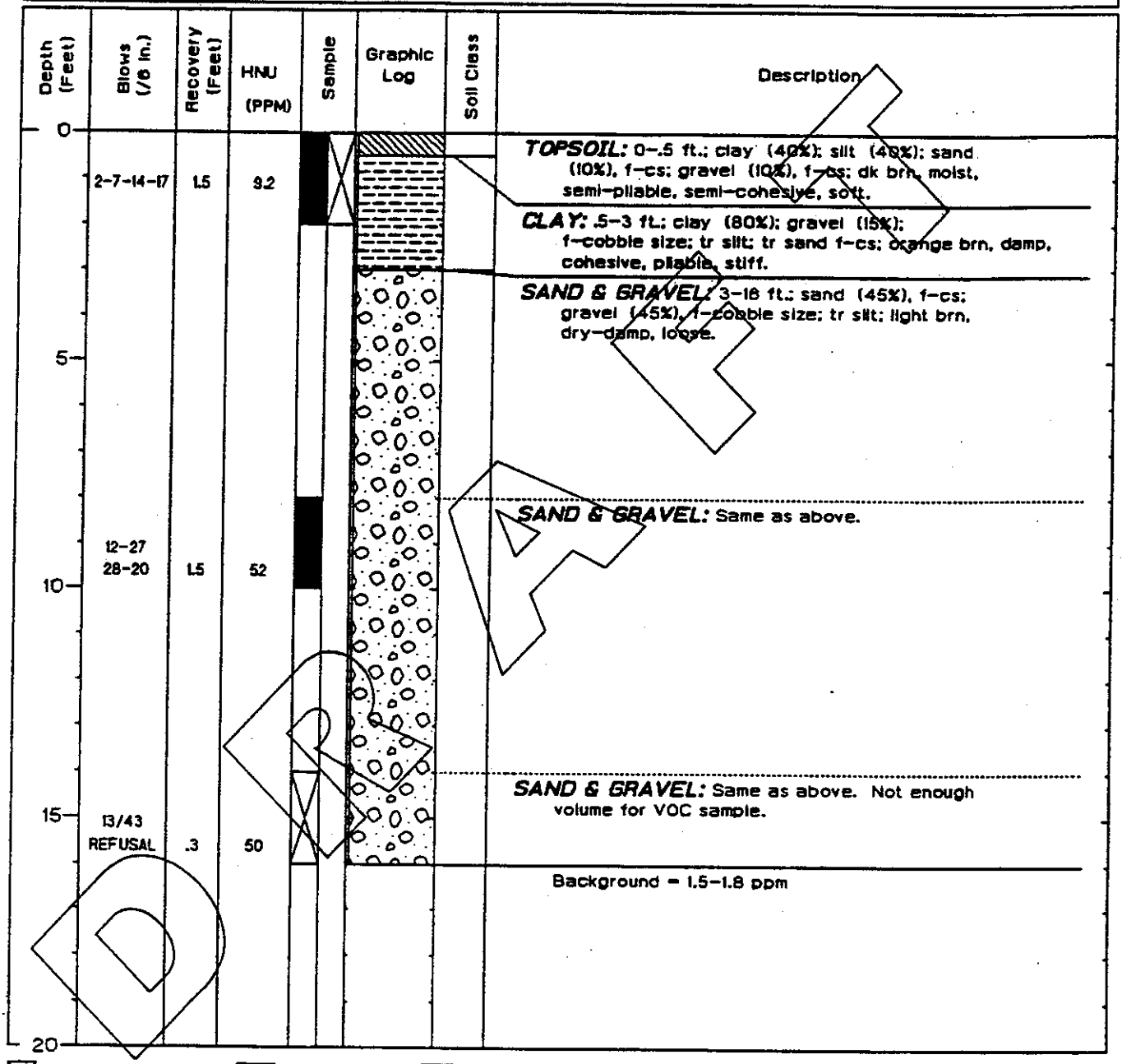
Sampling Personnel R. Astle

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: BKG-BH11

HARRISON RFI

Moraine, Ohio



☒ Composite to Lab ■ VOC to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Belasco
Driller: G. Mayle
Drilling Method: HSA 4 1/4"
Drilling Fluid: None
Remarks:

Geologist: R. Astle
Total Depth: 18
Surface Elev.:
Datum: Feet, MSL
West Coor.:

Begin Drilling: 11/08/92
End Drilling: 11/08/92
Converted to Well: No
Well Name:
South Coor.:

OH019.12

harrison

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 1 of 2

Site Location Moraine, Ohio

Sample No. BKG-BH11-02SL Coded/ Replicate No. _____ Date 11-6-92

Weather Cloudy, 40sF Time Sampling Began 10:40 a.m. Time Sampling Completed 10:50 a.m.

Sampling Method and Material 3" diameter split spoon

Grab ____ Composite X

From	To	Soil/Sediment Description
0	2	Clay; some silt; some gravel, f-cs; little sand, f-cs; dk brn to orange brown, damp to moist, pliable, cohesive.

Other (OVA; HNU; etc.) HNU in spoon = 9.2 ppm. Background = 1.5 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice
TCL SVOCs & PCB/Pest.	4 oz glass jar	Ice
TAL Metals & Cyanide	16 oz glass jar	Ice

Remarks _____

Sampling Personnel R. Astle

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 2 of 2

Site Location Moraine, Ohio

Sample No. BKG-BH11-16SL Coded/ Replicate No. _____ Date 11-6-92

Weather Cloudy, 40sF Time Sampling Began 11:40 a.m. Time Sampling Completed 11:50 a.m.

Sampling Method and Material 2" diameter split spoon

Grab ____ Composite X

From	To	Soil/Sediment Description
14	16	Sand (45%), f-cs; gravel (45%), f-cobble size; silt (10%); lt brn, dry-damp, loose.

Other (OVA; HNU; etc.) HNU in spoon = 50 ppm. Background = 1.8 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TAL Metals & Cyanide	16 oz glass jar	Ice

Remarks _____

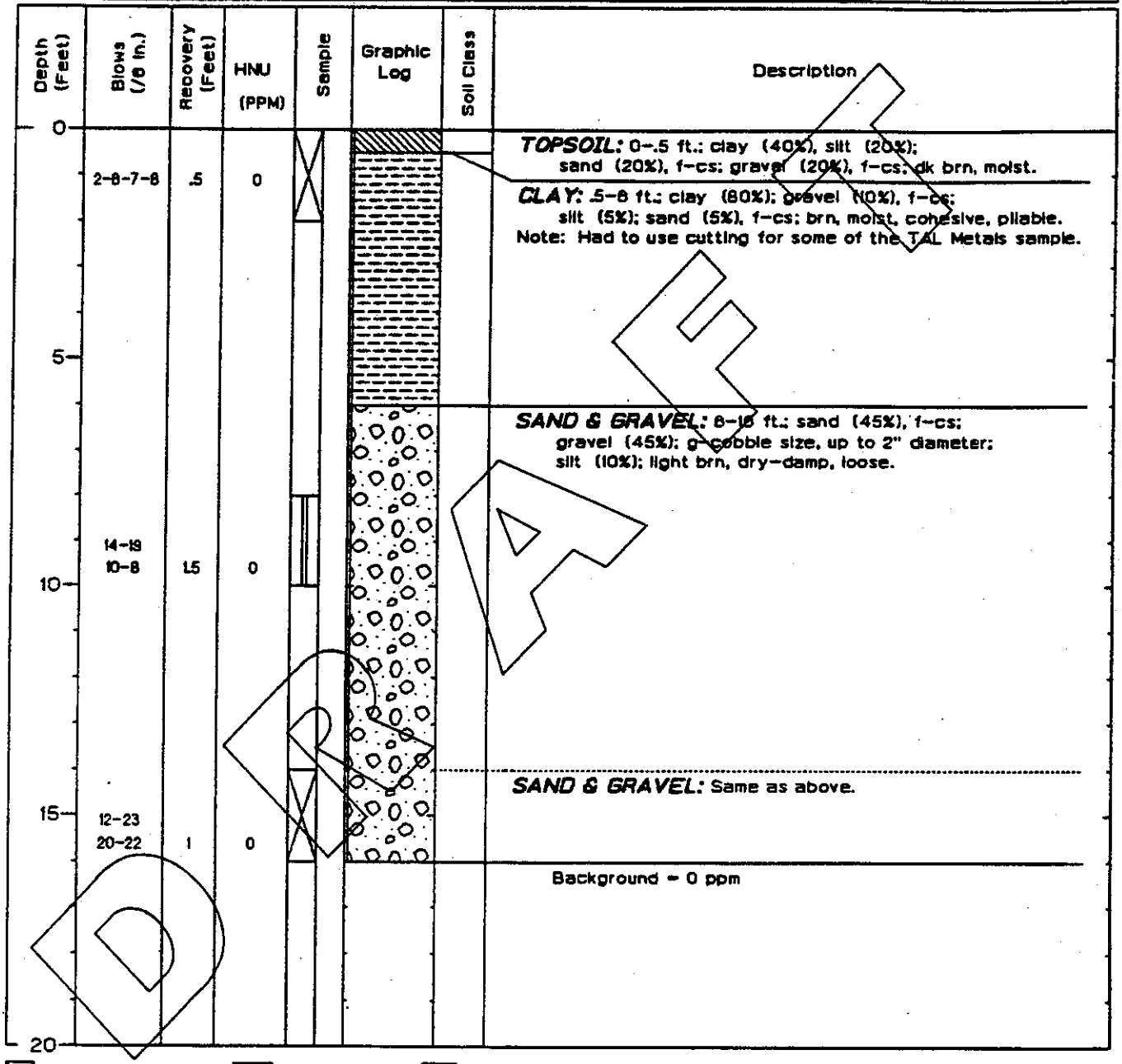
Sampling Personnel R. Astle

DRAFT

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: BKG-BH12

HARRISON RFI — Moraine, Ohio



☒ Composite to Lab ■ VOC to Lab ▥ Split-Spoon Not Analyzed

Page 1 of 1

Drilling Co.: Belasco
Driller: G. Mayle
Drilling Method: HSA 4 1/4"
Drilling Fluid: None
Remarks:

Geologist: R. Astle
Total Depth: 18
Surface Elev.:
Datum: Feet, MSL
West Coor.:

Begin Drilling: 11/05/92
End Drilling: 11/05/92
Converted to Well: No
Well Name:
South Coor.:

OH019.12

harrison

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 1 of 2

Site Location Moraine, Ohio

Sample No. BKG-BH12-02SL Coded/ Replicate No. _____ Date 11-5-92

Weather Cloudy, 40sF Time Sampling Began 1:30 p.m. Time Sampling Completed 2:30 p.m.

Sampling Method and Material 2" diameter split spoon

Grab X Composite ____

From	To	Soil/Sediment Description
0	2	Clay; little silt; little sand, f-cs; little gravel, f-cs; dk brn to brn, moist, cohesive, pliable.

Other (OVA; HNU; etc.) HNU in spoon = 0 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TAL Metals	16 oz glass jar	Ice

Remarks Had to use some cuttings to completely fill jar.

Sampling Personnel R. Astle

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 2 of 2

Site Location Moraine, Ohio

Sample No. BKG-BH12-16SL Coded/ Replicate No. _____ Date 11-5-92

Weather Cloudy, 40sF Time Sampling Began 1:30 p.m. Time Sampling Completed 2:30 p.m.

Sampling Method and Material 2" diameter split spoon

Grab X Composite ____

From	To	Soil/Sediment Description
14	16	Sand (45%), f-cs; gravel (45%), f-cobble size; silt (10%); lt brn, dry-damp, loose.

Other (OVA; HNU; etc.) HNU in spoon = 0 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TAL Metals	16 oz glass jar	Ice

Remarks _____

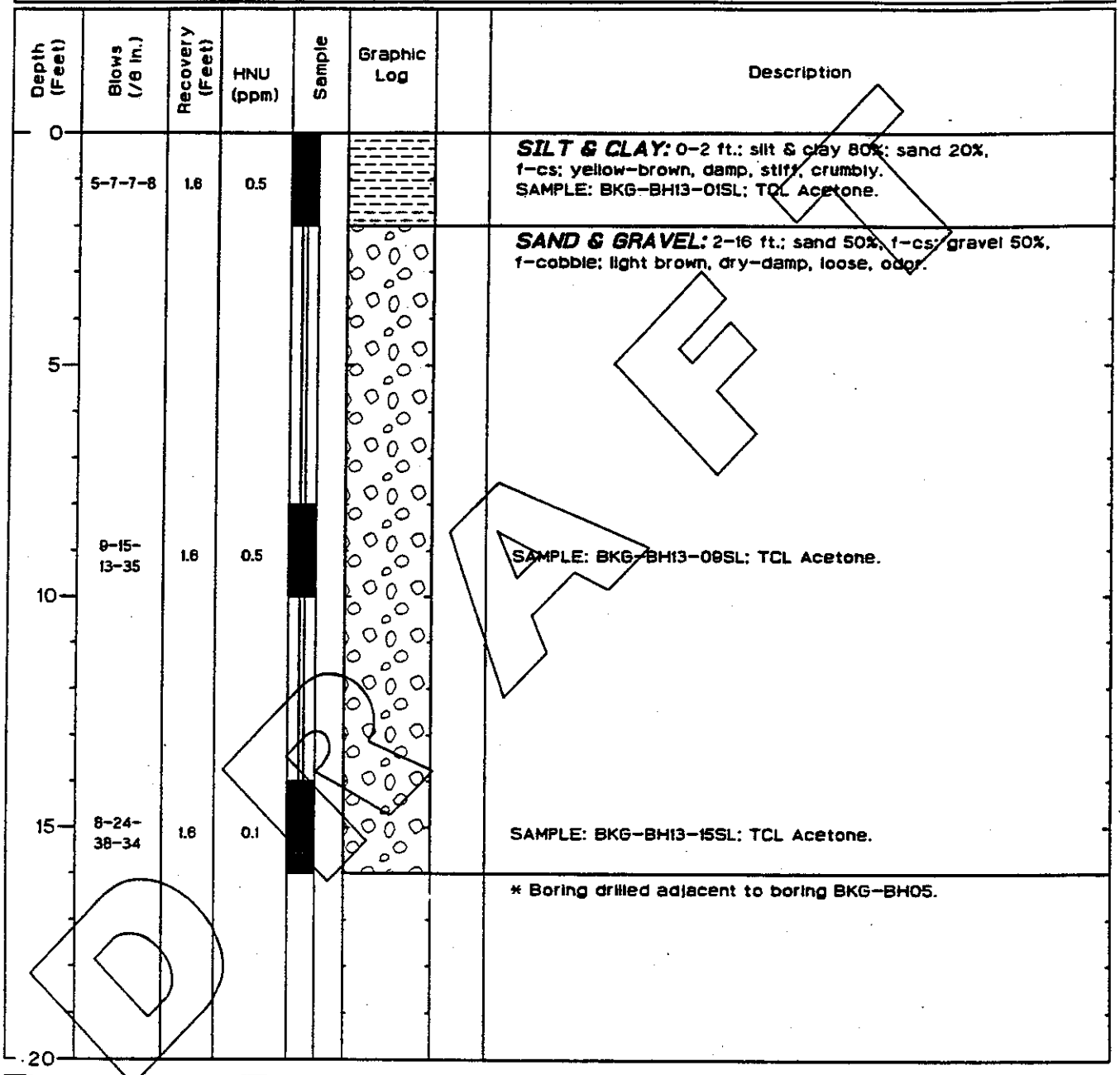
Sampling Personnel R. Astle

DRAFT

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: BKG-BH13

HARRISON RADIATOR - OH0019.018 Moraine, Ohio



■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: R. Fisher
Drilling Method: Hollow-Stem Auger
Drilling Fluid: None
Remarks: Split-Spoon

Geologist: R. Astle
Total Depth: 16
Surface Elev.:
Datum:
West Coor.:

Begin Drilling: 09/27/94
End Drilling: 09/27/94
Converted to Well: No
Well Name:
South Coor.:

OH0019.018

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison/OH0019.018 Page 1 of 3

Site Location Moraine, Ohio

Sample No. BKG-BH13-01SL Coded/ Replicate No. Date 9/27/94

Weather Cool; Overcast Time Sampling Began 3:10p.m. Time Sampling Completed 3:20p.m.

Sampling Method and Material 2" stainless steel split spoon

Grab x Composite

From	To	Soil/Sediment Description
0'	2'	Silt and clay; rare sand, fine-coarse; yellow brown; damp; stiff; crumbly.

Other (OVA; HNU; etc.) HNU scan: 0.5 ppm

Constituents Sampled	Container Description From Lab x or G&M	Preservative
TCL Acetone	4 oz glass jar	cool

Remarks Sample adjacent to boring BKG-BH05

Sampling Personnel R. Astle

DRAFT

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison/OH0019.018 Page 2 of 3

Site Location Moraine, Ohio

Sample No. BKG-BH13-09SL Coded/ Replicate No. _____ Date 9/27/94

Weather Cool; Overcast Time Sampling Began 3:20 p.m. Time Sampling Completed 3:30 p.m.

Sampling Method and Material 2" stainless-steel split spoon

Grab x Composite ___

From	To	Soil/Sediment Description
8'	10'	Sand, fine-coarse; gravel, fine-coarse; light brown; dry-damp; loose; odor.

Other (OVA; HNU; etc.) HNU scan: 0.5 ppm

Constituents Sampled	Container Description From Lab x or G&M ___	Preservative
TCL Acetone	4 oz glass jar	cool

Remarks Sample adjacent to boring BKG-BH05

Sampling Personnel R. Astle

DRAFT

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison/OH0019.018 Page 3 of 3

Site Location Moraine, Ohio

Sample No. BKG-BH13-15SL Coded/ Replicate No. Date 9/27/94

Weather Cool; Overcast Time Sampling Began 3:30p.m. Time Sampling Completed 3:40p.m.

Sampling Method and Material 2" stainless steel split spoon

Grab x Composite

From	To	Soil/Sediment Description
14'	16'	Sand, fine-coarse; gravel, fine-coarse; light brown; dry-damp; loose.

Other (OVA; HNU; etc.) HNU scan: 0.1 ppm

Constituents Sampled	Container Description From Lab x or G&M	Preservative
TCL Acetone	4 oz glass jar	cool

Remarks Sample adjacent to boring BKG-BH05

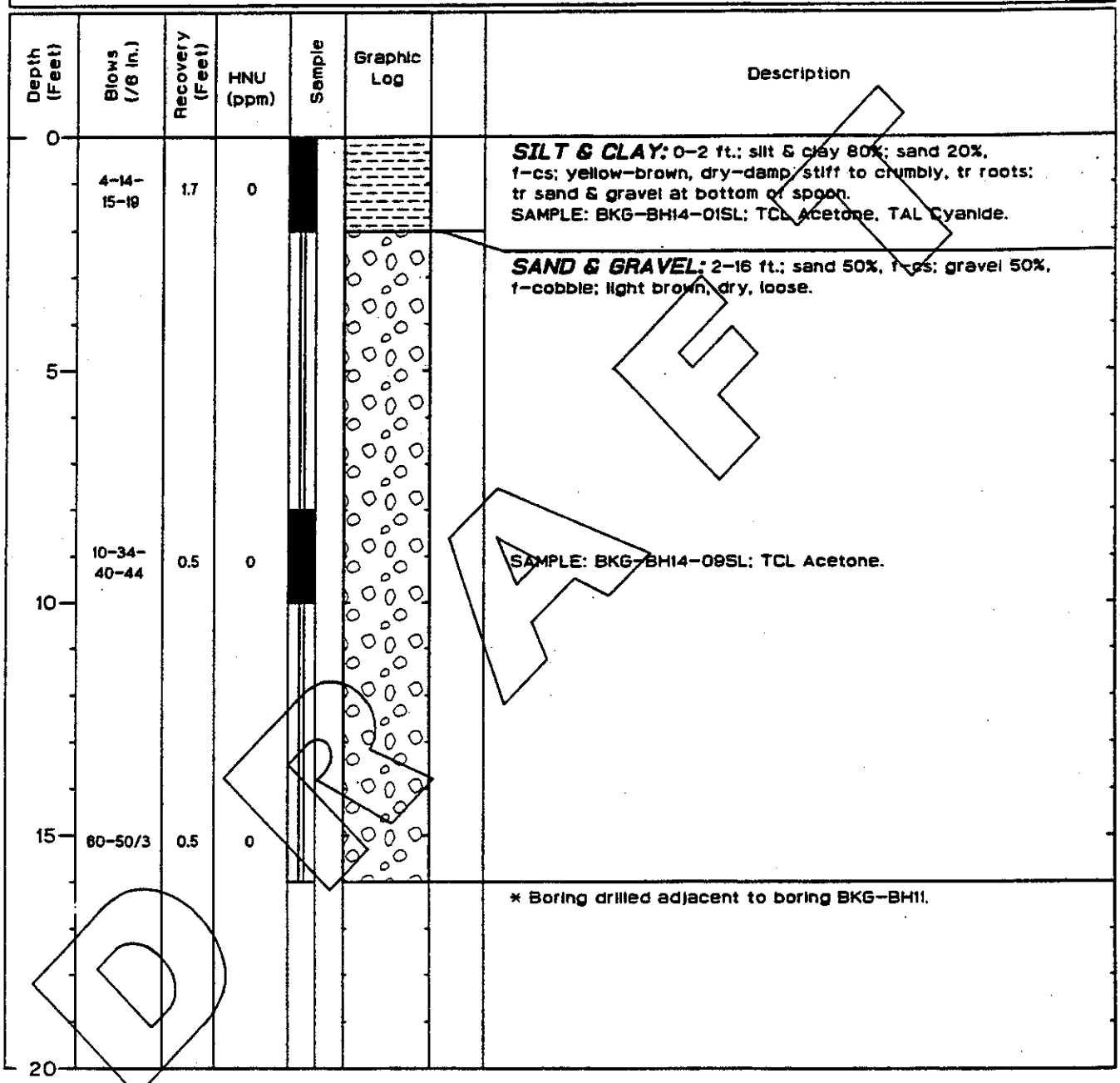
Sampling Personnel R. Astle

DRAFT

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: BKG-BH14

HARRISON RADIATOR - OH0019.018 Moraine, Ohio



■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Geologist: R. Astle
Begin Drilling: 09/27/94
Driller: R. Fisher
Total Depth: 16
End Drilling: 09/27/94
Drilling Method: Hollow-Stem Auger
Surface Elev.:
Converted to Well: No
Drilling Fluid: None
Datum:
Well Name:
Remarks: Split-Spoon
West Coor.:
South Coor.:

OH0019.018

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison/OH0019.018 Page 1 of 3

Site Location Moraine, Ohio

Sample No. BKG-BH14-09SL Coded/ Replicate No. Date 9/27/94

Weather Cool; Overcast Time Sampling Began 4:50 p.m. Time Sampling Completed 5:00 p.m.

Sampling Method and Material 2" stainless steel split spoon

Grab x Composite

From	To	Soil/Sediment Description
8'	10'	Sand, fine-coarse; gravel, fine-coarse; light brown; dry; loose.

Other (OVA; HNU; etc.) HNU scan: 0 ppm

Constituents Sampled	Container Description From Lab x or G&M	Preservative
TCL Acetone	4 oz glass jar	cool

Remarks Boring drilled adjacent to boring BKG-BH11

Sampling Personnel R. Astle

DRAFT

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison/OH0019.018 Page 2 of 3

Site Location Moraine, Ohio

Sample No. BKG-BH14-015L Coded/ Replicate No. Date 9/27/94

Weather Cool; Overcast Time Sampling Began 4:40 p.m. Time Sampling Completed 4:50 p.m.

Sampling Method and Material 2" stainless-steel split spoon

Grab x Composite

From	To	Soil/Sediment Description
0'	2'	Silt and clay; little sand, fine-coarse; yellow-brown; dry-damp; crumbly and stiff; tree roots.

Other (OVA; HNU; etc.) HNU scan: 0 ppm

Constituents Sampled	Container Description From Lab x or G&M	Preservative
TCL Acetone	4 oz glass jar	cool
TCL Total Cyanide	16 oz glass jar	cool

Remarks Boring drilled adjacent to boring BKG-BH11

Sampling Personnel R. Astle

DRAFT

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison/OH0019.018 Page 3 of 3

Site Location Moraine, Ohio

Sample No. BKG-BH14-15SL Coded/ Replicate No. Date 9/27/94

Weather Cool; Overcast Time Sampling Began 5:00 p.m. Time Sampling Completed 5:10 p.m.

Sampling Method and Material 2" stainless-steel split spoon

Grab x Composite

From	To	Soil/Sediment Description
14'	16'	Sand, fine-coarse; gravel, fine-coarse; light brown; dry; loose.

Other (OVA; HNU; etc.) HNU scan: 0 ppm

Constituents Sampled	Container Description From Lab x or G&M	Preservative
TCL Acetone	4 oz glass jar	cool

Remarks Boring drilled adjacent to boring BKG-BH11

Sampling Personnel R. Astle

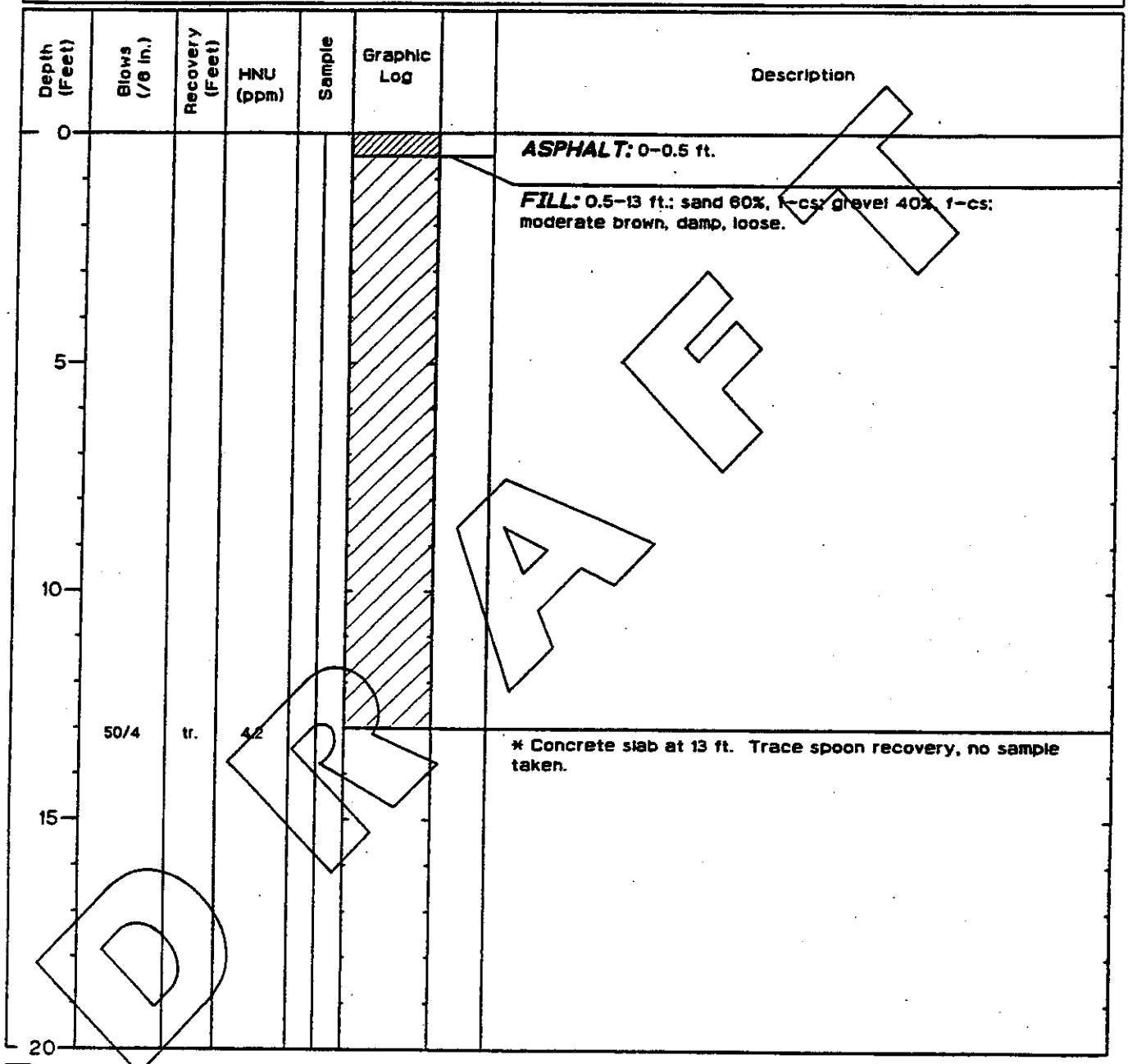
DRAFT

T10-BH01A to BH01C

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: T10-BH01A

HARRISON RADIATOR - OH0019.018 Moraine, Ohio



■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: L. Bell
Drilling Method: Hollow-Stem Auger
Drilling Fluid: None
Remarks: Split-Spoon

Geologist: R. Astle
Total Depth: 13
Surface Elev.:
Datum:
West Coor.:

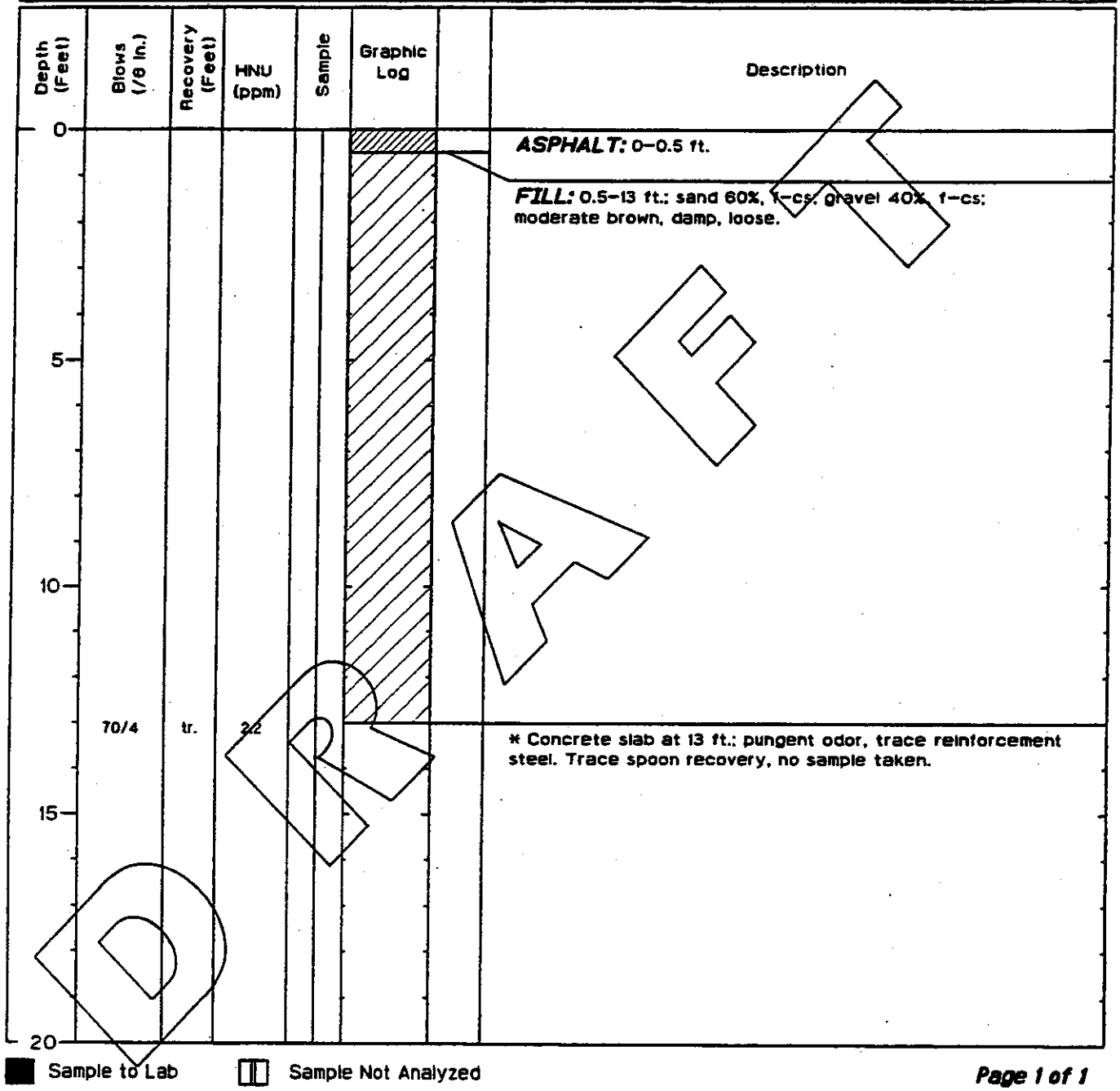
Begin Drilling: 09/20/94
End Drilling: 09/20/94
Converted to Well: No
Well Name:
South Coor.:

OH0019.018

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: T10-BH01B

HARRISON RADIATOR - OH0019.018 Moraine, Ohio



DRAFT

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: L. Bell
Drilling Method: Hollow-Stem Auger
Drilling Fluid: None
Remarks: Split-Spoon

Geologist: R. Astle
Total Depth: 13
Surface Elev.:
Datum:
West Coor.:

Begin Drilling: 09/20/84
End Drilling: 09/20/84
Converted to Well: No
Well Name:
South Coor.:

OH0019.018

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison/OH0019.018 Page 1 of 1

Site Location Moraine, Ohio

Sample No. T10-BH-01-16SL Coded/ Replicate No. DUP-27 Date 9/27/94

Weather Cool; Overcast Time Sampling Began 1:30p.m. Time Sampling Completed 1:40p.m.

Sampling Method and Material 2" stainless steel split spoon

Grab x Composite

From	To	Soil/Sediment Description
15'	17'	Sand (40%) fine-coarse; gravel (40%) fine-coarse; silt and clay (20%); brown; damp; loose; odor.

Other (OVA; HNU; etc.) HNU scan: 13.5 ppm

Constituents Sampled	Container Description From Lab x or G&M	Preservative
TCL VOCs	4 oz glass jar	cool

Remarks Sample taken on third attempt (T10-BH01L) due to cement slab obstruction

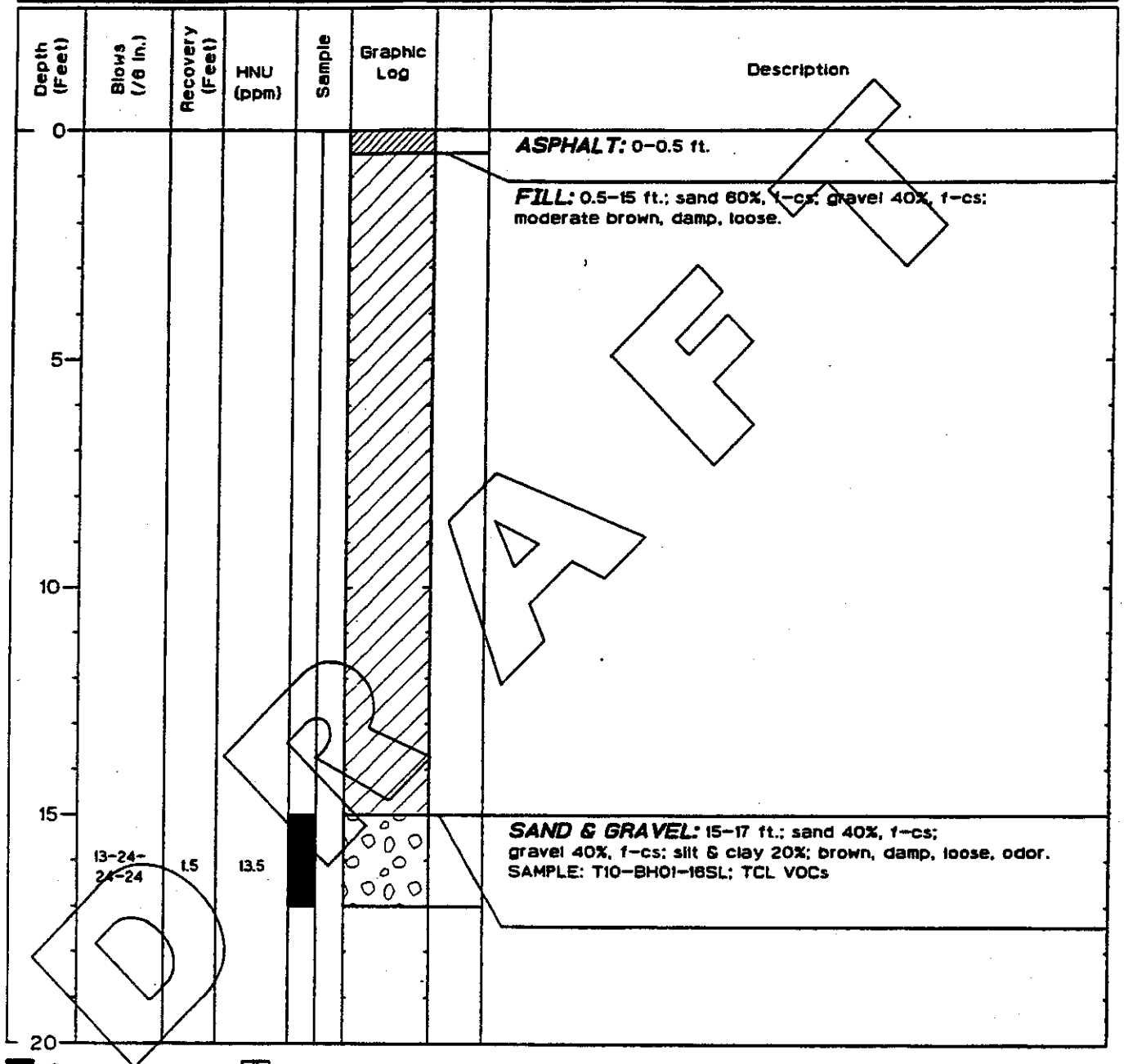
Sampling Personnel R. Astle

DRAFT

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: T10-BH01C

HARRISON RADIATOR - OH0019.018 Moraine, Ohio



■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: L. Bell
Drilling Method: Hollow-Stem Auger
Drilling Fluid: None
Remarks: Split-Spoon

Geologist: R. Astle
Total Depth: 17
Surface Elev.:
Datum:
West Coor.:

Begin Drilling: 09/20/94
End Drilling: 09/20/94
Converted to Well: No
Well Name:
South Coor.:

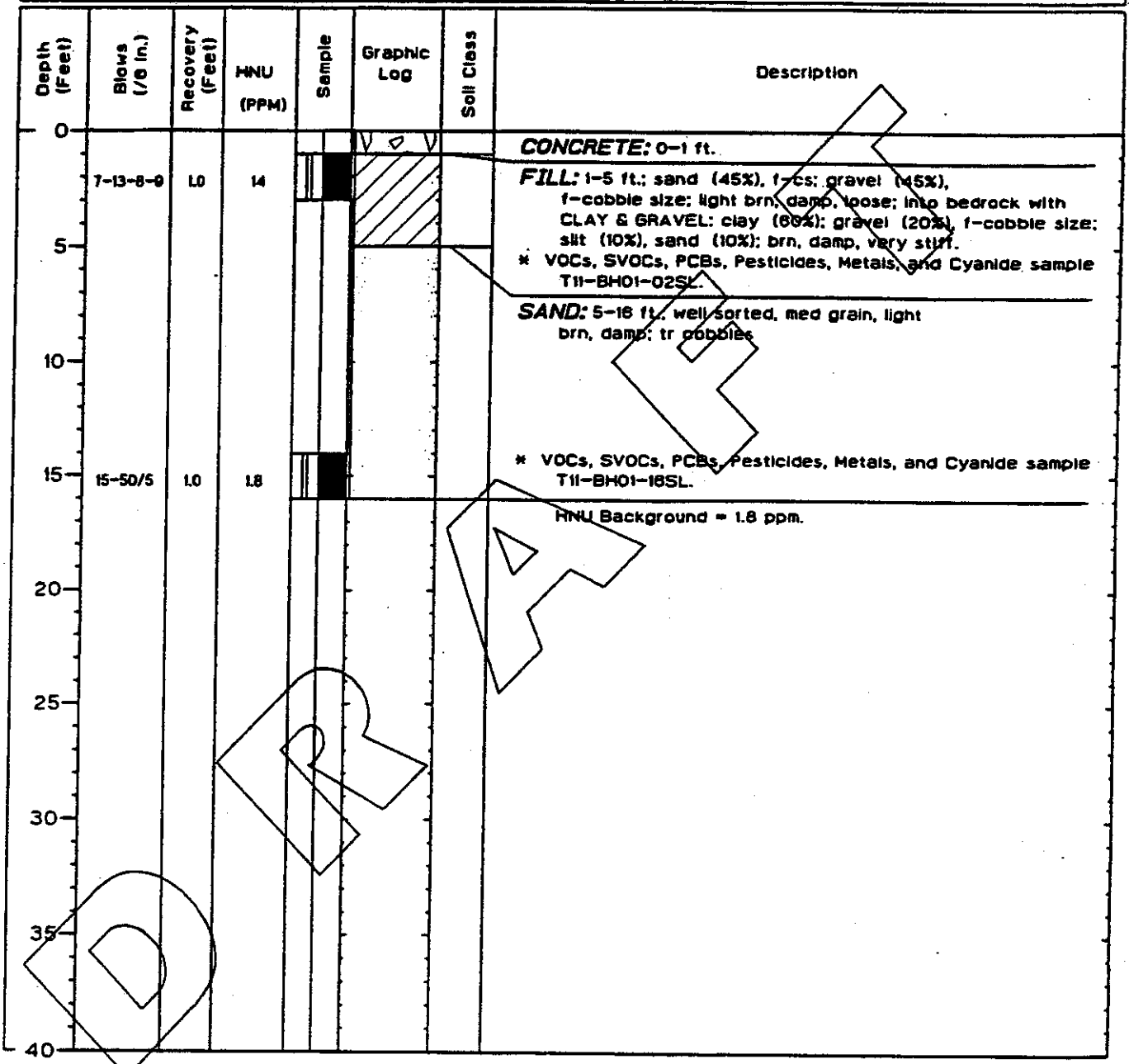
OH0019.018

T11-BH01 to BH03

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: T11-BH01

HARRISON RFI — Moraine, Ohio



☒ Composite to Lab ■ VOC to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Belasco
Driller: G. Mayle
Drilling Method: HSA 4 1/4"
Drilling Fluid: None
Remarks:

Geologist: R. Astle
Total Depth: 16
Surface Elev.:
Datum: Feet, MSL
West Coor.:

Begin Drilling: 12/02/92
End Drilling: 12/02/92
Converted to Well: No
Well Name:
South Coor.:

OH019.12

harrison

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 1 of 2

Site Location Moraine, Ohio

Sample No. T11-BH01-02SL Coded/ Replicate No. DUP-8 Date 12-2-92

Weather Ice, 30sF Time Sampling Began 1:00 p.m. Time Sampling Completed 2:00 p.m.

Sampling Method and Material 3" diameter split spoon

Grab X Composite ____

From	To	Soil/Sediment Description
0	2	Sand and gravel, clay and gravel, light brown, damp.

Other (OVA; HNU; etc.) HNU in spoon = 14 ppm. Background = 1.8 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice
TCL SVOCs & PCB/Pest.	4 oz glass jar	Ice
TAL Metals & Cyanide	16 oz glass jar	Ice

Remarks Actual sampling interval 1-3'. 1' asphalt overlay. Drove 2 spoons for duplicate.

Sampling Personnel R. Astle

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 2 of 2

Site Location Moraine, Ohio

Sample No. T11-BH01-16SL Coded/ Replicate No. _____ Date 12-2-92

Weather Ice, 30sF Time Sampling Began 1:00 p.m. Time Sampling Completed 2:00 p.m.

Sampling Method and Material 3" diameter split spoon

Grab X Composite ____

From	To	Soil/Sediment Description
14	16	Sand, well sorted, medium grain, light brown, damp.

Other (OVA; HNU; etc.) HNU in spoon = 1.8 ppm. Background = 1.8 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice
TCL SVOCs & PCB/Pest.	4 oz glass jar	Ice
TAL Metals & Cyanide	16 oz glass jar	Ice

Remarks _____

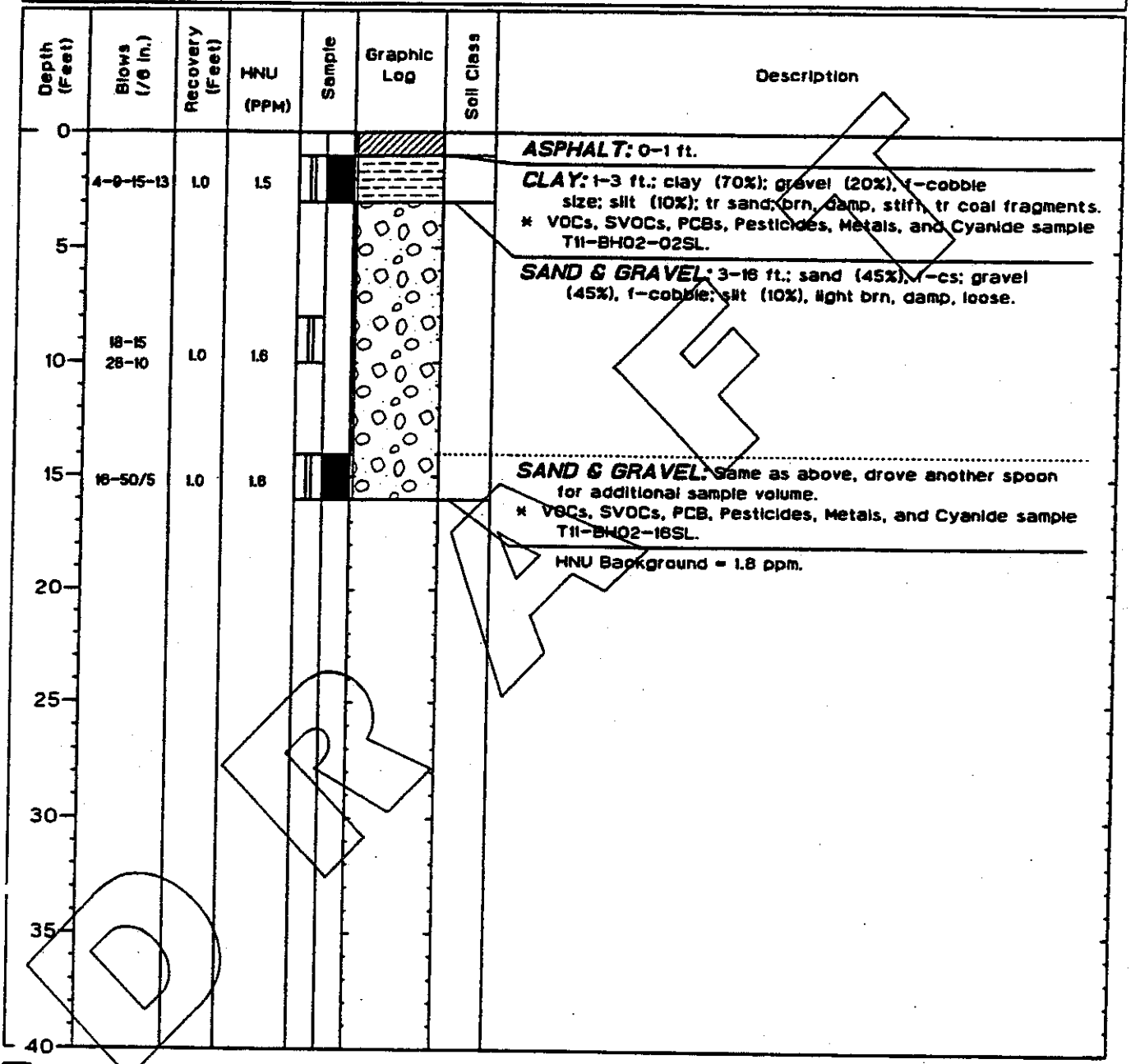
Sampling Personnel R. Astle

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: T11-BH02

HARRISON RFI

Moraine, Ohio



☒ Composite to Lab ■ VOC to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Belasco
Driller: G. Mayle
Drilling Method: HSA 4 1/4"
Drilling Fluid: None
Remarks:

Geologist: R. Astle
Total Depth: 16
Surface Elev.:
Datum: Feet, MSL
West Coor.:

Begin Drilling: 12/02/92
End Drilling: 12/02/92
Converted to Well: No
Well Name:
South Coor.:

OH019.12

harrison

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 1 of 2

Site Location Moraine, Ohio

Sample No. T11-BH02-02SL Coded/ Replicate No. _____ Date 12-2-92

Weather Cloudy, 30sF Time Sampling Began 2:00 p.m. Time Sampling Completed 3:00 p.m.

Sampling Method and Material 3" diameter split spoon

Grab X Composite ____

From	To	Soil/Sediment Description
0	2	Clay (70%); gravel (20%), f-cobble size; silt (10%); tr sand; brown, damp, stiff, tr coal fragments.

Other (OVA; HNU; etc.) HNU in spoon = 1.8 ppm. Background = 1.8 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice
TCL SVOCs & PCB/Pest.	4 oz glass jar	Ice
TAL Metals & Cyanide	16 oz glass jar	Ice

Remarks Actual sampling interval 1-3'. 1' asphalt overlay.

Sampling Personnel R. Astle

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 2 of 2

Site Location Moraine, Ohio

Sample No. T11-BH02-16SL Coded/ Replicate No. _____ Date 12-2-92

Weather Cloudy, 30sF Time Sampling Began 2:00 p.m. Time Sampling Completed 3:00 p.m.

Sampling Method and Material 3" diameter split spoon

Grab X Composite ____

From	To	Soil/Sediment Description
14	16	Sand (45%), f-cs; gravel (45%), f-cobble size; silt (10%); light brown, dry-damp, loose.

Other (OVA; HNU; etc.) HNU in spoon = 1.6 ppm. Background = 1.8 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice
TCL SVOCs & PCB/Pest.	4 oz glass jar	Ice
TAL Metals & Cyanide	16 oz glass jar	Ice

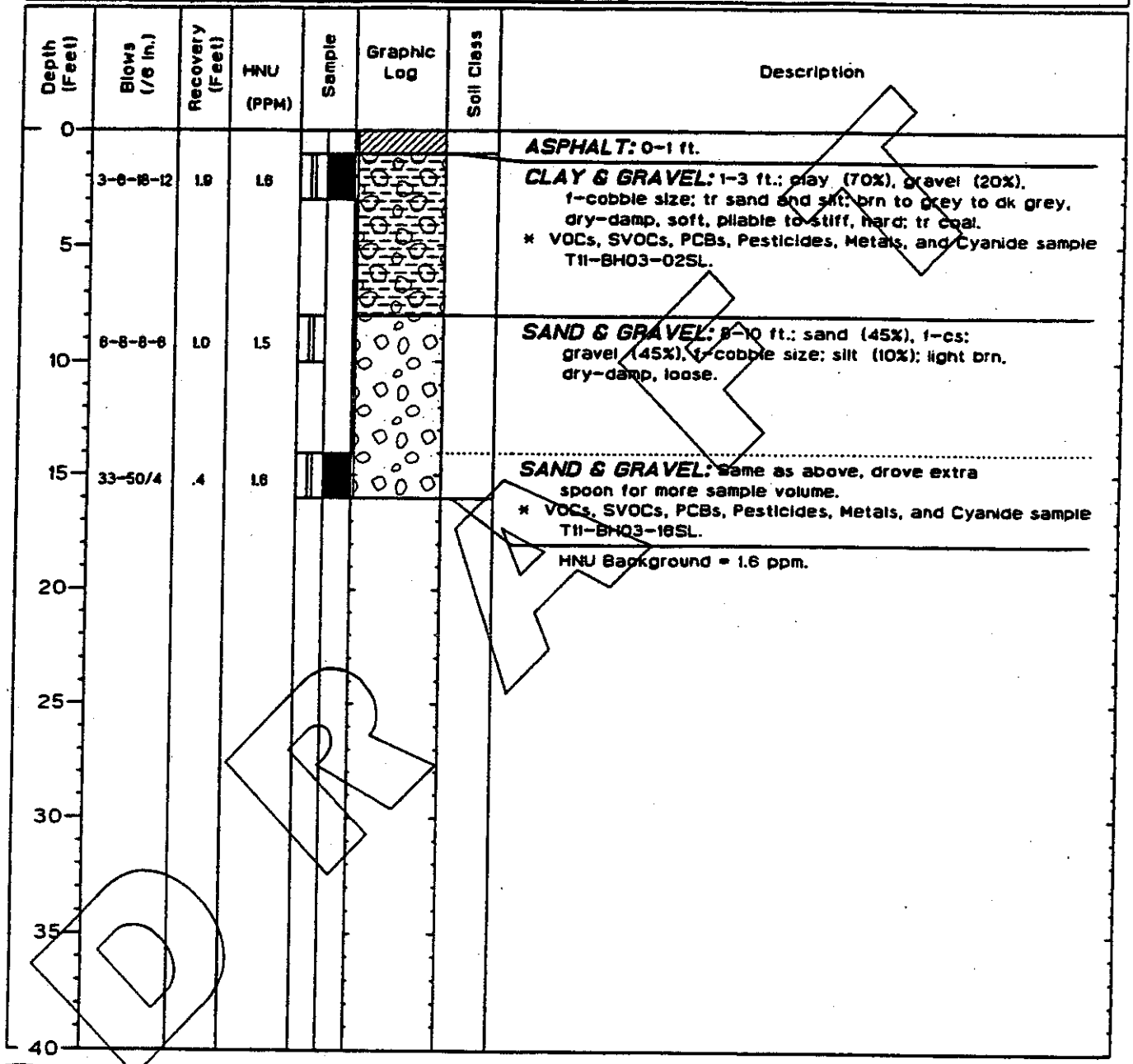
Remarks _____

Sampling Personnel R. Astle

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: T11-BH03

HARRISON RFI — Moraine, Ohio



☒ Composite to Lab ■ VOC to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Belasco
Driller: G. Mayle
Drilling Method: HSA 4 1/4"
Drilling Fluid: None
Remarks:

Geologist: R. Astle
Total Depth: 16
Surface Elev.:
Datum: Feet, MSL
West Coor.:

Begin Drilling: 12/02/92
End Drilling: 12/02/92
Converted to Well: No
Well Name:
South Coor.:

OH019.12

harrison

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 1 of 2

Site Location Moraine, Ohio

Sample No. T11-BH03-02SL Coded/ Replicate No. _____ Date 12-2-92

Weather Snow, 30sF Time Sampling Began 3:00 p.m. Time Sampling Completed 4:00 p.m.

Sampling Method and Material 3" diameter split spoon

Grab X Composite ____

From	To	Soil/Sediment Description
0	2	Clay (70%); gravel (20%), f-cobble size; tr sand & silt; brn, gray, & dk gray, dry-damp, soft, pliable to hard, stiff; tr coal.

Other (OVA; HNU; etc.) HNU in spoon = 1.6 ppm. Background = 1.6 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice
TCL SVOCs & PCB/Pest.	4 oz glass jar	Ice
TAL Metals & Cyanide	16 oz glass jar	Ice

Remarks Actual sampling interval 1-3'. 1' asphalt overlay.

Sampling Personnel R. Astle

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 2 of 2

Site Location Moraine, Ohio

Sample No. T11-BH03-16SL Coded/ Replicate No. _____ Date 12-2-92

Weather Snow, 30sF Time Sampling Began 3:00 p.m. Time Sampling Completed 4:00 p.m.

Sampling Method and Material 3" diameter split spoon

Grab X Composite ____

From	To	Soil/Sediment Description
14	16	Sand (45%), f-cs; gravel (45%), f-cobble size silt (10%); light brown, dry-damp, loose.

Other (OVA; HNU; etc.) HNU in spoon = 1.6 ppm. Background = 1.6 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice
TCL SVOCs & PCB/Pest.	4 oz glass jar	Ice
TAL Metals	16 oz glass jar	Ice

Remarks

Sampling Personnel R. Astle

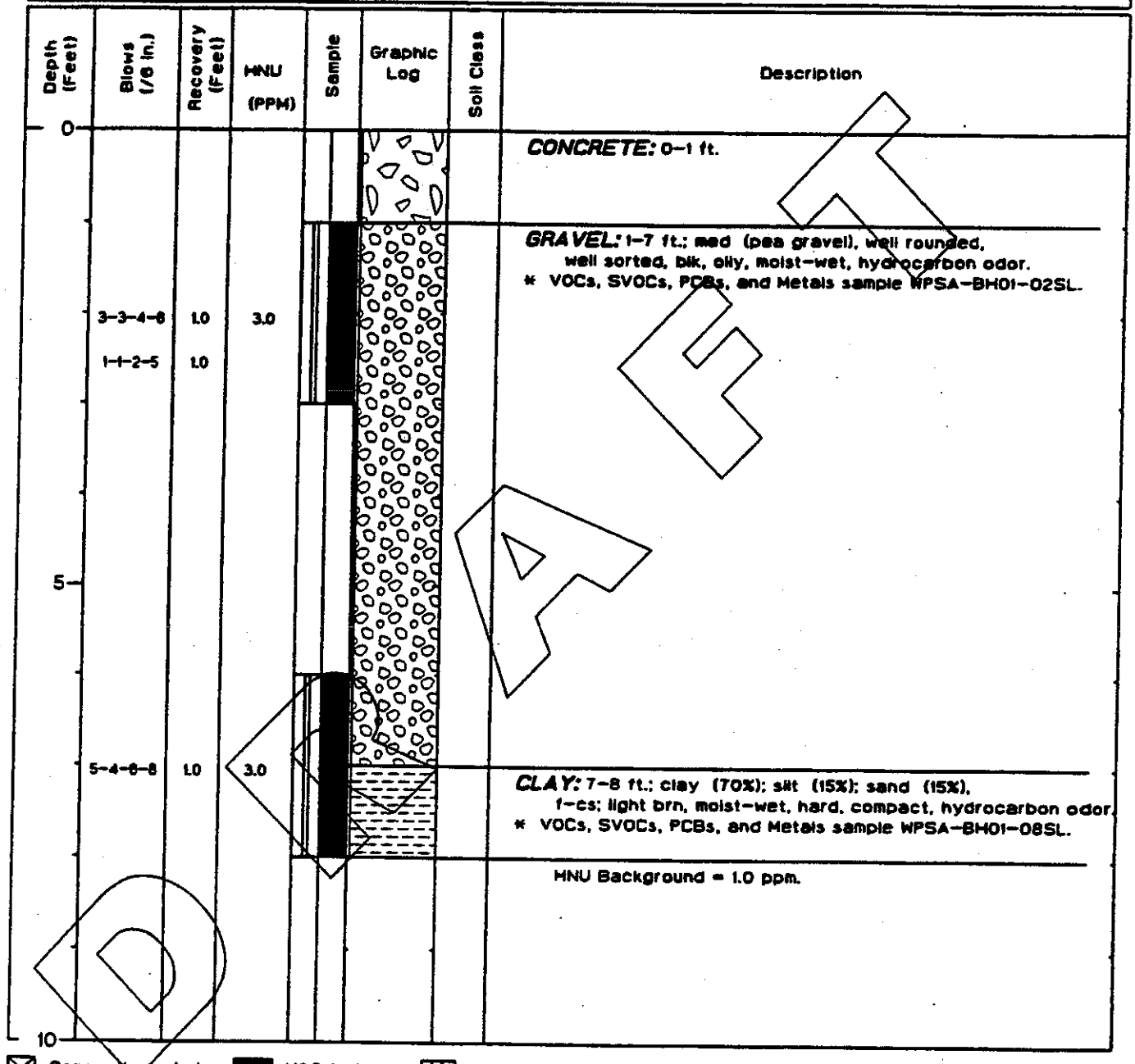
WPSA-BH01 to BH07

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: WPSA-BH01

HARRISON RFI

Moraine, Ohio



☒ Composite to Lab ■ VOC to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Belesco
Driller: G. Mayle
Drilling Method: HSA 4 1/4"
Drilling Fluid: None
Remarks:

Geologist: R. Astle
Total Depth: 8
Surface Elev.:
Datum: Feet, MSL
West Coor.:

Begin Drilling: 12/02/92
End Drilling: 12/02/92
Converted to Well: No
Well Name:
South Coor.:

OH019.12

harrison

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 1 of 2

Site Location Moraine, Ohio

Sample No. WPSA-BH01-02SL Coded/ Replicate No. DUP-7 Date 12-2-92

Weather Snow, 30sF Time Sampling Began 8:30 a.m. Time Sampling Completed 9:30 a.m.

Sampling Method and Material 3" diameter split spoon

Grab X Composite ____

From	To	Soil/Sediment Description
1	3	Gravel, med. (pea gravel), well rounded, well sorted, black, oily, moist-wet, hydrocarbon odor.

Other (OVA; HNU; etc.) HNU in spoon = 3.0 ppm. Background = 1.0 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice
TCL SVOCs & PCBs	4 oz glass jar	Ice
TAL Metals	16 oz glass jar	Ice

Remarks 1' of concrete at ground surface. Drove 2 spoons to collect duplicate.

Sampling Personnel R. Astle

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 2 of 2

Site Location Moraine, Ohio

Sample No. WPSA-BH01-08SL Coded/ Replicate No. _____ Date 12-2-92

Weather Snow, 30°F Time Sampling Began 8:30 a.m. Time Sampling Completed 9:30 a.m.

Sampling Method and Material 3" diameter split spoon

Grab X Composite ____

From	To	Soil/Sediment Description
7	8	Clay (70%); silt (15%); sand (15%), f-cs; light brown, moist-wet, hard, compact, hydrocarbon odor.

Other (OVA; HNU; etc.) HNU in spoon = 3.0 ppm. Background = 1.0 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice
TCL SVOCs & PCBs	4 oz glass jar	Ice
TAL Metals	16 oz glass jar	Ice

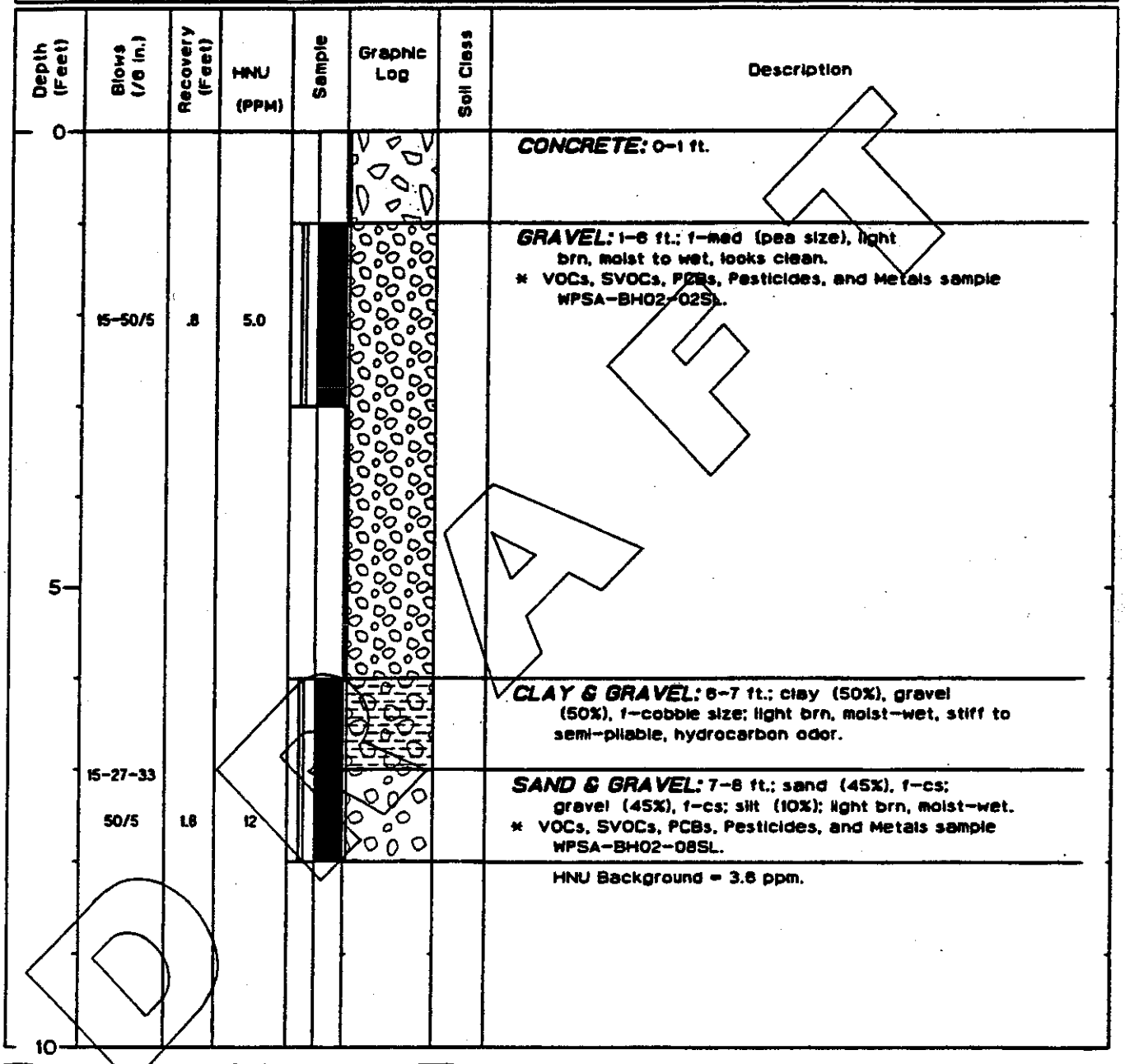
Remarks

Sampling Personnel R. Astle

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: WPSA-BH02

HARRISON RFI — Moraine, Ohio



DRAFT

☒ Composite to Lab ■ VOC to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Belasco
Geologist: R. Astle
Begin Drilling: 12/02/92
Driller: G. Hayle
Total Depth: 8
End Drilling: 12/02/92
Drilling Method: HSA 4 1/4"
Surface Elev.:
Converted to Well: No
Drilling Fluid: None
Datum: Feet, MSL
Well Name:
Remarks:
West Coor.:
South Coor.:

OH019.12

harrison

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 1 of 2

Site Location Moraine, Ohio

Sample No. WPSA-BH02-02SL Coded/ Replicate No. _____ Date 12-2-92

Weather Cloudy, 30sF Time Sampling Began 9:30 a.m. Time Sampling Completed 10:30 a.m.

Sampling Method and Material 3" diameter split spoon

Grab X Composite ____

From	To	Soil/Sediment Description
1	3	Gravel, f-med (pea size), light brn, moist-wet.

Other (OVA; HNU; etc.) HNU in spoon = 5.0 ppm. Background = 3.6 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice
TCL SVOCs & PCBs	4 oz glass jar	Ice
TAL Metals	16 oz glass jar	Ice

Remarks 1' concrete at ground surface.

Sampling Personnel R. Astle

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 2 of 2

Site Location Moraine, Ohio

Sample No. WPSA-BH02-08SL Coded/ Replicate No. _____ Date 12-2-92

Weather Cloudy, 30sF Time Sampling Began 9:30 a.m. Time Sampling Completed 10:30 a.m.

Sampling Method and Material 3" diameter split spoon

Grab X Composite ____

From	To	Soil/Sediment Description
6	8	Clay; gravel, f-cs; sand, f-cs; tr silt; light brown, moist-wet, hydrocarbon odor.

Other (OVA; HNU; etc.) HNU in spoon = 12 ppm. Background = 3.6 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice
TCL SVOCs & PCBs	4 oz glass jar	Ice
TAL Metals	16 oz glass jar	Ice

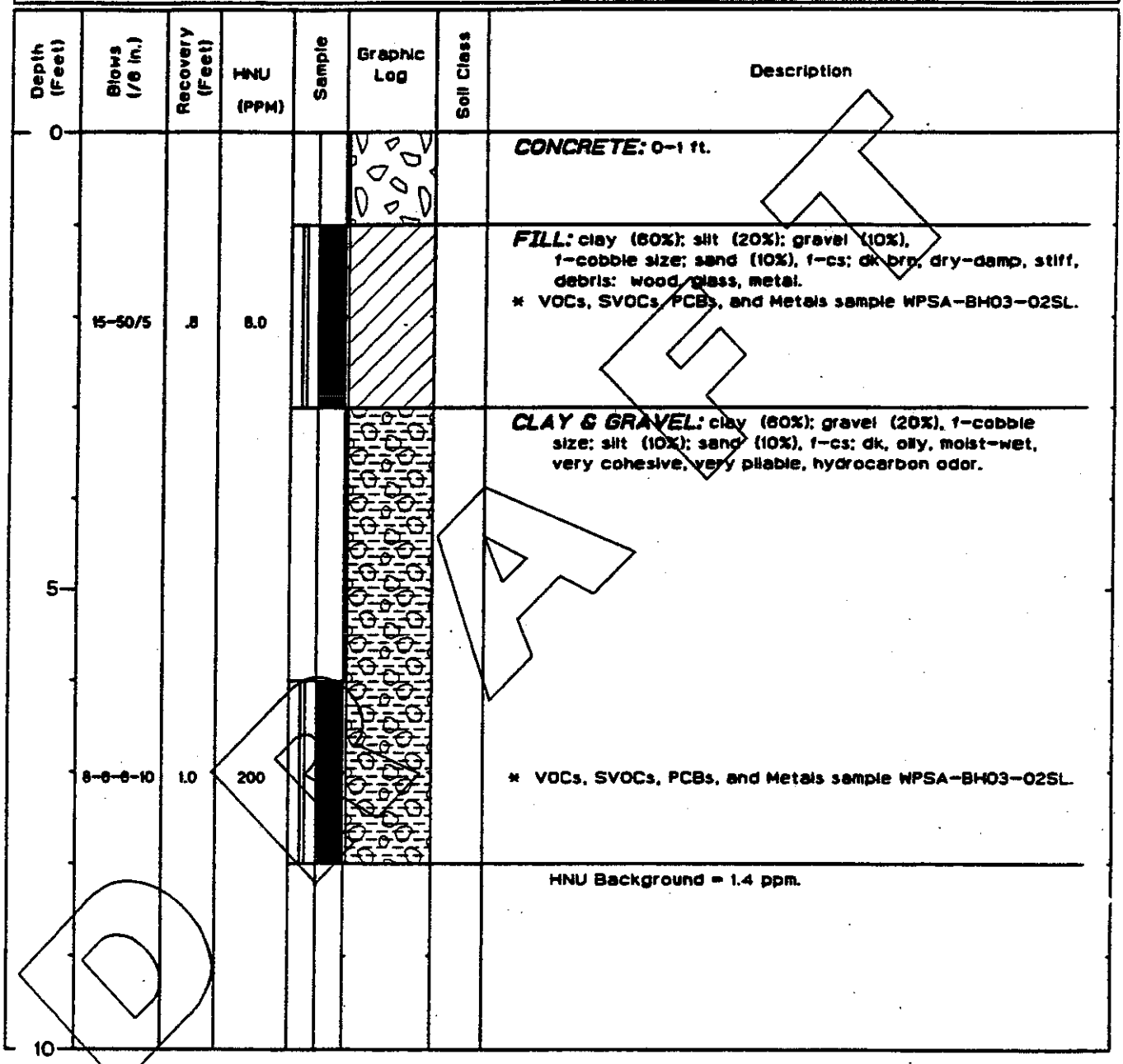
Remarks

Sampling Personnel R. Astle

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: WPSA-BH03

HARRISON RFI — Moraine, Ohio



☒ Composite to Lab ■ VOC to Lab ▥ Split-Spoon Not Analyzed

Page 1 of 1

Drilling Co.: Belasco
Driller: G. Mayle
Drilling Method: HSA 4 1/4"
Drilling Fluid: None
Remarks:

Geologist: R. Astle
Total Depth: 8
Surface Elev.:
Datum: Feet, MSL
West Coor.:

Begin Drilling: 12/02/92
End Drilling: 12/02/92
Converted to Well: No
Well Name:
South Coor.:

OH019.12

harrison

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 1 of 2

Site Location Moraine, Ohio

Sample No. WPSA-BH03-02SL Coded/ Replicate No. _____ Date 12-2-92

Weather Cloudy, 30sF Time Sampling Began 11:00 a.m. Time Sampling Completed 12:00 p.m.

Sampling Method and Material 3" diameter split spoon

Grab X Composite ____

From	To	Soil/Sediment Description
1	3	Clay (60%); silt (20%); gravel (10%), f-cobble size; sand (10%), f-cs; dark brown, dry-damp, stiff, debris: wood, glass, metal.

Other (OVA; HNU; etc.) HNU in spoon = 8 ppm. Background = 1.4 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice
TCL SVOCs & PCB	4 oz glass jar	Ice
TAL Metals	16 oz glass jar	Ice

Remarks 1' concrete at ground surface.

Sampling Personnel R. Astle

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 2 of 2

Site Location Moraine, Ohio

Sample No. WPSA-BH03-08SL Coded/ Replicate No. _____ Date 12-2-92

Weather Cloudy, 30sF Time Sampling Began 11:00 a.m. Time Sampling Completed 12:00 p.m.

Sampling Method and Material 3" diameter split spoon

Grab X Composite ____

From	To	Soil/Sediment Description
6	8	Clay (60%); gravel (20%), f-cobble size; silt (10%); sand (10%), f-cs; dk oily, moist-wet, very cohesive, very pliable, hydrocarbon odor.

Other (OVA; HNU; etc.) HNU in spoon = 200 ppm. Background = 1.4 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice
TCL SVOCs & PCBs	4 oz glass jar	Ice
TAL Metals	16 oz glass jar	Ice

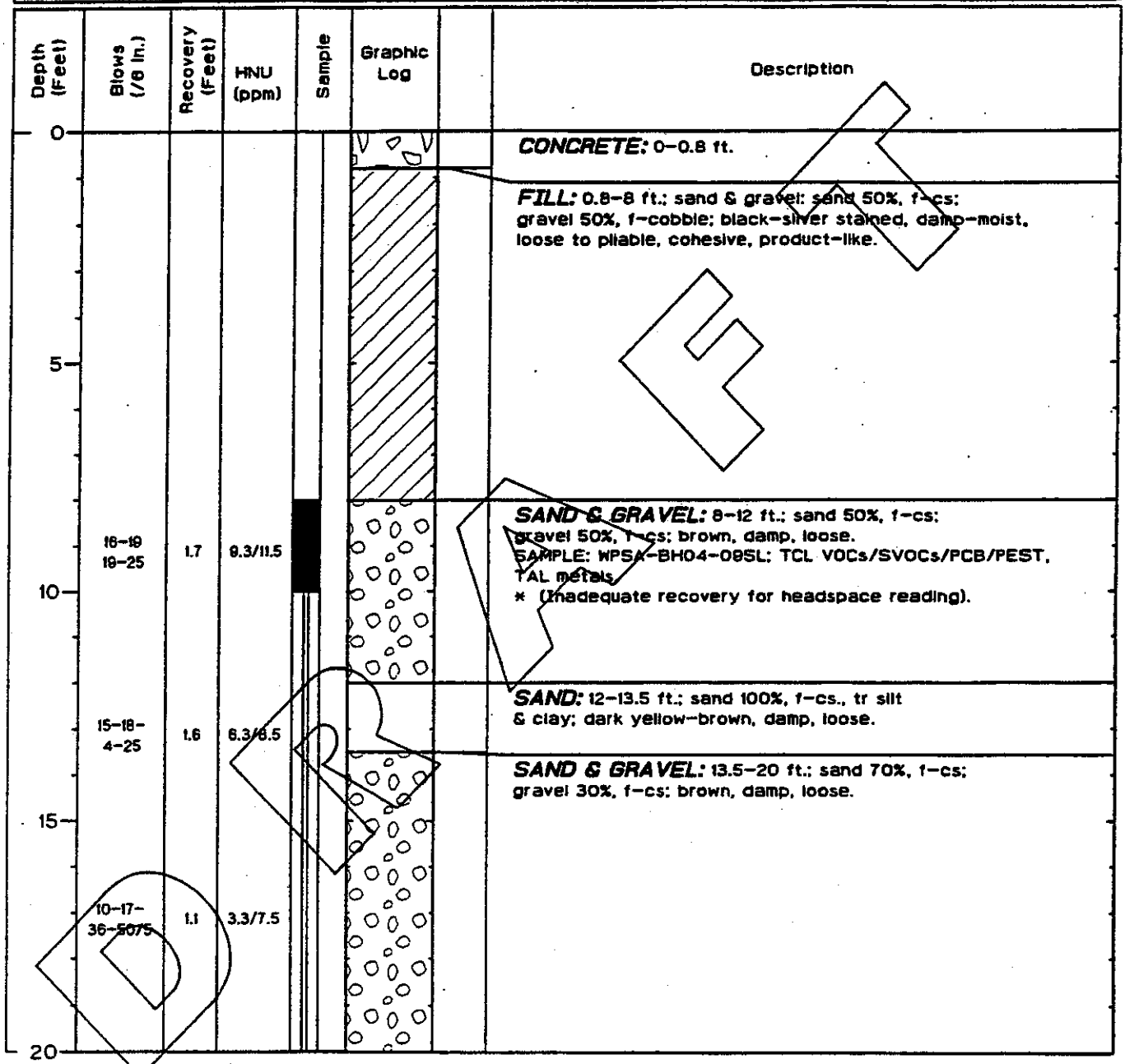
Remarks

Sampling Personnel R. Astle

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: WPSA-BH04

HARRISON RADIATOR – OH0019.018 Moraine, Ohio



Sample to Lab Sample Not Analyzed

Drilling Co.: Belasco Drilling Geologist: R. Astle Begin Drilling: 09/23/94

Driller: L. Bell Total Depth: 30 End Drilling: 09/23/94

Drilling Method: Hollow–Stem Auger Surface Elev.: Converted to Well: No

Drilling Fluid: Plant Potable Water Datum: Well Name:

Remarks: Split–Spoon West Coor.: South Coor.:

OH0019.018

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: WPSA-BH04

HARRISON RADIATOR – OH0019.018 Moraine, Ohio

Depth (Feet)	Blows (/6 in.)	Recovery (Feet)	HNU (ppm)	Sample	Graphic Log	Description
20	25-50/5	0.5	1.3/3.1	■		***SAND & GRAVEL:*** 20-24 ft.; sand 50%, f-cs; gravel 50%, f-cobble; tr silt & clay; brown, damp, loose. SAMPLE WPSA-BH04-21SL: TCL VOCs/SVOCs/PCB/PEST, TAL metals. * Wet sample, headspace not applicable.
25	50/6	0.1	0.1/NA			***SILT, CLAYEY SAND, & GRAVEL:*** 24-30 ft.; sand 40%, f-cs; gravel 40%, f-cobble; silt & clay 20%; gray-brown, moist, loose to semi-pliable, semi-cohesive.
30	25-25-50/6	1.5	1.5/NA **			** HNU Scan/HNU Headspace
35						
40						

DRAFT

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling Geologist: R. Astle Begin Drilling: 09/23/94

Driller: L. Bell Total Depth: 30 End Drilling: 09/23/94

Drilling Method: Hollow-Stem Auger Surface Elev.: Converted to Well: No

Drilling Fluid: Plant Potable Water Datum: Well Name:

Remarks: Split-Spoon West Coor.: South Coor.:

OH0019.018

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison/OH0019.018 Page 1 of 2

Site Location Moraine, Ohio

Sample No. WPSA-BH04-09SL Coded/ Replicate No. _____ Date 9/23/94

Weather Cool; Overcast Time Sampling Began 8:50 a.m. Time Sampling Completed 9:00 a.m.

Sampling Method and Material 3" stainless steel split spoon

Grab x Composite ___

From	To	Soil/Sediment Description
8'	10'	Sand, fine-coarse; gravel, fine-coarse; brown; damp; loose.

Other (OVA; HNU; etc.) HNU scan: 9.3 ppm; HNU headspace: 11.5 ppm

Constituents Sampled	Container Description From Lab x or G&M ___	Preservative
TCL VOCs	4 oz glass jar	cool
TCL SVOCs/PCBs/Pesticides	8 oz glass jar	cool
TAL Metals	16 oz glass jar	cool

Remarks Highest headspace reading at waste pile staging area; boring No. 4, 8-10 ft.

Sampling Personnel R. Astle

DRAFT

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison/OH0019.018 Page 2 of 2

Site Location Moraine, Ohio

Sample No. WPSA-BH04-21SL Coded/ Replicate No. _____ Date 9/23/94

Weather Cool; Overcast Time Sampling Began 9:10 a.m. Time Sampling Completed 9:20 a.m.

Sampling Method and Material 3" stainless steel split spoon

Grab x Composite ___

From	To	Soil/Sediment Description
20'	22'	Sand, fine-coarse; gravel, fine-cobble; trace silt and clay; brown; damp; loose.

Other (OVA; HNU; etc.) HNU scan: 1.3 ppm; HNU headspace: 3.1 ppm

Constituents Sampled	Container Description From Lab x or G&M ___	Preservative
TCL VOCs	4 oz glass jar	cool
TCL SVOCs/PCBs/Pesticides	8 oz glass jar	cool
TAL Metals	16 oz glass jar	cool

Remarks Lowest headspace reading at waste pile staging area; Boring No. 4, 20-22 ft.

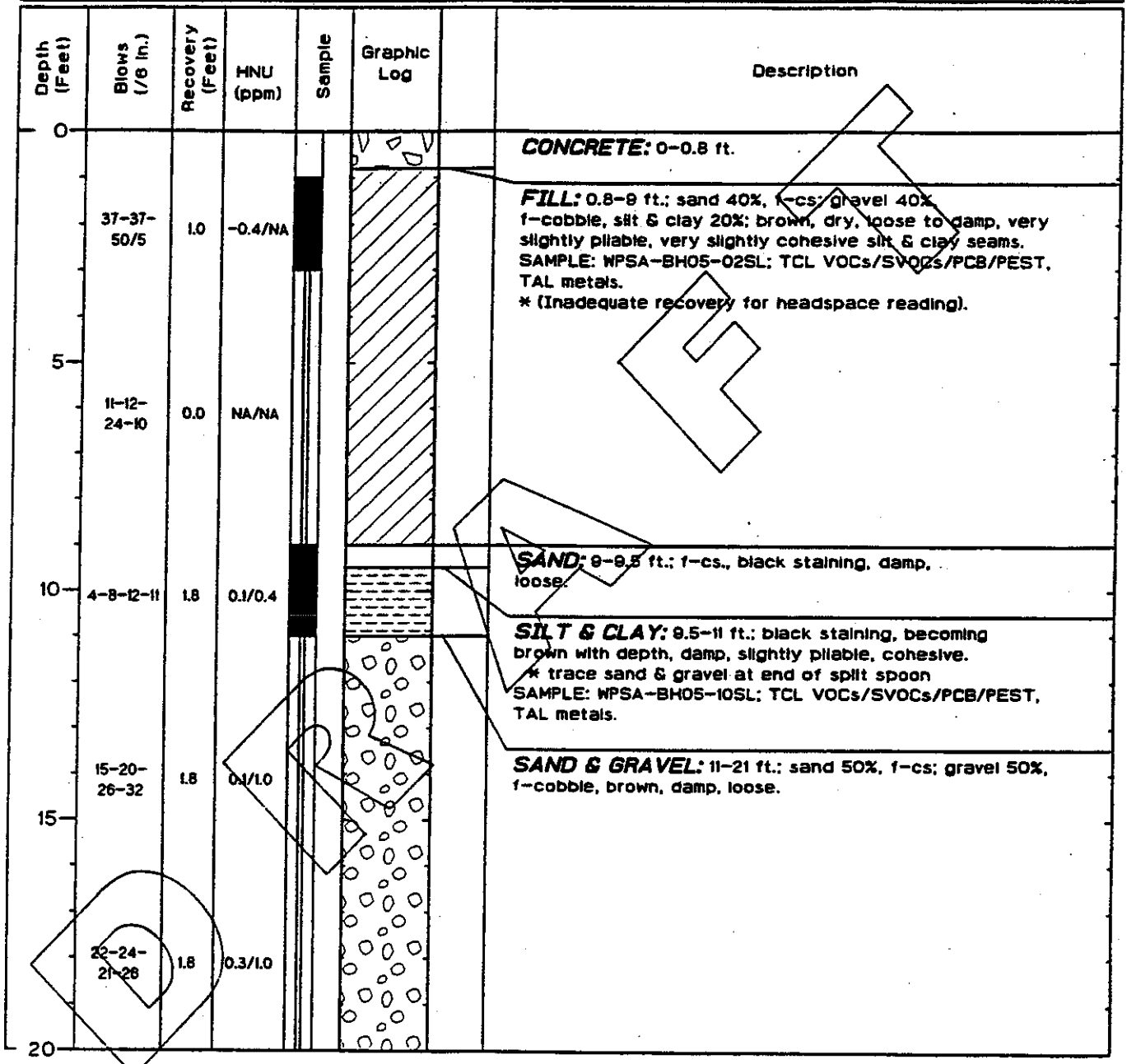
Sampling Personnel R. Astle

DRAFT

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: WPSA-BH05

HARRISON RADIATOR – OH0019.018 Moraine, Ohio



■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Betasco Drilling
Driller: L. Bell
Drilling Method: Hollow-Stem Auger
Drilling Fluid: Plant Potable Water
Remarks: Split-Spoon

Geologist: R. Astle
Total Depth: 26
Surface Elev.:
Datum:
West Coor.:

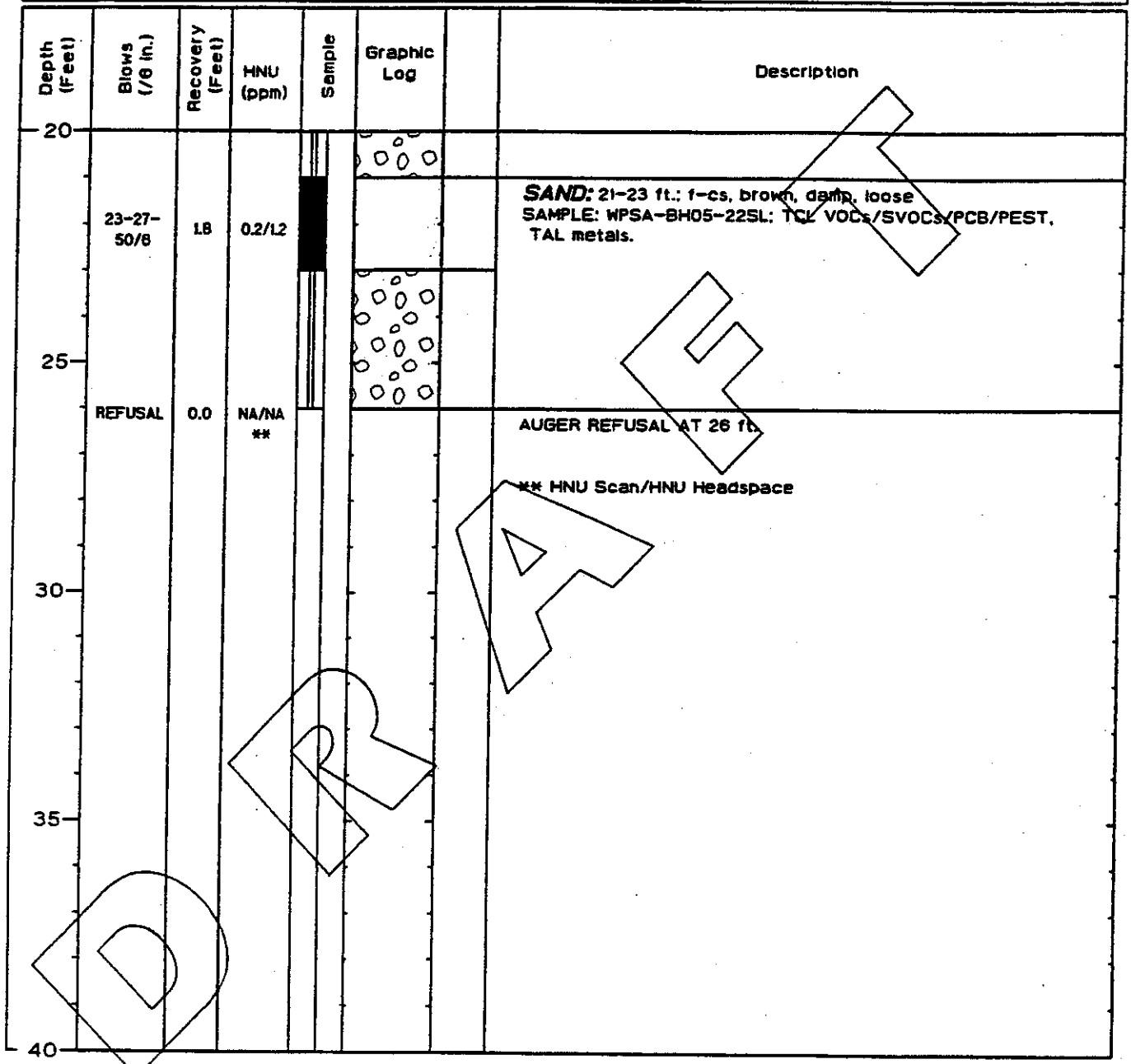
Begin Drilling: 09/22/94
End Drilling: 09/22/94
Converted to Well: No
Well Name:
South Coor.:

OH0019.018

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: WPSA-BH05

HARRISON RADIATOR – OH0019.018 Moraine, Ohio



DRAFT

■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: L. Bell
Drilling Method: Hollow-Stem Auger
Drilling Fluid: Plant Potable Water
Remarks: Split-Spoon

Geologist: R. Astle
Total Depth: 26
Surface Elev.:
Datum:
West Coor.:

Begin Drilling: 09/22/94
End Drilling: 09/22/94
Converted to Well: No
Well Name:
South Coor.:

OH0019.018

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison/OH0019.018 Page 1 of 3

Site Location Moraine, Ohio

Sample No. WPSA-BH05-02SL Coded/ Replicate No. _____ Date 9/22/94

Weather Cool; Overcast Time Sampling Began 12:00 p.m. Time Sampling Completed 2:10 p.m.

Sampling Method and Material 3" stainless steel split spoon

Grab x Composite ___

From	To	Soil/Sediment Description
1'	3'	Sand, fine-coarse; gravel, fine-coarse; trace silt and clay; brown; dry to damp; loose to slightly pliable; semi-cohesive.

Other (OVA; HNU; etc.) HNU scan: 0.4 ppm; HNU headspace not available due to inadequate recovery.

Constituents Sampled	Container Description From Lab x or G&M ___	Preservative
TCL VOCs	4 oz glass jar	cool
TCL SVOCs/PCBs/Pesticides	8 oz glass jar	cool
TAL Metals	16 oz glass jar	cool

Remarks Sample waste pile staging area; boring No. 5, 1-3 ft.

Sampling Personnel R. Astle

DRAFT

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison/OH0019.018 Page 2 of 3

Site Location Moraine, Ohio

Sample No. WPSA-BH05-10SL Coded/ Replicate No. _____ Date 9/22/94

Weather Cool; Overcast Time Sampling Began 1:50 p.m. Time Sampling Completed 2:00 p.m.

Sampling Method and Material 3" stainless steel split spoon

Grab x Composite ___

From	To	Soil/Sediment Description
9'	11'	Silt and clay; black stained to brown; damp; slightly pliable; cohesive.

Other (OVA; HNU; etc.) HNU scan: 0.7 ppm; HNU headspace: 0.4 ppm

Constituents Sampled	Container Description From Lab x or G&M ___	Preservative
TCL VOCs	4 oz glass jar	cool
TCL SVOCs/PCBs/Pesticides	8 oz glass jar	cool
TAL Metals	16 oz glass jar	cool

Remarks Lowest headspace reading at waste pile staging area; boring No. 5, 9-11 ft.

Sampling Personnel R. Astle

DRAFT

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison/OH0019.018 Page 3 of 3

Site Location Moraine, Ohio

Sample No. WPSA-BH05-22SL Coded/ Replicate No. DUP-25 Date 9/22/94

Weather Cool; Overcast Time Sampling Began 2:30 .m. Time Sampling Completed 2:40 .m.

Sampling Method and Material 3" stainless steel split spoon

Grab x Composite

From	To	Soil/Sediment Description
21'	23'	Sand, fine-coarse; brown; damp; loose.

Other (OVA; HNU; etc.) HNU scan: 0.2 ppm; HNU headspace: 1.2 ppm

Constituents Sampled	Container Description From Lab x or G&M	Preservative
TCL VOCs	4 oz glass jar	cool
TCL SVOCs/PCBs/Pesticides	4 oz glass jar	cool
TAL Metals	16 oz glass jar	cool

Remarks Highest headspace reading at waste pile staging area; Boring No. 5, 21-23 ft.

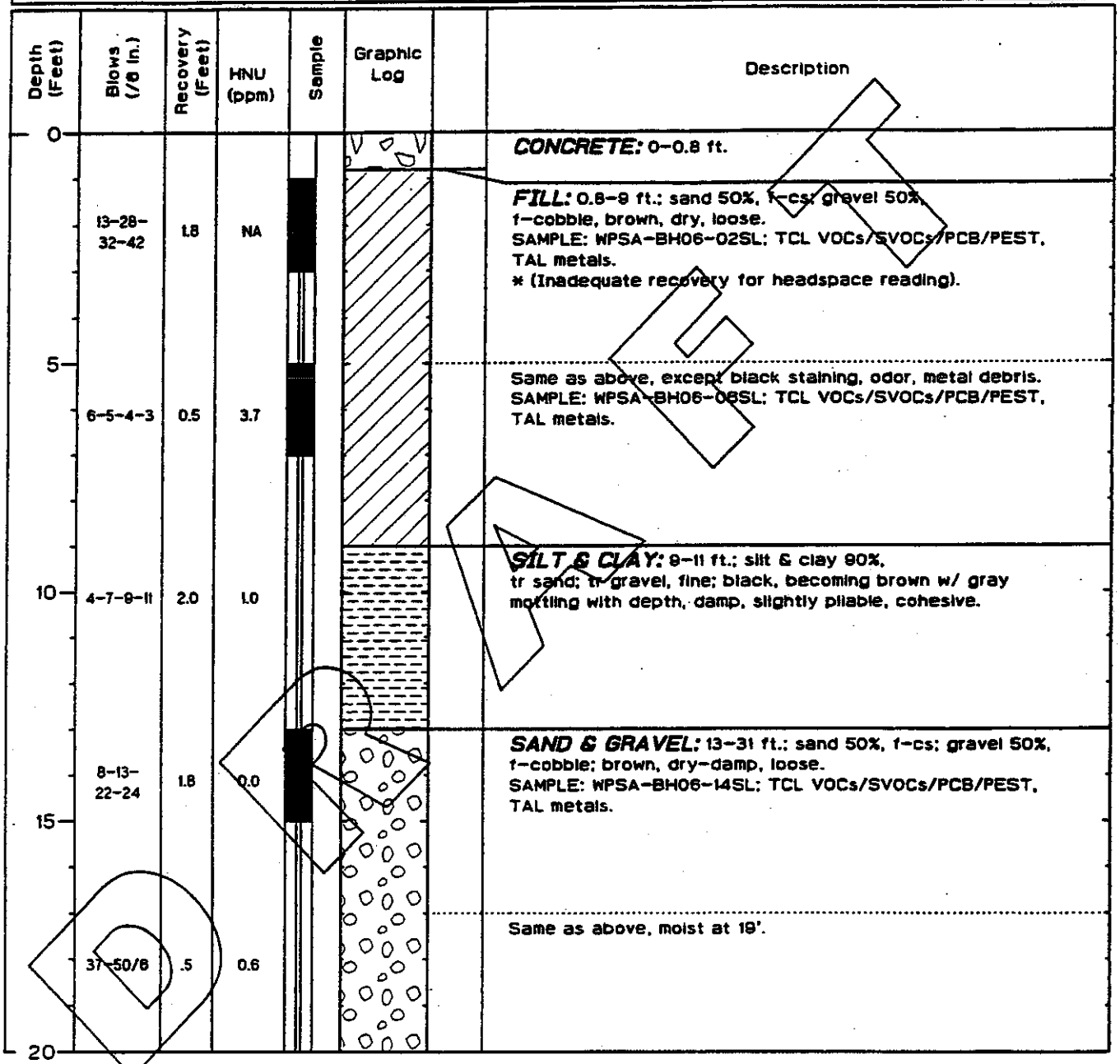
Sampling Personnel R. Astle

FIELD COPY

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: WPSA-BH06

HARRISON RADIATOR – OH0019.018 Moraine, Ohio



■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: L. Bell
Drilling Method: Hollow-Stem Auger
Drilling Fluid: Plant Potable Water
Remarks: Split-Spoon

Geologist: R. Astle
Total Depth: 31
Surface Elev.:
Datum:
West Coor.:

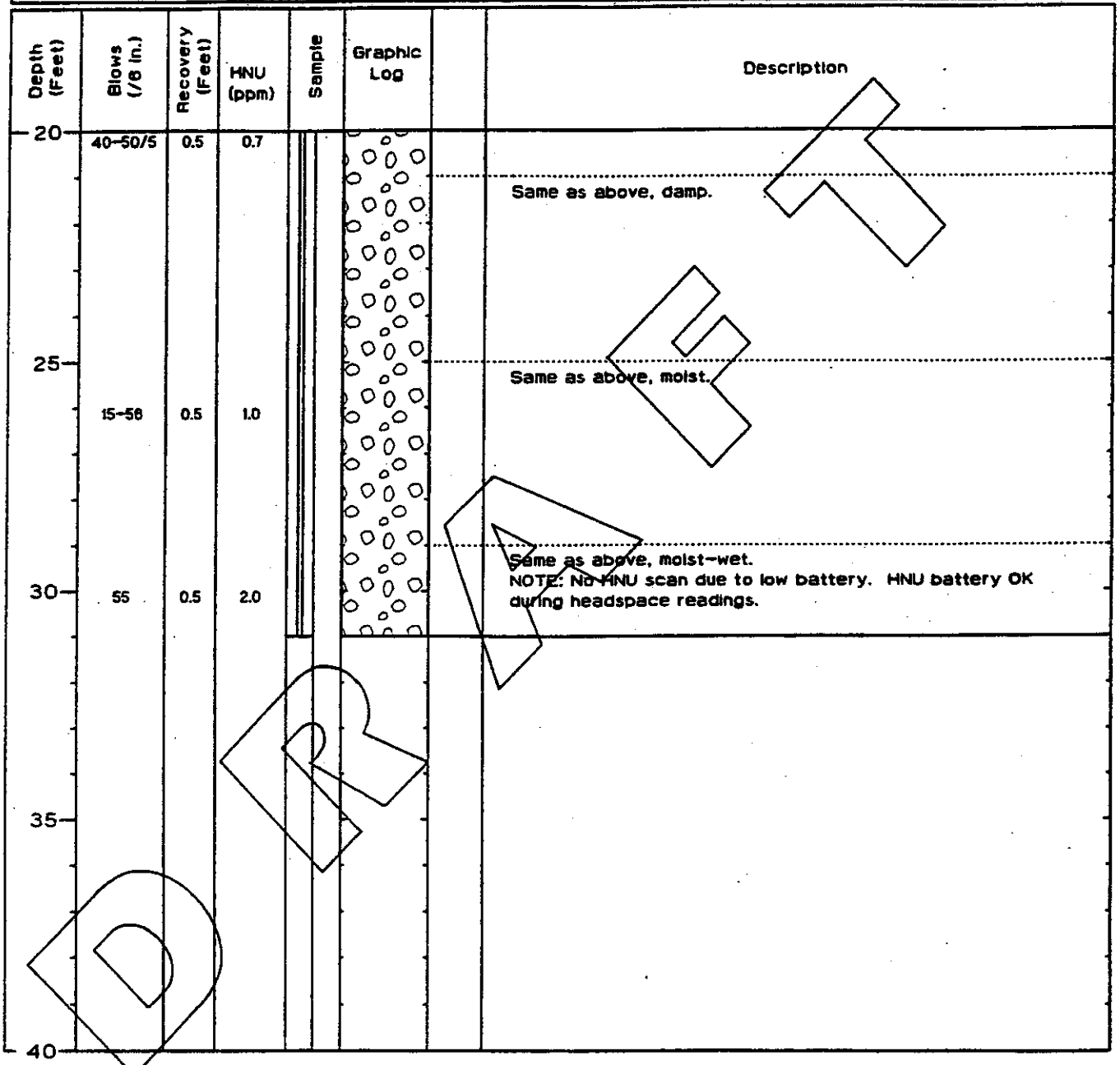
Begin Drilling: 09/21/94
End Drilling: 09/21/94
Converted to Well: No
Well Name:
South Coor.:

OH0019.018

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: WPSA-BH06

HARRISON RADIATOR – OH0019.018 Moraine, Ohio



Sample to Lab Sample Not Analyzed

Drilling Co.: Belasco Drilling Geologist: R. Astle Begin Drilling: 09/21/94

Driller: L. Bell Total Depth: 31 End Drilling: 09/21/94

Drilling Method: Hollow-Stem Auger Surface Elev.: Converted to Well: No

Drilling Fluid: Plant Potable Water Datum: Well Name:

Remarks: Split-Spoon West Coor.: South Coor.:

OH0019.018

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison/OH0019.018 Page 1 of 3

Site Location Moraine, Ohio

Sample No. WPSA-BH06-02SL Coded/ Replicate No. _____ Date 9/21/94

Weather Cool; Overcast Time Sampling Began 3:55 p.m. Time Sampling Completed 4:10 p.m.

Sampling Method and Material 3" stainless steel split spoon

Grab x Composite ___

From	To	Soil/Sediment Description
1'	3'	Sand, fine-coarse; gravel, fine-cobble; brown; dry; loose.

Other (OVA; HNU; etc.) No HNU scan reading due to low battery; no HNU headspace reading due to inadequate sample recovery.

Constituents Sampled	Container Description From Lab x or G&M ___	Preservative
TCL VOCs	4 oz glass jar	cool
TCL SVOCs/PCBs/Pesticides	8 oz glass jar	cool
TAL Metals	16 oz glass jar	cool

Remarks Waste pile staging area; Boring No. 6, 1-3 ft.

Sampling Personnel R. Astle

FINAL

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison/OH0019.018 Page 2 of 3

Site Location Moraine, Ohio

Sample No. WPSA-BH06-06SL Coded/ Replicate No. _____ Date 9/21/94

Weather Cool; Overcast Time Sampling Began 4:10 p.m. Time Sampling Completed 4:20 p.m.

Sampling Method and Material 3" stainless steel split spoon

Grab x Composite ___

From	To	Soil/Sediment Description
5'	7'	Sand, fine-coarse; gravel, fine-cobble; trace silt and clay; dark staining; dry; loose; odor; metal debris.

Other (OVA; HNU; etc.) No HNU scan reading due to low battery; HNU headspace: 3.7ppm

Constituents Sampled	Container Description From Lab x or G&M ___	Preservative
TCL VOCs	4 oz glass jar	cool
TCL SVOCs/PCBs/Pesticides	8 oz glass jar	cool
TAL Metals	16 oz glass jar	cool

Remarks Highest headspace sample reading at waste pile staging area; Boring No. 6, 5-7 ft.

Sampling Personnel R. Astle

DRAFT

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison/OH0019.018 Page 3 of 3

Site Location Moraine, Ohio

Sample No. WPSA-BH06-14SL Coded/ Replicate No. _____ Date 9/21/94

Weather Cool; Overcast Time Sampling Began 4:30 p.m. Time Sampling Completed 4:40 p.m.

Sampling Method and Material 3 " stainless steel split spoon

Grab x Composite ___

From	To	Soil/Sediment Description
13'	15'	Sand, fine-coarse; gravel, fine-cobble; brown; dry-damp; loose.

Other (OVA; HNU; etc.) No HNU scan reading due to low battery; HNU headspace: 0 ppm

Constituents Sampled	Container Description From Lab x or G&M ___	Preservative
TCL VOCs	4 oz glass jar	cool
TCL SVOCs/PCBs/Pesticides	4 oz glass jar	cool
TAL Metals	16 oz glass jar	cool

Remarks Lowest headspace sample reading at waste pile staging area; Boring No. 6, 13-15 ft.

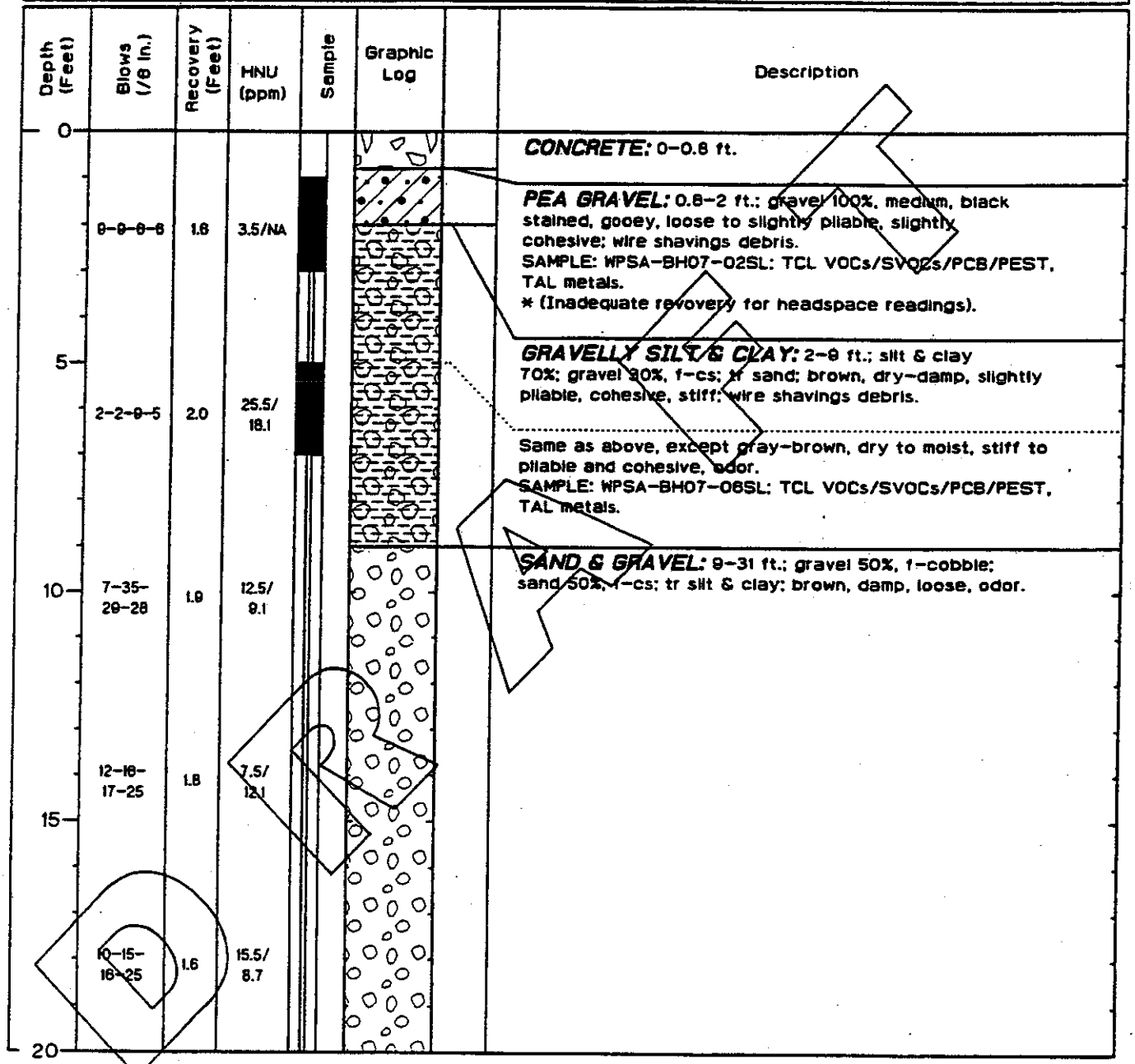
Sampling Personnel R. Astle

DRAFT

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: WPSA-BH07

HARRISON RADIATOR - OH0019.018 Moraine, Ohio



■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: L. Bell
Drilling Method: Hollow-Stem Auger
Drilling Fluid: Plant Potable Water
Remarks: Split-Spoon

Geologist: R. Astle
Total Depth: 31
Surface Elev.:
Datum:
West Coor.:

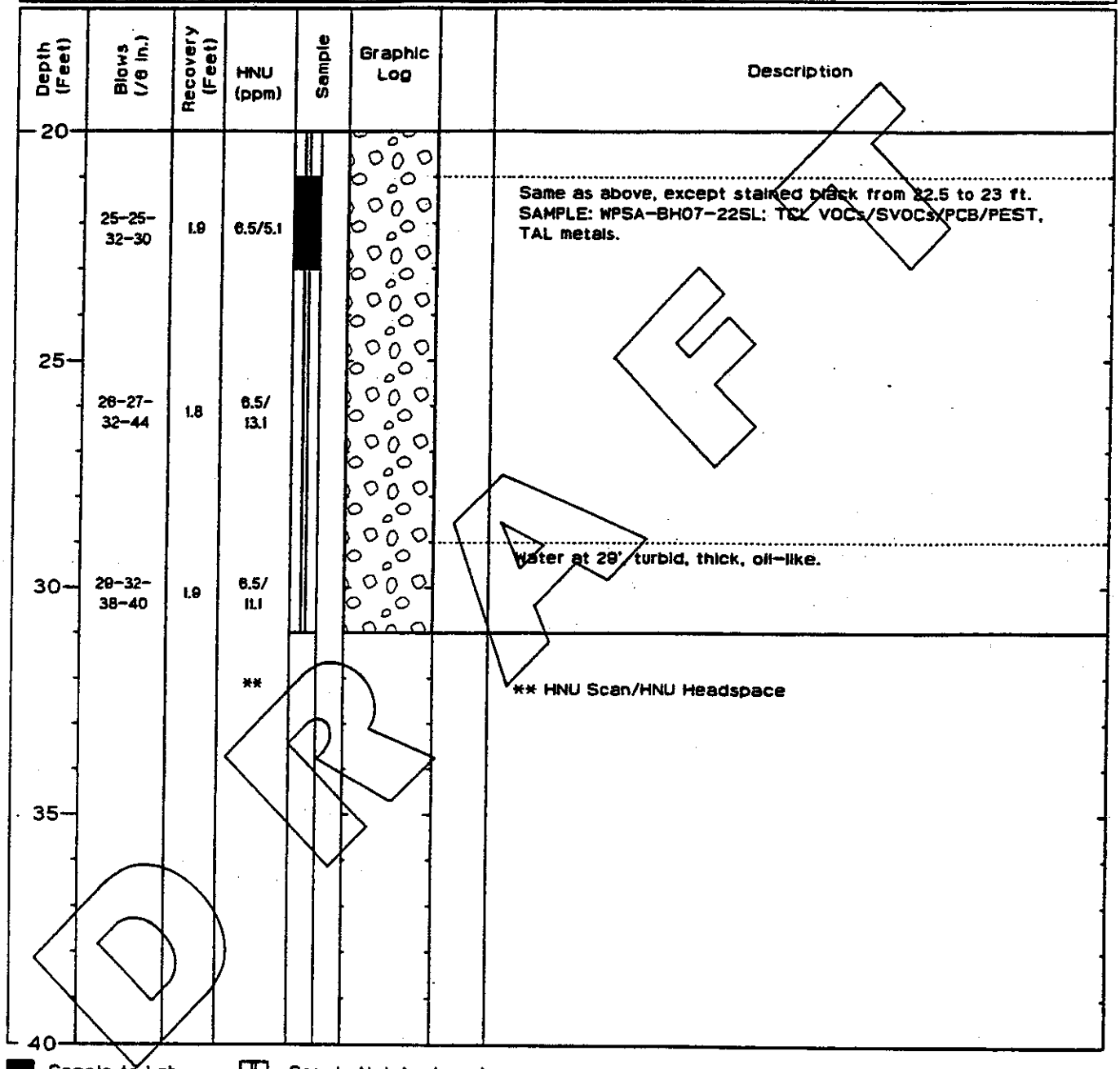
Begin Drilling: 09/23/94
End Drilling: 09/23/94
Converted to Well: No
Well Name:
South Coor.:

OH0019.018

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: WPSA-BH07

HARRISON RADIATOR – OH0019.018 Moraine, Ohio



Sample to Lab Sample Not Analyzed

Drilling Co.: Belasco Drilling Geologist: R. Astle Begin Drilling: 09/23/94

Driller: L. Bell Total Depth: 31 End Drilling: 09/23/94

Drilling Method: Hollow-Stem Auger Surface Elev.: Converted to Well: No

Drilling Fluid: Plant Potable Water Datum: Well Name:

Remarks: Split-Spoon West Coor.: South Coor.:

OH0019.018

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison/OH0019.018 Page 1 of 3

Site Location Moraine, Ohio

Sample No. WPSA-BH07-06SL Coded/ Replicate No. _____ Date 9/23/94

Weather Cool; Overcast Time Sampling Began 11:50 a.m. Time Sampling Completed 12:00 p.m.

Sampling Method and Material 3" stainless steel split spoon

Grab x Composite ___

From	To	Soil/Sediment Description
5'	7'	Gravelly silt and clay, trace sand; gray-brown; dry-moist; stiff to pliable and cohesive; odor.

Other (OVA; HNU; etc.) HNU scan: 25.3 ppm, HNU headspace: 18.1 ppm

Constituents Sampled	Container Description From Lab x or G&M ___	Preservative
TCL VOCs	4 oz glass jar	cool
TCL SVOCs/PCBs/Pesticides	8 oz glass jar	cool
TAL Metals	16 oz glass jar	cool

Remarks Highest headspace reading at waste pile staging area; Boring No. 7, 5-7 ft.

Sampling Personnel R. Astle

DRAFT

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison/OH0019.018 Page 2 of 3

Site Location Moraine, Ohio

Sample No. WPSA-BH07-02SL Coded/ Replicate No. _____ Date 9/23/94

Weather Cool; Overcast Time Sampling Began 11:40 a.m. Time Sampling Completed 11:50 a.m.

Sampling Method and Material 3" stainless-steel split spoon

Grab x Composite ___

From	To	Soil/Sediment Description
1'	3'	Gravel, medium; black stained; gooey; loose to slightly pliable; and cohesive with gravelly silt and clay; brown; dry-damp; slightly pliable; slightly cohesive; wire debris.

Other (OVA; HNU; etc.) HNU scan: 3.5 ppm, inadequate recovery for headspace reading.

Constituents Sampled	Container Description From Lab x or G&M ___	Preservative
TCL VOCs	4 oz glass jar	cool
TCL SVOCs/PCBs/Pesticides	8 oz glass jar	cool
TAL Metals	16 oz glass jar	cool

Remarks Sampled waste pile staging area; Boring No. 7, 1-3 ft.

Sampling Personnel R. Astle

DRAFT

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison/OH0019.018 Page 3 of 3

Site Location Moraine, Ohio

Sample No. WPSA-BH07-22SL Coded/ Replicate No. _____ Date 9/23/94

Weather Cool; Overcast Time Sampling Began 1:45 p.m. Time Sampling Completed 2:00 p.m.

Sampling Method and Material 3" stainless steel split spoon

Grab x Composite ___

From	To	Soil/Sediment Description
21'	23'	Sand, fine-coarse; gravel, fine-cobble; trace silt and clay; black stained; damp; loose; odor.

Other (OVA; HNU; etc.) HNU scan: 6.5 ppm, HNU headspace: 5.1 ppm

Constituents Sampled	Container Description From Lab x or G&M ___	Preservative
TCL VOCs	4 oz glass jar	cool
TCL SVOCs/PCBs/Pesticides	8 oz glass jar	cool
TAL Metals	16 oz glass jar	cool

Remarks Lowest headspace reading at waste pile staging area; Boring No. 7, 21-23 ft

Sampling Personnel R. Astle

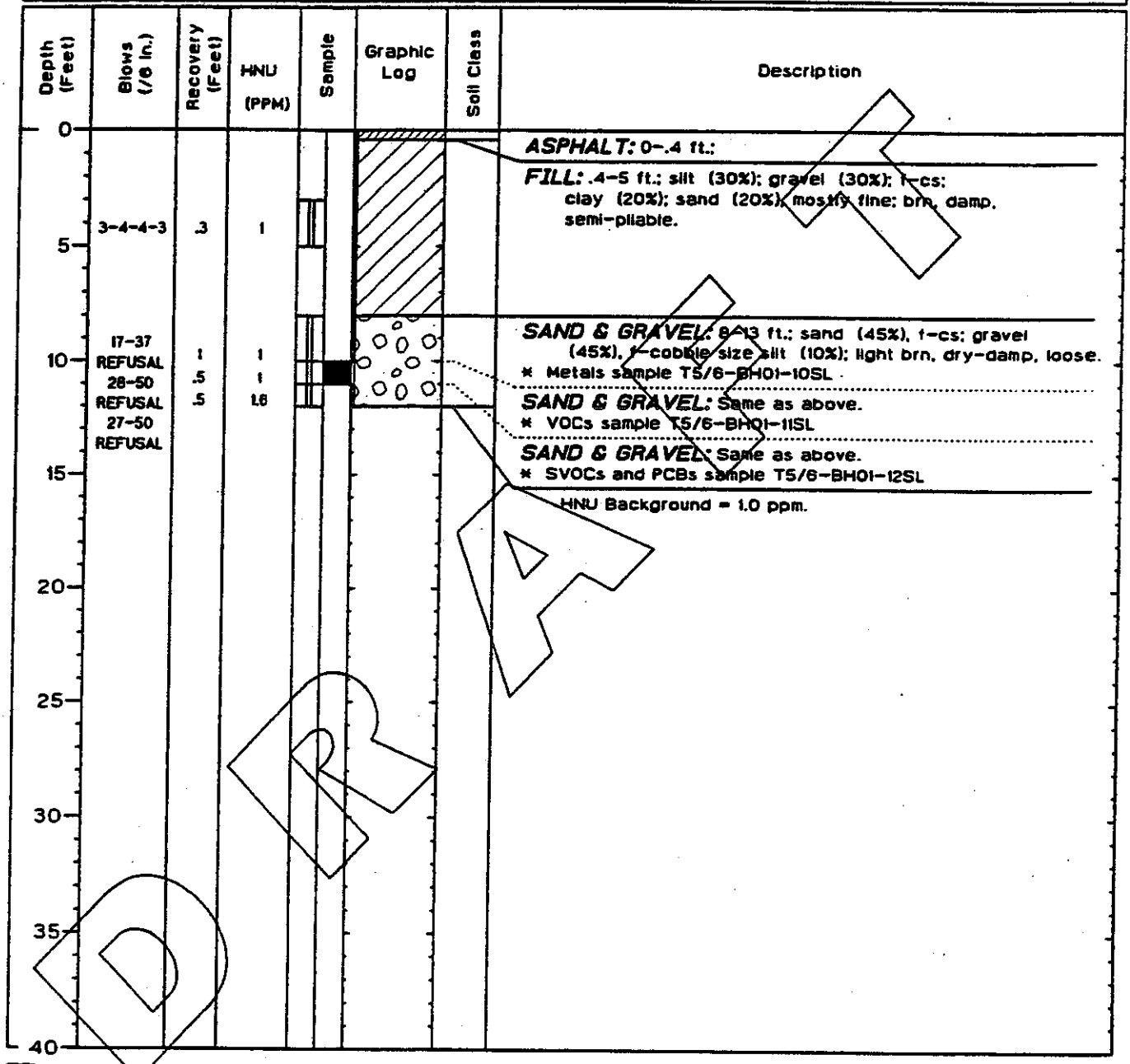
DRAFT

T5 / 6-BH01 to BH02

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: T5/6-BH01

HARRISON RFI — Moraine, Ohio



☒ Composite to Lab ■ VOC to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Belasco
Driller: G. Mayle
Drilling Method: HSA 4 1/4"
Drilling Fluid: None
Remarks:

Geologist: R. Astle
Total Depth: 12
Surface Elev.:
Datum: Feet, MSL
West Coor.:

Begin Drilling: 12/01/92
End Drilling: 12/01/92
Converted to Well: No
Well Name:
South Coor.:

OH019.12

harrison

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 1 of 3

Site Location Moraine, Ohio

Sample No. T5/6-BH01-10SL Coded/ Replicate No. DUP-6 Date 12-1-92

Weather Cloudy, 30s F Time Sampling Began 12:30 p.m. Time Sampling Completed 2:30 p.m.

Sampling Method and Material 3" diameter split spoon

Grab X Composite ____

From	To	Soil/Sediment Description
8	10	Sand (45%), f-cs; gravel (45%), f-cobble size; silt (10%); lt brn, dry-damp, loose.

Other (OVA; HNU; etc.) HNU in spoon = 1.0 ppm. Background = 1.0 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TAL Metals	16 oz glass jar	Ice

Remarks Had to drive 3 intervals of spoons to fill duplicate.

Sampling Personnel R. Astle

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 2 of 3

Site Location Moraine, Ohio

Sample No. T5/6-BH01-11SL Coded/ Replicate No. DUP-6 Date 12-1-92

Weather Cloudy, 30s F Time Sampling Began 12:30 p.m. Time Sampling Completed 2:30 p.m.

Sampling Method and Material 3" diameter split spoon

Grab X Composite ____

From	To	Soil/Sediment Description
10	11	Sand (45%), f-cs; gravel (45%), f-cobble size; silt (10%); light brown, dry-damp, loose

Other (OVA; HNU; etc.) HNU in spoon = 1.0 ppm. Background = 1.0 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice

Remarks Had to drive 3 intervals of spoons to fill duplicate.

Sampling Personnel R. Astle

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 3 of 3

Site Location Moraine, Ohio

Sample No. T5/6-BH01-12SL Coded/ Replicate No. DUP-6 Date 12-1-92

Weather Cloudy, 30sF Time Sampling Began 12:30 p.m. Time Sampling Completed 2:30 p.m.

Sampling Method and Material 3" diameter split spoon

Grab X Composite ____

From	To	Soil/Sediment Description
11	12	Sand (45%), f-cs; gravel (45%), f-cobble size; silt (10%); lt brn, dry-damp, loose.

Other (OVA; HNU; etc.) HNU in spoon = 1.6 ppm. Background = 1.0 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL SVOC & PCB/Pesticides	4 oz glass jar	Ice

Remarks Had to drive 3 spoons to fill duplicate sample.

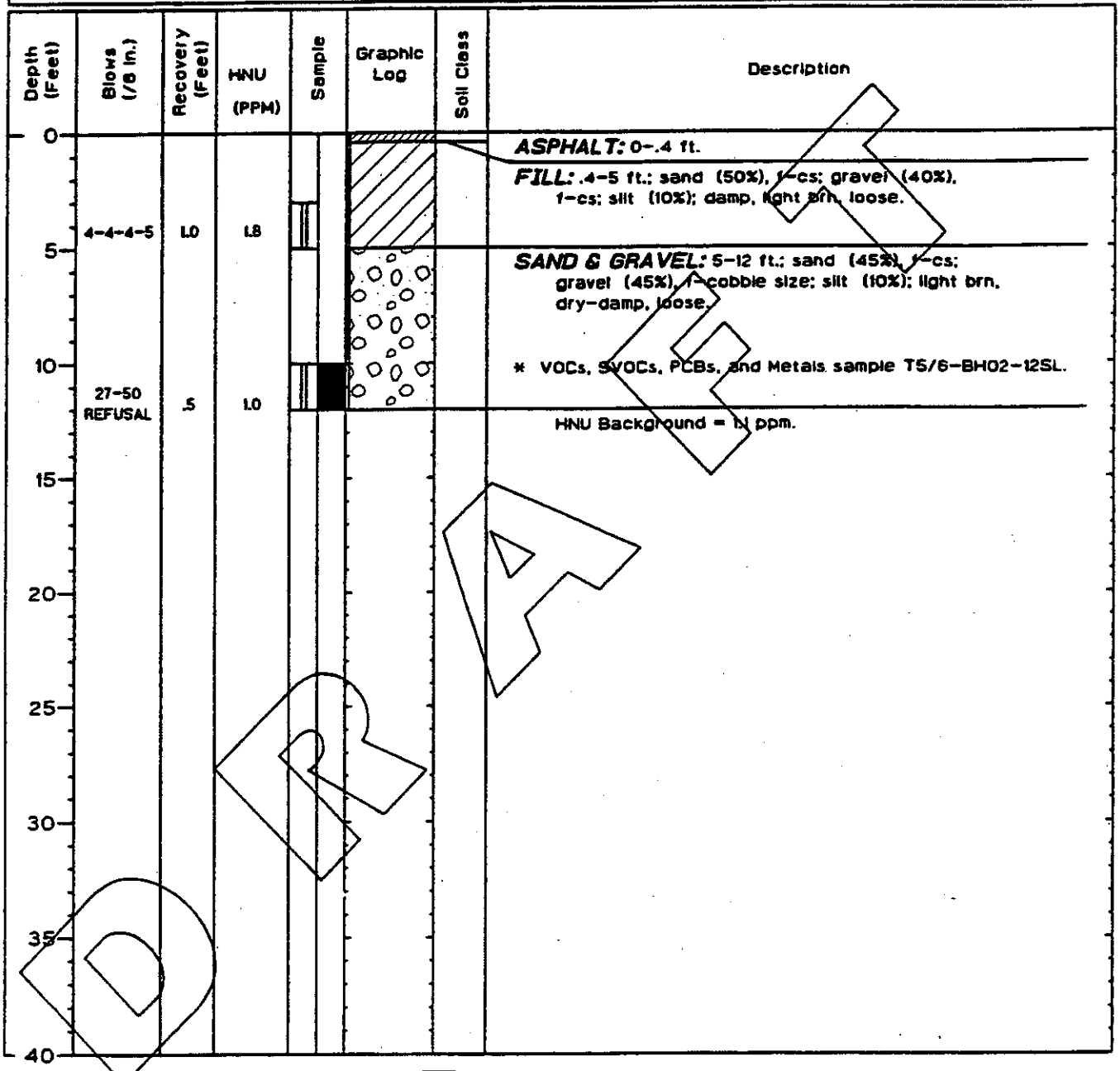
Sampling Personnel R. Astle

DRAFT

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: T5/6-BH02

HARRISON RFI — Moraine, Ohio



☒ Composite to Lab ■ VOC to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Belasco
Driller: G. Mayle
Drilling Method: HSA 4 1/4"
Drilling Fluid: None
Geologist: R. Astle
Total Depth: 12
Surface Elev.:
Datum: Feet, MSL
Begin Drilling: 12/01/92
End Drilling: 12/01/92
Converted to Well: No
Well Name:
Remarks:
West Coor.:
South Coor.:

OH019.12

harrison

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 1 of 1

Site Location Moraine, Ohio

Sample No. T5/6-BH02-12SL Coded/ Replicate No. _____ Date 12-1-92

Weather Cloudy, 30°F Time Sampling Began 2:30 p.m. Time Sampling Completed 3:30 p.m.

Sampling Method and Material 3" diameter split spoon

Grab X Composite ____

From	To	Soil/Sediment Description
10	12	Sand (45%), f-cs; gravel (45%), f-cobble size; silt (10%); lt brn, dry-damp, loose.

Other (OVA; HNU; etc.) HNU in spoon = 1.0 ppm. Background = 1.1 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice
TCL SVOCs & PCB/Pesticides	4 oz glass jar	Ice
TAL Metals	16 oz glass jar	Ice

Remarks

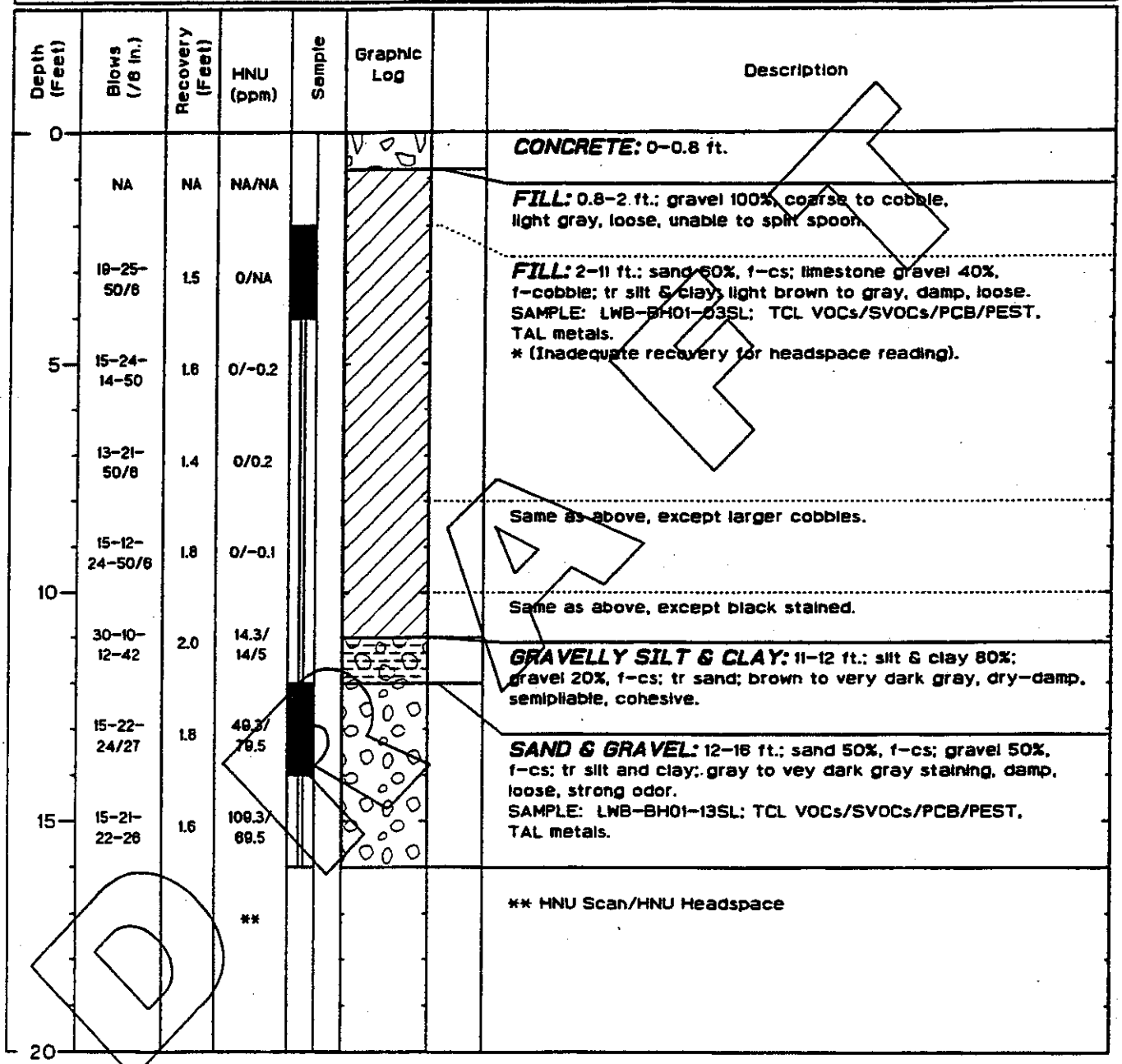
Sampling Personnel R. Astle

LWB-BH01

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: LWB-BH01

HARRISON RADIATOR - OH0019.018 Moraine, Ohio



■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Geologist: R. Astle
Begin Drilling: 09/21/94
Driller: L. Bell
Total Depth: 16
End Drilling: 09/21/94
Drilling Method: Hollow-Stem Auger
Surface Elev.:
Converted to Well: No
Drilling Fluid: None
Datum:
Well Name:
Remarks: Split Spoon
West Coor.:
South Coor.:
OH0019.018

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison/OH0019.018 Page 1 of 2

Site Location Moraine, Ohio

Sample No. LWB-BH01-03SL Coded/ Replicate No. _____ Date 9/21/94

Weather Cool; Overcast Time Sampling Began 9:25 a.m. Time Sampling Completed 9:35 a.m.

Sampling Method and Material 3" stainless steel split spoon

Grab x Composite ___

From	To	Soil/Sediment Description
2'	4'	Fill: sand, fine-coarse; gravel, fine-cobble; trace silt and clay; light brown to gray; damp; loose.

Other (OVA; HNU; etc.) HNU scan: 0 ppm; HNU headspace: NA *Inadequate recovery to headspace reading

Constituents Sampled	Container Description From Lab x or G&M ___	Preservative
TCL VOCs	4 oz glass jar	cool
TCL SVOCs/PCBs/Pesticides	8 oz glass jar	cool
TAL Metals	16 oz glass jar	cool

Remarks Liquid waste burner, boring No. 1, 2-4ft. Unable to sample until 2 ft. below ground surface. Concrete 0-1 ft.; large cobbles 1-2ft.

Sampling Personnel R. Astle

DRAFT

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison/OH0019.018 Page 2 of 2

Site Location Moraine, Ohio

Sample No. LWB-BH01-13SL Coded/ Replicate No. DUP-24 Date 9/21/94

Weather Cool; Overcast Time Sampling Began 9:50 a.m. Time Sampling Completed 10:10 a.m.

Sampling Method and Material 3" stainless steel split spoon

Grab x Composite ___

From	To	Soil/Sediment Description
12'	14'	Sand and gravel: sand, fine-coarse; gravel, fine-coarse; trace silt and clay; gray to very dark gray staining; damp; loose; strong odor.

Other (OVA; HNU; etc.) HNU scan: 49.3 ppm; HNU headspace: 79.5 ppm

Constituents Sampled	Container Description From Lab x or G&M ___	Preservative
TCL VOCs	4 oz glass jar	cool
TCL SVOCs/PCBs/Pesticides	8 oz glass jar	cool
TAL Metals	16 oz glass jar	cool

Remarks Highest headspace reading at liquid waste burner; boring no. 1, 12-14 ft.

Sampling Personnel R. Astle

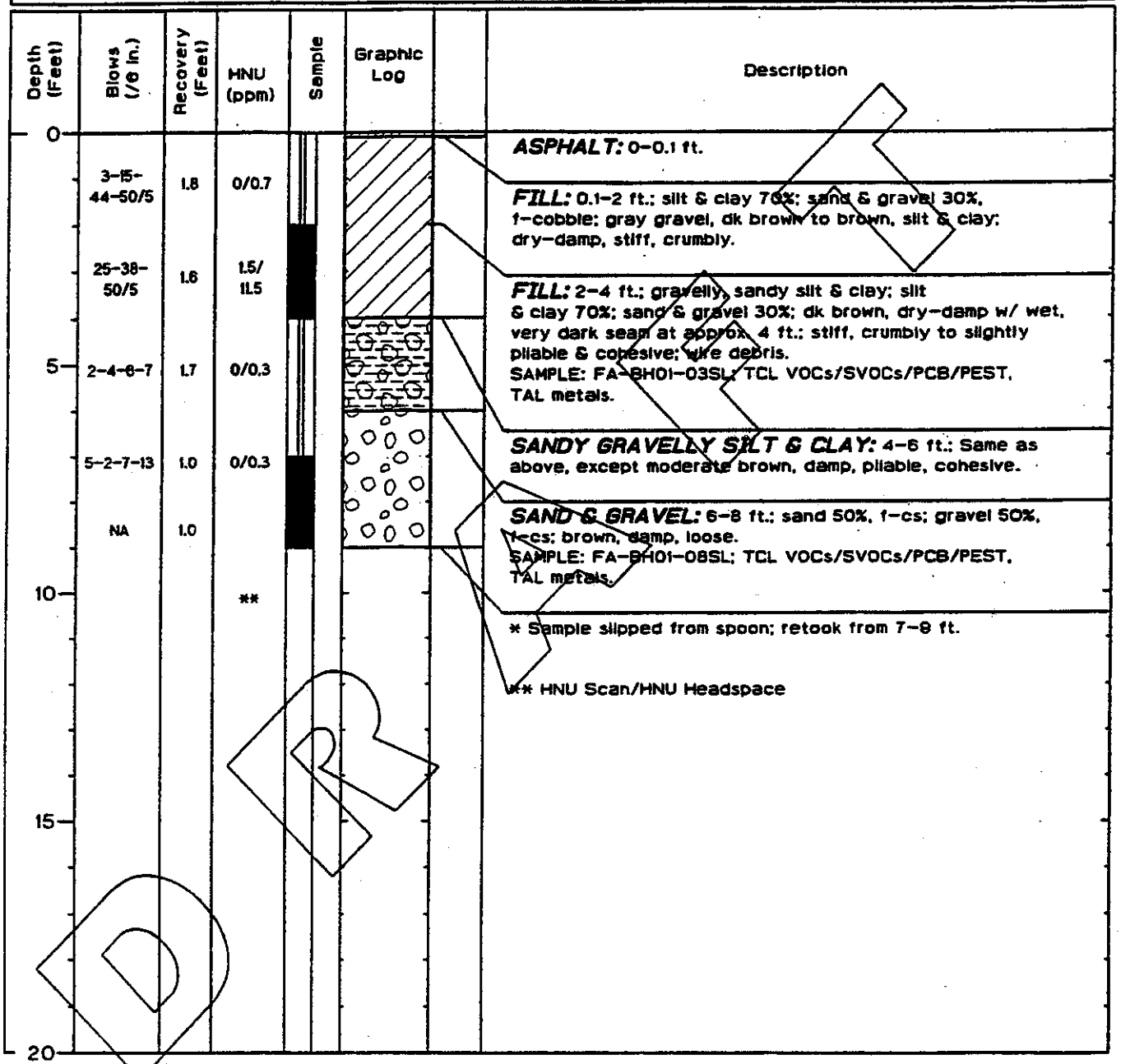
DRAFT

FA-BH01 to BH02

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: FA-BH01

HARRISON RADIATOR - OH0019.018 Moraine, Ohio



Sample to Lab Sample Not Analyzed

Drilling Co.: Belasco Drilling Geologist: R. Astle Begin Drilling: 09/27/94

Driller: R. Fisher Total Depth: 9 End Drilling: 09/27/94

Drilling Method: Hollow-Stem Auger Surface Elev.: Converted to Well: No

Drilling Fluid: None Datum: Well Name:

Remarks: Split-Spoon West Coor.: South Coor.:

OH0019.018

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison/OH0019.018 Page 1 of 2

Site Location Moraine, Ohio

Sample No. FA-BH01-03SL Coded/ Replicate No. _____ Date 9/27/94

Weather Cool; Overcast Time Sampling Began 9:10 a.m. Time Sampling Completed 9:20 a.m.

Sampling Method and Material 3" stainless steel split spoon

Grab x Composite ___

From	To	Soil/Sediment Description
2'	4'	Gravelly, sandy silt and clay; dark brown to dark stained; dry-damp to wet; pliable; cohesive to crumbly; trace wire debris.

Other (OVA; HNU; etc.) HNU scan: 1.5 ppm; HNU headspace 11.5 ppm

Constituents Sampled	Container Description From Lab x or G&M ___	Preservative
TCL VOCs	4 oz glass jar	cool
TCL SVOCs/PCBs/Pesticides	8 oz glass jar	cool
TAL Metals	16 oz glass jar	cool

Remarks Highest headspace reading: fill area, boring no.1, 2-4 ft.

Sampling Personnel R. Astle

DRAFT

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison/OH0019.018 Page 2 of 2

Site Location Moraine, Ohio

Sample No. FA-BH01-08SL Coded/ Replicate No. _____ Date 9/27/94

Weather Cool; Overcast Time Sampling Began 9:30 a.m. Time Sampling Completed 9:40 a.m.

Sampling Method and Material 3" stainless steel split spoon

Grab x Composite ___

From	To	Soil/Sediment Description
7'	9'	Sand, fine-coarse; gravel, fine-coarse; brown; damp; loose.

Other (OVA; HNU; etc.) HNU scan: 0 ppm; HNU headspace 0.3 ppm

Constituents Sampled	Container Description From Lab x or G&M ___	Preservative
TCL VOCs	4 oz glass jar	cool
TCL SVOCs/PCBs/Pesticides	8 oz glass jar	cool
TAL Metals	16 oz glass jar	cool

Remarks Lowest headspace reading: fill area, boring no.1, 7-9 ft.

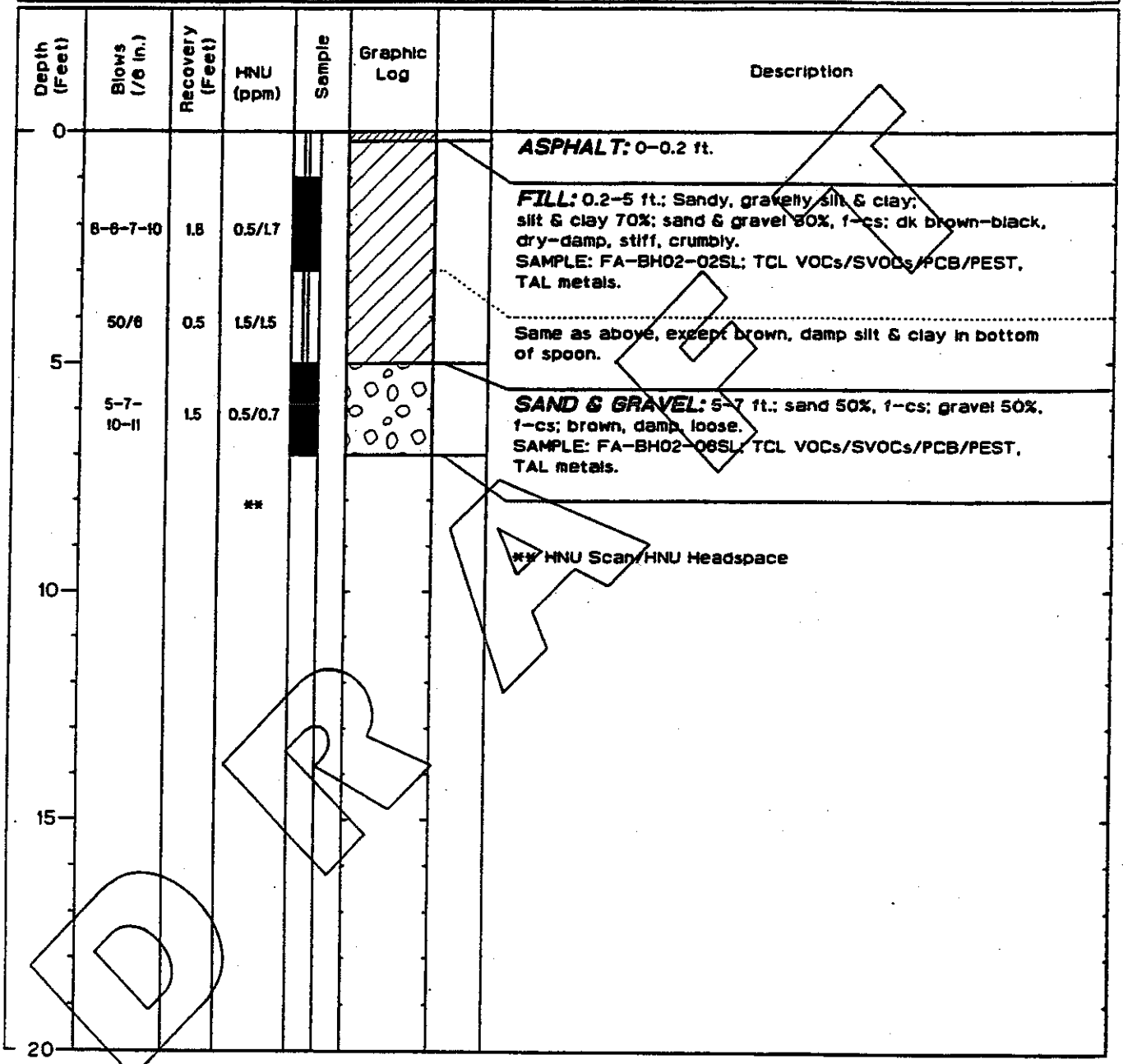
Sampling Personnel R. Astle

DRAFT

Geraghty & Miller, Inc.
Environmental Services

Log of Boring: FA-BH02

HARRISON RADIATOR - OH0019.018 Moraine, Ohio



■ Sample to Lab ▯ Sample Not Analyzed

Drilling Co.: Belasco Drilling
Driller: R. Fisher
Drilling Method: Hollow-Stem Auger
Drilling Fluid: None
Remarks: Split-Spoon

Geologist: R. Astle
Total Depth: 7
Surface Elev.:
Datum:
West Coor.:

Begin Drilling: 09/27/94
End Drilling: 09/27/94
Converted to Well: No
Well Name:
South Coor.:

OH0019.018

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison/OH0019.018 Page 1 of 2

Site Location Moraine, Ohio

Sample No. FA-BH02-02SL Coded/ Replicate No. _____ Date 9/27/94

Weather Cool; Overcast Time Sampling Began 10:30 a.m. Time Sampling Completed 10:40 a.m.

Sampling Method and Material 3 " stainless steel split spoon

Grab x Composite ____

From	To	Soil/Sediment Description
1'	3'	Sandy, gravelly, silt and clay; dark brown-black, dry-damp, stiff, crumbly.

Other (OVA; HNU; etc.) HNU scan: 0.5 ppm; HNU headspace 1.7 ppm

Constituents Sampled	Container Description From Lab x or G&M ____	Preservative
TCL VOCs	4 oz glass jar	cool
TCL SVOCs/PCBs/Pesticides	8 oz glass jar	cool
TAL Metals	16 oz glass jar	cool

Remarks Highest headspace reading: fill area, boring no.2, 1-3 ft.

Sampling Personnel R. Astle

DRAFT

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison/OH0019.018 Page 2 of 2

Site Location Moraine, Ohio

Sample No. FA-BH02-06SL Coded/ Replicate No. _____ Date 9/27/94

Weather Cool; Overcast Time Sampling Began 11:00 a.m. Time Sampling Completed 11:10 a.m.

Sampling Method and Material 3 " stainless steel split spoon

Grab x Composite ____

From	To	Soil/Sediment Description
5'	7'	Sand and gravel; brown, damp, loose

Other (OVA; HNU; etc.) HNU scan: 0.5 ppm; HNU headspace 0.7 ppm

Constituents Sampled	Container Description From Lab x or G&M ____	Preservative
TCL VOCs	4 oz glass jar	cool
TCL SVOCs/PCBs/Pesticides	8 oz glass jar	cool
TAL Metals	16 oz glass jar	cool

Remarks Lowest headspace reading: fill area, boring no.2, 5-7 ft.

Sampling Personnel R. Astle

DRAFT

L1-GS01-01WT to GS05

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 1 of 5

Site Location Moraine, Ohio

Sample No. L1-GS01-02WT Coded/ Replicate No. DUP-9 Date 10-12-92

Weather Cloudy, 30sF Time Sampling Began 1:30 p.m. Time Sampling Completed 2:10 p.m.

Sampling Method and Material 2.75-inch diameter stainless steel hand auger.

Grab ____ Composite ____

From	To	Soil/Sediment Description
0	2	Silt (50%); clay (30%); gravel (11%), f-cobble; tr ceramic pieces, metal; brn to gray, damp, semicohesive, semipliable.

Other (OVA; HNU; etc.) HNU in spoon = .2 ppm. Background = .2 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice
TCL SVOCs & PCB/Pest.	4 oz glass jar	Ice
TAL Metals & Cyanide	16 oz glass jar	Ice

Remarks

Sampling Personnel R. Astle, C. Standard

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 2 of 5

Site Location Moraine, Ohio

Sample No. L1-GS02-02WT Coded/ Replicate No. _____ Date 12-10-92

Weather Cloudy, 30sF Time Sampling Began 3:00 p.m. Time Sampling Completed 3:30 p.m.

Sampling Method and Material 2.75-inch diameter stainless steel hand auger.

Grab X Composite ____

From	To	Soil/Sediment Description
0	2	Silt (75%); clay (20%); tr gravel, ceramic fragments, metal; gray, damp, very slightly cohesive, very slightly pliable.

Other (OVA; HNU; etc.) HNU in spoon = 0 ppm. Background = .2 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice
TCL SVOCs & PCB/Pest.	4 oz glass jar	Ice
TAL Metals & Cyanide	16 oz glass jar	Ice

Remarks HNU deflection.

Sampling Personnel R. Astle, C. Standard

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 3 of 5

Site Location Moraine, Ohio

Sample No. L1-GS03-02WT Coded/ Replicate No. _____ Date 12-10-92

Weather Cloudy, 30sF Time Sampling Began 2:30 p.m. Time Sampling Completed 3:00 p.m.

Sampling Method and Material 2.75-inch diameter stainless steel hand auger.

Grab X Composite ____

From	To	Soil/Sediment Description
0	2	Silt (70%); clay (20%); gravel (10%), f-cobble; tr ceramic waste, lt brn clay, gray silt, damp-moist, sl pliable, sl cohesive.

Other (OVA; HNU; etc.) HNU in spoon = .2 ppm. Background = .2 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice
TCL SVOCs & PCB/Pest.	4 oz glass jar	Ice
TAL Metals & Cyanide	16 oz glass jar	Ice

Remarks _____

Sampling Personnel R. Astle, C. Standard

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 4 of 5

Site Location Moraine, Ohio

Sample No. L1-GS04-02WT Coded/ Replicate No. _____ Date 12-10-92

Weather Cloudy, 30sF Time Sampling Began 4:00 p.m. Time Sampling Completed 4:30 p.m.

Sampling Method and Material 2.75-inch diameter stainless steel hand auger.

Grab X Composite ____

From	To	Soil/Sediment Description
0	1	Clay (60%); gravel (30%), f-cobble size; silt (10%); tr ceramic fragments & metal; brown, damp, stiff, hard.

Other (OVA; HNU; etc.) HNU in spoon = .5 ppm. Background = .5 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice
TCL SVOCs & PCB/Pest.	4 oz glass jar	Ice
TAL Metals & Cyanide	16 oz glass jar	Ice

Remarks Refusal at 1'.

Sampling Personnel R. Astle, C. Standard

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 5 of 5

Site Location Moraine, Ohio

Sample No. L1-GS05-02WT Coded/ Replicate No. _____ Date 12-10-92

Weather Cloudy, 30sF Time Sampling Began 3:30 p.m. Time Sampling Completed 4:00 p.m.

Sampling Method and Material 2.75-inch diameter stainless steel hand auger.

Grab X Composite ____

From	To	Soil/Sediment Description
0	2	Clay (50%); gravel (30%), f-cobble size; silt (20%); brown, damp, stiff, hard.

Other (OVA; HNU; etc.) HNU in spoon = .5 ppm. Background = .5 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice
TCL SVOCs & PCB/Pest.	4 oz glass jar	Ice
TAL Metals & Cyanide	16 oz glass jar	Ice

Remarks _____

Sampling Personnel R. Astle, C. Standard

L2-GS01-01WT to GS03

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 1 of 6

Site Location Moraine, Ohio

Sample No. L2-GS01-02WT Coded/ Replicate No. DUP-10 Date 12-11-92

Weather Cloudy, 30sF Time Sampling Began 11:45 a.m. Time Sampling Completed 12:00 p.m.

Sampling Method and Material 2.75-inch diameter stainless steel hand auger.

Grab X Composite ____

From	To	Soil/Sediment Description
0	1.25	Clay (60%); gravel (20%), f-cobble size; silt (10%); sand (10%), f-cs; brown to dark brown, damp, pliable, cohesive.

Other (OVA; HNU; etc.) HNU in spoon = .5 ppm. Background = .5 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice
TCL SVOCs & PCB/Pest.	4 oz glass jar	Ice
TAL Metals	16 oz glass jar	Ice

Remarks

Sampling Personnel R. Astle, C. Standard

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 2 of 6

Site Location Moraine, Ohio

Sample No. L2-GS02-02WT Coded/ Replicate No. _____ Date 12-11-92

Weather Cloudy, 30sF Time Sampling Began 11:15 a.m. Time Sampling Completed 11:40 a.m.

Sampling Method and Material 2.75-inch diameter stainless steel hand auger.

Grab X Composite ____

From	To	Soil/Sediment Description
0	1.5	Clay (40%); gravel (40%), f-cobble size; silt (10%); sand (10%), f-cs; tr brick, roots; brown, damp, semicohesive, semipliable.

Other (OVA; HNU; etc.) HNU in spoon = .5 ppm. Background = .5 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice
TCL SVOCs & PCB/Pest.	4 oz glass jar	Ice
TAL Metals	16 oz glass jar	Ice

Remarks Refusal at 1.5 feet.

Sampling Personnel R. Astle, C. Standard

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 3 of 6

Site Location Moraine, Ohio

Sample No. L2-GS03-02WT Coded/ Replicate No. _____ Date 12-11-92

Weather Cloudy, 30sF Time Sampling Began 11:00 a.m. Time Sampling Completed 11:15 a.m.

Sampling Method and Material 2.75-inch diameter stainless steel hand auger.

Grab X Composite ____

From	To	Soil/Sediment Description
0	1.1	Clay (50%), f-cobble size; clay (30%); silt (10%); sand (10%), f-cs; brown, damp, slightly cohesive, slightly pliable.

Other (OVA; HNU; etc.) HNU in spoon = .5 ppm. Background = .5 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice
TCL SVOCs & PCB/Pest.	4 oz glass jar	Ice
TAL Metals	16 oz glass jar	Ice

Remarks Refusal at 1.1 feet.

Sampling Personnel R. Astle, C. Standard

SOIL/SEDIMENT SAMPLING LOG

Project/No. NET / OH225.01 Page 4 of 6

Site Location Moraine, Ohio

Sample No. L2-GS01-02WT Coded/ Replicate No. DUP-10 Date 2/24/93

Weather Sunny, 20sF Time Sampling Began 2:15 p.m. Time Sampling Completed 2:30 p.m.

Sampling Method and Material One-man power auger

Grab ____ Composite X

From	To	Soil/Sediment Description
0	2	Clay (60%); gravel (30%), f-cobble size; silt (10%); sand (10%), f-cs; brown to dark brown, damp, pliable, cohesive.

Other (OVA; HNU; etc.) HNU = .2 ppm = background

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TAL Cyanide	16 oz Glass Jar	Ice

Remarks

Sampling Personnel R. Astle, H. Sharifi

SOIL/SEDIMENT SAMPLING LOG

Project/No. NET / OH225.01 Page 5 of 6

Site Location Moraine, Ohio

Sample No. L2-GS02-02WT Coded/ Replicate No. _____ Date 2/24/93

Weather Sunny, 20sF Time Sampling Began 2:00 p.m. Time Sampling Completed 2:15 p.m.

Sampling Method and Material One-man power auger

Grab ____ Composite X

From	To	Soil/Sediment Description
0	2	Clay (40%); gravel (40%), f-cobble size; silt (10%); sand (10%), f-cs; tr brick, roots; brn, damp, semicohesive, semipliable.

Other (OVA; HNU; etc.) HNU = .4 ppm = background

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TAL Cyanide	16 oz Glass Jar	Ice

Remarks

Sampling Personnel R. Astle, H. Sharifi

SOIL/SEDIMENT SAMPLING LOG

Project/No. NET / OH225.01 Page 6 of 6

Site Location Moraine, Ohio

Sample No. L2-GS03-02WT Coded/ Replicate No. _____ Date 2/24/93

Weather Sunny, 20sF Time Sampling Began 1:45 p.m. Time Sampling Completed 2:00 p.m.

Sampling Method and Material One-man power auger

Grab ____ Composite X

From	To	Soil/Sediment Description
0	2	Clay (50%), f-cobble size; clay (30%); silt (10%); sand (10%), f-cs; brown, damp, slightly cohesive, slightly pliable.

Other (OVA; HNU; etc.) HNU = .7 ppm in bowl. Background = .6 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TAL Cyanide	16 oz Glass Jar	Ice

Remarks

Sampling Personnel R. Astle, H. Sharifi

L3-GS01-01WT to GS03

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 1 of 6

Site Location Moraine, Ohio

Sample No. L3-GS01-02WT Coded/ Replicate No. _____ Date 12-11-92

Weather Cloudy, 30sF Time Sampling Began 8:45 a.m. Time Sampling Completed 9:30 a.m.

Sampling Method and Material 2.75-inch diameter stainless steel hand auger.

Grab X Composite ____

From	To	Soil/Sediment Description
0	1.3	Clay (40%); gravel (30%), f-cs; silt (15%); sand, f-cs (15%); brown, damp, semipliable, semicohesive.

Other (OVA; HNU; etc.) HNU in spoon = .9 ppm. Background = .9 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice
TCL SVOCs & PCB/Pest.	4 oz glass jar	Ice
TAL Metals	16 oz glass jar	Ice

Remarks Refusal at 1.3 feet.

Sampling Personnel R. Astle, C. Standard

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 2 of 6

Site Location Moraine, Ohio

Sample No. L3-GS02-02WT Coded/ Replicate No. _____ Date 12-11-92

Weather Cloudy, 30sF Time Sampling Began 9:30 a.m. Time Sampling Completed 10:30 a.m.

Sampling Method and Material 2.75-inch diameter stainless steel hand auger.

Grab X Composite ____

From	To	Soil/Sediment Description
0	1.1	Clay (50%); gravel (30%), f-cobble size; silt (10%); sand (10%), f-cs; brown, damp, stiff.

Other (OVA; HNU; etc.) HNU in spoon = .2 ppm. Background = .2 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice
TCL SVOCs & PCB/Pest.	4 oz glass jar	Ice
TAL Metals	16 oz glass jar	Ice

Remarks Refusal at 1.1 feet.

Sampling Personnel R. Astle, C. Standard

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 3 of 6

Site Location Moraine, Ohio

Sample No. L3-GS03-02WT Coded/ Replicate No. _____ Date 12-11-92

Weather Cloudy, 30sF Time Sampling Began 10:00 a.m. Time Sampling Completed 10:30 a.m.

Sampling Method and Material 2.75-inch diameter stainless steel hand auger.

Grab X Composite ____

From	To	Soil/Sediment Description
0	1.3	Clay (50%); gravel (30%), f-cobble size; silt (10%); sand (10%), f-cs; brown, damp to wet w/depth, semipliable, semicohesive.

Other (OVA; HNU; etc.) HNU in spoon = .5 ppm. Background = .5 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice
TCL SVOCs & PCB/Pest.	4 oz glass jar	Ice
TAL Metals	16 oz glass jar	Ice

Remarks Water at 1.3 feet. Refusal at 1.5 feet. MS/MSD sample.

Sampling Personnel R. Astle, C. Standard

SOIL/SEDIMENT SAMPLING LOG

Project/No. NET / OH225.01 Page 4 of 6

Site Location Moraine, Ohio

Sample No. L3-GS01-02WT Coded/ Replicate No. _____ Date 2/24/93

Weather Sunny, 20sF Time Sampling Began 3:00 p.m. Time Sampling Completed 3:10 p.m.

Sampling Method and Material One-man power auger

Grab ____ Composite X

From	To	Soil/Sediment Description
0	2	Clay (40%), gravel (30%), f-cs; silt (15%), sand (15%), f-cs; brown, damp, semipliable, semicohesive.

Other (OVA; HNU; etc.) HNU = 1.3 to 2.0 ppm in bowl. Background = 1.3 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TAL Cyanide	16 oz Glass Jar	Ice

Remarks _____

Sampling Personnel R. Astle, H. Sharifi

SOIL/SEDIMENT SAMPLING LOG

Project/No. NET / OH225.01 Page 5 of 6

Site Location Moraine, Ohio

Sample No. L3-GS02-02WT Coded/ Replicate No. _____ Date 2/24/93

Weather Sunny, 20sF Time Sampling Began 3:10 p.m. Time Sampling Completed 3:20 p.m.

Sampling Method and Material One-man power auger

Grab ____ Composite X

From	To	Soil/Sediment Description
0	2	Clay (50%), gravel (30%), f-cobble size; silt (10%); sand (10%), f-cs; brown, damp, stiff.

Other (OVA; HNU; etc.) HNU = 4 ppm in bowl. Background = 1.2 ppm.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TAL Cyanide	16 oz Glass Jar	Ice

Remarks _____

Sampling Personnel R. Astle, H. Sharifi

SOIL/SEDIMENT SAMPLING LOG

Project/No. NET / OH225.01 Page 6 of 6

Site Location Moraine, Ohio

Sample No. L3-GS03-02WT Coded/ Replicate No. _____ Date 2/24/93

Weather Sunny, 20sF Time Sampling Began 3:30 p.m. Time Sampling Completed 3:30 p.m.

Sampling Method and Material One-man power auger

Grab ____ Composite X

From	To	Soil/Sediment Description
0	2	Clay (50%), gravel (30%), f-cobble size; silt (10%); sand (10%), f-cs; brown, damp, semi-pliable, semicohesive.

Other (OVA; HNU; etc.) HNU = 20 ppm in bowl. Background = 1.3 ppm

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TAL Cyanide	16 oz Glass Jar	Ice

Remarks Run MS/MSD spike on this sample.

Sampling Personnel R. Astle

DD-GS01-02WT to GS02

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 1 of 2

Site Location Moraine, Ohio

Sample No. DD-GS01-02SD Coded/ Replicate No. DUP-11 Date 1-5-93

Weather Cloudy, 40s F Time Sampling Began 4:30 p.m. Time Sampling Completed 5:30 p.m.

Sampling Method and Material 2.75-inch diameter stainless steel hand auger

Grab X Composite ____

From	To	Soil/Sediment Description
0	2 ft	Sand (40%), f-cs; gravel (30%), f-cobble size; silt (20%); tr clay; dark gray to light brown, wet.

Other (OVA; HNU; etc.) HNU = .6 ppm = background.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice
TCL SVOCs & PCB/Pest.	4 oz glass jar	Ice
TAL Metals & Cyanide	16 oz glass jar	Ice

Remarks MS/MSD sample.

Sampling Personnel R. Astle, S. Ackers

SOIL/SEDIMENT SAMPLING LOG

Project/No. Harrison / OH019.12 Page 2 of 2

Site Location Moraine, Ohio

Sample No. DD-GS02-02SD Coded/ Replicate No. _____ Date 1-5-93

Weather Cloudy, 40s F Time Sampling Began 3:00 p.m. Time Sampling Completed 3:45 p.m.

Sampling Method and Material 2.75-inch diameter stainless steel hand auger

Grab X Composite ____

From	To	Soil/Sediment Description
0	.5 ft	Gravel (40%), f-cobble; sand (40%), f-cs; silt (15%); tr clay; tr decaying plants; lt brn to dark brown, wet.

Other (OVA; HNU; etc.) HNU = .6 ppm = background.

Constituents Sampled	Container Description From Lab X or G&M ____	Preservative
TCL VOCs	4 oz glass jar	Ice
TCL SVOCs, PCB/Pest.	4 oz glass jar	Ice
TAL Metals & Cyanide	16 oz glass jar	Ice

Remarks _____

Sampling Personnel R. Astle, S. Ackers

Section 20

Supplemental Investigation
Boring Logs

A-D
A-S

ARCADIS

Log of Boring: A-D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
38								See log Well A-S for lithologic description to 40'	
40	N/A	24	0.0				CL	SILTY CLAY Gray, fine-medium gravel (20%), very stiff, low plasticity, brittle, dry	
42	N/A	24	0.0				CL	Same as above	
44	N/A	24	0.0				CL	Same as above	
46	N/A	24	0.0				CL	SILTY CLAY Gray, fine gravel (5%), soft, medium plasticity, dry	
48	N/A	24	0.0				SM	SAND Gray, fine, some silt, poorly graded, moist	
							CL	SILTY CLAY Gray, fine gravel (5%), very stiff, low plasticity, brittle, dry	
50									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: T. Fortner
Total Depth: 100
Surface Elev.: Not surveyed
North Coor.: Not surveyed

Begin Drilling: 7/25/06 @ 1806
End Drilling: 7/26/06 @ 0915
Converted to Well: N Well I.D.: NA
East Coor.: Not surveyed

Remarks: Water sample 70-75'; 80-85'; 95-100'

Project No.: OH000294.0008.00002 Datum: Filename: July 2006

ARCADIS

Log of Boring: A-D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
50	N/A	24	0.0				CL	Same as above	
52	N/A	24	0.0				CL	Same as above	
54	N/A	24	0.0				CL	Same as above	
56	N/A	24	0.0				CL	Same as above	
58	N/A	24	0.0				CL	Same as above, medium plasticity, gravel (5-10%)	
60	N/A	24	0.0				CL	Same as above	
62									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Geologist: T. Fortner
Begin Drilling: 7/25/06 @ 1806
Driller: M. Osterberg
Total Depth: 100
End Drilling: 7/26/06 @ 0915
Drilling Method: Rotosonic
Surface Elev.: Not surveyed
Converted to Well: N Well I.D.: NA
Drilling Fluid: Water
North Coor.: Not surveyed
East Coor.: Not surveyed
Remarks: Water sample 70-75'; 80-85'; 95-100'
Project No.: OH000294.0008.00002
Datum:
Filename: July 2006

ARCADIS

Log of Boring: A-D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
62	N/A	24	0.0				SM	SAND Gray, fine, some silt, poorly graded, moist	
							CL	SANDY CLAY Gray, very stiff, gravel (10%), low plasticity, dry	
64	N/A	12	0.0				SP	SAND Brown, fine-medium, poorly graded, moist	
	N/A	24	1.7				SW	SAND Brown, medium-coarse, fine-medium gravel, well graded, wet	
66	N/A	24	0.6				SW	Same as above	
68	N/A	24	1.6				SW	Same as above, with little fine sand, gravel (5-10%)	
70	N/A	24	0.6				SW	Same as above	
72	N/A	24	1.4				SW	Same as above	
74									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: T. Fortner
Total Depth: 100
Surface Elev.: Not surveyed
North Coor.: Not surveyed

Begin Drilling: 7/25/06 @ 1806
End Drilling: 7/26/06 @ 0915
Converted to Well: N Well I.D.: NA
East Coor.: Not surveyed

Remarks: Water sample 70-75'; 80-85'; 95-100'

Project No.: OH000294.0008.00002 Datum: Filename: July 2006

ARCADIS

Log of Boring: A-D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
74									
	N/A	24	1.9				SP	SILTY SAND Brown-gray, fine, poorly graded, wet	
76									
	N/A	24	1.3				SP	Same as above	
78									
	N/A	24	1.0				SP	SAND Brown, fine-medium, poorly graded, wet	
80									
	N/A	24	1.3				SP	Same as above	
82									
	N/A	24	1.6				SW	SAND Brown, medium-coarse sand, fine- medium gravel (20%), well graded, wet	
84									
	N/A	24	0.8				SW	Same as above	
86									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: T. Fortner
Total Depth: 100
Surface Elev.: Not surveyed
North Coor.: Not surveyed

Begin Drilling: 7/25/06 @ 1806
End Drilling: 7/26/06 @ 0915
Converted to Well: N Well I.D.: NA
East Coor.: Not surveyed

Remarks: Water sample 70-75'; 80-85'; 95-100'

Project No.: OH000294.0008.00002 Datum: Filename: July 2006

ARCADIS

Log of Boring: A-D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
86									
	N/A	24	1.3				SW	Same as above	
88									
	N/A	24	1.4				SW	Same as above	
90									
	N/A	24	1.1				SW	Same as above	
92									
	N/A	24	1.7				SW	Same as above	
94									
	N/A	24	0.9				SW	Same as above, medium-coarse sand (30%)	
96									
	N/A	24	2.1				SW	Same as above	
98									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: T. Fortner
Total Depth: 100
Surface Elev.: Not surveyed
North Coor.: Not surveyed

Begin Drilling: 7/25/06 @ 1806
End Drilling: 7/26/06 @ 0915
Converted to Well: N Well I.D.: NA
East Coor.: Not surveyed

Remarks: Water sample 70-75'; 80-85'; 95-100'

Project No.: OH000294.0008.00002 Datum: Filename: July 2006

ARCADIS

Log of Boring: A-D

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
98									
	N/A	12	4.4				SW	Same as above, medium-coarse sand (20%)	
100								End of boring	
102									
104									
106									
108									
110									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: T. Fortner
Total Depth: 100
Surface Elev.: Not surveyed
North Coor.: Not surveyed

Begin Drilling: 7/25/06 @ 1806
End Drilling: 7/26/06 @ 0915
Converted to Well: N Well I.D.: NA
East Coor.: Not surveyed

Remarks: Water sample 70-75'; 80-85'; 95-100'

Project No.: OH000294.0008.00002 Datum: Filename: July 2006

ARCADIS

Log of Boring: A-S

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	N/A	N/A	N/A					No recovery	
2	N/A	24	4.1				CL	SILTY CLAY Brown, coarse gravel (20%), stiff, low plasticity, dry	
4	N/A	24	1.7				SM	SILTY SAND Brown, fine-medium, coarse gravel to cobble (10-15%), dry	
6	N/A	24	3.9				SM	Same as above	
8	N/A	24	4.4				CL	SILTY CLAY Brown, coarse gravel (10%), stiff, low plasticity, dry	
10	N/A	24	2.5				GM	GRAVEL Brown, fine-coarse, silt and fine sand (40%), dry	
12									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water

Geologist: T. Fortner
Total Depth: 41
Surface Elev.: Not surveyed
North Coor.: Not surveyed

Begin Drilling: 7/11/06 @ 12:45
End Drilling: 7/11/06 @ 1405
Converted to Well: N Well I.D.: NA
East Coor.: Not surveyed

Remarks: Water sample 30-35'

Project No.: OH000294.0008.00002 Datum: Filename: July 2006

ARCADIS

Log of Boring: A-S

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
12	N/A	24	1.7				GM	Same as above	
14	N/A	24	4.3				GP	GRAVEL Brown, fine gravel, medium-coarse sand (5%), moderately graded, dry	
16	N/A	24	6.1				GP	Same as above, increasing gravel (10%)	
18	N/A	24	5.5				GP	Same as above	
20	N/A	24	5.9				GP	Same as above	
22	N/A	24	3.2				GP	GRAVEL Brown, fine, medium-coarse sand, poorly graded, wet	▼
24									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: T. Fortner
Total Depth: 41
Surface Elev.: Not surveyed
North Coor.: Not surveyed
Begin Drilling: 7/11/06 @ 12:45
End Drilling: 7/11/06 @ 1405
Converted to Well: N Well I.D.: NA
East Coor.: Not surveyed
Remarks: Water sample 30-35'
Project No.: OH000294.0008.00002
Datum:
Filename: July 2006

ARCADIS

Log of Boring: A-S

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
24	N/A	24	2.5				GW	GRAVEL Fine-medium, medium coarse sand (30%), poorly graded, wet	
26	N/A	24	3.3				GW	GRAVEL Brown, coarse gravel with little fines, well graded, wet	
28	N/A	24	3.1				SW	SAND/GRAVEL Brown, medium gravel (50%), fine-medium sand, poorly graded, wet	
30	N/A	24	4.3				SW	Same as above	
32	N/A	24	2.6				SW	Same as above	
34	N/A	24	0.5				SW	Same as above	
							CL	SILTY CLAY Brown, fine gravel (5%), low plasticity, moist	
36									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▥ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: T. Fortner
Total Depth: 41
Surface Elev.: Not surveyed
North Coor.: Not surveyed
Begin Drilling: 7/11/06 @ 12:45
End Drilling: 7/11/06 @ 1405
Converted to Well: N Well I.D.: NA
East Coor.: Not surveyed
Remarks: Water sample 30-35'
Project No.: OH000294.0008.00002
Datum:
Filename: July 2006

ARCADIS

Log of Boring: A-S

General Motors Corporation — Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
36	N/A	24	0.5				CL	SILTY CLAY Gray, fine gravel (10%), low plasticity, stiff, dry	
38	N/A	24	0.5				CL	Same as above	
40	N/A	24	0.5				CL	Same as above	
42								End of boring	
44									
46									
48									

☒ Composite Sample to Lab ■ Grab Sample to Lab ▯▯ Split-Spoon Not Analyzed

Drilling Co.: Boart Longyear
Driller: M. Osterberg
Drilling Method: Rotosonic
Drilling Fluid: Water
Geologist: T. Fortner
Total Depth: 41
Surface Elev.: Not surveyed
North Coor.: Not surveyed
Begin Drilling: 7/11/06 @ 12:45
End Drilling: 7/11/06 @ 1405
Converted to Well: N Well I.D.: NA
East Coor.: Not surveyed
Remarks: Water sample 30-35'
Project No.: OH000294.0008.00002
Datum:
Filename: July 2006

KEY TO SYMBOLS

Symbol Description

Strata symbols


Blank


Well graded sand


Well graded gravel


Poorly graded sand


Low plasticity clay


High plasticity clay


Silty sand


Silty gravel


Poorly graded gravel


Fill


Basalt (or generic rock)


Silt

Misc. Symbols


Water table at boring completion

Soil Samplers


No recovery


Rock core

S ple Destinations

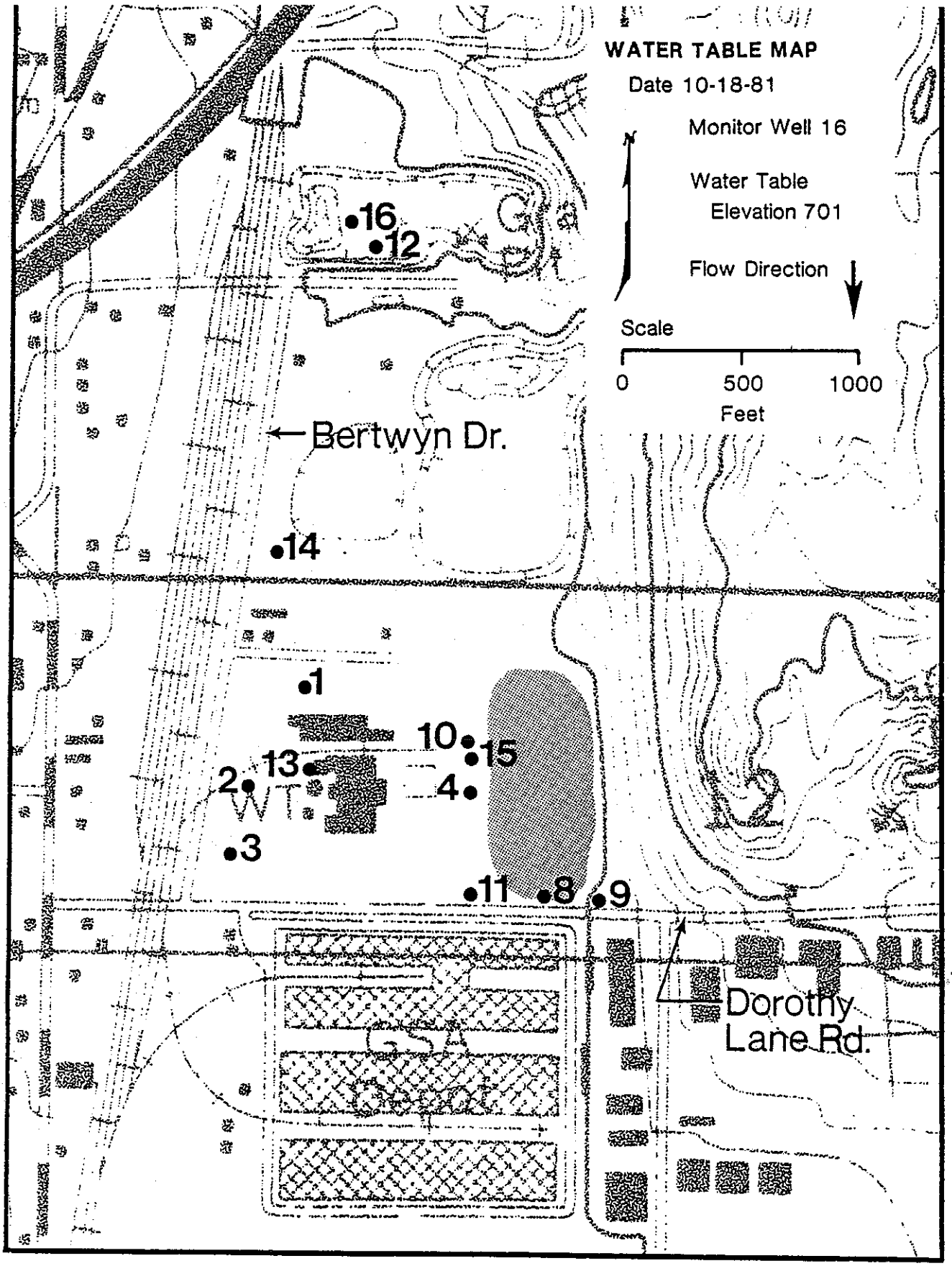

Split-Spoon not Analyzed

Section 21

Wright State University Logs

1
8
9
10
11
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13
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16
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19

FIGURE 9



monitor well locations phase I

TABLE 1.

DETAILS OF MONITOR WELL CONSTRUCTION

Top of Steel

Well No	Depth (ft)	Screen Setting (feet below land surface)	Gravel Setting (feet below land surface)	Cement/ Bentonite (feet below land surface)	Measuring Point Elevation (ft, msl)
1	100	90-100	83-100	0-83	735.63
2	55	45-55	38-55	0-38	735.77
3	100	90-100	83-100	0-83	730.47
4	150	140-150	135-150	0-135	731.77
5	100	90-100	83-100	0-83	731.34
6	45	35-45	28-45	0-28	730.26
7	100	90-100	83-100	0-83	735.03
8	50	40-50	33-50	0-33	735.06
9	100	90-100	83-100	0-83	724.05
10	50	40-50	30-40	0-30	723.80
11	100	90-100	83-100	0-83	723.61
12	150	140-150	135-150	0-135	724.03
13	100	90-100	83-100	0-83	723.67
14	150	140-150	135-150	0-135	723.41
15	100	90-100	83-100	0-83	724.65
16	58	48-58	43-58	0-43	724.65
17	50	40-50	33-50	0-33	723.73
18	55	45-55	38-55	0-38	723.67

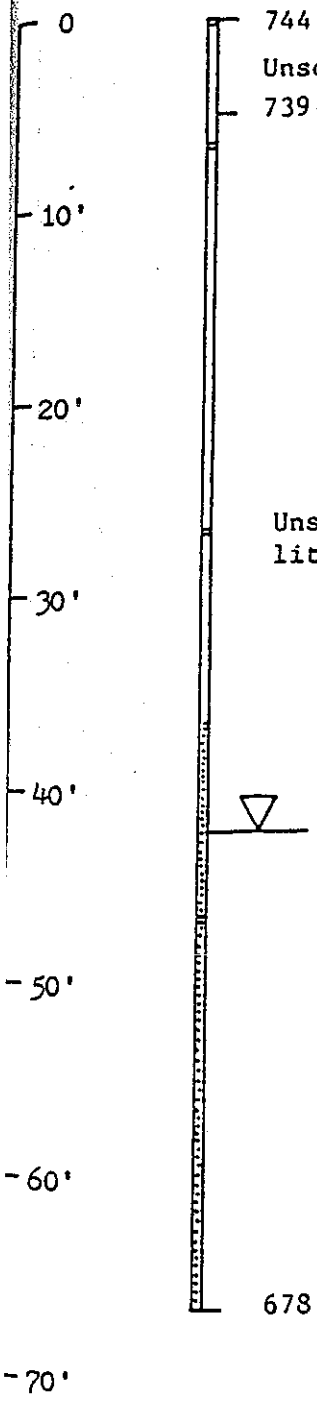
ARCADIS

Well 1

WELL 1

FIGURE A34

LOCATION: Dayton Indoor Tennis Club, Inc.
2800 Bertynn Drive
Dayton, Ohio
East of Building



DRILLING RECORD

Method: Hollow-Stem Auger

Date: 9/25/78

Crew: Schmidt/McIntire;
Wright State University;
Dayton, Ohio 45435

Casing: PVC

Diameter: 1.5" I.D.

Length: 66.5'

Coupling: Solvent Weld

Screen: Perforated PVC

Diameter: 1.5" I.D.

Length: 30.0'

Perforation Diameter: .012"

Scheme: 360°, 48/ft.

SERVICE RECORD

Development: 5/08/81

Repairs: Replaced twice (1979 & 1980);
2/26/81 repaired broken PVC top.

BASIC DATA

Water Table: 42.0'

Elevation - top of casing: 744.9'

Height of casing above ground: 16"

STATUS OF WELL: Active

REVISIONS

Original: 7/12/81

Revised: 12/28/81

Well 8

WELL 8

ATION: 100 yds. east of Dayton Showcase on north side of Dorothy Lane.

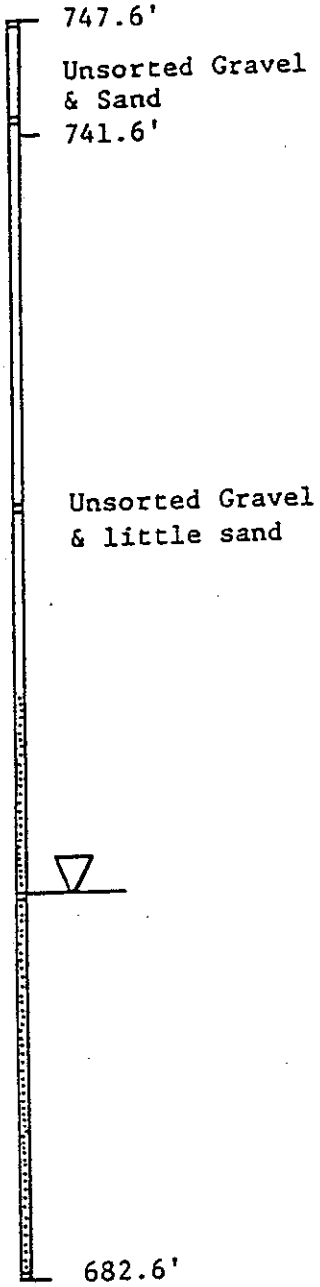


FIGURE A35

DRILLING RECORD

Method: Hollow-Stem Auger

Date: 10/26/80

Crew: McIntire;
Wright State University;
Dayton, Ohio 45435

Casing: PVC

Diameter: 1.5" I.D.

Length: 65.0'

Coupling: Solvent Weld

Screen: Perforated PVC

Diameter: 1.5" I.D.

Length: 30.0'

Perforation Diameter: .012"

Scheme: 360°; 48/ft.

SERVICE RECORD

Development: 5/26/81

Cap Installation: 9/22/81

Repairs: 9/22/81, Repaired broken PVC top.

BASIC DATA

Water Table: 45.0'

Elevation - top of casing: 747.6'

Height of casing above ground: 8"

STATUS OF WELL: Active

REVISIONS

Original: 7/12/81

Revised: 12/28/81

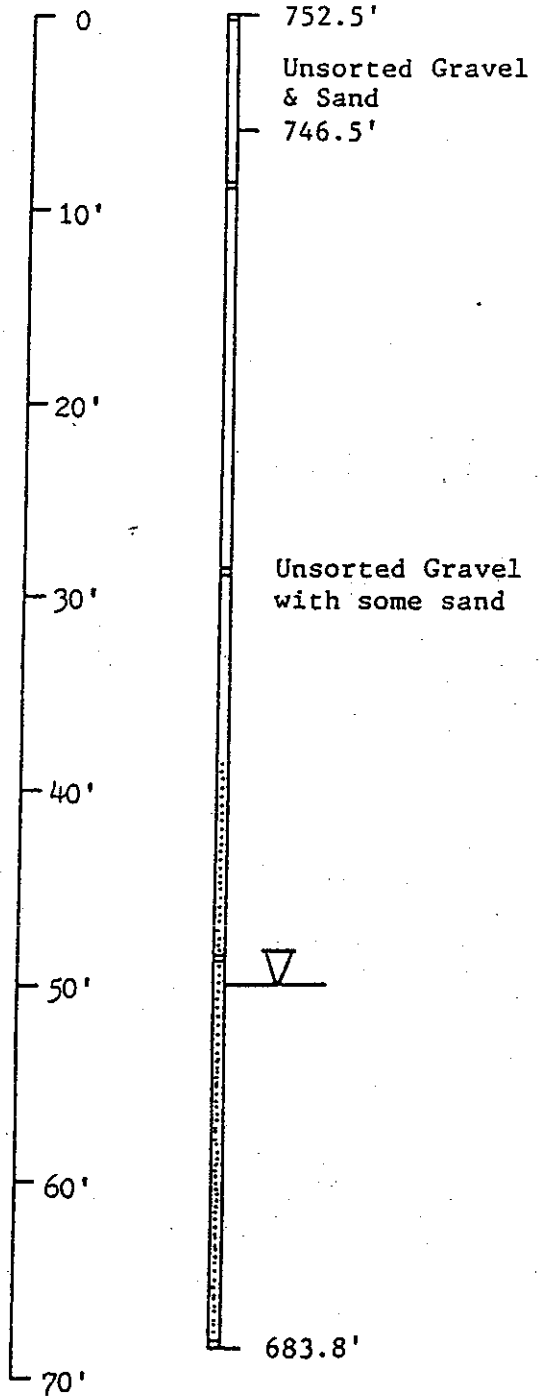
ARCADIS

Well 9

WELL 9

FIGURE A36

LOCATION: 200 yds east of Dayton Showcase on north side of Dorothy Lane.



DRILLING RECORD

Method: Hollow-Stem Auger

Date: 10/26/80

Crew: Bill McIntire;
Wright State University;
Dayton, Ohio 45435

Casing: PVC

Diameter: 1.5" I.D.

Length: 68.66'

Coupling: Solvent Weld

Screen: Perforated PVC

Diameter: 1.5" I.D.

Length: 30.0'

Perforation Diameter: .012"

Scheme: 360°; 48/ft.

SERVICE RECORD

Date of Development: 5/26/81

Cap Installation: 9/22/81

Repairs: 8/7/81, Repaired broken PVC top.

BASIC DATA

Water Table: 50.0'

Elevation - top of casing: 752.5'

Height of casing above ground: 0"

STATUS OF WELL: Active

REVISIONS

Original: 7/12/81

Revised: 12/28/81

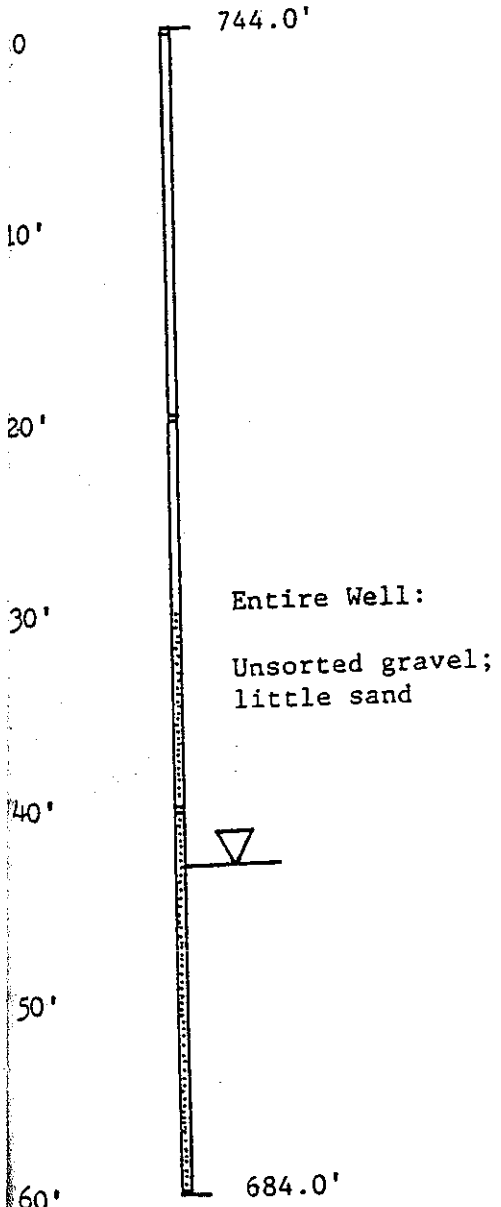
ARCADIS

Well 10

WELL 10

FIGURE A37

LOCATION: Dayton Showcase;
2601 W. Dorothy Lane
Dayton, Ohio;
North of building



DRILLING RECORD

Method: Hollow-Stem Auger

Date: 11/4/80

Crew: Bill McIntire;
Wright State University;
Dayton, Ohio 45435

Casing: PVC

Diameter: 2.0" I.D.

Length: 60.0'

Coupling: Solvent Weld

Screen: Perforated PVC

Diameter: 2.0" I.D.

Length: 30.0'

Perforation Diameter: .012"

Scheme: 360°; 48/ft.

SERVICE RECORD

Never developed - went dry;
replaced with well 15.

BASIC DATA

Water Table: 43'

Elevation - top of casing: 744.0'

Casing height above ground: 6"

STATUS OF WELL: Inactive; well filled up with sediment. Casing pulled, well replaced with #15.

REVISIONS:

Original: 7/12/81

Revised:

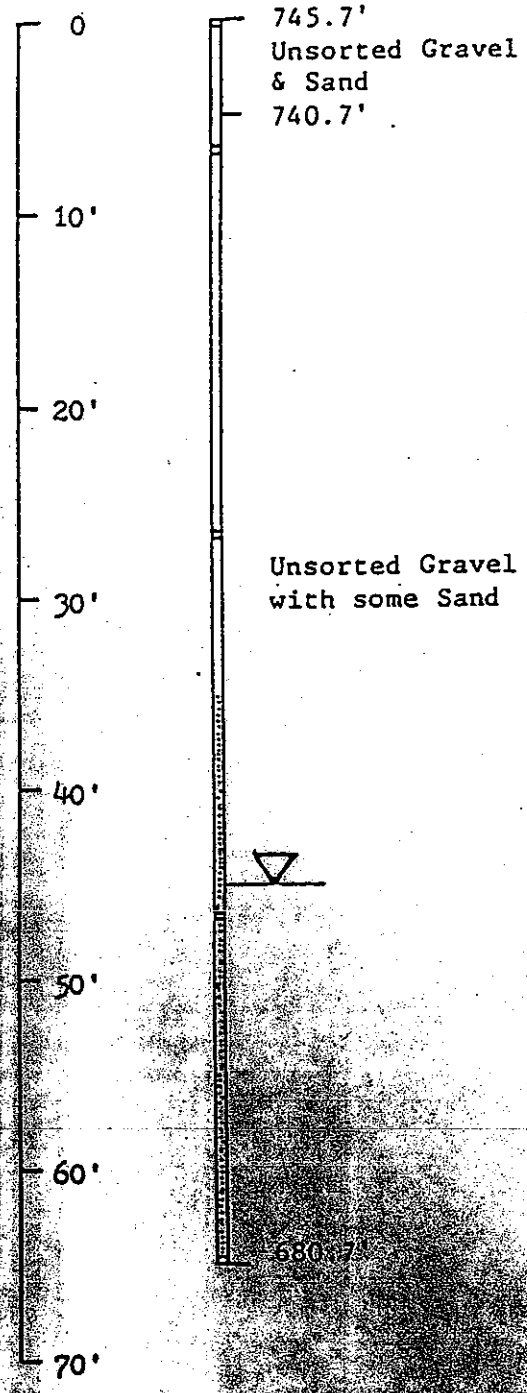
ARCADIS

Well 11

WELL 11

FIGURE A38

LOCATION: Dayton Showcase;
2601 W. Dorothy Lane
Dayton, Ohio;
South of Building



DRILLING RECORD

Method: Hollow-Stem Auger

Date: 11/11/80

Crew: Kearns/McIntire/Lewis;
Wright State University;
Dayton, Ohio 45435

Casing: PVC

Diameter: 2.0" I.D.

Length: 65.0'

Coupling: Solvent Weld

Screen: Perforated PVC

Diameter: 2.0" I.D.

Length: 30.0'

Perforation Diameter: .024"

Scheme: 360°; 48/ft.

SERVICE RECORD

Date of Development: 4/18/81; 5/26/81

Cap Installation: 9/22/81

Repairs: None to date

BASIC DATA

Water Table: 45'

Elevation - top of casing: 745.7'

Height of casing above ground: 5"

STATUS OF WELL: Active

REVISIONS

Original: 7/12/81

Revised: 12/28/81

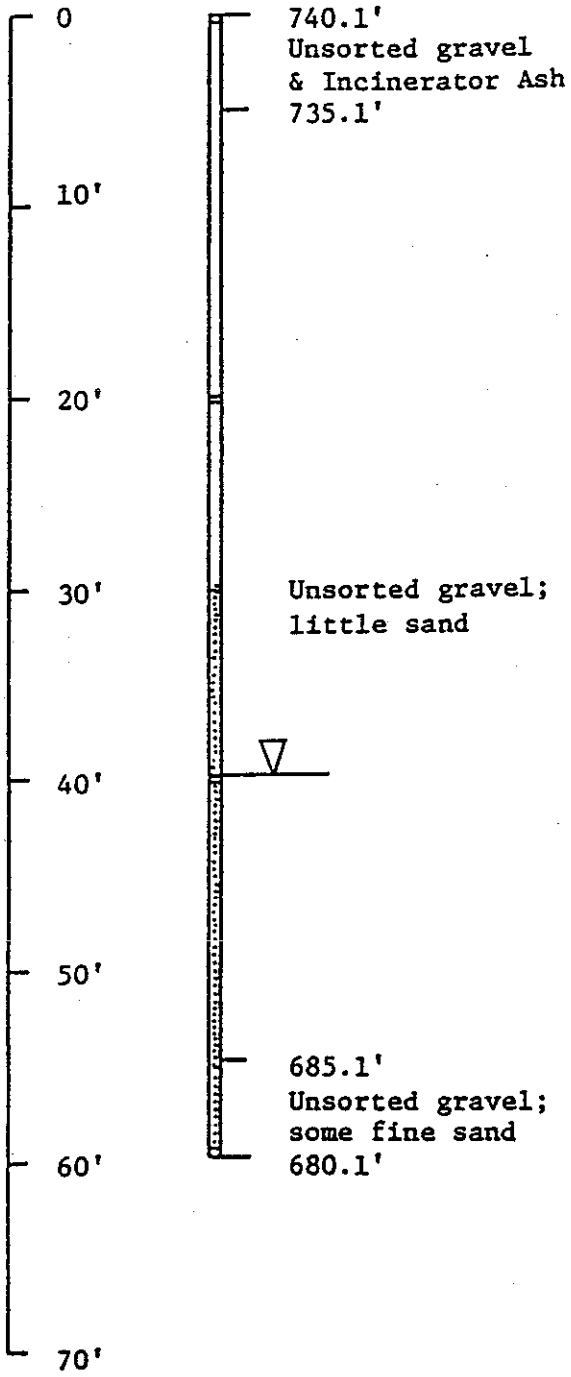
ARCADIS

Well 12

LOCATION: Montgomery County South Incinerator
2550 Bertynn Drive
Dayton, Ohio;
South of Building

WELL 12

FIGURE A39



DRILLING RECORD

Method: Hollow-Stem Auger

Date: 11/15/81

Crew: Kearns/McIntire/Lewis;
Wright State University;
Dayton, Ohio 45435

Casing: PVC

Diameter: 2.0" I.D.

Length: 60.0'

Coupling: Solvent Weld

Screen Perforated PVC

Diameter: 2.0" I.D.

Length: 60.0'

Perforation Diameter: .012"

Scheme: 360°; 48/ft.

SERVICE RECORD

Buried under Incinerator Ash.
Replaced with well 16.

BASIC DATA

Water Table: 40'

Elevation - top of casing: 740.1'

Casing height above ground: 6"

STATUS OF WELL: Inactive;
Under 10' of Incinerator Ash.

REVISIONS

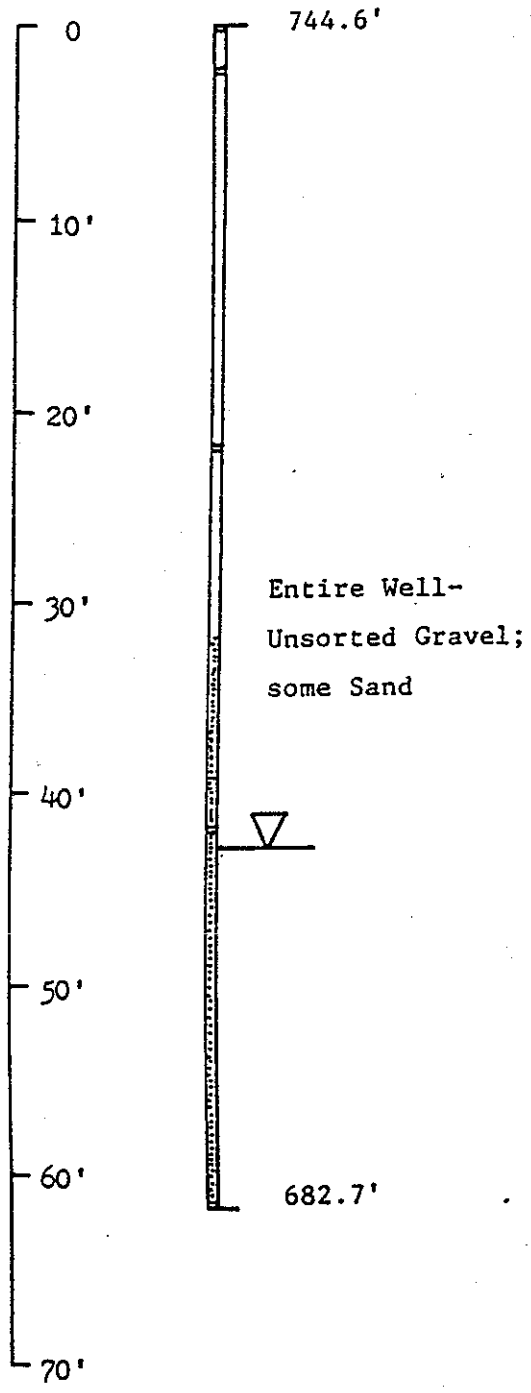
Original: 7/12/81
Revised:

Well 13

WELL 13

FIGURE A40

LOCATION: Amole Inc.
2425 W. Dorothy Lane
Dayton, Ohio



DRILLING RECORD

Method: Hollow-Stem Auger

Date: 12/05/80

Crew: McIntire/Lewis;
Wright State University;
Dayton, Ohio 45435

Casing: PVC

Diameter: 2.0" I.D.

Length: 61.9'

Coupling: Solvent Weld

Screen: Perforated PVC

Diameter: 2.0" I.D.

Length: 30.0'

Perforation Diameter: .024"

Scheme: 360°; 48/ft.

SERVICE RECORD

Date of Development: 5/08/81

Repairs: Well re-claimed 6/30/81
because of broken casing.
Depth = 50.79'

BASIC DATA

Water Table: 43'

Elevation - top of casing: 744.6'

Height of casing about ground: 6"

STATUS OF WELL: Active

REVISIONS

Original: 7/13/81

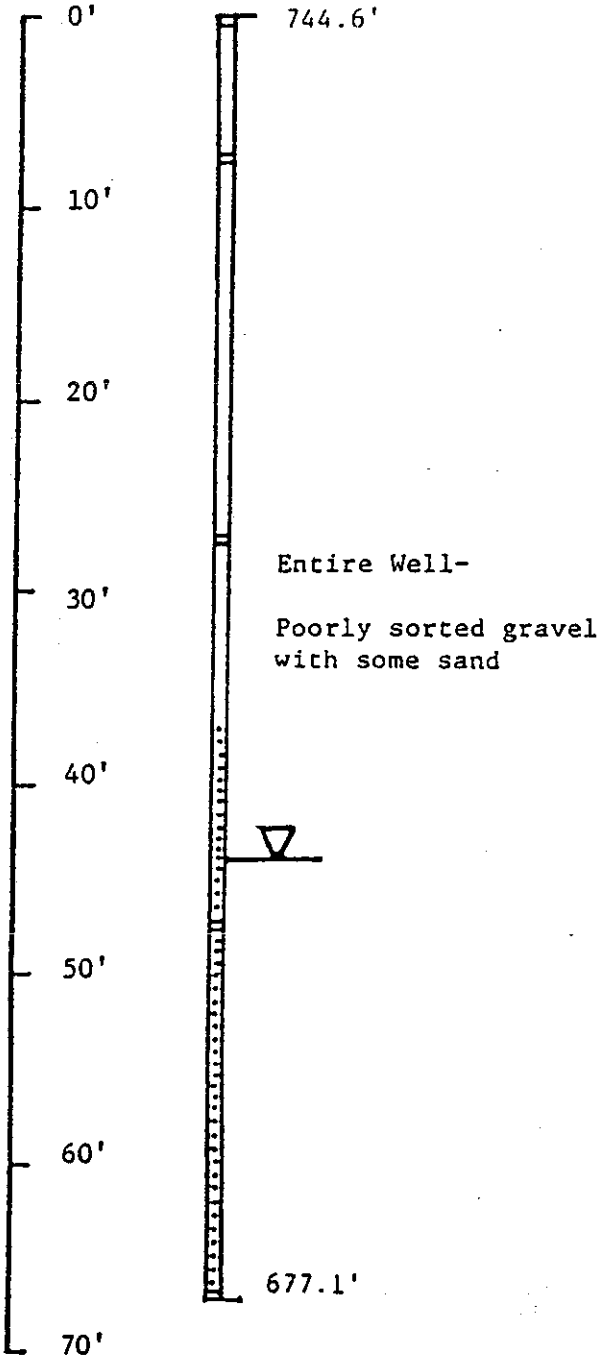
Revised:

Well 14

WELL 14

FIGURE A41

LOCATION: Frito-Lay Inc.
2400 Bertynn Drive
Dayton, Ohio;
South of Building



DRILLING RECORD

Method: Hollow-Stem Auger

Date: 2/28/81

Crew: Brown/Lewis;
Wright State University;
Dayton, Ohio 45435

Casing: PVC

Diameter: 2.0" I.D.

Length: 67.50'

Coupling: Solvent Weld

Screen: Perforated PVC

Diameter: 2.0" I.D.

Length: 30.0'

Perforation Diameter: .012"

Scheme: 360°; 48/ft.

SERVICE RECORD

Date of Development: 5/12/81

Repairs: None to date

BASIC DATA

Water Table: 44'

Elevation - top of casing: 744.6'

Casing Height Above Ground: 13"

STATUS OF WELL: Active

REVISIONS

Original: 7/13/81

Revised:

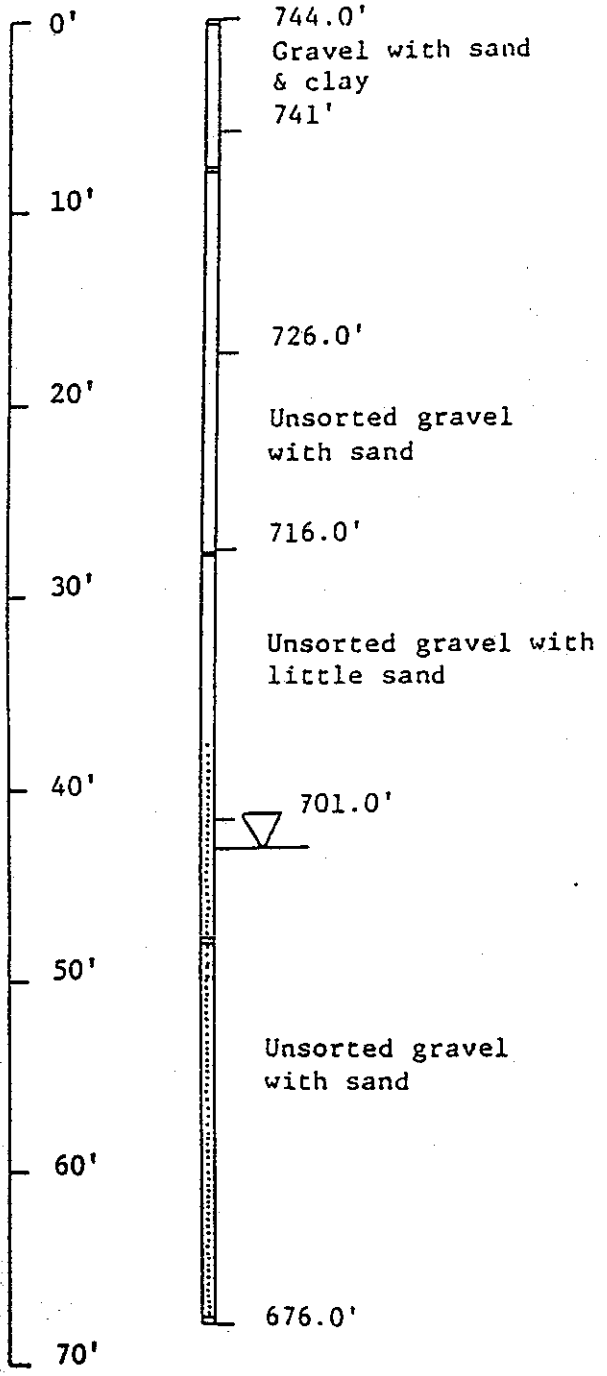
ARCADIS

Well 15

WELL 15

FIGURE A42

LOCATION: Dayton Showcase
2601 W. Dorothy Lane
Dayton, Ohio;
North of Building



DRILLING RECORD

Method: Hollow-Stem Auger

Date: 4/02/81

Crew: Lewis/Walker;
Wright State University;
Dayton, Ohio 45435

Casing: PVC

Diameter: 2.0" I.D.

Length: 68.0'

Coupling: Solvent Weld

Screen: Perforated PVC

Diameter: 2.0" I.D.

Length: 30.0'

Perforation Diameter: .012"

Scheme: 360"; 48/ft.

SERVICE RECORD

Date of Development: 5/12/81

Repairs: None to date

BASIC DATA

Water Table: 43'

Elevation - top of casing: 744.0'

Casing height above ground: 9"

STATUS OF WELL: Active

REVISIONS

Original: 7/13/81

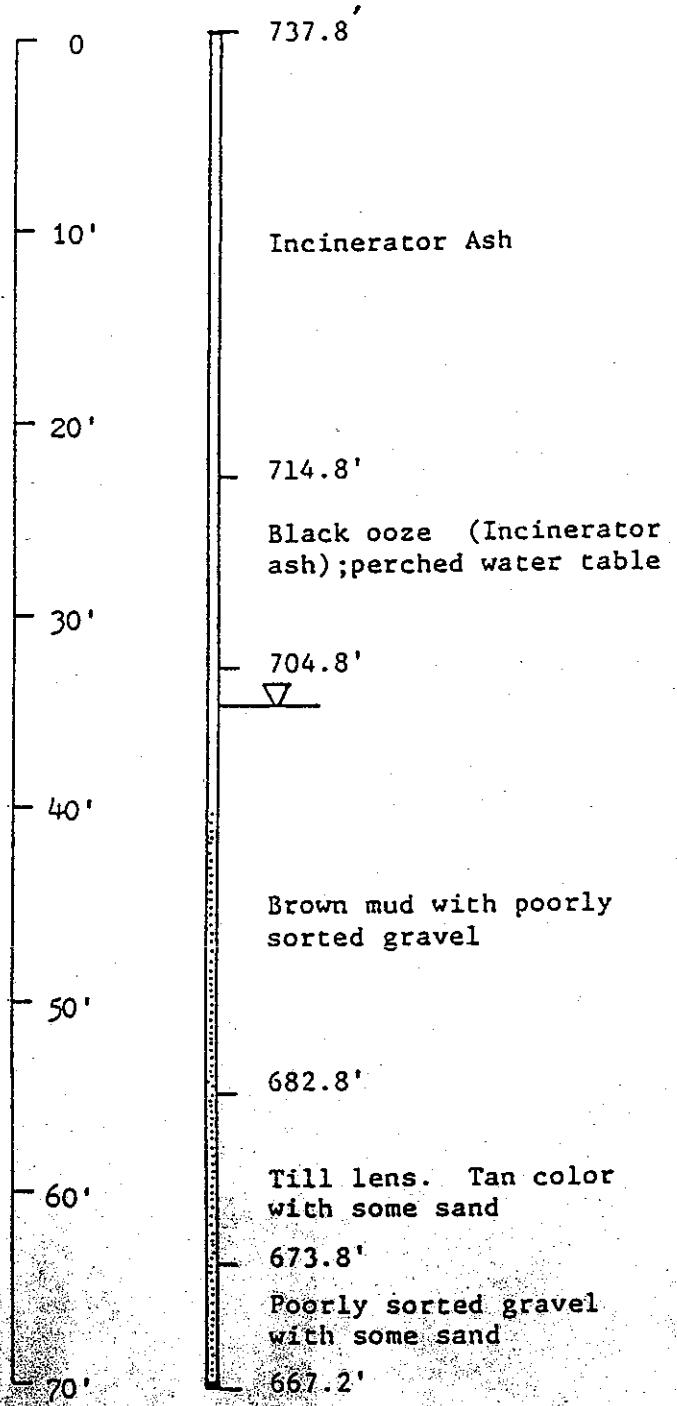
Revised:

ARCADIS

Well 16

WELL 16

LOCATION: Montgomery County South Incinerator
2550 Bertynn Drive
Dayton, Ohio:
South of Building



DRILLING RECORD

Method: Hollow-Stem Auger

Date: 5/05/81

Crew: Lewis/Walker;
Wright State University;
Dayton, Ohio 45435

Casing: PVC

Diameter: 2.0" I.D.

Length: 70.6'

Coupling: Solvent Weld

Screen: Perforated PVC

Diameter: 2.0" I.D.

Length: 30.0'

Perforation Diameter: .012"

Scheme: 360°; 48/ft.

SERVICE RECORD

Date of Development: 5/08/81

Repairs: None to date

BASIC DATA

Water Table: 35'

Elevation at top of casing: 735.0'

Height of casing above ground: 6"

STATUS OF WELL: Active

REVISIONS

Original: 7/13/81

Revised:

FIGURE A43

ROUGH DRAFT

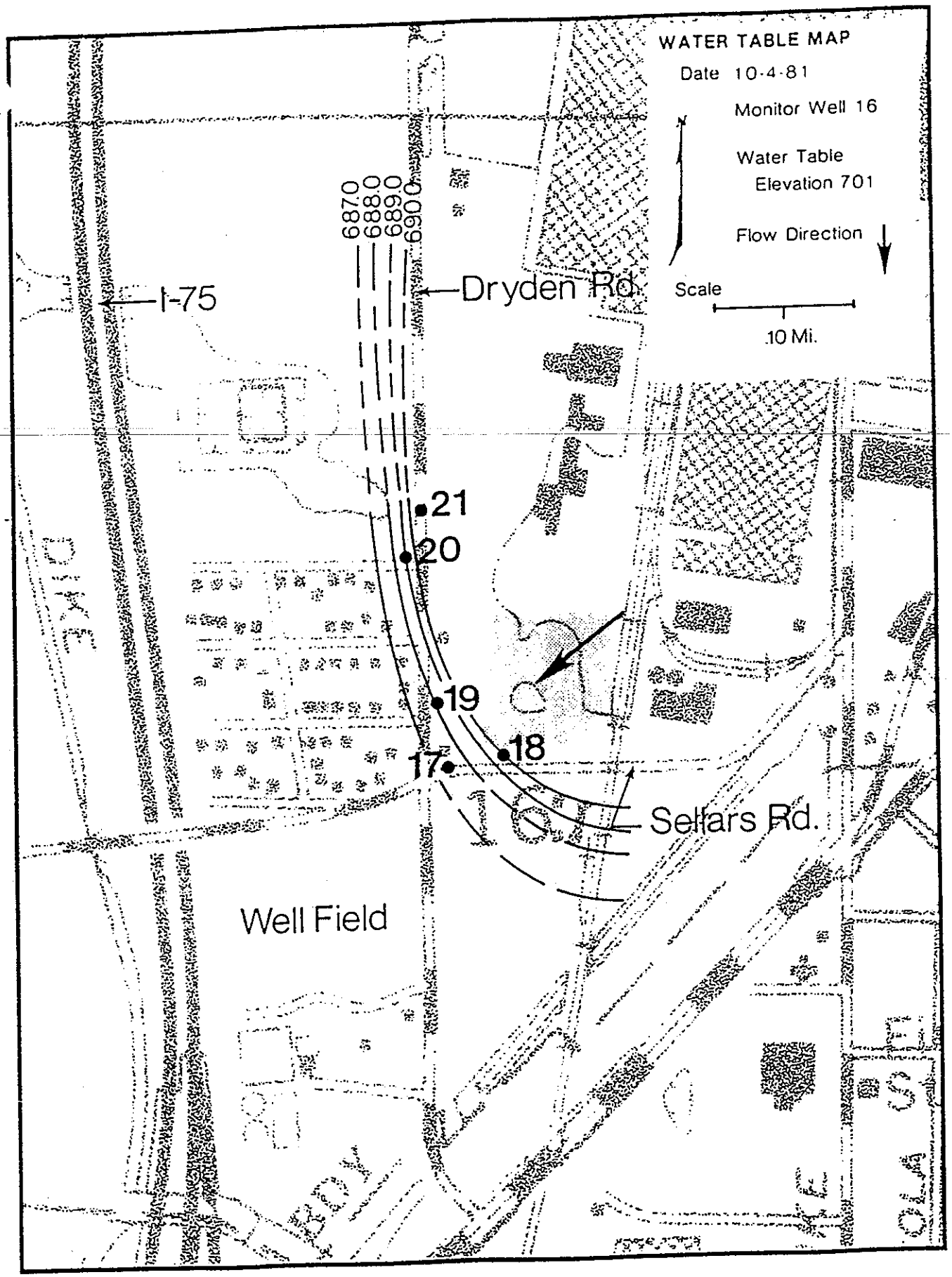


fig. A-9

monitor well locations phase II

ARCADIS

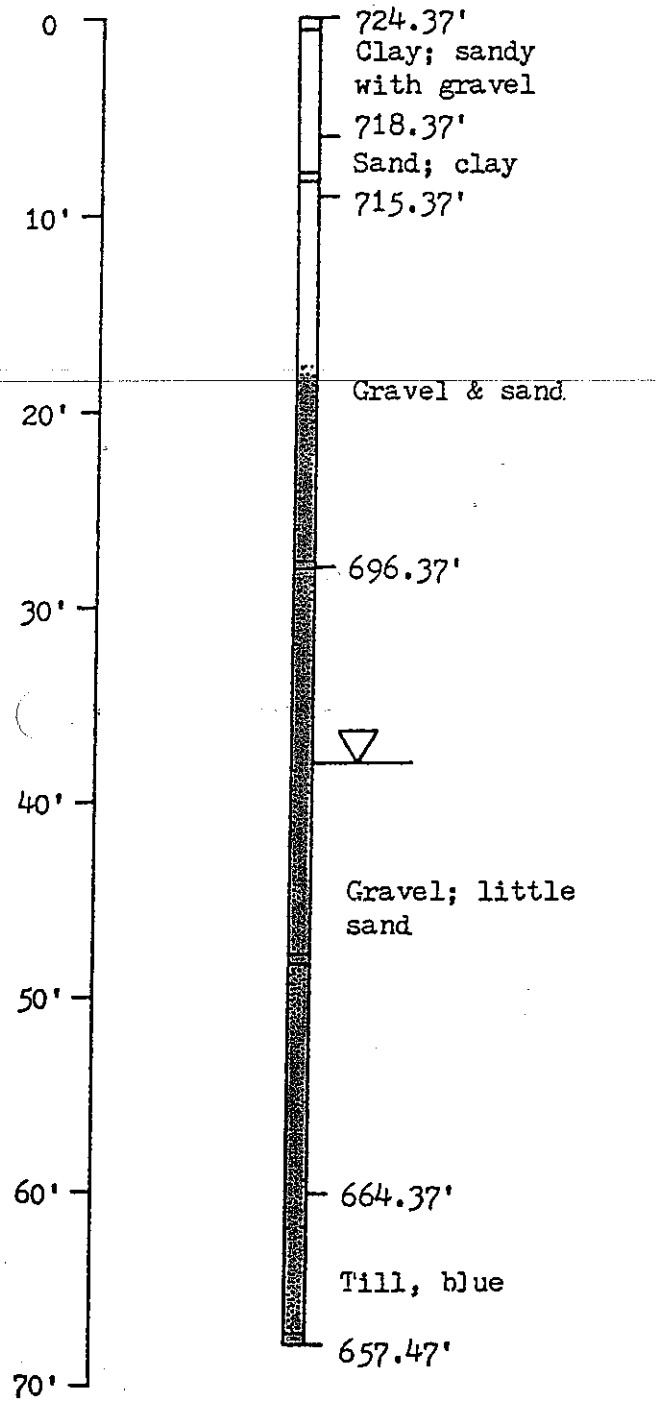
Well 17

ROUGH DRAFT

WELL 17

fig. A-1

Location: Northeast corner of the intersection of Dryden and Sellars Roads; Moraine, Ohio



DRILLING RECORD

Method: Hollow-Stem Auger

Date: 8/06/81

Crew: Dan Lewis/Jim Walker; Wright State University; Dayton, Ohio 45435

Casing: PVC

Diameter: 2.0" I.D.

Length: 66.9'

Coupling: Solvent weld

Screen: Perforated PVC

Diameter: 2.0" I.D.

Length: [illegible]

Perforation Diameter: .140"

Scheme: 360°; 96/ft.

SERVICE RECORD

Development: 9/04, 10/16/81

Cap Installation: 8/14/81

Repairs: None to date

BASIC DATA

Water Table: 38'

Elevation - top of cap: 725.12'

Height of Cap Above Ground: 9"

STATUS OF WELL

Active

REVISIONS

Original: 11/17/81

Revised:

ARCADIS

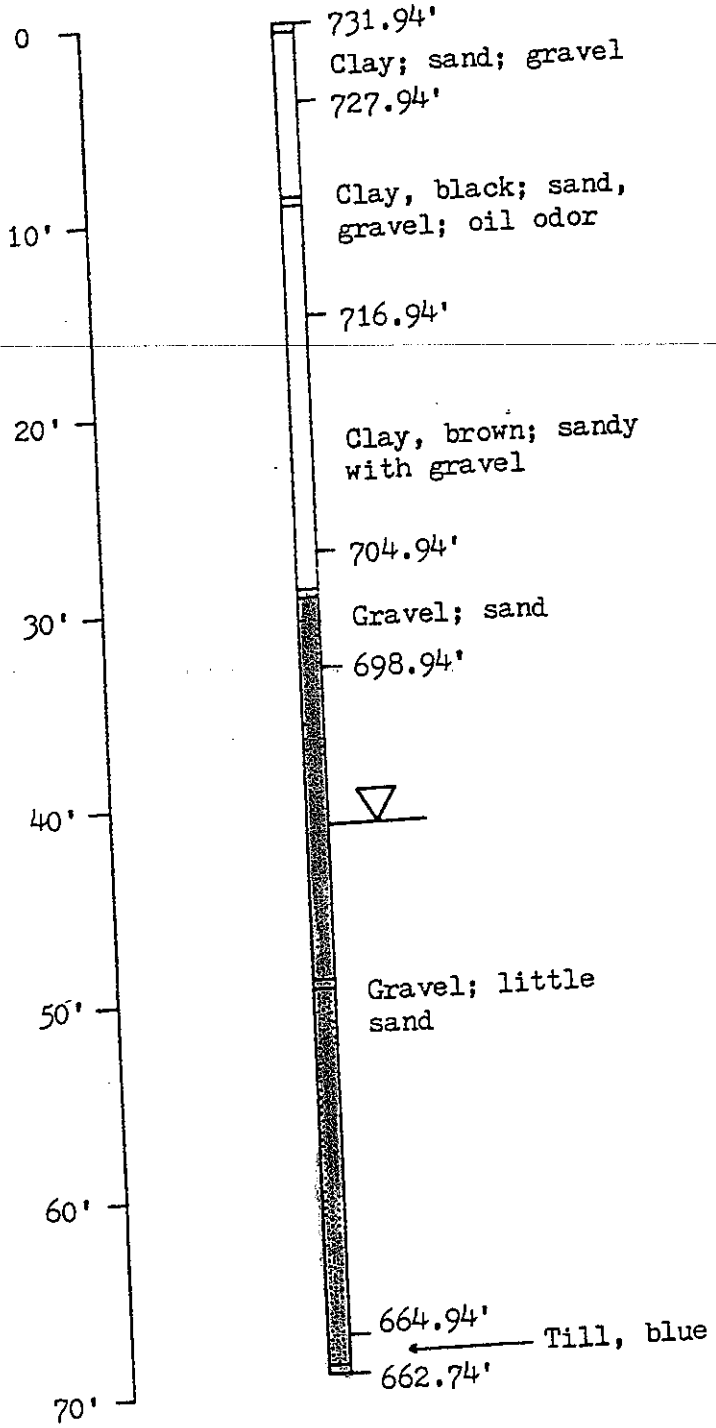
Well 18

ROUGH DRAFT

WELL 18

fig. A-2

Location: 200' east of Dryden Road;
24' north of Sellars Road;
Moraine, Ohio



DRILLING RECORD

Method: Hollow-Stem Auger
Date: 8/10/81
Crew: Dan Lewis/Jim Walker;
Wright State University;
Dayton Ohio 45435

Casing: PVC
Diameter: 2.0" I.D.
Length: 69.2'
Coupling: Solvent weld

Screen: Perforated PVC
Diameter: 2.0" I.D.
Length: 40'
Perforation Diameter: .140"
Scheme: 360°; 96/ft.

SERVICE RECORD

Development: 9/04, 10/16
Cap Installation: 8/22/81
Repairs: None to date

BASIC DATA

Water Table: 41'
Elevation - top of cap: 732.60'
Height of cap above ground: 8"

STATUS OF WELL

Active

REVISIONS

Original: 11/17/81
Revised:

ARCADIS

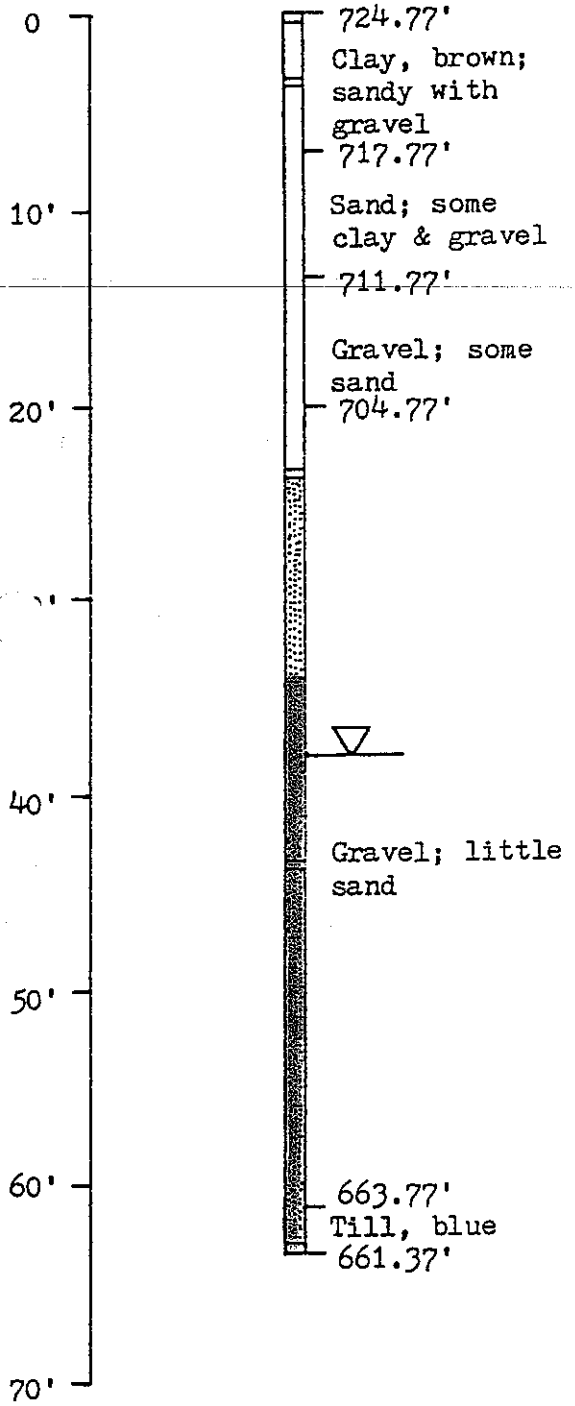
Well 19

ROUGH DRAFT

WELL 19

fig. A-3

Location: 250' north of Sellars Road;
10' east of Dryden Road;
Moraine, Ohio 45435



DRILLING RECORD

Method: Hollow-Stem Auger
Date: 8/12/81
Crew: Dan Lewis/Jim Walker;
Wright State University;
Dayton, Ohio 45435
Casing: PVC
Diameter: 2.0" I.D.
Length: 63.4'
Coupling: Solvent weld
Screen: Perforated PVC
Diameter: 2.0" I.D.
Length: [redacted]
Perforation Diameter: .140"
Scheme: 360°; 96/ft.

SERVICE RECORD

Development: 9/04, 10/08/81
Cap Installation: 8/14/81
Repairs: None to date

BASIC DATA

Water Table: 38'
Elevation - top of cap: 725.44'
Height of Cap Above Ground: 8"

STATUS OF WELL

Active

REVISIONS

Original: 11/17/81
Revised:

ARCADIS

Section 22

City of Moraine Well
And Boring Logs

CBC-1/MW-1
CBC-2/MW-2
CBC-3/MW-3
CBC-4
CBC-5
CBC-6
CBC-7
CBC-8
CBC-9/MW-9
CBC-10
CBC-11/MW-4
CBC-12/MW-5
CBC-13/MW-6
CBC-14/MW-7
CBC-15/MW-8
CBC-16/MW-10

Table 1: Summary of Test Boring Information
(Splash Moraine and Miami Shores "Dewatering" System)

Boring No. (Job No.)	Depth (ft.)	Monitoring Well Installed (Yes/No)	Monitoring Well No.
CBC-1 (7540)	71.2	Yes	MW-1
CBC-2 (7540)	72.9	Yes	MW-2
CBC-3 (7540)	70.0	Yes	MW-3
CBC-4 (7540)	80.0	No	- -
CBC-5 (7540)	80.0	No	- -
CBC-6 (7540)	80.0	No	- -
CBC-7 (7540)	80.0	No	- -
CBC-8 (7540)	75.0	No	- -
CBC-9 (7540)	73.0	Yes	MW-9
CBC-10 (7540)	70.0	No	- -
CBC-11 (8418)	40.0	Yes	MW-4
CBC-12 (8418)	43.0	Yes	MW-5
CBC-13 (8418)	42.6	Yes	MW-6
CBC-14 (8418)	38.8	Yes	MW-7
CBC-15 (8418)	42.3	Yes	MW-8
CBC-16 (8418)	40.0	Yes	MW-10

Table 2: Summary of Observation Well
(Splash Moraine and Miami Shores Dewatering System)

Monitoring Well No.	Job No.	Surface Elevation (Ft.)	Well Tip Depth (Ft.)	Well Tip Elevation (Ft.)	Initial Groundwater Depth (Ft.)	Groundwater Elevation (Ft.)
MW-1	(7540)	713.5	71.2	642.3	3.19	710.3
MW-2	(7540)	718.0	72.9	645.1	9.97	708.0
MW-3	(7540)	702.0	69.0	633.0	Flooded	Flooded
MW-4	(8418)	707.0	39.5	667.5	0.55	706.5
MW-5	(8418)	709.0	42.5	666.5	1.84	707.2
MW-6	(8418)	708.0	42.6	665.4	3.92	704.1
MW-7	(8418)	710.0	38.7	671.3	4.58	705.4
MW-8	(8418)	708.0	42.2	665.8	4.18	703.8
MW-9	(7540)	712.0	73.0	639.0	6.2	705.8
MW-10	(8418)	708.0	39.0	669.0	2.04	706.0

3.3 TEST WELL INSTALLATION

The 60' deep, 16" diameter well was installed on January 2, 2007 using cable tool methods. The outer casing was 24-inch OD and extended approximately sixty (~60) feet beneath the ground surface. Representative soil samples were collected, dried and mechanically sieved to determine the appropriate well screen, slot-size. From these tests, a twenty (20) foot section

CBC-1/MW-1

CBC Engineers & Associates, Ltd.
125 Westpark Road
Centerville, OH 45459
(P) (937) 428-6150 / (F) (937) 428-6154

BORING LOG

CLIENT: City of Moraine — REPORT NO.: 7540 — BORING NO.: B-1
Moraine, Ohio — DATE STD.: 2/16/06 — DATE FINISHED: 2/16/06
PROJECT: Splash Moraine & Miami Shores — DRILLERS: CBC — GROUND ELEV.: 713.5
LOCATION: As Shown on the Boring Location Plan — METHOD: 2 1/4" HSA

SCALE, FT.	STRATUM DEPTH, FT.	CLASSIFICATION OF MATERIAL Major Soil Components: Gravel, Sand, Silt, Clay Minor Component Term: Trace 1-10%, Some 11-35%, And 36-50%	SAMPLE NUMBER & SAMPLE TYPE	DEPTH OF SAMPLE, FT. FROM	DEPTH OF SAMPLE, FT. TO	BLOWS ON SAMPLER PER SPT (6" INTERVAL)	SPT "N", OR RECOVERY (IN. FOR SHELBY TUBES, % FOR ROCK CORE)
0.0	0.0	TOPSOIL					
	0.9	Very dense, brown fine to coarse SAND, some silt,					
2.0		trace fine to coarse gravel (dry)					
			1A	3.5	5.0	24-23-28	51
4.0							
6.0							
8.0		Becomes medium dense and wet at 8.5 feet	2A	8.5	10.0	20-8-5	13
10.0							
12.0							
		Becomes dense at 13.5 feet	3A	13.5	15.0	14-17-19	36
14.0							
16.0							
18.0		Becomes medium dense at 18.5 feet	4A	18.5	20.0	15-9-11	20
20.0							
22.0	22.0	Loose, fine GRAVEL, trace fine to coarse sand (wet)					
			5A	23.5	25.0	15-4-5	9
24.0							
26.0							
28.0		Becomes medium dense at 28.5 feet	6A	28.5	30.0	12-11-11	22
30.0	30.0	Dense, gray, fine to coarse SAND, some silt, trace fine					
		to coarse gravel (wet)					
32.0							
			7A	33.5	35.0	24-19-21	40
34.0							
36.0							
38.0		Becomes medium dense at 38.5 feet	8A	38.5	40.0	15-17-13	30

WATER LEVEL OBSERVATIONS
Noted on rods 9.4 ft.
At completion 9.4 ft.
After — hours — ft.

BORING METHOD
HSA Hollow Stem Auger
CFA Continuous Flight Auger
DC Driven Casing
MD Mud Drilling
RC Rock Coring
CA Casing Advancer

TYPE SAMPLE
A - Split Spoon
B - Rock Core
C - Shelby Tube
D - Other

*These Shelby Tube Samples Obtained In An Auxiliary Boring Drilled A Few Feet From This Boring

SCALE FT.	STRATUM DEPTH, FT.	CLASSIFICATION OF MATERIAL Major Soil Components: Gravel Silt Sand Clay Minor Component Term: Trace 1-10% Some 11-35% And 36-50%	SAMPLE NUMBER & SAMPLE TYPE	DEPTH OF SAMPLE, FT. FROM	DEPTH OF SAMPLE, FT. TO	BLOWS ON SAMPLER PER SPT (6" INTER-VAL)	SPT "N", OR RECOVERY (IN. FOR SHELBY TUBES, % FOR ROCK CORE)
40.0							
42.0							
		Becomes dense at 43.5 feet	9A	43.5	45.0	20-19-24	43
44.0							
46.0							
48.0			10A	48.5	50.0	24-21-20	41
50.0							
52.0							
			11A	53.5	55.0	21-21-20	41
54.0							
56.0							
58.0		Becomes very dense at 58.5 feet	12A	58.5	60.0	24-27-26	53
60.0							
62.0							
			13A	63.5	64.0	50/6"	100+
64.0							
66.0	66.0	Hard, gray, SILT, trace clay, trace fine to coarse sand, trace fine gravel (damp)					
68.0			14A	68.5	70.0	34-37-35	72
70.0							
72.0		BOTTOM OF BORING AT 71.2 FEET					
74.0							
76.0							
78.0							
80.0							
82.0							
84.0							

WATER LEVEL OBSERVATIONS
Noted on rods 9.4 ft.
At completion 9.4 ft.
After -- hours -- ft.

BORING METHOD
HSA Hollow Stem Auger
CFA Continuous Flight Auger
DC Driven Casing
MD Mud Drilling
RC Rock Coring
CA Casing Advancer

TYPE SAMPLE
A - Split Spoon
B - Rock Core
C - Shelby Tube
D - Other

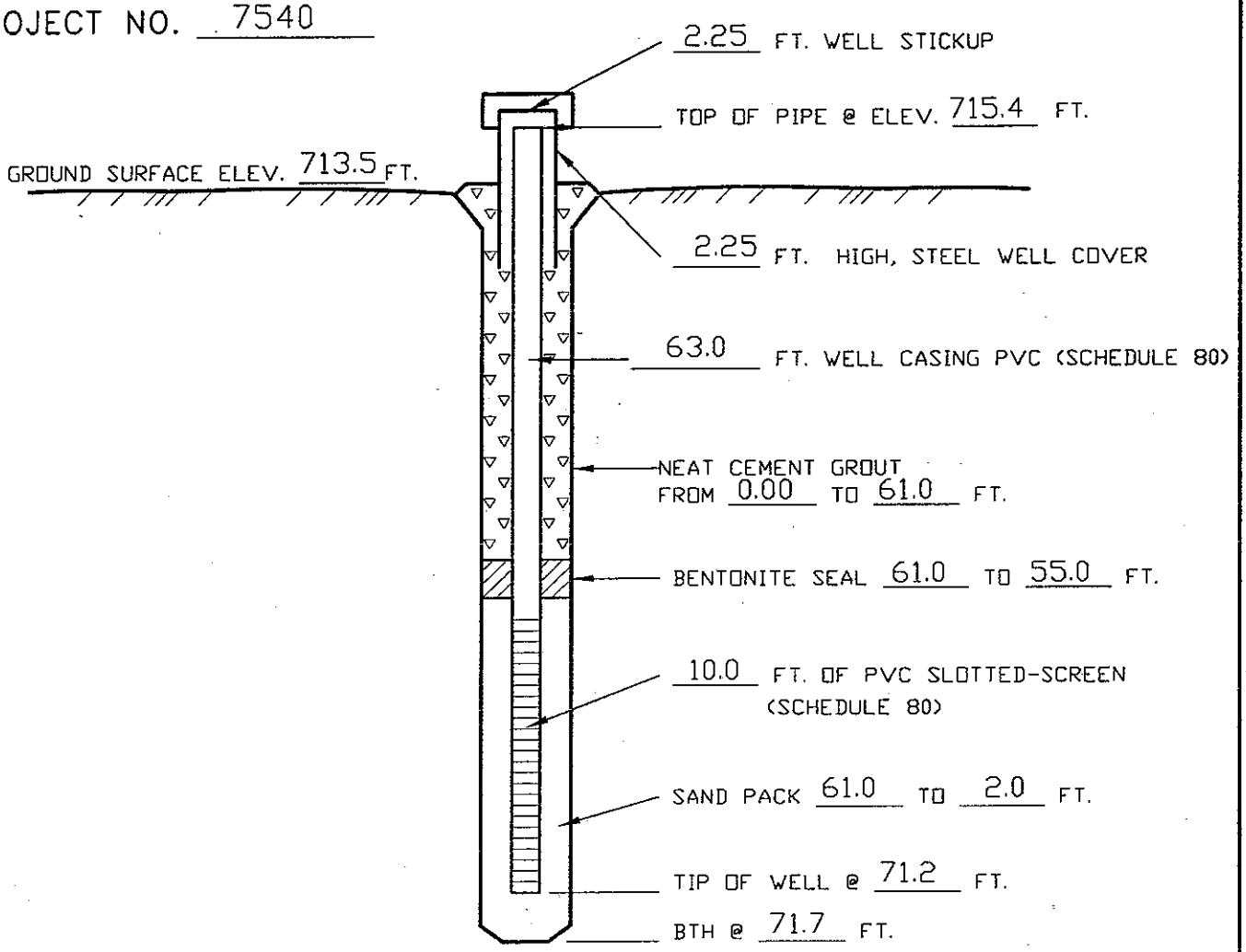
*These Shelby Tube Samples Obtained In An Auxiliary Boring Drilled A Few Feet From This Boring

WELL NO. MW-1 (OLD)

CLIENT CITY OF MORAINE, OHIO

PROJECT GROUND WATER MANAGEMENT

PROJECT NO. 7540



NO. OF SPLIT SPOONS 17

MATERIALS USED		
RISER	63	FT.
SCREEN	10	FT.
SAND	4	BAGS
CEMENT	1	BAGS
BENT. PWDR.	-	BAGS
BENT. PELLETS	3	BKTS.
PROT. COVER	1	
INNER LOCK CAP	1	
PADLOCK	-	
TOP CAP	1	
GUARD POSTS	-	
BOTTOM PLUG	1	

DATE INSTALLED	03/3/06
DATE DEVELOPED	
METHOD OF DRILLING	HSA-3 1/4
METHOD OF DEVELOP	
DURATION OF DEVELOP	
DRILLER	STEVE
INSPECTOR	

GROUNDWATER LEVEL OBSERVATIONS DURING DRILLING, (FT.)

	DEPTH	ELEV
Water first encountered	9.5'	
Water at completion	52'	

IN WELL

DATE	WATER ELEV. (FT)

MONITORING WELL CONSTRUCTION FIELD DETAILS

CBC ENGINEERS & ASSOCIATES
DAYTON, OHIO

CBC-2/MW-2

CBC Engineers & Associates, Ltd.
125 Westpark Road
Centerville, OH 45459
(P) (937) 428-6150 / (F) (937) 428-6154

BORING LOG

CLIENT: City of Moraine | REPORT NO: 7540 | BORING NO: B-2
Moraine, Ohio | DATE STD: 03-02-06 | DATE FINISHED: 03-02-06
PROJECT: Splash Moraine & Miami Shores | DRILLERS: CBC | GROUND ELEV: 718'
LOCATION: As Shown on the Boring Location Plan | METHOD: 3¼" HSA

CLASSIFICATION OF MATERIAL
Major Soil Components: Gravel, Sand, Silt, Clay
Minor Component Term: Trace 1-10%, Some 11-35%, And 36-50%

SCALE, FT.	STRATUM DEPTH, FT.	CLASSIFICATION OF MATERIAL	SAMPLE NUMBER & SAMPLE TYPE	DEPTH OF SAMPLE, FT. FROM	DEPTH OF SAMPLE, FT. TO	BLOWS ON SAMPLER PER SPT (6" INTERVAL)	SPT "N", OR RECOVERY (IN. FOR SHELBY TUBES, % FOR ROCK CORE)
0.0	0.0	Dark brown CLAY, some silt, some sand, trace gravel (damp)					
2.0	1.2	Medium dense, brown fine to coarse SAND, some silt trace fine to coarse gravel (damp)	1A	3.5	5.0	13-13-14	27
4.0							
6.0							
8.0		Becomes dense at 8.5 feet	2A	8.5	10.0	19-17-19	36
10.0							
12.0			3A	13.5	15.0	25-23-27	50
14.0							
16.0							
18.0	17.0	Very dense, brown and gray, fine to coarse SAND and fine gravel, trace silt (wet)	4A	18.5	20.0	35-34-30	64
20.0							
22.0			5A	23.5	25.0	30-29-32	61
24.0							
26.0	26.0	Very dense, brown and gray, fine to coarse SAND, some fine gravel, trace silt (wet)					
28.0			6A	28.5	30.0	30-29-30	59
30.0							
32.0			7A	33.5	35.0	29-28-31	59
34.0							
36.0							
38.0			8A	38.5	39.2	35-50/3"	100+

WATER LEVEL OBSERVATIONS
Noted on rods 17.0 ft.
At completion 17.0 ft.
After __ hours __ ft.

BORING METHOD
HSA Hollow Stem Auger
CFA Continuous Flight Auger
DC Driven Casing
MD Mud Drilling
RC Rock Coring
CA Casing Advancer

TYPE SAMPLE
A - Split Spoon
B - Rock Core
C - Shelby Tube
D - Other

*These Shelby Tube Samples Obtained In An Auxiliary Boring Drilled A Few Feet From This Boring

SCALE FT.	STRATUM DEPTH, FT.	CLASSIFICATION OF MATERIAL Major Soil Components: Gravel Sand Silt Clay Minor Component Term: Trace 1-10% Some 11-35% And 36-50%	SAMPLE NUMBER & SAMPLE TYPE	DEPTH OF SAMPLE, FT. FROM	DEPTH OF SAMPLE, FT. TO	BLOWS ON SAMPLER PER SPT (6" INTERVAL)	SPT "N", OR RECOVERY (IN. FOR SHELBY TUBES, % FOR ROCK CORE)
40.0							
42.0	42.0	Dense, gray, fine to coarse SAND, some fine to coarse gravel, some silt (wet)	9A	43.5	45.0	10-15-19	34
44.0							
46.0							
48.0		Becomes very dense at 48.5 feet	10A	48.5	50.0	33-35-36	71
50.0							
52.0							
			11A	53.5	55.0	33-26-29	55
54.0							
56.0							
58.0		Becomes dense at 58.5 feet	12A	58.5	60.0	19-23-21	44
60.0							
62.0	62.0	Dense, gray, fine to coarse SAND, trace fine gravel, trace silt (wet)	13A	63.5	65.0	29-24-24	48
64.0							
	65.0	Hard, gray, SILT, some clay, trace fine to coarse sand, (moist)					
66.0							
68.0			14A	68.5	70.0	25-31-37	68
70.0							
72.0		BOTTOM OF BORING AT 72.9 FEET					
74.0							
76.0							
78.0							
80.0							
82.0							
84.0							

WATER LEVEL OBSERVATIONS
Noted on rods 17.0 ft.
At completion 17.0 ft.
After -- hours -- ft.

BORING METHOD
HSA Hollow Stem Auger
CFA Continuous Flight Auger
DC Driven Casing
MD Mud Drilling
RC Rock Coring
CA Casing Advancer

TYPE SAMPLE
A - Split Spoon
B - Rock Core
C - Shelby Tube
D - Other

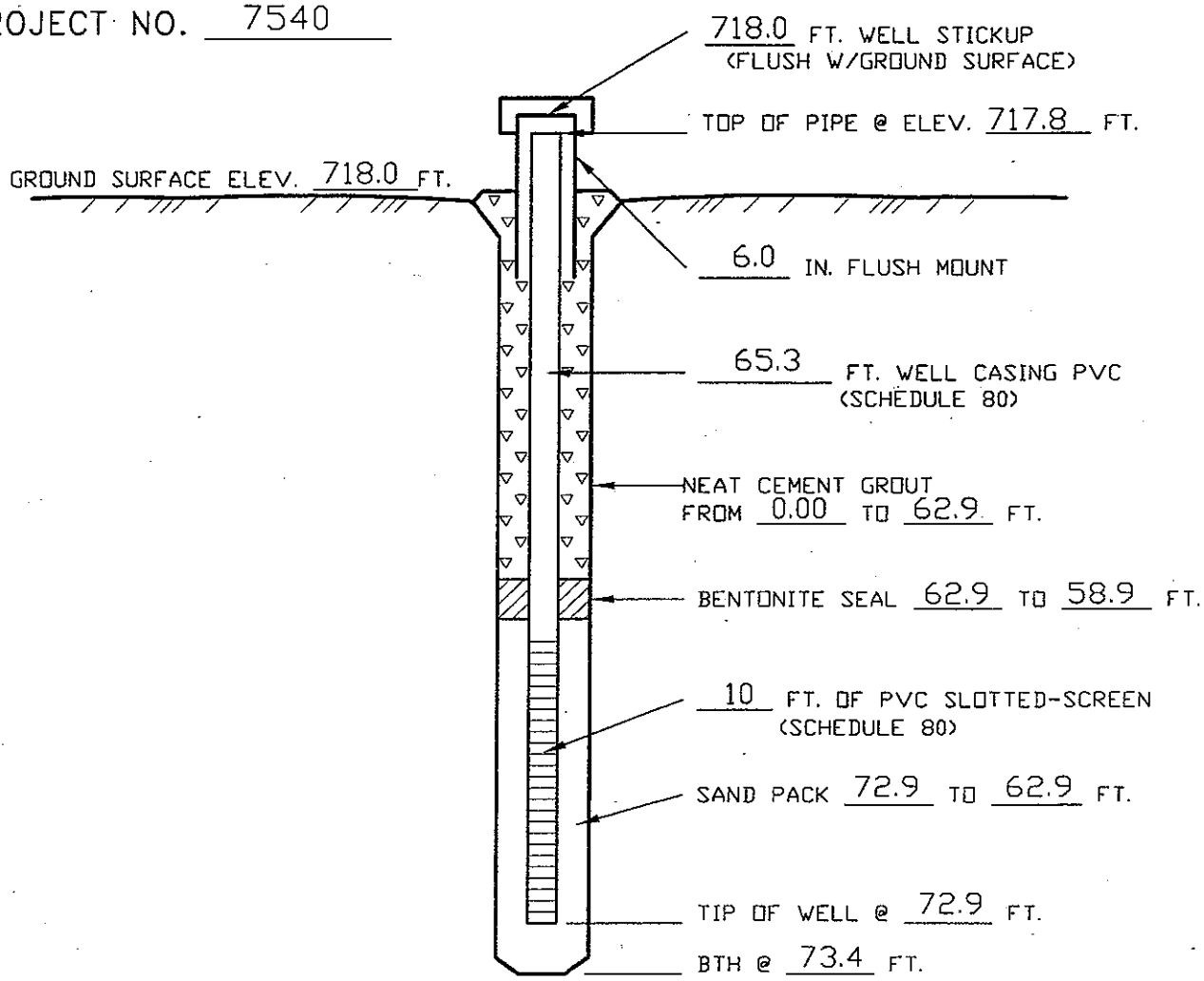
*These Shelby Tube Samples Obtained In An Auxiliary Boring Drilled A Few Feet From This Boring

WELL NO. MW-2 (OLD)

CLIENT CITY OF MORAINE, OHIO

PROJECT GROUND WATER MANAGEMENT

PROJECT NO. 7540



NO. OF SPLIT SPOONS 17

MATERIALS USED		
RISER	65.3	FT.
SCREEN	10	FT.
SAND	5	BAGS
CEMENT	1	BAGS
BENT. PWDR.	2	BAGS
BENT. PELLETS	-	BKTS.
PROT. COVER	1	
INNER LOCK CAP	1	
PADLOCK	-	
TOP CAP	1	
GUARD POSTS	-	
BOTTOM PLUG	1	

DATE INSTALLED	03/2/06
DATE DEVELOPED	
METHOD OF DRILLING	HSA-3 1/4
METHOD OF DEVELOP	
DURATION OF DEVELOP	
DRILLER	STEVE
INSPECTOR	

GROUNDWATER LEVEL OBSERVATIONS DURING DRILLING, (FT.)

	DEPTH	ELEV
Water first encountered	12.8'	
Water at completion	56'	

IN WELL

DATE	WATER ELEV. (FT)

MONITORING WELL CONSTRUCTION FIELD DETAILS

CBC ENGINEERS & ASSOCIATES
DAYTON, OHIO

CBC-3/MW-3

CBC Engineers & Associates, Ltd.
125 Westpark Road
Centerville, OH 45459
(P) (937) 428-6150 / (F) (937) 428-6154

BORING LOG

CLIENT: City of Moraine — REPORT NO.: 7540 — BORING NO.: B-3
Moraine, Ohio — DATE STD.: 03-03-06 — DATE FINISHED: 03-03-06
PROJECT: Splash Moraine & Miami Shores — DRILLERS: CBC — GROUND ELEV.: 702.0'
LOCATION: As Shown on the Boring Location Plan — METHOD: 3 1/4" HSA

SCALE, FT.	STRATUM DEPTH, FT.	CLASSIFICATION OF MATERIAL Major Soil Components: Gravel, Sand, Silt, Clay Minor Component Term: Trace 1-10%, Some 11-35%, And 36-50%	SAMPLE NUMBER & SAMPLE TYPE	DEPTH OF SAMPLE, FT. FROM	DEPTH OF SAMPLE, FT. TO	BLOWS ON SAMPLER PER SPT (6" INTERVAL)	SPT "N", OR RECOVERY (IN. FOR SHELBY TUBES, % FOR ROCK CORE)
0.0	0.0	TOPSOIL					
	1.5	Medium dense, brown, fine to medium, SAND, some					
2.0		silt, trace fine gravel (damp)					
			1A	3.5	5.0	5-6-7	13
4.0							
6.0							
8.0	8.0	Dense, brown and gray, fine to coarse SAND, some	2A	8.5	10.0	13-16-19	33
		fine to coarse gravel, some silt (wet)					
10.0							
12.0	12.7	Hard, gray SILT, some clay, trace fine to medium sand					
		(damp)	3A	13.5	15.0	25-27-29	56
14.0							
16.0							
18.0			4A	18.5	20.0	17-19-24	43
20.0							
22.0							
	23.0	Very dense, gray, fine to coarse SAND, some fine to	5A	23.5	25.0	31-26-29	55
24.0		coarse gravel, trace silt (wet)					
26.0							
28.0			6A	28.5	30.0	28-31-22	53
30.0							
32.0							
		Becomes dense at 33.5 feet	7A	33.5	35.0	22-21-24	45
34.0							
36.0							
38.0			8A	38.5	40.0	20-21-24	45

WATER LEVEL OBSERVATIONS
Noted on rods 8.0 ft.
At completion 8.0 ft.
After -- hours -- ft.

BORING METHOD
HSA Hollow Stem Auger
CFA Continuous Flight Auger
DC Driven Casing
MD Mud Drilling
RC Rock Coring
CA Casing Advancer

TYPE SAMPLE
A - Split Spoon
B - Rock Core
C - Shelby Tube
D - Other

*These Shelby Tube Samples Obtained In An Auxiliary Boring Drilled A Few Feet From This Boring

SCALE FT.	STRATUM DEPTH, FT.	CLASSIFICATION OF MATERIAL Major Soil Components: Gravel Silt Sand Clay Minor Component Term: Trace 1-10% Some 11-35% And 36-50%	SAMPLE NUMBER & SAMPLE TYPE	DEPTH OF SAMPLE, FT. FROM	DEPTH OF SAMPLE, FT. TO	BLOWS ON SAMPLER PER SPT (6" INTERVAL)	SPT "N", OR RECOVERY (IN. FOR SHELBY TUBES, % FOR ROCK CORE)
40.0							
42.0	42.0	Dense, gray, fine to coarse SAND, some silt, trace fine gravel (wet)					
			9A	43.5	45.0	17-19-15	34
44.0							
	45.0	Dense, gray, fine to medium SAND, some silt (wet)					
46.0							
48.0			10A	48.5	50.0	17-16-16	32
50.0							
52.0							
		Becomes medium dense at 53.5 feet	11A	53.5	55.0	17-13-15	28
54.0							
56.0							
58.0		Becomes dense at 58.5 feet	12A	58.5	60.0	21-19-23	42
60.0							
62.0							
		Becomes very dense at 63.5 feet	13A	63.5	65.0	25-25-26	51
64.0							
66.0	66.0	Very dense, gray, fine to coarse SAND, trace silt (wet)					
68.0			14A	68.5	70.0	27-31-34	65
70.0		BOTTOM OF BORING AT 70.0 FEET					
72.0							
74.0							
76.0							
78.0							
80.0							
82.0							
84.0							

WATER LEVEL OBSERVATIONS
Noted on rods 8.0 ft.
At completion 8.0 ft.
After __ hours __ ft.

BORING METHOD
HSA Hollow Stem Auger
CFA Continuous Flight Auger
DC Driven Casing
MD Mud Drilling
RC Rock Coring
CA Casing Advancer

TYPE SAMPLE
A - Split Spoon
B - Rock Core
C - Shelby Tube
D - Other

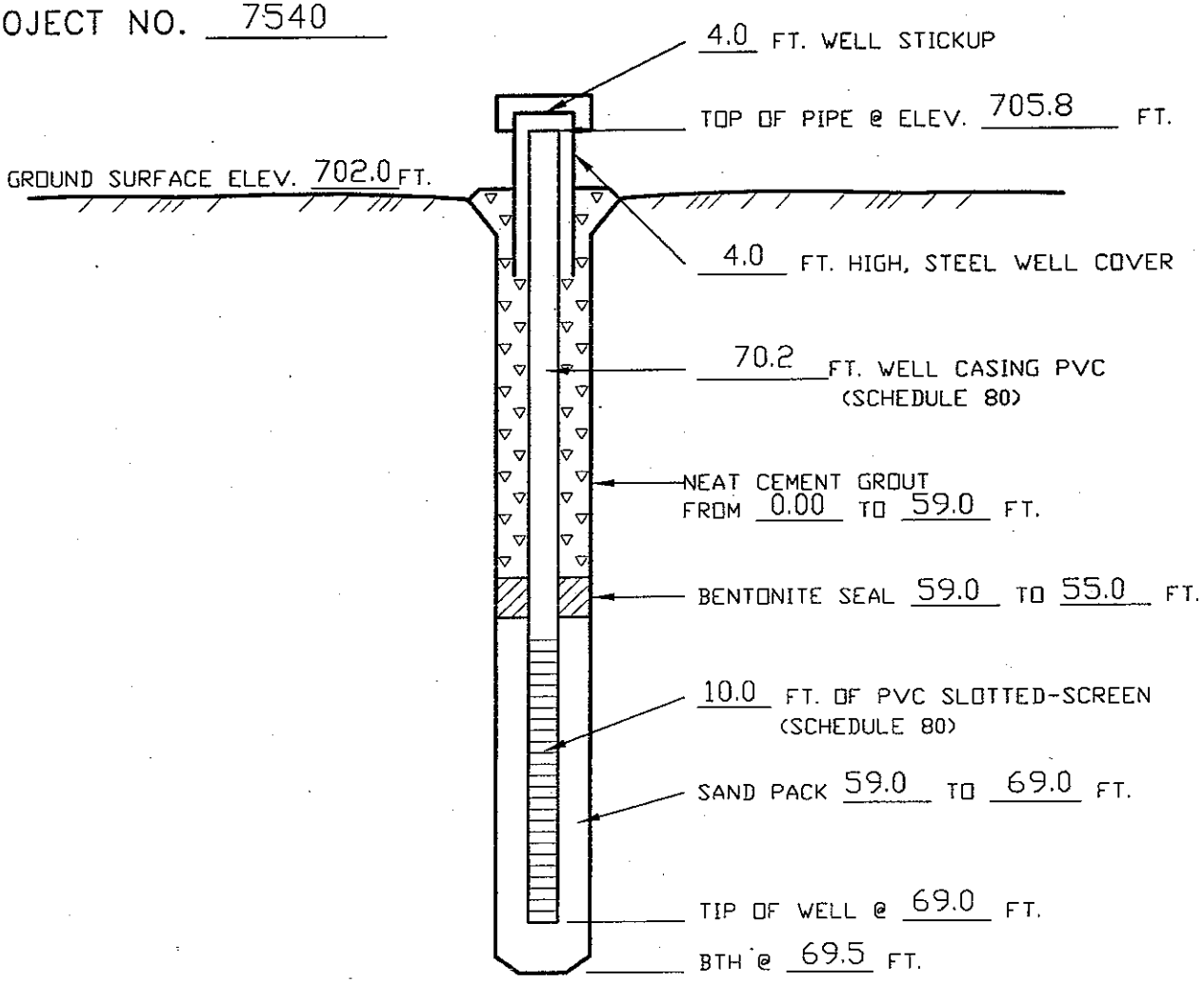
*These Shelby Tube Samples Obtained In An Auxiliary Boring Drilled A Few Feet From This Boring

WELL NO. MW-3 (OLD)

CLIENT CITY OF MORAINE, OHIO

PROJECT GROUND WATER MANAGEMENT

PROJECT NO. 7540



NO. OF SPLIT SPOONS 17

MATERIALS USED		
RISER	70.2	FT.
SCREEN	10	FT.
SAND	4	BAGS
CEMENT	1	BAGS
BENT. PWDR.	2	BAGS
BENT. PELLETS	-	BKTS.
PROT. COVER	1	
INNER LOCK CAP	1	
PADLOCK	-	
TOP CAP	1	
GUARD POSTS	-	
BOTTOM PLUG	1	

DATE INSTALLED	03/3/06
DATE DEVELOPED	
METHOD OF DRILLING	HSA-3 1/4
METHOD OF DEVELOP	
DURATION OF DEVELOP	
DRILLER	STEVE
INSPECTOR	

GROUNDWATER LEVEL OBSERVATIONS DURING DRILLING, (FT.)

	DEPTH	ELEV
Water first encountered	8'	
Water at completion	59'	

IN WELL

DATE	WATER ELEV. (FT)

MONITORING WELL CONSTRUCTION FIELD DETAILS

CBC ENGINEERS & ASSOCIATES
DAYTON, OHIO

CBC Engineers & Associates, Ltd.
125 Westpark Road
Centerville, OH 45459
(P) (937) 428-6150 / (F) (937) 428-6154

BORING LOG

CLIENT: City of Moraine | REPORT NO.: 7540 | BORING NO.: B-4
DATE STD.: 03-10-06 | DATE FINISHED: 03-10-06
PROJECT: Splash Moraine & Miami Shores | DRILLERS: CBC | GROUND ELEV.: 704.0'
LOCATION: As Shown on the Boring Location Plan | METHOD: 3¼" HSA

SCALE, FT.	STRATUM DEPTH, FT.	CLASSIFICATION OF MATERIAL Major Soil Components: Gravel, Sand, Silt, Clay Minor Component Term: Trace 1-10%, Some 11-35%, And 36-50%	SAMPLE NUMBER & SAMPLE TYPE	DEPTH OF SAMPLE, FT. FROM	DEPTH OF SAMPLE, FT. TO	BLOWS ON SAMPLER PER SPT (6" INTERVAL)	SPT "N", OR RECOVERY (IN. FOR SHELBY TUBES, % FOR ROCK CORE)
0.0	0.0	TOPSOIL					
	15"	Medium stiff, dark brown some gray, CLAY, some silt trace sand (very moist)					
2.0			1A	3.5	5.0	3-4-5	9
4.0							
6.0	6.0	Dense, brown SAND and gravel, trace silt (wet)					
8.0			2A	8.5	10.0	11-14-17	31
10.0							
12.0							
		Becomes medium dense at 13.5 feet	3A	13.5	15.0	13-13-12	25
14.0							
16.0							
	17.0	Hard, gray, SILT, some clay, some sand, trace gravel (moist)					
18.0			4A	18.5	20.0	17-19-18	37
20.0							
22.0							
			5A	23.5	25.0	39-41-32	78
24.0							
26.0							
	27.0	Very dense, gray SAND, some gravel (wet)					
28.0			6A	28.5	30.0	37-27-31	58
30.0							
32.0							
			7A	33.5	35.0	35-41-36	77
34.0							
36.0							
38.0			8A	38.5	40.0	31-39-37	76

WATER LEVEL OBSERVATIONS
Noted on rods 8.0 ft.
At completion 8.0 ft.
After — hours — ft.

BORING METHOD
HSA Hollow Stem Auger
CFA Continuous Flight Auger
DC Driven Casing
MD Mud Drilling
RC Rock Coring
CA Casing Advancer

TYPE SAMPLE
A - Split Spoon
B - Rock Core
C - Shelby Tube
D - Other

*These Shelby Tube Samples Obtained In An Auxiliary Boring Drilled A Few Feet From This Boring

SCALE FT.	STRATUM DEPTH, FT.	CLASSIFICATION OF MATERIAL Major Soil Components: Gravel, Sand, Silt, Clay Minor Component Term: Trace 1-10%, Some 11-35%, And 36-50%	SAMPLE NUMBER & SAMPLE TYPE	DEPTH OF SAMPLE, FT. FROM	DEPTH OF SAMPLE, FT. TO	BLOWS ON SAMPLER PER SPT (6" INTERVAL)	SPT "N", OR RECOVERY (IN. FOR SHELBY TUBES, % FOR ROCK CORE)
40.0							
42.0							
	43.0	Very dense, Gray sand, and large gravel (wet)	9A	43.5	45.0	35-40-33	73
44.0							
46.0							
48.0			10A	48.5	50.0	33-38-42	80
50.0							
52.0							
			11A	53.5	55.0	38-48-41	81
54.0							
56.0							
58.0			12A	58.5	60.0	41-40-44	84
60.0							
62.0							
			13A	63.5	65.0	38-38-39	75
64.0							
66.0							
68.0			14A	68.5	70.0	41-38-40	78
70.0							
72.0							
			15A	73.5	75.0	34-39-41	90
74.0							
76.0							
78.0	79.0	Hard, gray SILT and clay, some sand, trace gravel (moist)	16A	78.5	80.0	13-19-17	36
80.0		BOTTOM OF BORING AT 80.0					
82.0							
84.0							

WATER LEVEL OBSERVATIONS
Noted on rods 8.0 ft.
At completion 8.0 ft.
After -- hours -- ft.

BORING METHOD
HSA Hollow Stem Auger
CFA Continuous Flight Auger
DC Driven Casing
MD Mud Drilling
RC Rock Coring
CA Casing Advancer

TYPE SAMPLE
A - Split Spoon
B - Rock Core
C - Shelby Tube
D - Other

*These Shelby Tube Samples Obtained In An Auxiliary Boring Drilled A Few Feet From This Boring

CBC Engineers & Associates, Ltd.
125 Westpark Road
Centerville, OH 45459
(P) (937) 428-6150 / (F) (937) 428-6154

BORING LOG

CLIENT: City of Moraine — REPORT NO.: 7540 — BORING NO.: B-5
DATE STD.: 02-03-06 — DATE FINISHED: 02-03-06
PROJECT: Splash Moraine & Miami Shores — DRILLERS: CBC — GROUND ELEV.: 709.0
LOCATION: As Shown on the Boring Location Plan — METHOD: 3 ¼ HSA

SCALE, FT.	STRATUM DEPTH, FT.	CLASSIFICATION OF MATERIAL Major Soil Components: Gravel, Sand, Silt, Clay Minor Component Term: Trace 1-10%, Some 11-35%, And 36-50%	SAMPLE NUMBER & SAMPLE TYPE	DEPTH OF SAMPLE, FT. FROM	DEPTH OF SAMPLE, FT. TO	BLOWS ON SAMPLER PER SPT (6" INTERVAL)	SPT "N", OR RECOVERY (IN. FOR SHELBY TUBES, % FOR ROCK CORE)
0.0	0.0	TOPSOIL					
	0.9	Medium dense, brown fine to medium					
2.0		SAND, some silt, trace clay (moist)					
			1A	3.5	5.0	3-5-6	11
4.0							
6.0							
8.0		Becomes dense at 8.5 feet	2A	8.5	10.0	11-18-21	39
	9.5	Dense, brown and gray, fine to coarse SAND, some					
10.0		fine to coarse gravel, trace silt (damp)					
12.0							
			3A	13.5	15.0	20-17-19	36
14.0							
16.0	16.0	Medium dense, gray, fine to medium SAND, trace silt,					
		(wet)					
18.0			4A	18.5	20.0	11-13-14	27
20.0							
	21.0	Medium dense, brown and gray, fine to coarse SAND,					
22.0		some silt, trace fine gravel (wet)					
			5A	23.5	25.0	18-15-15	30
24.0							
26.0							
28.0							
	29.0	Hard, gray silt, some fine to coarse SAND, trace clay	6A	28.5	30.0	28-29-33	62
30.0		(damp)					
	31.0	Very dense, gray fine to coarse SAND, some fine to					
32.0		coarse gravel, trace silt (wet)					
			7A	33.5	34.1	49-50/2"	100+
34.0							
36.0	36.0	Very dense, tan and gray, fine to coarse SAND, some					
		fine to coarse gravel, some silt (wet)					
38.0			8A	38.5	40.0	29-38-35	73

WATER LEVEL OBSERVATIONS
Noted on rods 12.0 ft.
At completion 12.0 ft.
After __ hours __ ft.

BORING METHOD
HSA Hollow Stem Auger
CFA Continuous Flight Auger
DC Driven Casing
MD Mud Drilling
RC Rock Coring
CA Casing Advancer

TYPE SAMPLE
A - Split Spoon
B - Rock Core
C - Shelby Tube
D - Other

*These Shelby Tube Samples Obtained In An Auxiliary Boring Drilled A Few Feet From This Boring

SCALE FT.	STRATUM DEPTH, FT.	CLASSIFICATION OF MATERIAL Major Soil Components: Gravel Silt Sand Clay Minor Component Term: Trace 1-10% Some 11-35% And 36-50%	SAMPLE NUMBER & SAMPLE TYPE	DEPTH OF SAMPLE, FT. FROM	DEPTH OF SAMPLE, FT. TO	BLOWS ON SAMPLER PER SPT (6" INTERVAL)	SPT "N", OR RECOVERY (IN. FOR SHELBY TUBES, % FOR ROCK CORE)
40.0							
42.0							
			9A	43.5	45.0	32-34-30	64
44.0							
46.0							
48.0			10A	48.5	50.0	32-37-40	77
50.0							
52.0							
			11A	53.5	55.0	24-31-35	66
54.0							
56.0							
58.0	58.0	Dense, gray fine to medium SAND, trace fine gravel, trace silt (wet)	12A	58.5	60.0	21-19-24	43
60.0							
62.0							
			13A	63.5	65.0	17-19-21	40
64.0							
66.0							
68.0			14A	68.5	70.0	24-27-21	48
70.0	70.0	Dense, gray, fine to coarse SAND and fine to coarse gravel, trace silt (wet)					
72.0							
			15A	73.5	75.0	31-24-26	50
74.0							
76.0							
78.0		Becomes very dense at 78.5 feet					
			16A	78.5	80.0	28-31-30	61
80.0		BOTTOM OF BORING AT 80.0 FEET					
82.0							
84.0							

WATER LEVEL OBSERVATIONS
Noted on rods 12.0 ft.
At completion 12.0 ft.
After -- hours -- ft.

BORING METHOD
HSA Hollow Stem Auger
CFA Continuous Flight Auger
DC Driven Casing
MD Mud Drilling
RC Rock Coring
CA Casing Advancer

TYPE SAMPLE
A - Split Spoon
B - Rock Core
C - Shelby Tube
D - Other

*These Shelby Tube Samples Obtained In An Auxiliary Boring Drilled A Few Feet From This Boring

CBC Engineers & Associates, Ltd.
125 Westpark Road
Centerville, OH 45459
(P) (937) 428-6150 / (F) (937) 428-6154

BORING LOG

CLIENT: City of Moraine — REPORT NO: 7540 — BORING NO: B-6
Moraine, Ohio — DATE STD: 03-01-06 — DATE FINISHED: 03-01-06
PROJECT: Splash Moraine & Miami Shores — DRILLERS: CBC — GROUND ELEV: 710.0
LOCATION: As Shown on the Boring Location Plan — METHOD: 3¼ HSA

SCALE, FT.	STRATUM DEPTH, FT.	CLASSIFICATION OF MATERIAL Major Soil Components: Gravel, Sand, Silt, Clay Minor Component Term: Trace 1-10%, Some 11-35%, And 36-50%	SAMPLE NUMBER & SAMPLE TYPE	DEPTH OF SAMPLE, FT. FROM	DEPTH OF SAMPLE, FT. TO	BLOWS ON SAMPLER PER SPT (6" INTERVAL)	SPT "N", OR RECOVERY (IN. FOR SHELBY TUBES, % FOR ROCK CORE)
0.0	0.0	TOPSOIL					
	0.8	Stiff, brown SILT and fine to medium SAND (moist)					
2.0							
			1A	3.5	5.0	4-5-7	12
4.0							
6.0							
	7.0	Medium dense, gray, fine to coarse SAND and fine to					
8.0		coarse gravel, trace silt (damp)	2A	8.5	10.0	11-12-10	22
10.0							
12.0							
		Becomes dense and wet at 13.5 feet	3A	13.5	15.0	21-20-23	43
14.0							
16.0							
18.0			4A	18.5	20.0	19-17-15	32
20.0							
22.0	22.0	Dense, gray, fine to coarse SAND, some silt (wet)					
			5A	23.5	25.0	13-15-19	34
24.0							
26.0							
28.0	28.7	Hard, gray, CLAY, some silt, trace fine to coarse sand					
		(moist)					
30.0	28.9	Dense, brown and gray, fine to coarse SAND and fine	6A	28.5	30.0	13-17-15	32
		to coarse gravel, some silt (wet)					
32.0							
		Becomes very dense at 33.5 feet	7A	33.5	35.0	46-40-39	79
34.0							
36.0							
38.0			8A	38.5	40.0	36-24-27	51

WATER LEVEL OBSERVATIONS
Noted on rods 12.5 ft.
At completion 12.5 ft.
After — hours — ft.

BORING METHOD
HSA Hollow Stem Auger
CFA Continuous Flight Auger
DC Driven Casing
MD Mud Drilling
RC Rock Coring
CA Casing Advancer

TYPE SAMPLE
A - Split Spoon
B - Rock Core
C - Shelby Tube
D - Other

*These Shelby Tube Samples Obtained In An Auxiliary Boring Drilled A Few Feet From This Boring

SCALE FT.	STRATUM DEPTH, FT.	CLASSIFICATION OF MATERIAL Major Soil Components: Gravel Sand Silt Clay Minor Component Term: Trace 1-10% Some 11-35% And 36-50%	SAMPLE NUMBER & SAMPLE TYPE	DEPTH OF SAMPLE, FT. FROM	DEPTH OF SAMPLE, FT. TO	BLOWS ON SAMPLER PER SPT (6" INTERVAL)	SPT "N", OR RECOVERY (IN. FOR SHELBY TUBES, % FOR ROCK CORE)
40.0							
42.0							
		Becomes dense at 43.5 feet	9A	43.5	45.0	15-17-20	37
44.0							
46.0							
48.0			10A	48.5	50.0	15-18-18	36
50.0							
52.0	52.0	Dense, gray, fine to coarse SAND, some fine gravel, trace silt (wet)					
			11A	53.5	55.0	17-19-19	38
54.0							
56.0							
58.0	58.0	Very dense, gray, fine to medium SAND, trace silt (wet)	12A	58.5	60.0	37-29-32	61
60.0							
62.0							
			13A	63.5	65.0	28-26-30	56
64.0							
66.0							
68.0			14A	68.5	70.0	30-33-37	70
70.0							
72.0	72.0	Very dense, gray, fine to coarse SAND, trace gravel trace silt (wet)					
			15A	73.5	75.0	21-29-27	56
74.0							
76.0							
78.0			16A	78.5	80.0	31-42-34	76
80.0		BOTTOM OF BORING AT 80.0 FEET					
82.0							
84.0							

WATER LEVEL OBSERVATIONS
Noted on rods 12.5 ft.
At completion 12.5 ft.
After — hours — ft.

BORING METHOD
HSA Hollow Stem Auger
CFA Continuous Flight Auger
DC Driven Casing
MD Mud Drilling
RC Rock Coring
CA Casing Advancer

TYPE SAMPLE
A - Split Spoon
B - Rock Core
C - Shelby Tube
D - Other

*These Shelby Tube Samples Obtained In An Auxiliary Boring Drilled A Few Feet From This Boring

CBC Engineers & Associates, Ltd.
125 Westpark Road
Centerville, OH 45459
(P) (937) 428-6150 / (F) (937) 428-6154

BORING LOG

CLIENT: City of Moraine — REPORT NO.: 7540 — BORING NO.: B-7
DATE STD.: 03-10-06 — DATE FINISHED: 03-10-06
PROJECT: Splash Moraine & Miami Shores — DRILLERS: CBC — GROUND ELEV.: 710.0
LOCATION: As Shown on the Boring Location Plan — METHOD: 3 ¼ HSA

SCALE, FT.	STRATUM DEPTH, FT.	CLASSIFICATION OF MATERIAL	SAMPLE NUMBER & SAMPLE TYPE	DEPTH OF SAMPLE, FT. FROM	DEPTH OF SAMPLE, FT. TO	BLOWS ON SAMPLER PER SPT (6" INTERVAL)	SPT "N", OR RECOVERY (IN. FOR SHELBY TUBES, % FOR ROCK CORE)
0.0	0.0	TOPSOIL					
	13"	Medium stiff brown, CLAY, some silt, some sand,					
2.0		trace gravel (very moist)					
			1A	3.5	5.0	5-5-6	11
4.0							
6.0	6.0	Medium dense brown SAND, some gravel, trace silt					
		(damp)					
8.0			2A	8.5	10.0	8-7-7	14
10.0							
	11.6	Medium dense, gray SAND and gravel, trace silt (wet)					
12.0							
			3A	13.5	15.0	8-13-17	30
14.0							
16.0							
18.0							
	19.0	Very stiff, gray SILT and clay, some sand, trace fine	4A	18.5	20.0	10-12-12	24
20.0		gravel (wet)					
22.0							
			5A	23.5	25.0	11-13-17	30
24.0							
26.0							
28.0	28.5	Dense, brown, sand and gravel, trace silt (wet)	6A	28.5	30.0	13-19-17	36
30.0							
32.0							
			7A	33.5	35.0	17-17-18	35
34.0							
36.0							
	37.0	Hard, gray SILT, some clay, some sand, trace gravel					
38.0		(moist)	8A	38.5	40.0	24-28-26	54

Major Soil Components: Gravel, Sand, Silt, Clay
Minor Component Term: Trace 1-10%; Some 11-35%; And 36-50%

WATER LEVEL OBSERVATIONS
Noted on rods 11.5 ft.
At completion 11.5 ft.
After — hours — ft.

BORING METHOD
HSA Hollow Stem Auger
CFA Continuous Flight Auger
DC Driven Casing
MD Mud Drilling
RC Rock Coring
CA Casing Advancer

TYPE SAMPLE
A - Split Spoon
B - Rock Core
C - Shelby Tube
D - Other

*These Shelby Tube Samples Obtained In An Auxiliary Boring Drilled A Few Feet From This Boring

SCALE FT.	STRATUM DEPTH, FT.	CLASSIFICATION OF MATERIAL Major Soil Components: Gravel Sand Silt Clay Minor Component Term: Trace 1-10% Some 11-35% And 36-50%	SAMPLE NUMBER & SAMPLE TYPE	DEPTH OF SAMPLE, FT. FROM	DEPTH OF SAMPLE, FT. TO	BLOWS ON SAMPLER PER SPT (6" INTERVAL)	SPT "N", OR RECOVERY (IN. FOR SHELBY TUBES, % FOR ROCK CORE)
40.0							
42.0	42.0	Dense, gray SAND and gravel, trace silt (wet)					
			9A	43.5	45.0	29-25-24	49
44.0							
46.0							
48.0		Becomes very dense at 48.5 feet	10A	48.5	50.0	48-37-39	76
50.0							
52.0							
	53.0	Very dense, brown, SAND, some gravel, trace silt (wet)	11A	53.5	55.0	47-44-43	87
54.0							
56.0							
58.0			12A	58.5	60.0	30-29-31	60
60.0							
62.0							
	63.5	Very dense, gray SAND, some fine gravel, trace silt (wet)	13A	63.5	65.0	28-27-29	56
64.0							
66.0							
68.0			14A	68.5	70.0	31-34-30	64
70.0							
72.0							
			15A	73.5	75.0	23-29-30	59
74.0							
76.0							
	77.0	Hard, gray SILT, some clay, trace fine gravel (moist)					
78.0			16A	78.5	80.0	15-20-17	37
80.0		BOTTOM OF BORING AT 80.0 FEET					
82.0							
84.0							

WATER LEVEL OBSERVATIONS
Noted on rods 11.5 ft.
At completion 11.5 ft.
After -- hours -- ft.

BORING METHOD
HSA Hollow Stem Auger
CFA Continuous Flight Auger
DC Driven Casing
MD Mud Drilling
RC Rock Coring
CA Casing Advancer

TYPE SAMPLE
A - Split Spoon
B - Rock Core
C - Shelby Tube
D - Other

*These Shelby Tube Samples Obtained In An Auxiliary Boring Drilled A Few Feet From This Boring

CBC Engineers & Associates, Ltd.
125 Westpark Road
Centerville, OH 45459
(P) (937) 428-6150 / (F) (937) 428-6154

BORING LOG

CLIENT: City of Moraine
Moraine, Ohio
PROJECT: Splash Moraine & Miami Shores
LOCATION: As Shown on the Boring Location Plan

REPORT NO: 7540
DATE STD: 03-02-06
DRILLERS: CBC
METHOD: 3¼ HSA

BORING NO: B-8
DATE FINISHED: 03-02-06
GROUND ELEV: 715.0 ±

SCALE, FT.	STRATUM DEPTH, FT.	CLASSIFICATION OF MATERIAL Major Soil Components: Gravel, Sand, Silt, Clay Minor Component Term: Trace 1-10%, Some 11-35%, And 36-50%	SAMPLE NUMBER & SAMPLE TYPE	DEPTH OF SAMPLE, FT. FROM	DEPTH OF SAMPLE, FT. TO	BLOWS ON SAMPLER PER SPT (6" INTERVAL)	SPT "N", OR RECOVERY (IN. FOR SHELBY TUBES, % FOR ROCK CORE)
0.0	0.0	TOPSOIL					
	1.3	Loose, brown, fine to medium SAND, some silt, trace clay (damp)					
2.0			1A	3.5	5.0	4-4-3	7
4.0							
6.0							
8.0		Becomes very loose at 8.5 feet	2A	8.5	10.0	3-2-3	5
10.0							
12.0	12.8	Loose, brown and gray, fine to coarse SAND and fine gravel, trace silt (wet)	3A	13.5	15.0	7-4-4	8
14.0							
16.0							
18.0		Becomes medium dense at 18.5 feet	4A	18.5	20.0	9-10-9	19
20.0							
22.0			5A	23.5	25.0	10-7-9	16
24.0							
26.0							
28.0	28.5	Dense, brown, fine to coarse SAND, some fine to coarse gravel, trace silt (wet)	6A	28.5	30.0	20-17-19	36
30.0							
32.0							
34.0		Becomes medium dense at 33.5 feet	7A	33.5	35.0	25-19-21	30
36.0							
38.0		Becomes very dense at 38.5 feet	8A	38.5	40.0	28-25-30	55

WATER LEVEL OBSERVATIONS
Noted on rods 12.7 ft.
At completion 12.7 ft.
After -- hours -- ft.

BORING METHOD
HSA Hollow Stem Auger
CFA Continuous Flight Auger
DC Driven Casing
MD Mud Drilling
RC Rock Coring
CA Casing Advancer

TYPE SAMPLE
A - Split Spoon
B - Rock Core
C - Shelby Tube
D - Other

*These Shelby Tube Samples Obtained In An Auxiliary Boring Drilled A Few Feet From This Boring

SCALE FT.	STRATUM DEPTH, FT.	CLASSIFICATION OF MATERIAL Major Soil Components: Gravel Silt Sand Clay Minor Component Term: Trace 1-10% Some 11-35% And 36-50%	SAMPLE NUMBER & SAMPLE TYPE	DEPTH OF SAMPLE, FT. FROM	DEPTH OF SAMPLE, FT. TO	BLOWS ON SAMPLER PER SPT (6" INTERVAL)	SPT "N", OR RECOVERY (IN. FOR SHELBY TUBES, % FOR ROCK CORE)
40.0							
42.0	42.0	Dense, brown, fine to coarse SAND and fine to coarse					
		gravel, trace silt (wet)	9A	43.5	45.0	21-19-24	43
44.0							
46.0							
	47.0	Very dense, gray, fine to coarse SAND, trace fine					
48.0		gravel, trace silt (wet)	10A	48.5	50.0	25-24-30	54
50.0							
52.0							
		Becomes dense at 53.5 feet	11A	53.5	55.0	20-19-17	36
54.0							
56.0							
58.0		Becomes very dense at 58.5 feet	12A	58.5	60.0	27-29-28	57
60.0							
62.0							
			13A	63.5	65.0	31-28-32	60
64.0							
66.0							
68.0			14A	68.5	70.0	39-42-41	83
70.0	70.0	Hard, gray SILT, some clay, some fine to coarse sand,					
		trace fine gravel (damp)					
72.0							
			15A	73.5	75.0	15-19-18	37
74.0							
		BOTTOM OF BORING AT 75.0 FEET					
76.0							
78.0							
80.0							
82.0							
84.0							

WATER LEVEL OBSERVATIONS
Noted on rods 12.7 ft.
At completion 12.7 ft.
After -- hours -- ft.

BORING METHOD
HSA Hollow Stem Auger
CFA Continuous Flight Auger
DC Driven Casing
MD Mud Drilling
RC Rock Coring
CA Casing Advancer

TYPE SAMPLE
A - Split Spoon
B - Rock Core
C - Shelby Tube
D - Other

*These Shelby Tube Samples Obtained In An Auxiliary Boring Drilled A Few Feet From This Boring

CBC-9/MW-9

CBC Engineers & Associates, Ltd.
125 Westpark Road
Centerville, OH 45459
(P) (937) 428-6150 / (F) (937) 428-6154

BORING LOG

CLIENT: City of Moraine | REPORT NO: 7540 | BORING NO: B-9
PROJECT: Splash Moraine & Miami Shores | DATE STD: 03-15-06 | DATE FINISHED: 03-15-06
LOCATION: As Shown on the Boring Location Plan | DRILLERS: CBC | GROUND ELEV: 714.0
METHOD: 3 1/4" HSA

SCALE, FT.	STRATUM DEPTH, FT.	CLASSIFICATION OF MATERIAL Major Soil Components: Gravel, Sand, Silt, Clay Minor Component Term: Trace 1-10%, Some 11-35%, And 36-50%	SAMPLE NUMBER & SAMPLE TYPE	DEPTH OF SAMPLE, FT. FROM	DEPTH OF SAMPLE, FT. TO	BLOWS ON SAMPLER PER SPT (6" INTERVAL)	SPT "N", OR RECOVERY (IN. FOR SHELBY TUBES, % FOR ROCK CORE)
0.0	0.0	TOPSOIL					
	16"	Medium stiff, brown SILT, some clay, some sand trace gravel (very moist)					
2.0			1A	3.5	5.0	4-4-5	9
4.0							
6.0							
8.0							
	9.0	Medium dense, brown SAND, some fine gravel, some silt (wet)	2A	8.5	10.0	4-10-10	20
10.0							
12.0	12.0	Medium dense, brown SAND, trace gravel, trace silt (wet)	3A	13.5	15.0	13-15-17	32
14.0							
16.0							
18.0			4A	18.5	20.0	15-15-16	31
20.0							
22.0							
			5A	23.5	25.0	25-32-30	62
24.0							
26.0							
28.0	28.0	Very dense, fine brown SAND, some gravel, trace silt (wet)	6A	28.5	30.0	32-60-34	64
30.0							
32.0							
			7A	33.5	35.0	41-40-38	78
34.0							
36.0							
38.0	38.5	Dense, gray SAND, some fine to medium gravel, trace silt (wet)	8A	38.5	40.0	30-17-19	36

WATER LEVEL OBSERVATIONS
Noted on rods 9.0 ft.
At completion 9.0 ft.
After -- hours -- ft.

BORING METHOD
HSA Hollow Stem Auger
CFA Continuous Flight Auger
DC Driven Casing
MD Mud Drilling
RC Rock Coring
CA Casing Advancer

TYPE SAMPLE
A - Split Spoon
B - Rock Core
C - Shelby Tube
D - Other

*These Shelby Tube Samples Obtained In An Auxiliary Boring Drilled A Few Feet From This Boring

SCALE FT.	STRATUM DEPTH, FT.	CLASSIFICATION OF MATERIAL Major Soil Components: Gravel Sand Silt Clay Minor Component Term: Trace 1-10% Some 11-35% And 36-50%	SAMPLE NUMBER & SAMPLE TYPE	DEPTH OF SAMPLE, FT. FROM	DEPTH OF SAMPLE, FT. TO	BLOWS ON SAMPLER PER SPT (6" INTERVAL)	SPT "N", OR RECOVERY (IN. FOR SHELBY TUBES, % FOR ROCK CORE)
40.0							
42.0							
44.0	44.0	Hard, gray SILT, some clay, some sand, trace gravel (wet)	9A	43.5	45.0	42-43-40	83
46.0	45.0	Very dense, gray SAND and gravel, trace silt (wet)					
48.0			10A	48.5	50.0	37-19-32	51
50.0							
52.0			11A	53.5	55.0	37-29-32	61
54.0							
56.0							
58.0			12A	58.5	60.0	39-35-37	72
60.0							
62.0							
			13A	63.5	65.0	50/6	100+
64.0							
66.0	66.0	Fine gray SAND, some gravel (wet)					
68.0							
70.0							
72.0							
		BOTTOM OF BORING AT 73.0 FEET					
74.0							
76.0							
78.0							
80.0							
82.0							
84.0							

WATER LEVEL OBSERVATIONS
Noted on rods 9.0 ft.
At completion 9.0 ft.
After — hours — ft.

BORING METHOD
HSA Hollow Stem Auger
CFA Continuous Flight Auger
DC Driven Casing
MD Mud Drilling
RC Rock Coring
CA Casing Advancer

TYPE SAMPLE
A - Split Spoon
B - Rock Core
C - Shelby Tube
D - Other

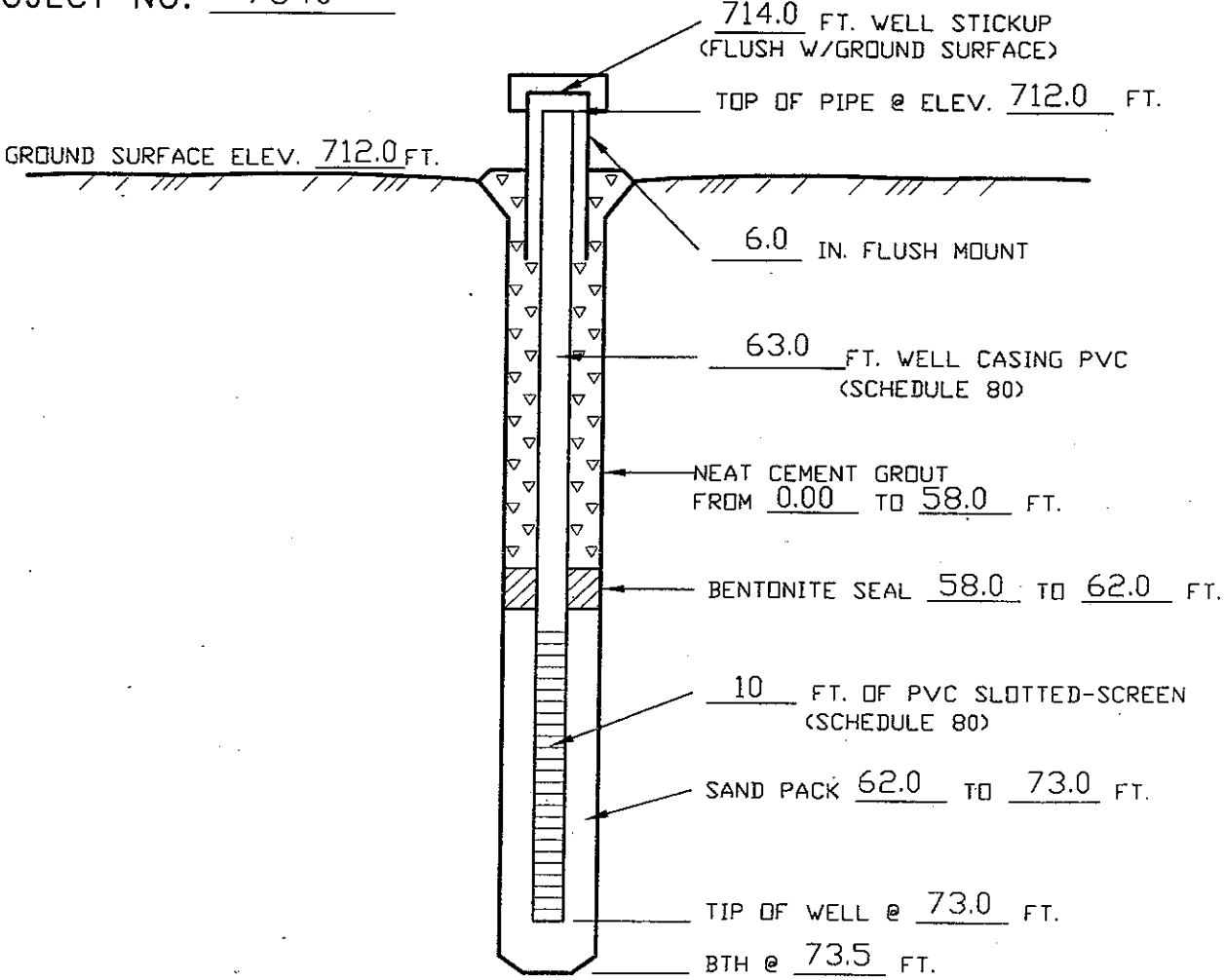
*These Shelby Tube Samples Obtained In An Auxiliary Boring Drilled A Few Feet From This Boring

WELL NO. MW-9 (OLD)

CLIENT CITY OF MORAINE, OHIO

PROJECT GROUND WATER MANAGEMENT

PROJECT NO. 7540



NO. OF SPLIT SPOONS 17

MATERIALS USED		
RISER	63.0	FT.
SCREEN	10	FT.
SAND	5	BAGS
CEMENT	2	BAGS
BENT. PWDR.	-	BAGS
BENT. PELLETS	2	BKTS.
PROT. COVER	1	
INNER LOCK CAP	1	
PADLOCK	-	
TOP CAP	1	
GUARD POSTS	-	
BOTTOM PLUG	1	

DATE INSTALLED	03/15/06
DATE DEVELOPED	
METHOD OF DRILLING	HSA-3 1/4
METHOD OF DEVELOP	
DURATION OF DEVELOP	
DRILLER	STEVE
INSPECTOR	

GROUNDWATER LEVEL OBSERVATIONS DURING DRILLING, (FT.)

	DEPTH	ELEV
Water first encountered	9'	
Water at completion	11.6'	

IN WELL

DATE	WATER ELEV. (FT)

MONITORING WELL CONSTRUCTION FIELD DETAILS

CBC ENGINEERS & ASSOCIATES
DAYTON, OHIO

CBC Engineers & Associates, Ltd.
125 Westpark Road
Centerville, OH 45459
(P) (937) 428-6150 / (F) (937) 428-6154

BORING LOG

CLIENT: City of Moraine | REPORT NO.: 7540 | BORING NO.: B-10
DATE STD.: 02-03-06 | DATE FINISHED: 02-03-06
PROJECT: Splash Moraine & Miami Shores | DRILLERS: CBC | GROUND ELEV.: 720.0
LOCATION: As Shown on the Boring Location Plan | METHOD: 3 ¼" HSA

SCALE, FT.	STRATUM DEPTH, FT.	CLASSIFICATION OF MATERIAL Major Soil Components: Gravel, Sand, Silt, Clay Minor Component Term: Trace 1-10%, Some 11-35%, And 36-50%	SAMPLE NUMBER & SAMPLE TYPE	DEPTH OF SAMPLE, FT. FROM	DEPTH OF SAMPLE, FT. TO	BLOWS ON SAMPLER PER SPT (6" INTERVAL)	SPT "N", OR RECOVERY (IN. FOR SHELBY TUBES, % FOR ROCK CORE)
0.0	0.0	TOPSOIL					
	0.9	Medium stiff, brown SILT, some clay, some fine sand (moist)					
2.0							
			1A	3.5	5.0	2-3-4	7
4.0							
6.0							
8.0		Becomes stiff at 8.5 feet	2A	8.5	10.0	4-5-7	12
10.0							
12.0							
14.0	14.0	Medium dense, brown fine to medium SAND, some silt, trace fine gravel (damp)	3A	13.5	15.0	3-4-10	14
16.0							
	17.0	Medium dense, brown fine to coarse SAND and gravel trace silt (wet)					
18.0			4A	18.5	20.0	10-5-7	12
20.0	22.0	Medium dense, brown fine to coarse SAND, some fine gravel, trace silt (wet)					
22.0							
			5A	23.5	25.0	12-9-12	21
24.0							
26.0							
28.0			6A	28.5	30.0	12-13-10	23
30.0							
32.0							
			7A	33.5	35.0	13-14-14	28
34.0							
36.0							
38.0	38.5	Dense, brown, fine to coarse SAND and fine gravel, trace silt (wet)	8A	38.5	40.0	10-18-16	34

WATER LEVEL OBSERVATIONS
Noted on rods 17.0 ft.
At completion 17.0 ft.
After -- hours -- ft.

BORING METHOD
HSA Hollow Stem Auger
CFA Continuous Flight Auger
DC Driven Casing
MD Mud Drilling
RC Rock Coring
CA Casing Advancer

TYPE SAMPLE
A - Split Spoon
B - Rock Core
C - Shelby Tube
D - Other

*These Shelby Tube Samples Obtained In An Auxiliary Boring Drilled A Few Feet From This Boring

SCALE FT.	STRATUM DEPTH, FT.	CLASSIFICATION OF MATERIAL Major Soil Components: Gravel, Sand, Silt, Clay Minor Component Term: Trace 1-10%, Some 11-35%, And 36-50%	SAMPLE NUMBER & SAMPLE TYPE	DEPTH OF SAMPLE, FT. FROM	DEPTH OF SAMPLE, FT. TO	BLOWS ON SAMPLER PER SPT (6" INTERVAL)	SPT "N", OR RECOVERY (IN. FOR SHELBY TUBES, % FOR ROCK CORE)
40.0							
42.0							
			9A	43.5	45.0	13-13-15	28
44.0							
46.0							
48.0		Becomes dense at 48.5 feet	10A	48.5	50.0	24-24-26	50
50.0							
52.0							
			11A	53.5	55.0	20-23-27	50
54.0							
56.0	56.0	Very dense, gray fine to medium SAND, some fine gravel, trace silt (wet)					
58.0			12A	58.5	60.0	27-25-28	53
60.0							
62.0	62.0	Hard, gray SILT, some clay, some fine sand, trace gravel (damp)					
			13A	63.5	64.8	48-46-50/4	100+
64.0							
66.0							
68.0			14A	68.5	70.0	35-44-46	90
70.0		BOTTOM OF BORING AT 70.0 FEET					
72.0							
74.0							
76.0							
78.0							
80.0							
82.0							
84.0							

WATER LEVEL OBSERVATIONS
Noted on rods 17.0 ft.
At completion 17.0 ft.
After __ hours __ ft.

BORING METHOD
HSA Hollow Stem Auger
CFA Continuous Flight Auger
DC Driven Casing
MD Mud Drilling
RC Rock Coring
CA Casing Advancer

TYPE SAMPLE
A - Split Spoon
B - Rock Core
C - Shelby Tube
D - Other

*These Shelby Tube Samples Obtained In An Auxiliary Boring Drilled A Few Feet From This Boring

CBC-11/MW-4

CBC Engineers & Associates, Ltd.
125 Westpark Road
Centerville, OH 45459
(P) (937) 428-6150 / (F) (937) 428-6154

BORING LOG

CLIENT: City of Moraine
Moraine, Ohio
PROJECT: Splash Moraine & Miami Shores
LOCATION: As Shown on the Boring Location Plan

REPORT NO.: 8418 | BORING NO.: B-11
DATE STD.: 11-10-06 | DATE FINISHED: 11-10-06
DRILLERS: CBC | GROUND ELEV.: 707.0
METHOD: 2-¼ HSA

SCALE, FT.	STRATUM DEPTH, FT.	CLASSIFICATION OF MATERIAL	SAMPLE NUMBER & SAMPLE TYPE	DEPTH OF SAMPLE, FT. FROM	DEPTH OF SAMPLE, FT. TO	BLOWS ON SAMPLER PER SPT (6" INTERVAL)	SPT "N", OR RECOVERY (IN. FOR SHELBY TUBES, % FOR ROCK CORE)
0.0	0.0	TOPSOIL					
	5"	Stiff dark brown CLAY and SILT, some sand	1A	1.0	2.5	5-6-6	12
2.0		(alluvium)					
4.0	4.0	Medium dense brown SAND and GRAVEL, trace silt	2A	3.5	5.0	5-6-8	14
		(damp)					
6.0		Becomes wet at 6.8'	3A	6.0	7.5	9-11-10	21
8.0			4A	8.5	10.0	13-12-13	25
12.0			5A	13.5	15.0	5-12-13	25
18.0		Becomes very dense at 18.5'	6A	18.5	19.5	22-50/6"	100+
22.0			7A	23.5	25.0	18-32-38	70
28.0			8A	28.5	30.0	28-48-45	93
32.0			9A	33.5	35.0	30-24-36	60
38.0			10A	38.5	40.0	27-30-29	59
		BOTTOM OF BORING AT 40.0'					

Major Soil Components: Gravel, Sand, Silt, Clay
Minor Component Term: Trace 1-10%, Some 11-35%, And 36-50%

WATER LEVEL OBSERVATIONS
Noted on rods 6.8 ft.
At completion 6.8 ft.
After — hours — ft.

BORING METHOD
HSA Hollow Stem Auger
CFA Continuous Flight Auger
DC Driven Casing
MD Mud Drilling
RC Rock Coring
CA Casing Advancer

TYPE SAMPLE
A - Split Spoon
B - Rock Core
C - Shelby Tube
D - Other

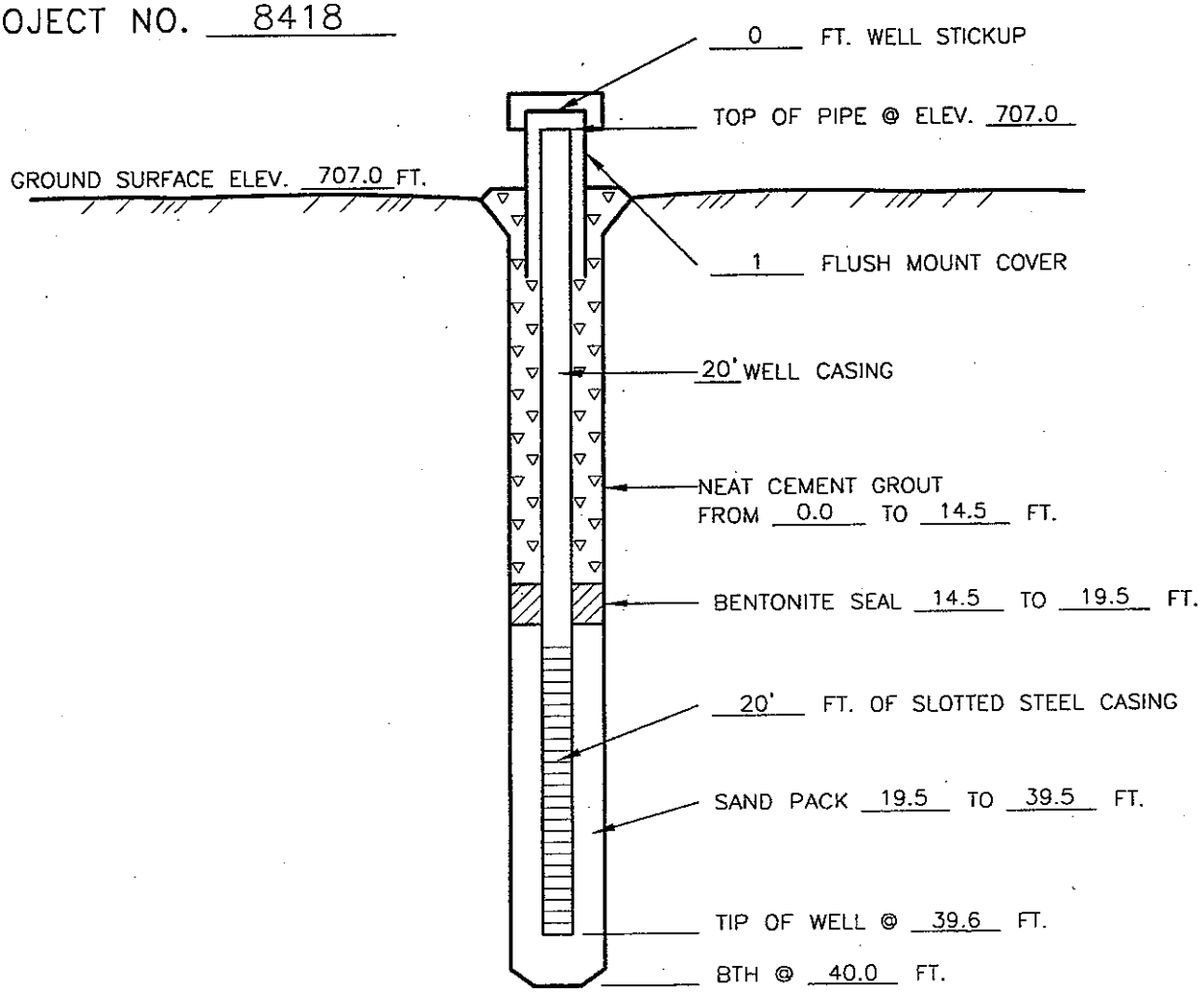
*These Shelby Tube Samples Obtained In An Auxiliary Boring Drilled A Few Feet From This Boring

WELL NO. MW-4 (NEW)

CLIENT CITY OF MORAINE, OHIO

PROJECT GROUND WATER MANAGEMENT

PROJECT NO. 8418



NO. OF SPLIT SPOONS 10

MATERIALS USED		
RISER	20'	FT.
SCREEN	20'	FT.
SAND	8	BAGS
CEMENT	1	BAGS
BENT. PWDR.	–	BAGS
BENT. PELLETS	2	BKTS.
PROT. FLUSH MOUNT	1	
INNER LOCK CAP	–	
PADLOCK	1	
TOP CAP	1	
GUARD POSTS	–	
BOTTOM PLUG	1	

DATE INSTALLED	11-10-06
DATE DEVELOPED	11-10-06
METHOD OF DRILLING	HSA-3 1/4
METHOD OF DEVELOP	2" PVC PIPE
DURATION OF DEVELOP	–
DRILLER	STEVE
INSPECTOR	–

GROUNDWATER LEVEL OBSERVATIONS DURING DRILLING, (FT.)

	DEPTH	ELEV
Water first encountered	8.5	
Water at completion	–	

IN WELL

DATE	WATER ELEV. (FT)

MONITORING WELL CONSTRUCTION FIELD DETAILS

CBC ENGINEERS & ASSOCIATES
DAYTON, OHIO

CBC-12/MW-5

CBC Engineers & Associates, Ltd.
125 Westpark Road
Centerville, OH 45459
(P) (937) 428-6150 / (F) (937) 428-6154

BORING LOG

CLIENT: City of Moraine
Moraine, Ohio
PROJECT: Splash Moraine & Miami Shores
LOCATION: As Shown on the Boring Location Plan

REPORT NO.: 8418
DATE STD.: 11-20-06
DRILLERS: CBC
METHOD: 2 ¼ HSA

BORING NO.: B-12
DATE FINISHED: 11-20-06
GROUND ELEV.: 709.0

SCALE, FT.	STRATUM DEPTH, FT.	CLASSIFICATION OF MATERIAL	SAMPLE NUMBER & SAMPLE TYPE	DEPTH OF SAMPLE, FT. FROM	DEPTH OF SAMPLE, FT. TO	BLOWS ON SAMPLER PER SPT (6" INTERVAL)	SPT "N", OR RECOVERY (IN. FOR SHELBY TUBES, % FOR ROCK CORE)
0.0	0.0	TOPSOIL					
	7"	Medium dense brown SAND and GRAVEL, trace silt (moist)					
2.0			1A	3.5	5.0	10-12-12	24
4.0							
6.0		Becomes very dense and wet at 7.2'					
8.0			2A	8.5	10.0	17-27-30	57
10.0							
12.0							
14.0							
16.0							
18.0							
20.0							
22.0							
24.0							
26.0							
28.0							
30.0							
32.0							
34.0							
36.0							
38.0							
		BOTTOM OF BORING AT 43.0'					

Major Soil Components: Gravel, Sand, Silt, Clay
Minor Component Term: Trace 1-10%, Some 11-35%, And 36-50%

WATER LEVEL OBSERVATIONS
Noted on rods 7.2 ft.
At completion 7.2 ft.
After — hours — ft.

BORING METHOD
HSA Hollow Stem Auger
CFA Continuous Flight Auger
DC Driven Casing
MD Mud Drilling
RC Rock Coring
CA Casing Advancer

TYPE SAMPLE
A - Split Spoon
B - Rock Core
C - Shelby Tube
D - Other

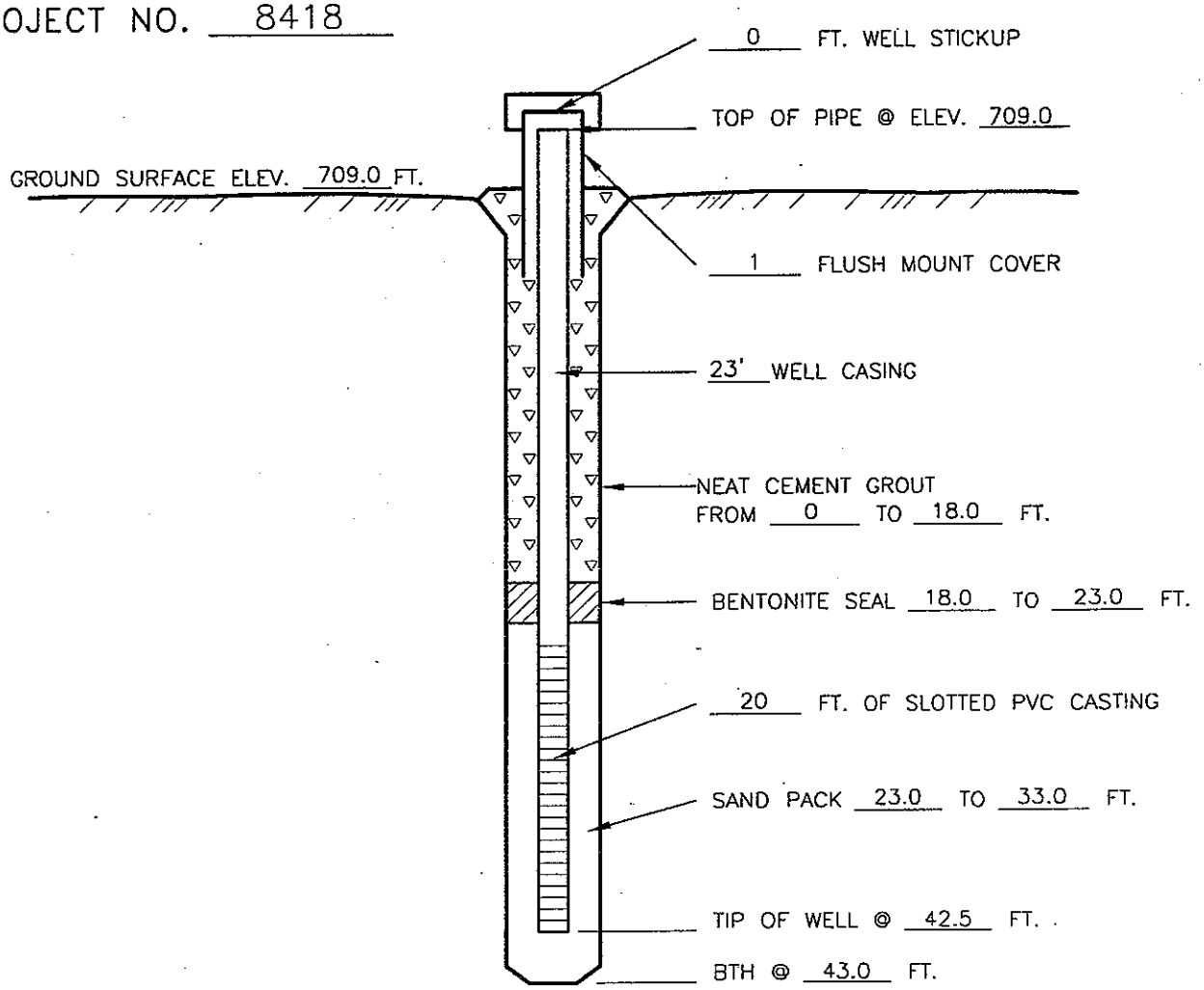
*These Shelby Tube Samples Obtained In An Auxiliary Boring Drilled A Few Feet From This Boring

WELL NO. MW-5 (NEW)

CLIENT CITY OF MORAINE, OHIO

PROJECT GROUND WATTER MANAGMENT

PROJECT NO. 8418



NO. OF SPLIT SPOONS -

MATERIALS USED		
RISER	23	FT.
SCREEN	20	FT.
SAND	8	BAGS
CEMENT	1	BAGS
BENT. PWDR.	0	BAGS
BENT. PELLETS	2	BKTS.
PROT. COVER	1	
INNER LOCK CAP	-	
PADLOCK	1	
TOP CAP	1	
GUARD POSTS	-	
BOTTOM PLUG	1	

DATE INSTALLED	11-20-06
DATE DEVELOPED	-
METHOD OF DRILLING	HSA-3 1/4
METHOD OF DEVELOP	-
DURATION OF DEVELOP	-
DRILLER	STEVE
INSPECTOR	-

GROUNDWATER LEVEL OBSERVATIONS DURING DRILLING, (FT.)

	DEPTH	ELEV
Water first encountered	7.25	
Water at completion	-	

IN WELL

DATE	WATER ELEV. (FT)

MONITORING WELL CONSTRUCTION FIELD DETAILS

CBC ENGINEERS & ASSOCIATES
DAYTON, OHIO

CBC-13/MW-6

CBC Engineers & Associates, Ltd.
125 Westpark Road
Centerville, OH 45459
(P) (937) 428-6150 / (F) (937) 428-6154

BORING LOG

CLIENT: City of Moraine — REPORT NO: 8418 — BORING NO: B-13
Moraine, Ohio — DATE STD: 11-17-06 — DATE FINISHED: 11-17-06
PROJECT: Splash Moraine & Miami Shores — DRILLERS: CBC — GROUND ELEV: 708.0
LOCATION: As Shown on the Boring Location Plan — METHOD: 2 ¼ HSA

SCALE, FT.	STRATUM DEPTH, FT.	CLASSIFICATION OF MATERIAL	SAMPLE NUMBER & SAMPLE TYPE	DEPTH OF SAMPLE, FT. FROM	DEPTH OF SAMPLE, FT. TO	BLOWS ON SAMPLER PER SPT (6" INTERVAL)	SPT "N", OR RECOVERY (IN. FOR SHELBY TUBES, % FOR ROCK CORE)
0.0	0.0	TOPSOIL					
	8"	Stiff brown CLAY and SILT, some sand (moist)					
2.0							
			1A	3.5	5.0	4-5-6	11
4.0							
6.0							
	6.9	Medium dense brown SAND and fine to medium					
8.0		gravel, trace silt (wet)	2A	8.5	10.0	12-13-13	26
10.0							
12.0							
14.0							
16.0							
18.0							
20.0							
22.0							
24.0							
26.0							
28.0							
30.0							
32.0							
34.0							
36.0							
38.0							
		BOTTOM OF BORING AT 42.6'					

Minor Component Term: Trace 1-10%; Some 11-35%; And 36-50%

WATER LEVEL OBSERVATIONS
Noted on rods 6.9 ft.
At completion 6.9 ft.
After -- hours -- ft.

BORING METHOD
HSA Hollow Stem Auger
CFA Continuous Flight Auger
DC Driven Casing
MD Mud Drilling
RC Rock Coring
CA Casing Advancer

TYPE SAMPLE
A - Split Spoon
B - Rock Core
C - Shelby Tube
D - Other

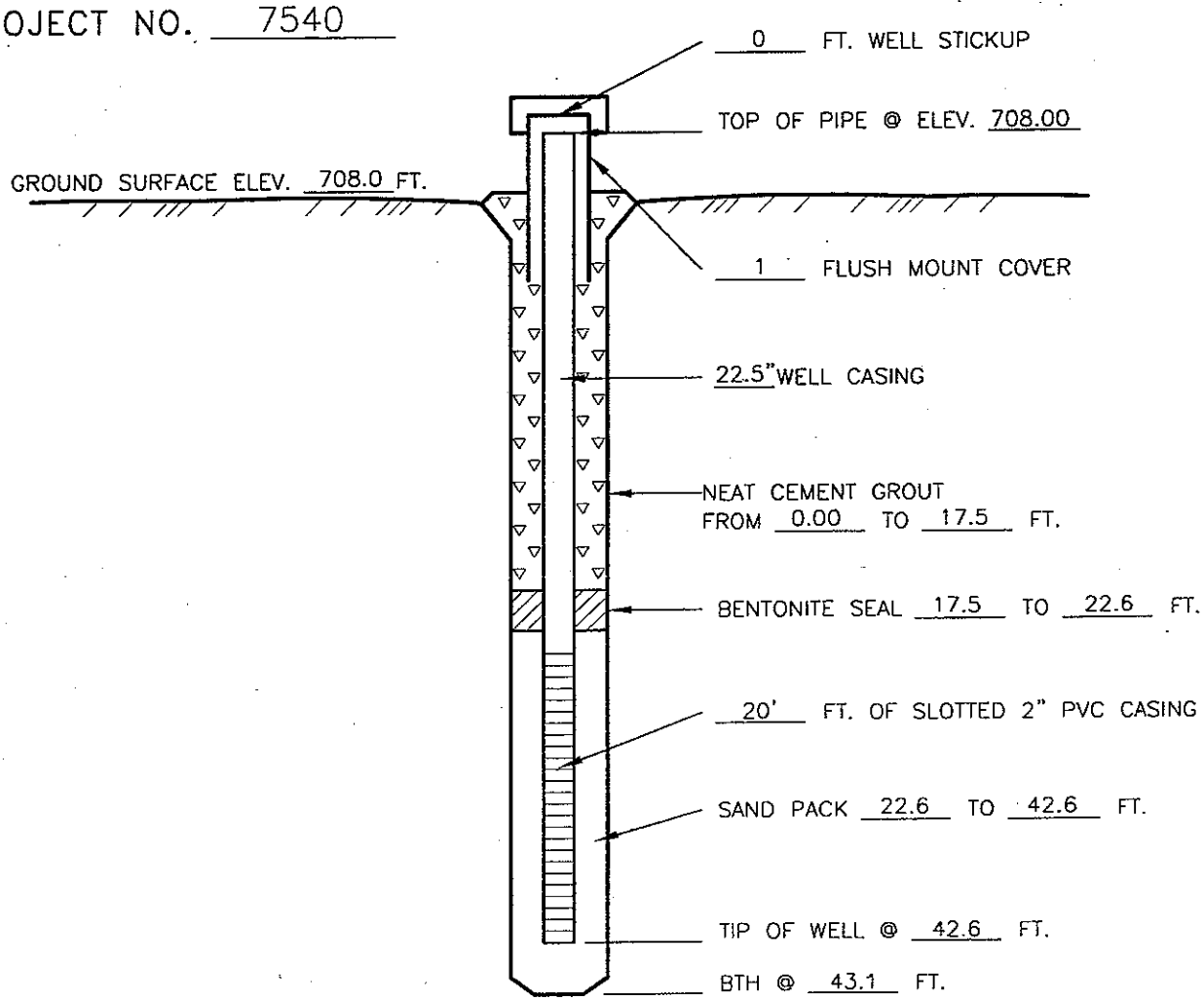
*These Shelby Tube Samples Obtained In An Auxiliary Boring Drilled A Few Feet From This Boring

WELL NO. MW-6 (NEW)

CLIENT CITY OF MORANIE

PROJECT GROUND WATER MANGEMENT

PROJECT NO. 7540



NO. OF SPLIT SPOONS 2

MATERIALS USED		
RISER	22.5	FT.
SCREEN	20	FT.
SAND	8	BAGS
CEMENT	1	BAGS
BENT. PWDR.	–	BAGS
BENT. PELLETS	2	BKTS.
PROT. FLUSH MOUNT	1	
INNER LOCK CAP	–	
PADLOCK	1	
TOP CAP	1	
GUARD POSTS	–	
BOTTOM PLUG	1	

DATE INSTALLED	11-17-06
DATE DEVELOPED	–
METHOD OF DRILLING	HSA- 3 1/4
METHOD OF DEVELOP	–
DURATION OF DEVELOP	–
DRILLER	STEVE
INSPECTOR	–

GROUNDWATER LEVEL OBSERVATIONS DURING DRILLING, (FT.)

	DEPTH	ELEV
Water first encountered	6.83	
Water at completion	–	

IN WELL

DATE	WATER ELEV. (FT)

MONITORING WELL CONSTRUCTION FIELD DETAILS

CBC ENGINEERS & ASSOCIATES
DAYTON, OHIO

CBC-14/MW-7

CBC Engineers & Associates, Ltd.
125 Westpark Road
Centerville, OH 45459
(P) (937) 428-6150 / (F) (937) 428-6154

BORING LOG

CLIENT: City of Moraine
Moraine, Ohio
PROJECT: Splash Moraine & Miami Shores
LOCATION: As Shown on the Boring Location Plan

REPORT NO.: 8418
DATE STD.: 11-20-06
DRILLERS: CBC
METHOD: 2¼ HSA

BORING NO.: B-14
DATE FINISHED: 11-20-06
GROUND ELEV.: 710.0

SCALE, FT.	STRATUM DEPTH, FT.	CLASSIFICATION OF MATERIAL Major Soil Components: Gravel, Sand, Silt, Clay Minor Component Term: Trace 1-10%, Some 11-35%, And 36-50%	SAMPLE NUMBER & SAMPLE TYPE	DEPTH OF SAMPLE, FT. FROM	DEPTH OF SAMPLE, FT. TO	BLOWS ON SAMPLER PER SPT (6" INTERVAL)	SPT "N", OR RECOVERY (IN. FOR SHELBY TUBES, % FOR ROCK CORE)
0.0	0.0	TOPSOIL					
	9"	Stiff brown CLAY and SILT, some sand (moist)					
2.0							
			1A	3.5	5.0	3-5-7	12
4.0							
6.0							
8.0	8.1	Medium dense brown SAND and GRAVEL, trace silt (wet)					
			2A	8.5	10.0	5-9-8	17
10.0							
12.0							
14.0							
16.0							
18.0							
20.0							
22.0							
24.0							
26.0							
28.0							
30.0							
32.0							
34.0							
36.0							
38.0							
		BOTTOM OF BORING AT 38.8'					

WATER LEVEL OBSERVATIONS
Noted on rods 8.1 ft.
At completion 8.1 ft.
After -- hours -- ft.

BORING METHOD
HSA Hollow Stem Auger
CFA Continuous Flight Auger
DC Driven Casing
MD Mud Drilling
RC Rock Coring
CA Casing Advancer

TYPE SAMPLE
A - Split Spoon
B - Rock Core
C - Shelby Tube
D - Other

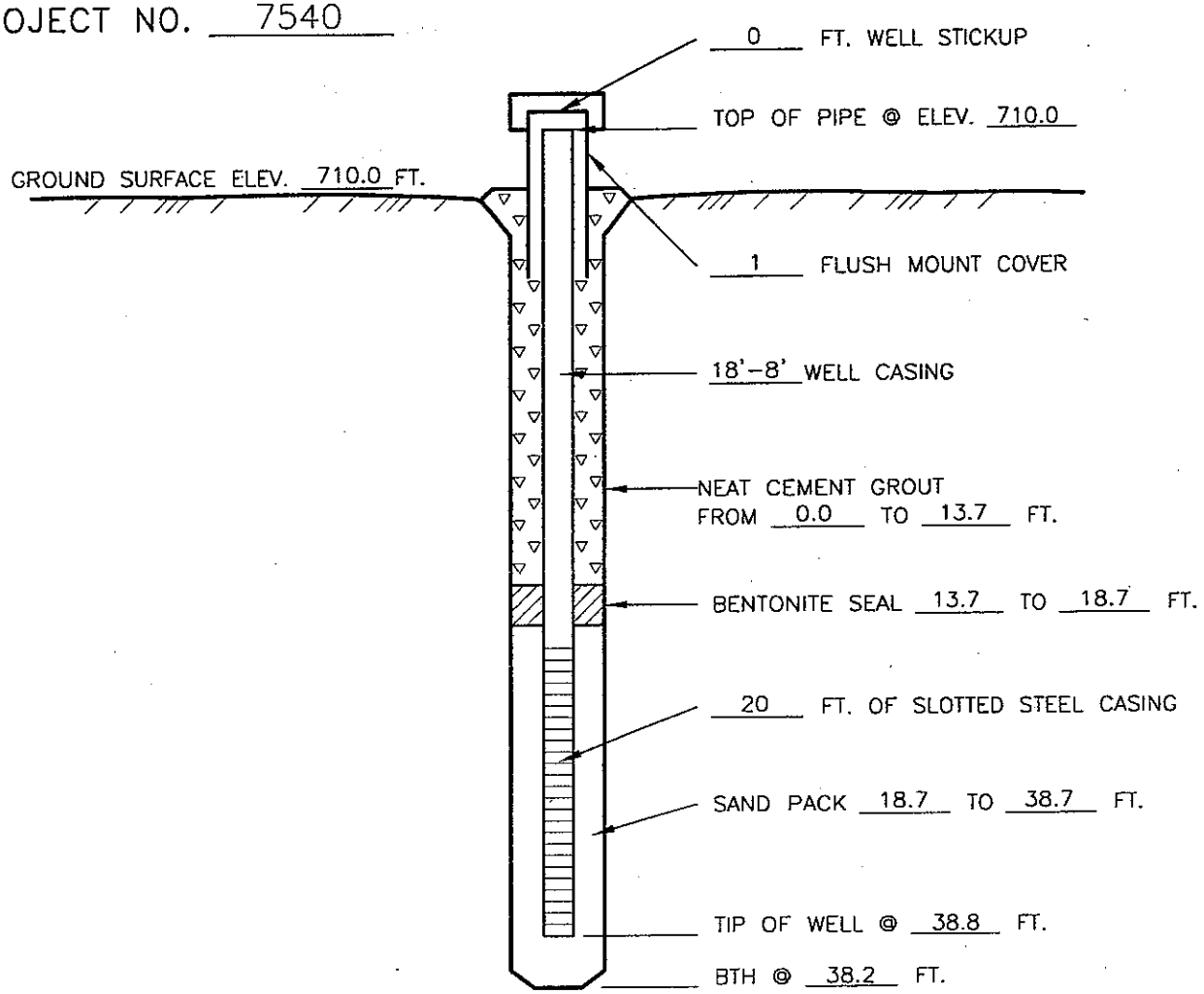
*These Shelby Tube Samples Obtained In An Auxiliary Boring Drilled A Few Feet From This Boring

WELL NO. MW-7 (NEW)

CLIENT CITY OF MORAINE

PROJECT GROUND WATER MANAGEMENT

PROJECT NO. 7540



NO. OF SPLIT SPOONS 0

MATERIALS USED		
RISER	18.66	FT.
SCREEN	20	FT.
SAND	8	BAGS
CEMENT	1	BAGS
BENT. PWDR.	–	BAGS
BENT. PELLETS	2	BKTS.
PROT. FLUSH MOUNT	1	
INNER LOCK CAP	–	
PADLOCK	1	
TOP CAP	1	
GUARD POSTS	–	
BOTTOM PLUG	1	

DATE INSTALLED	–
DATE DEVELOPED	–
METHOD OF DRILLING	HSA- 3 1/4
METHOD OF DEVELOP	–
DURATION OF DEVELOP	–
DRILLER	–
INSPECTOR	–

GROUNDWATER LEVEL OBSERVATIONS DURING DRILLING, (FT.)

	DEPTH	ELEV
Water first encountered	8.16	
Water at completion	–	

IN WELL

DATE	WATER ELEV. (FT)

MONITORING WELL CONSTRUCTION FIELD DETAILS

CBC ENGINEERS & ASSOCIATES
DAYTON, OHIO

CBC-15/MW-8

CBC Engineers & Associates, Ltd.
125 Westpark Road
Centerville, OH 45459
(P) (937) 428-6150 / (F) (937) 428-6154

BORING LOG

CLIENT: City of Moraine
Moraine, Ohio
PROJECT: Splash Moraine & Miami Shores
LOCATION: As Shown on the Boring Location Plan

REPORT NO.: 8418 | BORING NO.: B-15
DATE STD.: 11-17-06 | DATE FINISHED: 11-17-06
DRILLERS: CBC | GROUND ELEV.: 708.0
METHOD: 2 ¼ HSA

SCALE, FT.	STRATUM DEPTH, FT.	CLASSIFICATION OF MATERIAL	SAMPLE NUMBER & SAMPLE TYPE	DEPTH OF SAMPLE, FT. FROM	DEPTH OF SAMPLE, FT. TO	BLOWS ON SAMPLER PER SPT (6" INTERVAL)	SPT "N", OR RECOVERY (IN. FOR SHELBY TUBES, % FOR ROCK CORE)
0.0	0.0	TOPSOIL					
	10"	Medium stiff brown CLAY and SILT, some sand (moist)					
2.0			1A	3.5	5.0	4-4-4	8
4.0							
6.0							
	6.6	Medium dense brown SAND and GRAVEL, trace silt (wet)					
8.0			2A	8.5	10.0	11-15-16	31
10.0							
12.0							
14.0							
16.0							
18.0			3A	18.5	20.0	4-8-6	14
20.0							
22.0							
24.0							
26.0							
28.0							
30.0							
32.0							
34.0							
36.0							
38.0							
		BOTTOM OF BORING AT 42.3'					

Major Soil Components: Gravel, Sand, Silt, Clay
Minor Component Term: Trace 1-10%, Some 11-35%, And 36-50%

WATER LEVEL OBSERVATIONS
Noted on rods 6.6 ft.
At completion 6.6 ft.
After ___ hours ___ ft.

BORING METHOD
HSA Hollow Stem Auger
CFA Continuous Flight Auger
DC Driven Casing
MD Mud Drilling
RC Rock Coring
CA Casing Advancer

TYPE SAMPLE
A - Split Spoon
B - Rock Core
C - Shelby Tube
D - Other

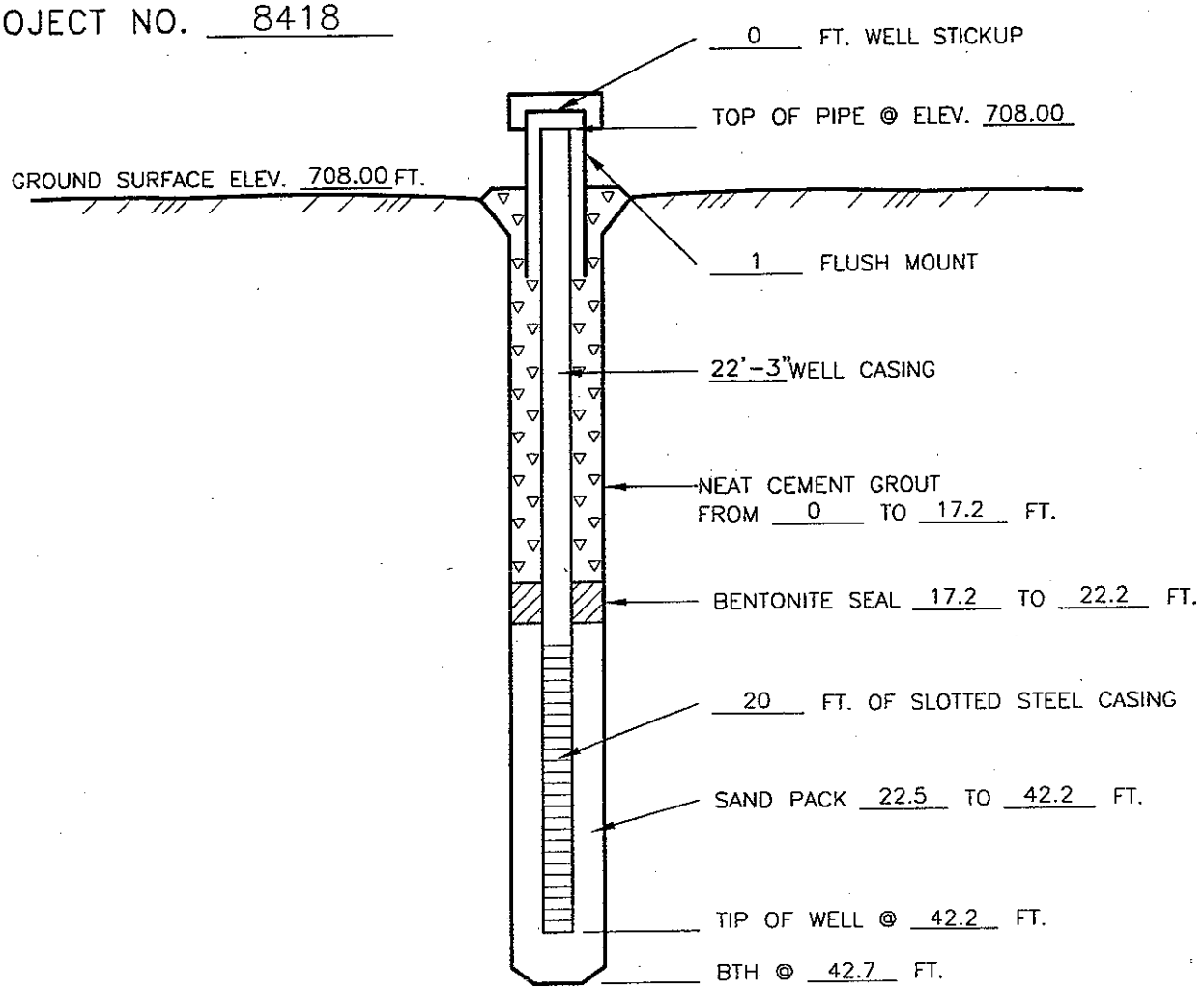
*These Shelby Tube Samples Obtained In An Auxiliary Boring Drilled A Few Feet From This Boring

WELL NO. MW-8 (NEW)

CLIENT CITY OF MORAINE, OHIO

PROJECT GROUND WATER MANAGEMENT

PROJECT NO. 8418



NO. OF SPLIT SPOONS 3

MATERIALS USED		
RISER	22.3	FT.
SCREEN	20	FT.
SAND	8	BAGS
CEMENT	1	BAGS
BENT. PWDR.	–	BAGS
BENT. PELLETS	2	BKTS.
FLUSH MOUNT	1	
INNER LOCK CAP	–	
PADLOCK	1	
TOP CAP	1	
GUARD POSTS	–	
BOTTOM PLUG	1	

DATE INSTALLED	11/17/06
DATE DEVELOPED	–
METHOD OF DRILLING	HSA- 3 1/4
METHOD OF DEVELOP	–
DURATION OF DEVELOP	–
DRILLER	STEVE
INSPECTOR	–

GROUNDWATER LEVEL OBSERVATIONS DURING DRILLING, (FT.)

	DEPTH	ELEV
Water first encountered	6.7	
Water at completion	–	

IN WELL

DATE	WATER ELEV. (FT)

MONITORING WELL CONSTRUCTION FIELD DETAILS

CBC ENGINEERS & ASSOCIATES
DAYTON, OHIO

CBC-16/MW-10

CBC Engineers & Associates, Ltd.
125 Westpark Road
Centerville, OH 45459
(P) (937) 428-6150 / (F) (937) 428-6154

BORING LOG

CLIENT: City of Moraine
Moraine, Ohio
PROJECT: Splash Moraine & Miami Shores
LOCATION: As Shown on the Boring Location Plan

REPORT NO.: 8418
DATE STD: 12-5-06
DRILLERS: CBC
METHOD: 2 ¼ HSA

BORING NO.: B-16
DATE FINISHED: 12-5-06
GROUND ELEV.: 708.0

SCALE, FT.	STRATUM DEPTH, FT.	CLASSIFICATION OF MATERIAL	SAMPLE NUMBER & SAMPLE TYPE	DEPTH OF SAMPLE, FT. FROM	DEPTH OF SAMPLE, FT. TO	BLOWS ON SAMPLER PER SPT (6" INTERVAL)	SPT "N", OR RECOVERY (IN. FOR SHELBY TUBES, % FOR ROCK CORE)
0.0	0.0	TOPSOIL					
	5"	Medium dense, brown fine to coarse SAND, trace silt,					
2.0		trace fine gravel (moist)					
			1A	3.5	5.0	7-8-7	15
4.0							
6.0							
8.0							
	8.1	Medium dense brown fine to coarse SAND, some fine					
10.0		to coarse gravel, trace silt (moist)	2A	8.5	10.0	10-11-12	23
12.0							
14.0							
16.0							
18.0							
		Becomes dense and wet @ 18.5'	3A	18.5	20.0	15-18-20	38
20.0							
22.0							
24.0							
26.0							
28.0							
30.0							
32.0							
34.0							
36.0							
38.0							
		BOTTOM OF BORING AT 40.0'					

WATER LEVEL OBSERVATIONS
Noted on rods 8.1 ft.
At completion 8.1 ft.
After — hours — ft.

BORING METHOD

HSA	Hollow Stem Auger	MD	Mud Drilling
CFA	Continuous Flight Auger	RC	Rock Coring
DC	Driven Casing	CA	Casing Advancer

TYPE SAMPLE
A - Split Spoon
B - Rock Core
C - Shelby Tube
D - Other

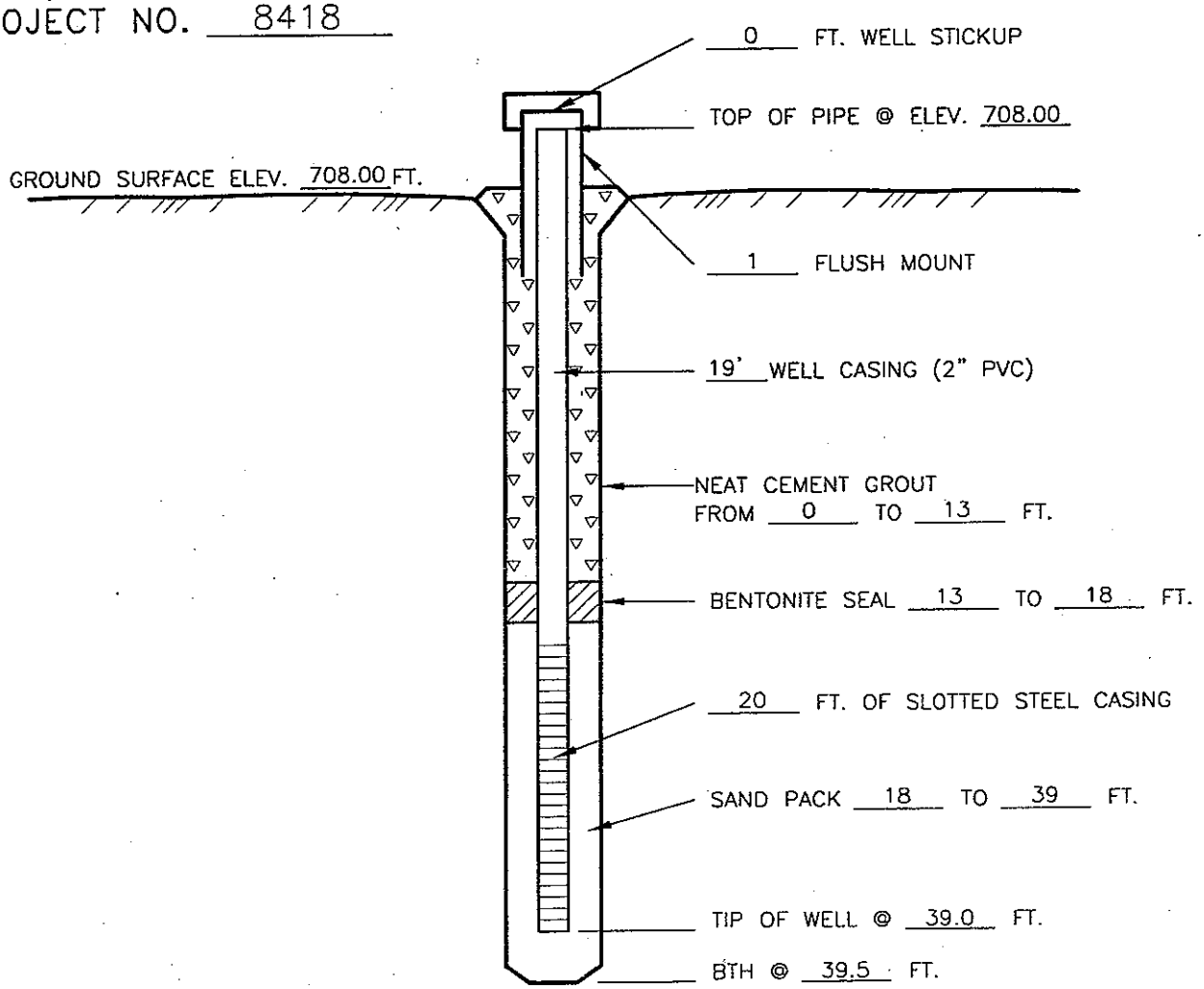
*These Shelby Tube Samples Obtained In An Auxiliary Boring Drilled A Few Feet From This Boring

WELL NO. MW-10 (NEW)

CLIENT CITY OF MORAINE, OHIO

PROJECT GROUND WATER MANAGEMENT

PROJECT NO. 8418



NO. OF SPLIT SPOONS 0

MATERIALS USED		
RISER	19	FT.
SCREEN	20	FT.
SAND	8	BAGS
CEMENT	1	BAGS
BENT. PWDR.	–	BAGS
BENT. PELLETS	2	BKTS.
FLUSH MOUNT	1	
INNER LOCK CAP	–	
PADLOCK	1	
TOP CAP	1	
GUARD POSTS	–	
BOTTOM PLUG	1	

DATE INSTALLED	12/05/06
DATE DEVELOPED	–
METHOD OF DRILLING	HSA– 3 1/4
METHOD OF DEVELOP	–
DURATION OF DEVELOP	–
DRILLER	STEVE
INSPECTOR	–

GROUNDWATER LEVEL OBSERVATIONS DURING DRILLING, (FT.)

	DEPTH	ELEV
Water first encountered	8.1	
Water at completion	–	

IN WELL

DATE	WATER ELEV. (FT)

MONITORING WELL CONSTRUCTION FIELD DETAILS

CBC ENGINEERS & ASSOCIATES
DAYTON, OHIO

Section 23

City of West Carrollton
Well Field

ODNR Well Information:
Well No. 1 and No. 4

Monitoring Wells:
A through E

Production Wells:
1
3
4

ARCADIS

ODNR Information

RECEIVED

AUG 2 2 1990

DEPT. OF NATURAL RESOURCES
WATER RESOURCES DEVELOPMENT

000872

STATE OF OHIO WATER WITHDRAWAL FACILITY REGISTRATION

SEND TO: OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATER
WATER RESOURCES DEVELOPMENT SECTION
1939 FOUNTAIN SQUARE COURT, BLDG. E-3
COLUMBUS, OHIO 43224-1336
(614) 265-6750

AUTHORITY: Ohio Revised Code Section 1521.16 requires that any owner of a facility, or combination of facilities, with the capacity to withdraw more than 100,000 gallons of water daily, register such facilities with the Ohio Department of Natural Resources, Division of Water.

100,000 Gallons Per Day (GPD) = 0.1 Million Gallons Per Day (MGD) = 4200 Gallons Per Hour (GPH) = 70 Gallons Per Minute (GPM)

Detailed directions are on a separate instruction sheet. Please type or print the following information:

1. OWNER OF WATER WITHDRAWAL FACILITY

Owner's Name: City of West Carrollton	Contact Person (If other than owner): Donald J. Hill; Service Director
Company Name: ~~Same~~ Water Dept	Company Name: Same
Mailing Address: 300 E. Central Ave.	Mailing Address:
City, State, Zip: West Carrollton, Ohio 45449	City, State, Zip:
SIC (Standard Industrial Classification)-4 digit: 4941 / Phone: (513) 859-5184	Phone: ( )

The annual withdrawal report form should be sent to : ☐ Owner ☒ Contact person (Check one)

2. WATER USE

Estimate percentage of the total water use from all sources for each type of use for both ground water and surface water. Total water use for both ground and surface water = 100%; GW = Ground water; SW = Surface water

WATER USE	GW%	SW%
Public Water Supply		
Community	100	
Non-community		
(OEPA # 5702812)		
Agricultural		
Livestock Watering		
Crop Irrigation		
Nursery/Turf/Landscaping		
Industrial		
Process Water		
Cooling Water		
Power Generation		
Nuclear		
Thermoelectric		
Hydroelectric		

WATER USE	GW%	SW%
Mineral Extraction		
Coal		
Oil		
Salt		
Sand and Gravel		
Limestone		
Other _____ (Please specify)		
Miscellaneous		
Recreation/Amusement		
Water Quality Remediation		
Heating/Cooling		
Domestic		
Fish Hatchery		
Dewatering		
Golf Course Irrigation		
Other _____ (Please specify)		

3. WATER WITHDRAWAL FACILITY CAPACITY

Total withdrawal capacity of the facility: 3.60 GPD or (MGD) (Circle one)

NOTE: Total withdrawal capacity is the sum of the withdrawal capacity for all wells and surface water intakes combined.

Was construction of this facility completed before January 1, 1990? X Yes ____ No

Name of facility City of West Carrollton Wellfield

4. SUPPLY SOURCES

GROUND-WATER SOURCES

Total number of wells 4

Total withdrawal capacity of all wells 3.60

GPD or (MGD) (Circle one)

SURFACE-WATER SOURCES

Total number of surface-water intakes _____

Total withdrawal capacity of all intakes _____

GPD or MGD (Circle one)

FOR EACH WELL
PROVIDE THE FOLLOWING:

A. Owner's well number 1
Well capacity 1.44 GPD or (MGD) (Circle one)
Well log number (or copy of well log) _____
Well depth 80 (ft) Well diameter _____ (in)

AQUIFER UTILIZED (Check one)

- ☐ Sand
- ☐ Sandstone (SS)
- ☒ Sand and gravel
- ☐ Limestone (LS) /Dolomite
- ☐ Shale (Sh)
- ☐ Interbedded SS, LS, Sh
- ☐ Underground mine
- ☐ Other _____

LOCATION OF WELL

County Montgomery
Township _____ Section _____
Nearest City or Town West Carrollton
Provide written description of well location.

B. Owner's well number 2
Well capacity 1.08 GPD or (MGD) (Circle one)
Well log number (or copy of well log) _____
Well depth 155 (ft) Well diameter _____ (in)

AQUIFER UTILIZED (Check one)

- ☐ Sand
- ☐ Sandstone (SS)
- ☒ Sand and gravel
- ☐ Limestone (LS) /Dolomite
- ☐ Shale (Sh)
- ☐ Interbedded SS, LS, Sh
- ☐ Underground mine
- ☐ Other _____

LOCATION OF WELL

County Montgomery
Township _____ Section _____
Nearest City or Town West Carrollton
Provide written description of well location.

C. Owner's well number 3
Well capacity 1.15 GPD or (MGD) (Circle one)
Well log number (or copy of well log) _____
Well depth 85 (ft) Well diameter _____ (in)

AQUIFER UTILIZED (Check one)

- ☐ Sand
- ☐ Sandstone (SS)
- ☒ Sand and gravel
- ☐ Limestone (LS) /Dolomite
- ☐ Shale (Sh)
- ☐ Interbedded SS, LS, Sh
- ☐ Underground mine
- ☐ Other _____

LOCATION OF WELL

County Montgomery
Township _____ Section _____
Nearest City or Town West Carrollton
Provide written description of well location.

(Note: Use additional sheets if necessary)

FOR EACH SURFACE-WATER INTAKE
PROVIDE THE FOLLOWING:

A. Owner's intake number N/A
Intake capacity _____ GPD or MGD (Circle one)
Name of body of water _____

SOURCE UTILIZED (Check one)

- ☐ River, stream, or drainage ditch
- ☐ Lake, pond, quarry, or reservoir
- ☐ Other _____

LOCATION OF INTAKE

County _____
Township _____ Section _____
Nearest City or Town _____
Provide written description of intake location.

B. Owner's intake number _____
Intake capacity _____ GPD or MGD (Circle one)
Name of body of water _____

SOURCE UTILIZED (Check one)

- ☐ River, stream, or drainage ditch
- ☐ Lake, pond, quarry, or reservoir
- ☐ Other _____

LOCATION OF INTAKE

County _____
Township _____ Section _____
Nearest City or Town _____
Provide written description of intake location.

C. Owner's intake number _____
Intake capacity _____ GPD or MGD (Circle one)
Name of body of water _____

SOURCE UTILIZED (Check one)

- ☐ River, stream, or drainage ditch
- ☐ Lake, pond, quarry, or reservoir
- ☐ Other _____

LOCATION OF INTAKE

County _____
Township _____ Section _____
Nearest City or Town _____
Provide written description of intake location.

(Note: Use additional sheets if necessary)

Supply Sources Continued:

D. Owner's well number 4
Well capacity 101 GPD or MGD (Circle one)
Well log number (or copy of well log) _____
Well depth 75 (ft) Well diameter _____ (in)

AQUIFER UTILIZED (Check one)

- ☐ Sand
- ☐ Sandstone (SS)
- ☒ Sand and gravel
- ☐ Limestone (LS) /Dolomite
- ☐ Shale (Sh)
- ☐ Interbedded SS, LS, Sh
- ☐ Underground mine
- ☐ Other _____

LOCATION OF WELL

County Montgomery
Township _____ Section _____
Nearest City or Town West Carrollton
Provide written description of well location.

D. Owner's intake number _____
Intake capacity _____ GPD or MGD (Circle one)
Name of body of water _____

SOURCE UTILIZED (Check one)

- ☐ River, stream, or drainage ditch
- ☐ Lake, pond, quarry, or reservoir
- ☐ Other _____

LOCATION OF INTAKE

County _____
Township _____ Section _____
Nearest City or Town _____
Provide written description of intake location.

5. LOCATION OF WATER USE

State Ohio County Montgomery Township _____ Section West Carrollton
Provide written description of location of water use. If more than one water use location exists, attach separate sheets providing the above information for each.

6. TYPE AND LOCATION OF DISCHARGE POINTS

Estimate percentage of water discharged to the following:

- ___ Recharge Well
- ___ On Site Sewage Disposal
- ___ Ground-water Recharge Basin
- ___ Land Application
- ___ Recycling Basin
- ___ Wetland
- ___ Pond, Lake, or Reservoir Name NL
- 100 River, Stream, or Drainage Ditch Name Gr Miami R
- ___ Other _____ (Please specify)

Location of Discharge Facility

State OH County Montgomery Township _____ Section _____

Provide written description of location of discharge facility. If more than one point of discharge exists, attach separate sheets providing the above information for each.

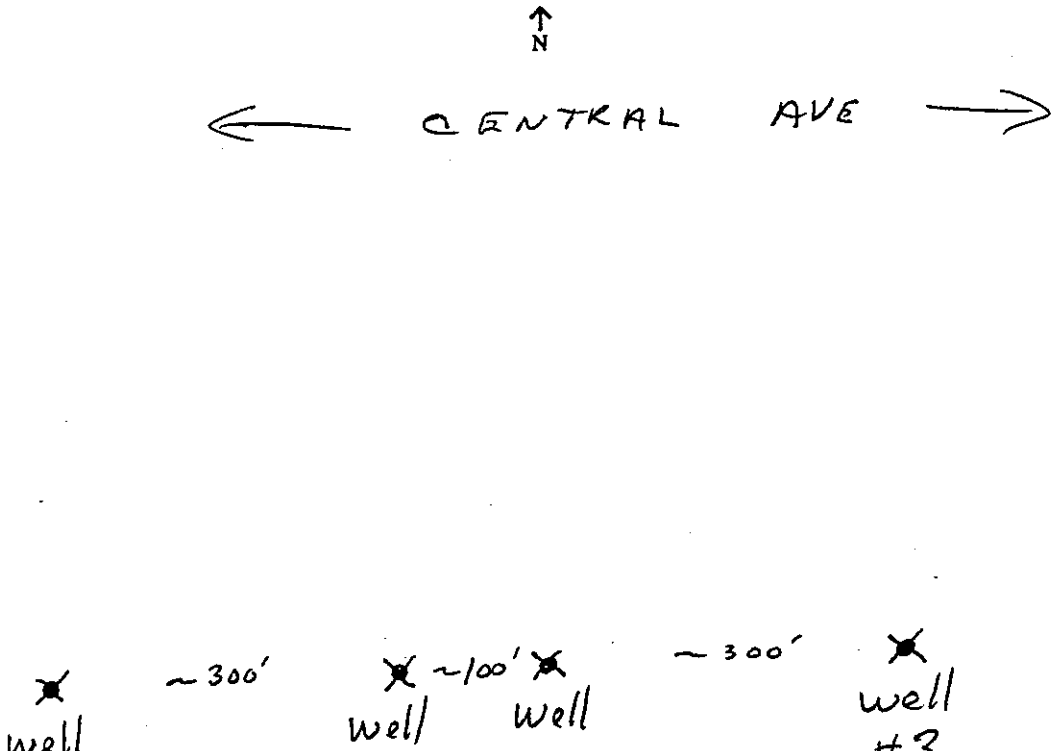
Please complete a water withdrawal facility location sketch on page 4.

7. STATEMENT OF AFFIRMATION

I hereby certify that to the best of my knowledge the information submitted herein, is true, accurate and complete.

Owner or authorized representative's signature	Date
Thomas D. Mick	8-21-90

WATER WITHDRAWAL FACILITY LOCATION SKETCH: Locate all wells, intake pipes, places of use, and discharge points with references to water sources, named roads, highways, buildings, or other distinctive landmarks. This section may be divided for additional maps or separate maps may be attached.



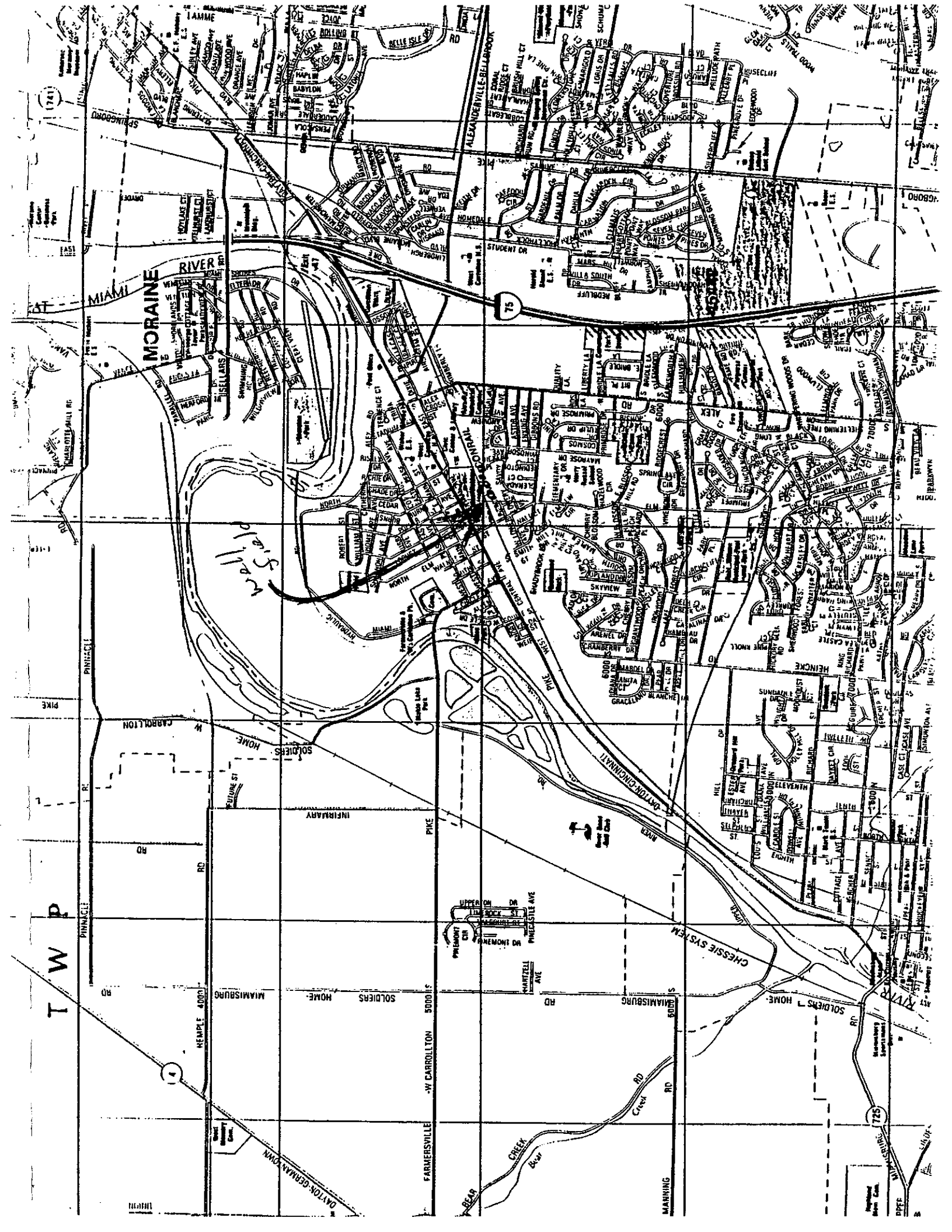
NOTE: #2 well is standby
#1, #3, #4 – std operation is using these 3 wells → WTP

FOR OFFICE USE ONLY:

Date of Registration _____ Basin 05080002 Registration Number 00672 Latitude 39°40'15" Longitude 84°15'00"

DAYTON SOUTH K-6

~1 MILE TO I-75


MIAMI RIVER
MORAINE
I-75
SPRINGBORO
ALEXANDERSVILLE-BELLBROOK
STUDENT DR
HOMEDALE
SOLDIERS HOME
MIAMISBURG
W CARROLLTON
FARMERSVILLE
DAYTON-GERMANTOWN
CHESSIE SYSTEM
DAYTON-CINCINNATI
PINNACLE
HEMPLE
INFIRMARY
HEINCKE
ELEVENTH
TWP

ARCADIS

Monitoring Wells

5. CONTRACTOR'S AFFIDAVIT FOR FINAL PAYMENT

As a requisite for payment of the final estimate, the Contractor will be required to sign the Contractor's Affidavit on the form attached herein, and have the same properly notarized.

6. PROJECT DESCRIPTION

The work consists of installation of six groundwater monitoring wells as per the included specifications. This work includes five shallow wells and one deep well located at the following locations:

A - (Shallow Well) - West side of Slonaker Street south of Central Avenue.

B - (Shallow Well) - Southwest side of Cross Street.

C- (Shallow Well) - Southwest corner of "Bubble Brush Car Wash", 518 E. Dixie Drive.

D - (Shallow Well & Deep Well) - South side of levee at bend in north Alex Road.

E - (Shallow Well) - In median along Landview Avenue.

The City will stake locations in the field. The City will provide access to all locations.

7. PROJECT COMPLETION

All work in this contract must be completed no later than March 31, 1996.

8. PROJECT LOCATION MAP

See following sheets.

WELL INFORMATION – DRIFT WELLS

The Layne Ohio Company

A Division of
LAYNE-WESTERN COMPANY, INC.
WATER SUPPLY SERVICES
WATER WELLS • LAYNE PUMPS • TEST DRILLING • WATER TREATMENT EQUIPMENT
4921 Vulcan Avenue · Columbus, Ohio 43228 · (614) 876-1195

Name of Job CITY OF WEST CARROLLTON Date 2/28/96

City or Village WEST CARROLLTON State OHIO

Well No.: M-W A-SHALLOW Drillers: ROY ESTES, GREG DAVIS Rig: L-14

Well Location: _____ ft. (____) and _____ ft.(____) of the _____ corner of

Section _____, Twp. _____ (____), Range _____ (____) _____ County.

Otherwise located as WEST SIDE OF SLONAKER STREET SOUTH OF CENTRAL AVENUE, AT CITY HALL PARKING LOT

Work Began: 2/27/96 Work Completed: 2/28/96 Well Depth to Plug: 28'

All measurements made from existing ground level at time well was drilled.

Casing Record:

Amount	Dia.	Wt. or Thickness	Material					
2-10'	4"		PVC	with	SCREW	joints from	18'	to 8'
				with		joints from		to
				with		joints from		to

Screen Record: Type PVC SLOTED

Amount	Dia.	Opening	Material					
1-10'	4"	.010	PVC	with	SCREW	joints from	28'	to 18'
				with		joints from		to

Type of Seal at Bottom PVC PLUG

Hole Record:

8"	inch from	0	to 30'
	inch from		to

Gravel Pack Record:

Amount	Size	Source	From	To
8-BAGS	#1	FILTER SAND	28'	16'

SEE OTHER SIDE

WELL LOG

Feet		Feet	Description
0	to	3'	BROWN TOP SOIL
3'	to	10'	FINE SAND AND GRAVEL-DRY
10'	to	15'	LARGE GRAVEL
15'	to	18'	SMALL GRAVEL
18'	to	21'	LARGE BOLDER
21'	to	28'	SMALL GRAVEL
28'	to	30'	DRY HARD GRAY CLAY
	to		SPOON-30'-32'
	to		
	to		
	to		
	to		
	to		
	to		
	to		
	to		
	to		

Well Test Data: Static Level 24' ; pumping level _____ after _____ hours pumping at _____ g.p.m.

Length of test _____ hrs. See Well Test Data Sheet Dated _____

REMARKS:

1-4" X 10' SCREEN

2-4" X 10' PIPE

1-4" BOTTOM PLUG

8-BAGS OF #1 FILTER SAND

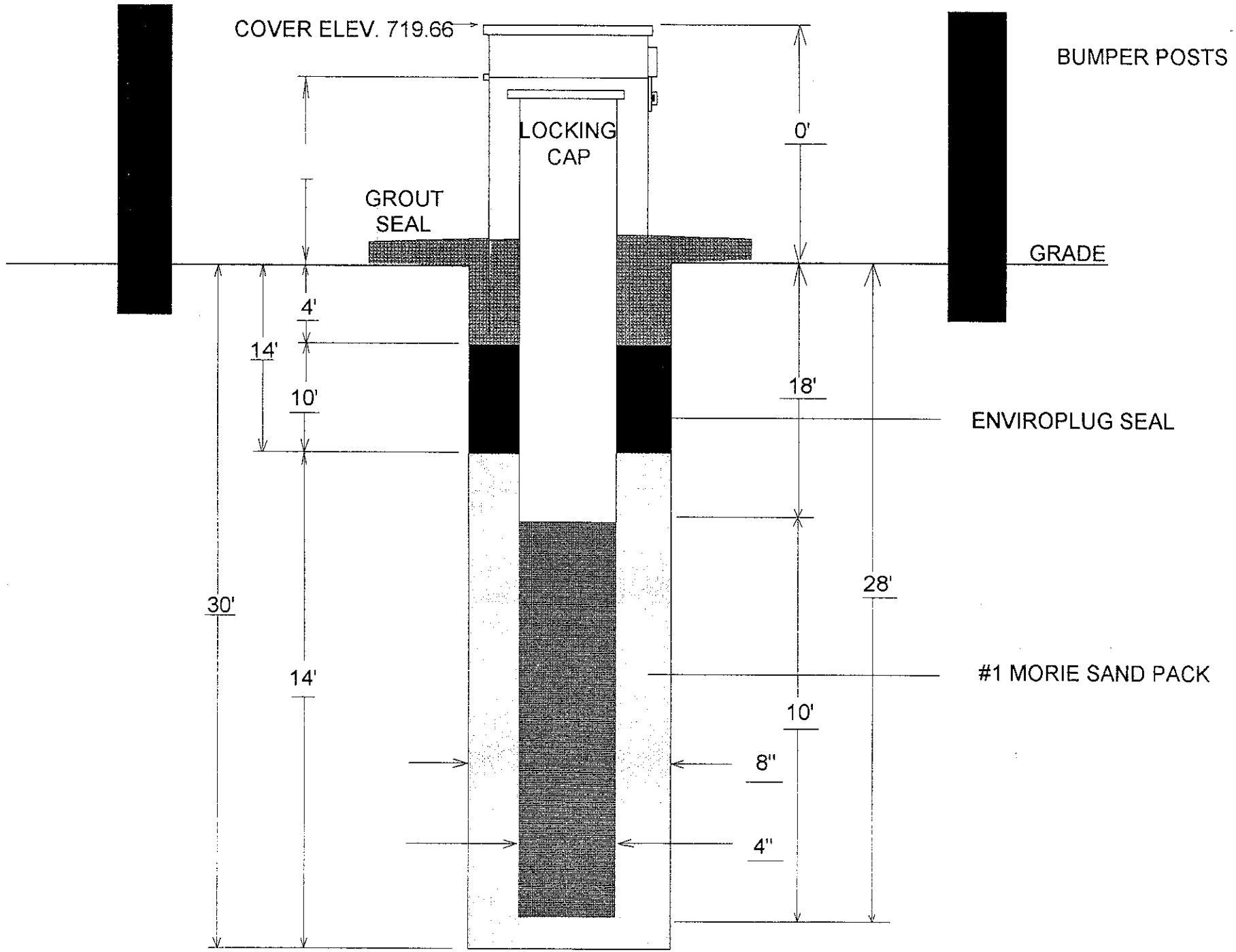
7-BAGS OF ENVIROPLUG

4-BAGS OF CONCRETE

1-6" FLUSH MOUNT COVER

1-4" LOCKABLE TOP CAP PLUG

CITY OF WEST CARROLLTON MW - A



WELL INFORMATION – DRIFT WELLS

The Layne Ohio Company

A Division of
LAYNE-WESTERN COMPANY, INC.
WATER SUPPLY SERVICES
WATER WELLS • LAYNE PUMPS • TEST DRILLING • WATER TREATMENT EQUIPMENT
4921 Vulcan Avenue · Columbus, Ohio 43228 · (614) 876-1195

Name of Job City of West Carrollton Date 2/20/96

City or Village West Carrollton State Ohio

MW-
Well No.: B Shallow Drillers: Roy Estes, Greg Davis Rig: L14

Well Location: _____ ft. (____) and _____ ft.(____) of the _____ corner of

Section _____, Twp. _____ (____), Range _____ (____) _____ County.

Otherwise located as Southwest side of Cross Street

Work Began: 2/20/96 Work Completed: 2/21/96 Well Depth to Plug: 46'11"

All measurements made from existing ground level at time well was drilled.

Casing Record:

Amount	Dia.	Wt. or Thickness	Material					
2-10'	4"		PVC	with	screw	joints from	16'	to 6'
				with		joints from		to
				with		joints from		to

Screen Record: Type 4" PVC slotted

Amount	Dia.	Opening	Material					
3-10'	4"	.010	PVC	with	screw	joints from	46'	to 16'
				with		joints from		to

Type of Seal at Bottom 4" PVC plug

Hole Record:

8" inch from 0 to 50'

_____ inch from _____ to _____

Gravel Pack Record:

Amount	Size	Source	From	To
15-50 lbs bags	#1	filtes sand	46'11"	14"

SEE OTHER SIDE

WELL LOG

Feet		Feet	Description
0	to	7'	Dark clay top soil
7	to	21'	Small gravel with some medium -dry
21	to	25'	Small gravel - wet
25	to	45'	Sand and gravel - wet
45	to	47'	Spoon fine sand with trace of clay
47	to	50'	Fine sand with clay
	to		
	to		
	to		
	to		
	to		
	to		
	to		
	to		
	to		
	to		

Well Test Data: Static Level 19' ; pumping level _____ after _____ hours pumping at _____ g.p.m.

Length of test _____ hrs. See Well Test Data Sheet Dated _____

REMARKS:

3-4" x 10' screen

2-4" x 10' pipe

1-4" PVC bottom plug

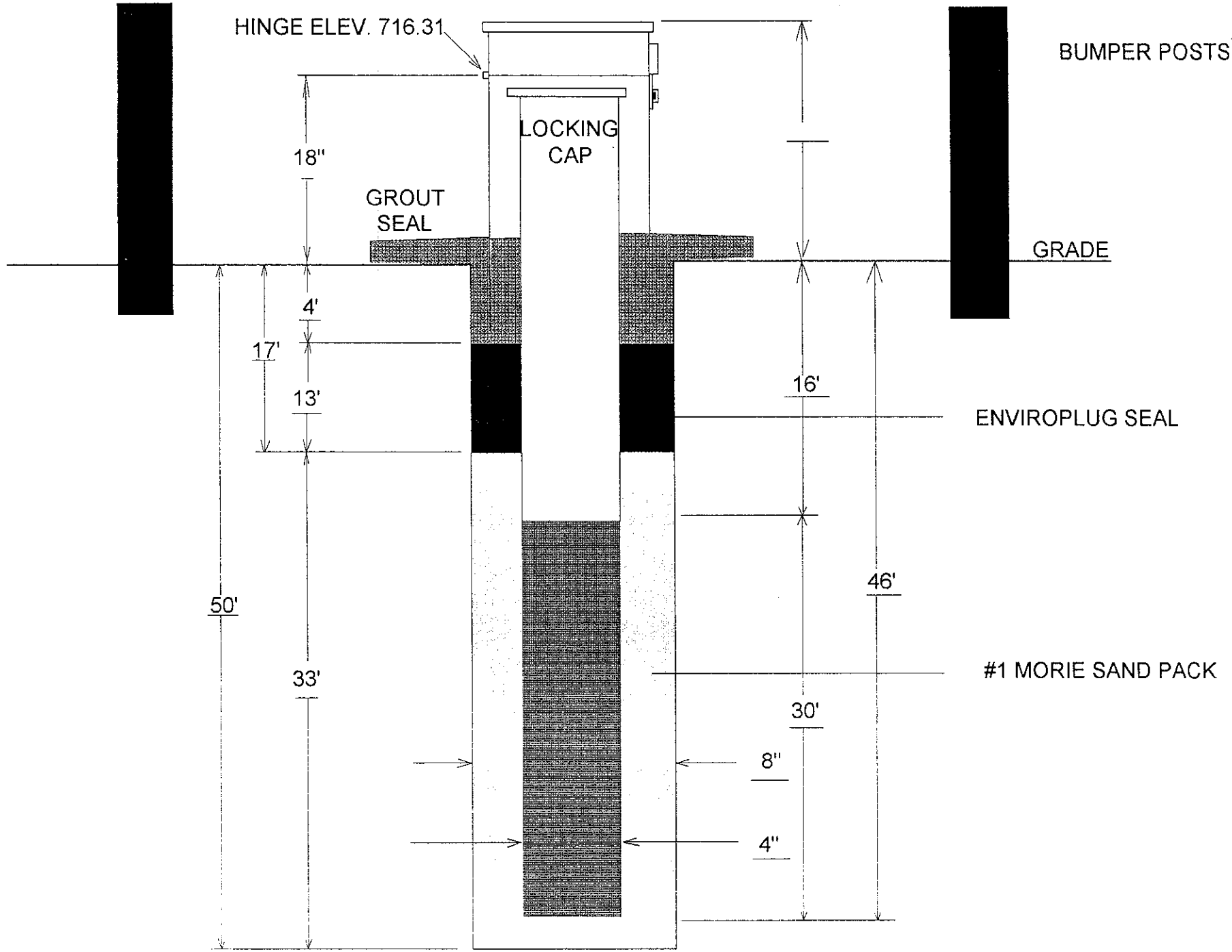
1-4" lockable top cap plug

1-6" x 8' protective cover

20 bags enviroplug

15 bags of #1 filter sand

CITY OF WEST CARROLLTON MW - B



WELL INFORMATION – DRIFT WELLS

The Layne Ohio Company

A Division of
LAYNE-WESTERN COMPANY, INC.

WATER SUPPLY SERVICES

WATER WELLS • LAYNE PUMPS • TEST DRILLING • WATER TREATMENT EQUIPMENT

4921 Vulcan Avenue · Columbus, Ohio 43228 · (614) 876-1195

Name of Job: City of West Carrollton Date: 2/14/96

City or Village: West Carrollton State: Ohio

Well No.: MW– C Shallow Drillers: Roy Estes, Dan Colburn Rig: L14

Well Location: _____ ft. (____) and _____ ft.(____) of the _____ corner of

Section _____, Twp. _____ (____), Range _____ (____) _____ County.

Otherwise located as Southwest corner of Bubble carwash 518 E Dixie Drive

Work Began: 2/14/96 Work Completed: 2/16/96 Well Depth to Plug: 46'9

All measurements made from existing ground level at time well was drilled.

Casing Record:

Amount	Dia.	Wt. or Thickness	Material					
2–10'	4"		PVC	with	screw	joints from	16'	to 6'
				with		joints from		to
				with		joints from		to

Screen Record: Type PVC slotted

Amount	Dia.	Opening	Material					
3–10'	4"	.010	PVC	with	screw	joints from	46'	to 16'
				with		joints from		to

Type of Seal at Bottom: 4" PVC plug

Hole Record:

8"	inch from	0	to	50'
	inch from		to	

Gravel Pack Record:

Amount	Size	Source	From	To
20–50 lbs bags	#1	filter sand	46'9"	14"

SEE OTHER SIDE

WELL LOG

Feet		Feet	Description
0	to	7'	Brown top soil sandy loam
7	to	12'	Small to medium gravel-dry
12	to	14'	Large gravel - dry
14	to	25'	Course to medium gravel - dry
25	to	50'	Course brown sand with some small gravel and trace of clay
	to		
	to		
	to		
	to		
	to		
	to		
	to		
	to		
	to		
	to		
	to		

Well Test Data: Static Level 22'4" ; pumping level _____ after _____ hours pumping at _____ g.p.m.

Length of test _____ hrs. See Well Test Data Sheet Dated _____

REMARKS:

3-4" x 10' screen

2-4" x 10' pipe

1-4" PVC bottom plug

1-4" lockable top cap plug

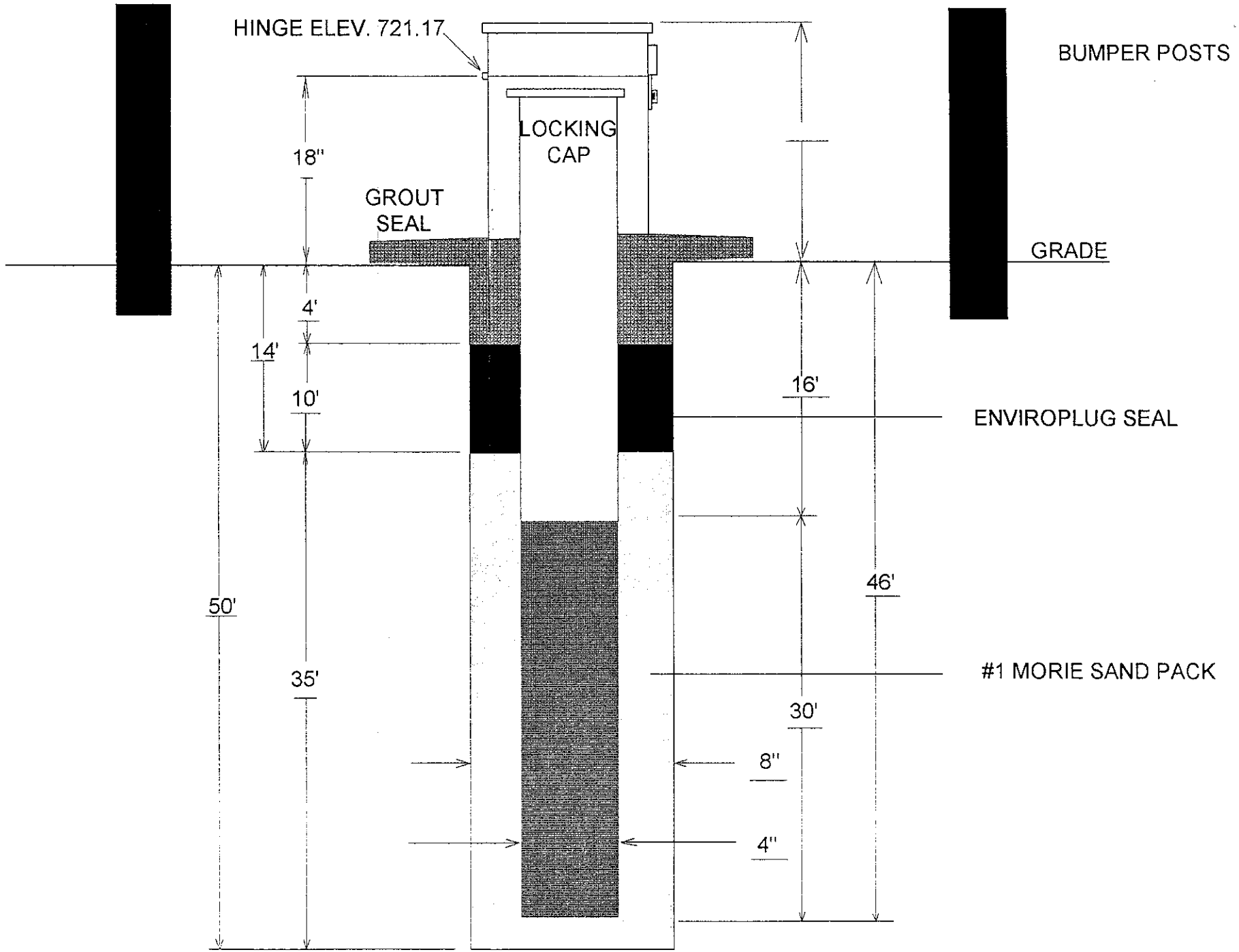
1-6" x 8' protective cover

8 bags enviroplug

20-50 lbs of #1 filter sand

3- Bumper Posts

CITY OF WEST CARROLLTON MW - C



WELL INFORMATION – DRIFT WELLS

The Layne Ohio Company

A Division of
LAYNE-WESTERN COMPANY, INC.
WATER SUPPLY SERVICES
WATER WELLS • LAYNE PUMPS • TEST DRILLING • WATER TREATMENT EQUIPMENT
4921 Vulcan Avenue · Columbus, Ohio 43228 · (614) 876-1195

Name of Job CITY OF WEST CARROLLTON Date 3/1/96

City or Village WEST CARROLLTON State OHIO

Well No.: M-W-D-SHALLOW Drillers: ROY ESTES, GREG DAVIS Rig: L-14

Well Location: _____ ft. (____) and _____ ft.(____) of the _____ corner of

Section _____, Twp. _____ (____), Range _____ (____) _____ County.

Otherwise located as SOUTH SIDE OF LEVEE AT BEND IN NORTH ALEX ROAD

Work Began: 2/29/96 Work Completed: 3/1/96 Well Depth to Plug: 49'

All measurements made from existing ground level at time well was drilled.

Casing Record:

Amount	Dia.	Wt. or Thickness	Material					
3-10'	4"		PVC	with	SCREW	joints from	24'	to 14'
3-10'	4"		PVC	with	SCREW	joints from	4'	to
				with		joints from		to

Screen Record: Type PVC SLOTED

Amount	Dia.	Opening	Material					
2-10'	4"	.010	PVC	with	SCREW	joints from	39'	to 29'
1-5'	4"	.010	PVC	with	SCREW	joints from	29'	to

Type of Seal at Bottom PVC PLUG

Hole Record:

8"	inch from	0	to	50'
	inch from		to	

Gravel Pack Record:

Amount	Size	Source	From	To
8 BAGS	#1	FILTER SAND	49'	22'

SEE OTHER SIDE

WELL LOG

Feet		Feet	Description
0	to	2'	DARK TOP SOIL
2'	to	18'	MEDIUM TO LARGE GRAVEL WITH STREAKS OF BROWN CLAY
18'	to	30'	GRAY CLAY HARD
30'	to	50'	SAND AND GRAVEL
	to		
	to		
	to		
	to		
	to		
	to		
	to		
	to		
	to		
	to		
	to		

Well Test Data: Static Level 21' ; pumping level _____ after _____ hours pumping at _____ g.p.m.

Length of test _____ hrs. See Well Test Data Sheet Dated _____

REMARKS:

2- 4" X 10' SCREEN

1- 4" X 5' SCREEN

3- 4" X 10' PIPE

1- 4" BOTTOM PLUG

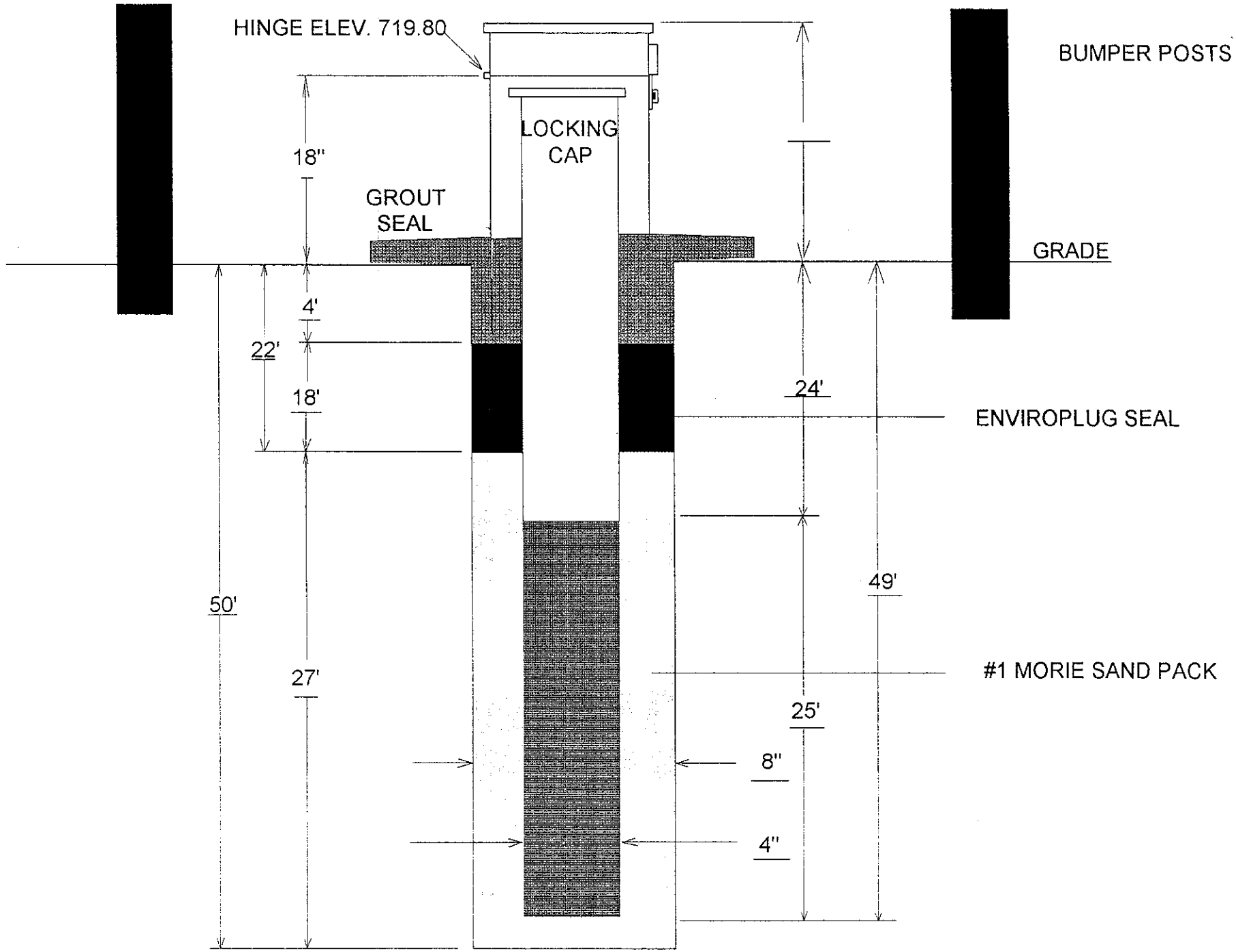
1- 4" LOCKABLE TOP CAP PLUG

1- 6" X 8' PROTECTIVE COVER

8- BAGS OF #1 FILTER SAND

10- BAGS OF ENVIROPLUG

CITY OF WEST CARROLLTON MW - D1



WELL INFORMATION – DRIFT WELLS

The Layne Ohio Company

A Division of
LAYNE-WESTERN COMPANY, INC.
WATER SUPPLY SERVICES
WATER WELLS • LAYNE PUMPS • TEST DRILLING • WATER TREATMENT EQUIPMENT
4921 Vulcan Avenue · Columbus, Ohio 43228 · (614) 876-1195

Name of Job CITY OF WEST CARROLLTON Date 3/14/96

City or Village WEST CARROLLTON State OHIO

Well No.: MW-D- DEEP WELL Drillers: ROY ESTES, GREG DAVIS Rig: L-14

Well Location: _____ ft. (____) and _____ ft.(____) of the _____ corner of

Section _____, Twp. _____ (____), Range _____ (____) _____ County.

Otherwise located as SOUTH SIDE OF LEVEE AT BEND IN NORTH ALEX ROAD

Work Began: 3/4/96 Work Completed: 3/14/96 Well Depth to Plug: 87'6"

All measurements made from existing ground level at time well was drilled.

Casing Record:

Amount	Dia.	Wt. or Thickness	Material					
8-10'	4"		PVC	with	SCREW	joints from	62'	to 52'
8-10'	4"		PVC	with	SCREW	joints from	42'	to 32'
8-10'	4"		PVC	with	SCREW	joints from	22'	to 2'

Screen Record: Type PVC SLOTED

Amount	Dia.	Opening	Material					
1-10	4"	.010	PVC	with	SCREW	joints from	77'	to 72'
1-5	4"	.010	PVC	with	SCREW	joints from		to

Type of Seal at Bottom PVC PLUG

Hole Record:

8" inch from 0 to 90'

_____ inch from _____ to _____

Gravel Pack Record:

Amount	Size	Source	From	To
10- BAGS	#1	FILTER SAND	87'6"	67'

SEE OTHER SIDE

WELL LOG

Feet		Feet	Description
0	to	1'	DARK TOP SOIL
1	to	18'	MEDIUM AND LARGE GRAVEL WITH BROWN CLAY-DRY
18'	to	30'	GRAY CLAY HARD-DRY
30"	to	90'	SAND AND GRAVEL-WET
	to		
	to		
	to		
	to		
	to		
	to		
	to		
	to		
	to		
	to		
	to		
	to		

Well Test Data: Static Level _____; pumping level _____ after _____ hours pumping at _____ g.p.m.

Length of test _____ hrs. See Well Test Data Sheet Dated _____

REMARKS:

1- 10' SCREEN

1- 5' SCREEN

8- 10' PIPE

1- 6" X 8' PROTECTIVE COVER

1- LOCKABLE TOP CAP

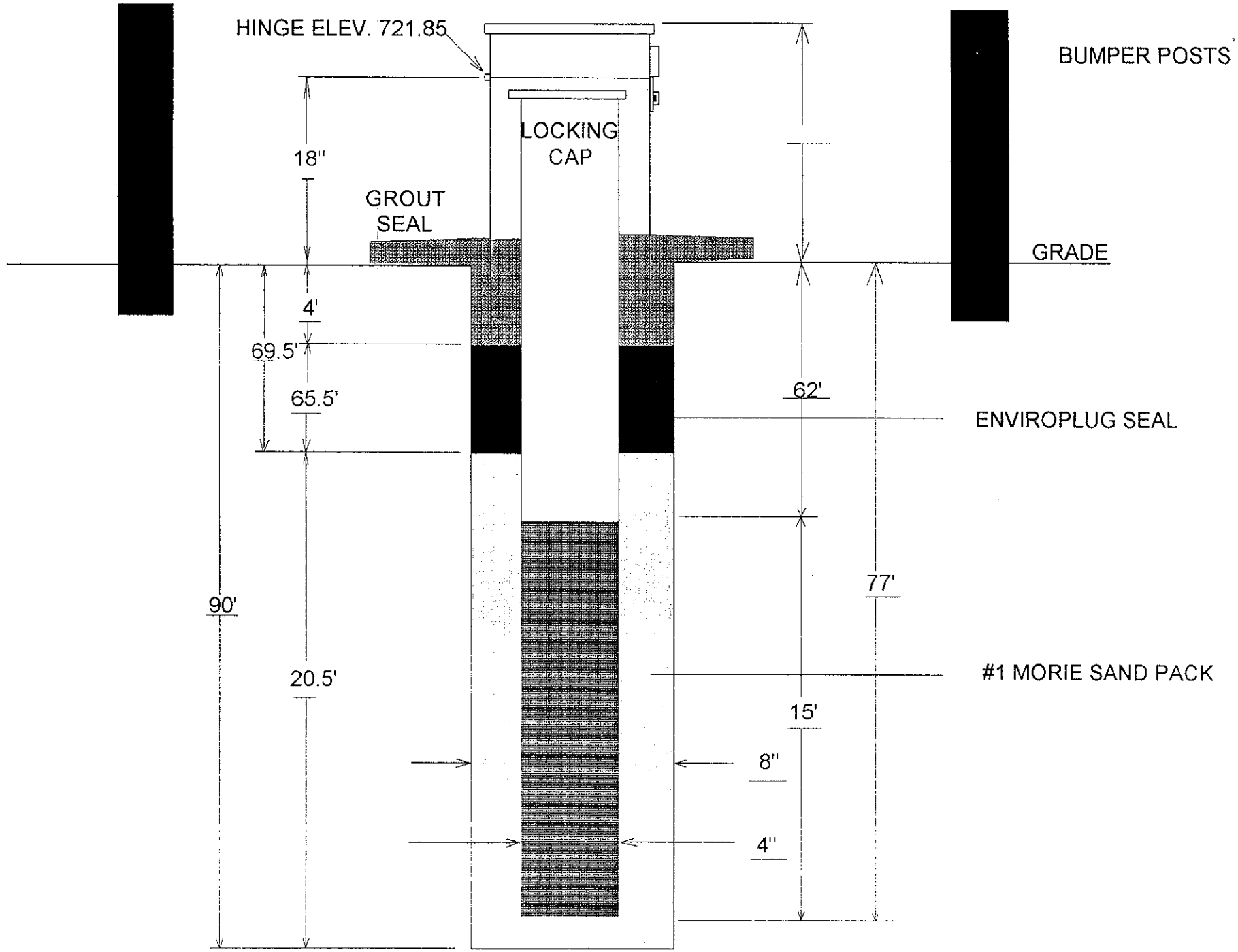
1- BOTTOM CAP

10- BAGS OF SAND

22- BAGS OF CHIPS

3- BUMPER POSTS AT WELL SITE D-DEEP-SHALLOW

CITY OF WEST CARROLLTON MW - D2



WELL INFORMATION – DRIFT WELLS

The Layne Ohio Company

A Division of
LAYNE-WESTERN COMPANY, INC.
WATER SUPPLY SERVICES
WATER WELLS • LAYNE PUMPS • TEST DRILLING • WATER TREATMENT EQUIPMENT
4921 Vulcan Avenue · Columbus, Ohio 43228 · (614) 876-1195

Name of Job City of West Carrollton Date 2/22/96

City or Village West Carrollton State Ohio

Well No.: MW– E Shallow Drillers: Roy Estes, Greg Davis Rig: L14

Well Location: _____ ft. (____) and _____ ft.(____) of the _____ corner of

Section _____, Twp. _____ (____), Range _____ (____) _____ County.

Otherwise located as In median along Landview Avenue

Work Began: 2/22/96 Work Completed: 2/23/96 Well Depth to Plug: 46'

All measurements made from existing ground level at time well was drilled.

Casing Record:

Amount	Dia.	Wt. or Thickness	Material					
2–2'3"	4"		PVC	with	screw	joints from	21'	to 1'
				with		joints from		to
				with		joints from		to

Screen Record: Type PVC slotted

Amount	Dia.	Opening	Material					
2–10'	4"	.010	PVC	with	screw	joints from	46'	to 26'
1– 5'	4"	.010	PVC	with	screw	joints from	26'	to 21'

Type of Seal at Bottom PVC Plug

Hole Record:

8"	inch from	0	to 50
	inch from		to

Gravel Pack Record:

Amount	Size	Source	From	To
16 bags	#1	Filter sand	46'	18'

SEE OTHER SIDE

WELL LOG

Feet		Feet	Description
0	to	5	Dark top soil clay
5	to	15	Small to medium gravel - dry
15	to	20	Large sand and gravel - dry
20	to	25	Small to medium sand and gravel - dry
25	to	40	Medium sand and gravel - wet
40	to	45	Large Bolders - wet
45	to	47	Sand and gravel - wet
47	to	50	Fine sand with trace of clay
	to		
	to		
	to		
	to		
	to		
	to		
	to		
	to		

Well Test Data: Static Level 24' ; pumping level _____ after _____ hours pumping at _____ g.p.m.

Length of test _____ hrs. See Well Test Data Sheet Dated _____

REMARKS:

2-4" x 10' screen

1-4" x 5' screen

1-4" PVC bottom plug

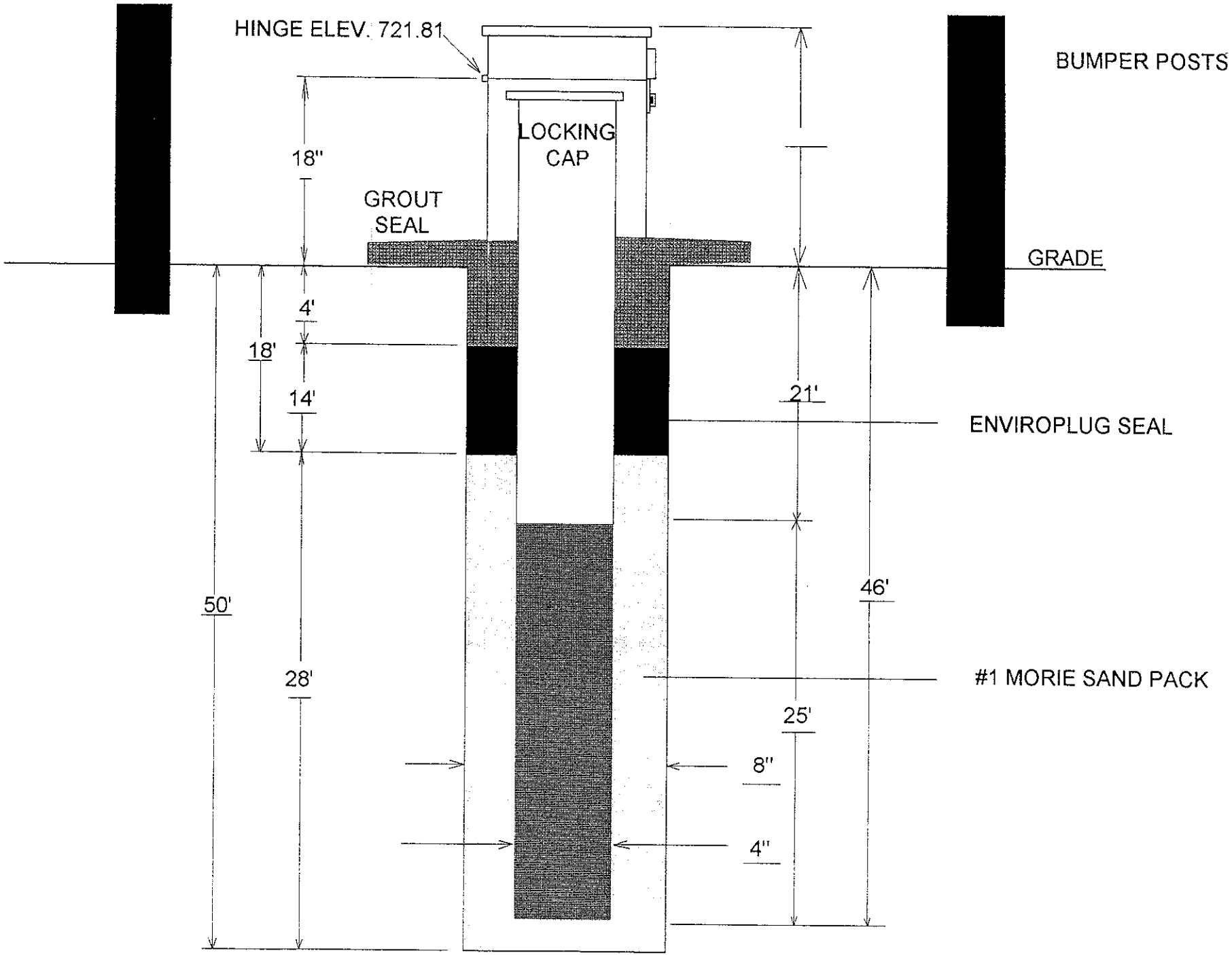
1-4" lockable top cap plug

1-6" x 8' protective cover

16 bags of #1 filter sand

13 bags of enviro plug

CITY OF WEST CARROLLTON MW - E



April 8, 1996

CITY OF WEST CARROLLTON, OHIO

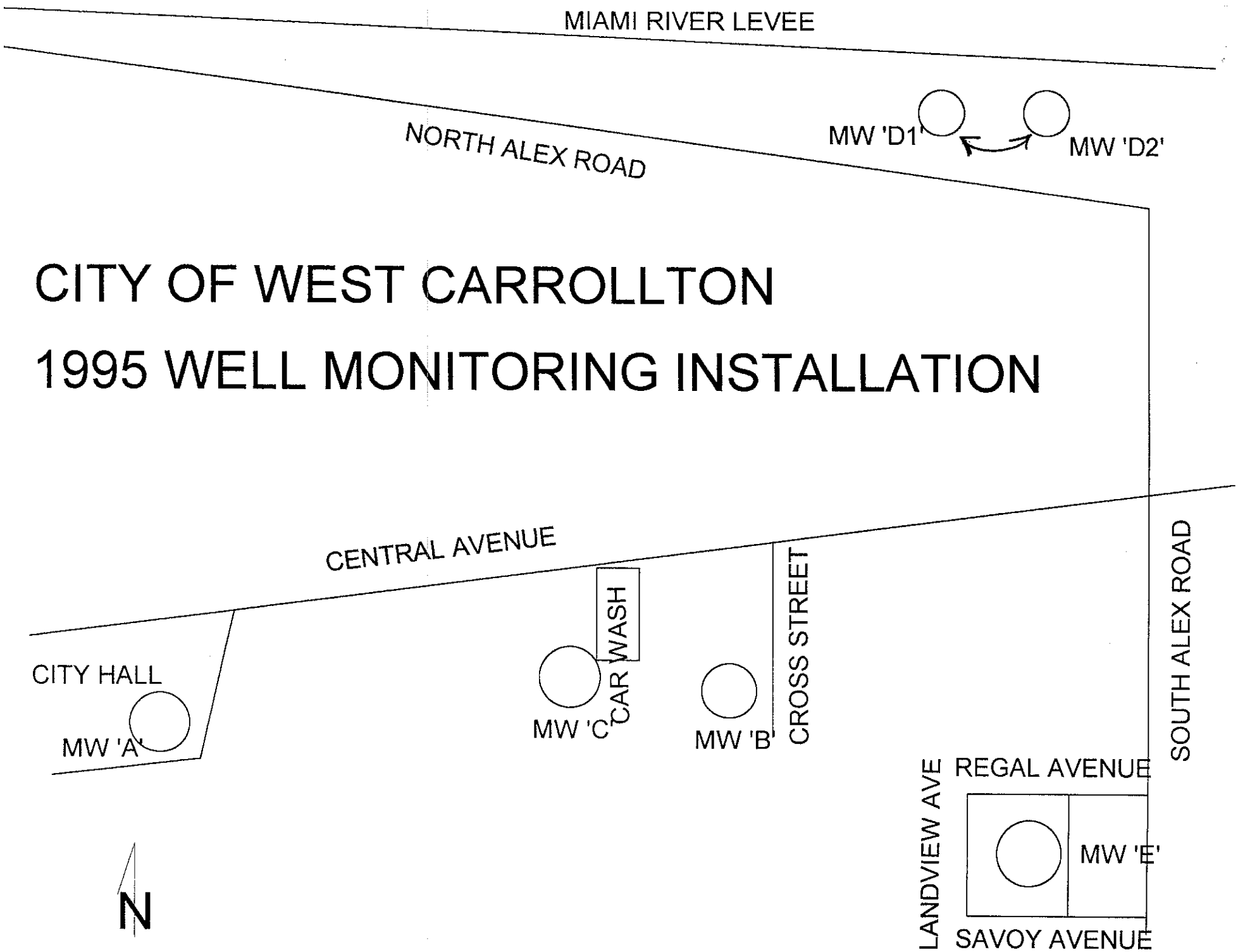
1995 WELL MONITORING INSTALLATION PROJECT

REFERENCE ELEVATIONS

Installation	Elevation
Monitoring well No. A	719.66
Monitoring well No. B	716.31
Monitoring well No. C	721.17
Monitoring well No. D1	719.80
Monitoring well No. D2	721.85
Monitoring well No. E	721.81

All measurements taken from hinge of protective cover.

See attached map for well locations.


MIAMI RIVER LEVEE
NORTH ALEX ROAD
MW 'D1'
MW 'D2'
CITY OF WEST CARROLLTON
1995 WELL MONITORING INSTALLATION
CENTRAL AVENUE
CITY HALL
MW 'A'
MW 'C'
CAR WASH
MW 'B'
CROSS STREET
SOUTH ALEX ROAD
LANDVIEW AVE
REGAL AVENUE
MW 'E'
SAVOY AVENUE
N

ARCADIS

Production Wells

MOODY'S of Dayton, Inc.



WELL LOG AND DRILLING REPORT

ADDRESS REPLY TO:
P.O. BOX 123
MIAMISBURG, OHIO 45342
PHONE AC 513-859-4482

Customer: City of West Carrollton

Address: 300 E. Central Avenue

Location of Well: Production Well #4 Job No. 47230

Date Started: 11/18/87 Date Finished 11/23/87

Driller: E. Wheeler Helper T. Wheeler

Formation Description	From	To
Sand & gravel with clay	0	10
Sand med, gravel lg, dry	10	25
Clay yellow	25	28
Clay grey	28	37
Sand med, gravel lg, drty	37	48
Sand med, gravel med to lg, boulders	48	76

LENGTH OF PIECES OF CASING

(First listed is bottom section)

Pipe left above or below ground 1'8"

Total Length of casing 61'8"

No. 1	Ft.	Inches
No. 2	Ft.	Inches
No. 3	Ft.	Inches
No. 4	Ft.	Inches
No. 5	Ft.	Inches
No. 6	Ft.	Inches
No. 7	Ft.	Inches
No. 8	Ft.	Inches
No. 9	Ft.	Inches
No. 10	Ft.	Inches
No. 11	Ft.	Inches
No. 12	Ft.	Inches
No. 13	Ft.	Inches
No. 14	Ft.	Inches
No. 15	Ft.	Inches
No. 16	Ft.	Inches
No. 17	Ft.	Inches
No. 18	Ft.	Inches

CONSTRUCTION DETAILS

Casing Diam: 24" Length 60'8"

Type of screen Cook s.s.

Length 16'

Static level (depth to water) 28

NOTE: Set screen at 75' from grade less 1' inside for water plug. Well is 74' from grade inside.

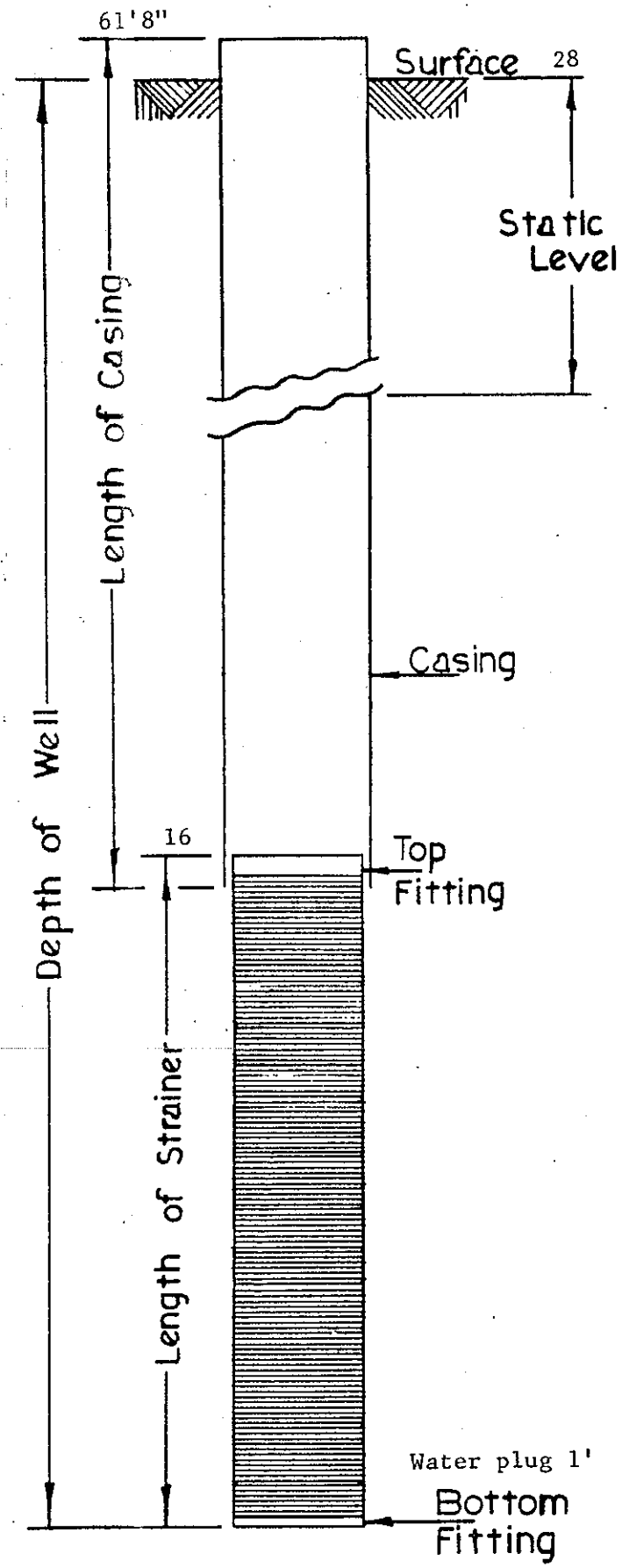
LENGTH OF PIECES OF CASING PULLED OUT TO EXPOSE SCREEN

(First listed is TOP section)

No. 1	Ft.	Inches
No. 2	Ft.	Inches
No. 3	Ft.	Inches
No. 4	Ft.	Inches
No. 5	Ft.	Inches

Time spent in developing well

WELL RECORD



DEPTH OF WELL 74 ft.
From Grade

WELL OWNER City of West Carrollton

WELL NO. ~~2-A~~ II 4

Date: 11/24/87

WELL CASING DETAILS

Length 60'8" ft.

Diameter 24 in.

Kind

STRAINER DETAILS

Make Cook S.S.

Length 16 ft.

Diameter 24 in.

Slot sizes

Metal Stainless Steel

STRAINER FITTINGS

Top Welded to 24" pipe

Bottom Open - poured 1' water plug in bottom

PUMP TEST

Static level ft.

Rate gpm

Draw down ft.

Hours pumped hrs.

DRILLER E. Wheeler

MOODY'S of Dayton, Inc.
P. O. Box 123
Miamisburg, Ohio 45342

Source Water Capacity Survey
Ground Water Systems

Please complete a separate form for each wellfield.
This form may be copied.

PWS Name: City of West Carrollton PWS ID Number: 5702812

Contact Name: Thomas D. Scherack Contact Phone #: 937-847-6070

Wellfield Name: City of West Carrollton Wellfield

Aquifer Name (if known): Great Miami Buried Valley Aquifer

Aquifer Type (Circle One): Sandstone Limestone (Sand/Gravel)
Other (explain):

Total Average Daily Production: 1.4 MGD

Peak Daily Production (w/in last 5 years): 2.5 MGD

If a wellfield has more than 5 wells, please list 5 wells that are representative of that wellfield.
Individual Well Information (including observation and backup wells):

Well Name/No.	1	3	4		
Use: Production, Occasional, Backup, Observation, etc.	Production	Production	Production		
In use? (Yes/No)	In summer	Yes	Yes		
Total Depth (from ground surface)	135'	85'	74'		
Casing Depth (from ground surface)	75'	55'	61'		
Pump Depth (from ground surface)	80'	65'	68'		

CONTINUED ON BACK

Well Name/No.	1	3	4		
Normal (Non-pumping) Static Water Level	31	31	32		
Present (Non-pumping) Static Water Level	34	31	31		
Normal Pumping Level	40	40	32		
Present Pumping Level	42	40	35		
Critical Pumping Level (If known)					
Date of Last Pump Test	1997	1999	1987		
Safe Yield From Last Pump Test (GPM)					
Current Production (GPM)	1000 gpm	800 gpm	700 gpm		
Production Capacity (GPM)					
Last Major Well Maintenance	7 / /1997	6 / /1999	11 /1987	/ /	/ /
Describe Last Major Well Maintenance (Cleaned or Replaced Screen; Redeveloped Well; Replaced/Rebuilt Pump; etc.)	pump rebuilt new shaft	Cleaned pump rebuilt new shaft and column	New Well		

Preparer: Thomas D. Scherack	Date: 2 /10 /2000

WELL LOG AND DRILLING REPORT

#1

CUSTOMER'S COPY

NO CARBON PAPER NECESSARY– SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Geological Survey
Fountain Square
Columbus, Ohio 43224 Phone (614) 466-5344

472240

COUNTY Montgomery TOWNSHIP _____ SECTION OF TOWNSHIP OR LOT NUMBER _____

OWNER City of West Carrollton, Ohio ADDRESS 41 E. Central Avenue

LOCATION OF PROPERTY Off Pierce Avenue which runs off Elm Street

CONSTRUCTION DETAILS

Casing diameter 16 inches Length of casing 82 ft.

Type of screen WWSS-135 slot Length of screen 14" x 60'

Type of pump Vertical Turbine

Capacity of pump 1000 gpm @ 245 ft. TDH

Depth of pump setting 78'3"

Date of completion Sept. 16, 1977

BAILING OR PUMPING TEST
(specify one by circling)

Test rate 950 gpm Duration of test 24 hrs

Drawdown 4 ft Date 9-28 &29, 1977

Static level (depth to water) 59 ft

Quality (clear, cloudy, taste, odor) Clear

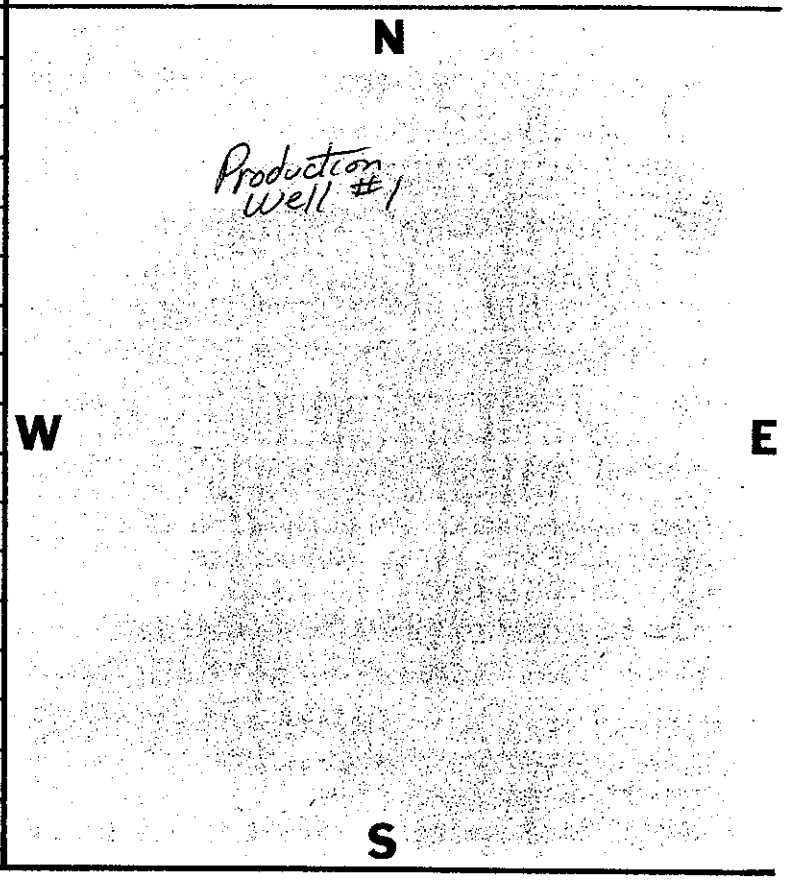
Pump installed by Moodys of Dayton, Inc.

WELL LOG* Well #1-A

Formations: sandstone, shale, limestone, gravel, clay	From	To
Clay	0 ft	6 ft
Dry Gravel	6	35
Dirty Gravel & Iron	35	58
Some Clay Chunks	58	59
Gravel - Clay	59	120
Gravel	120	142

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM MOODY'S OF DAYTON, INC. DATE JANUARY 18, 1978

ADDRESS 4359 Infirmary Rd., P.O. Box XXX 123
Miamisburg, Ohio 45342

SIGNED George L. Ross, III /jd

*If additional space is needed to complete well log, use next consecutive numbered form.

Layne-Ohio *a division of Layne Christensen Company*

801 W. Cherry Street • Sunbury, Ohio 43074 • (740) 965-6191 • Fax: (740) 965-3688

August 20, 1999

Mr. Tom Scherack
City of West Carrollton
300 East Central Avenue
West Carrollton, OH 45449

Subject: Well # 3

Dear Mr. Scherack,

Layne-Ohio a Division of Layne Christensen Company has completed the work on Well # 3. Attached are the before and after videos, the before and after tests and a pump installation report.

The cleaning of the well doubled the specific capacity of the well from the pre-cleaning test. The specific capacity is close to the 1986 specific capacity reported by another contractor. We deem the cleaning a success.

The after cleaning video is very clowdy due to suspended material in the water. This material is probably from the pipe line. It probably entered the well when we opened the check valve to clear the water in the well. It could also be clowdy form the cleaning process; as the well was not pumped out prior to the video survey. We have examined the tape very closely to make sure there are no problems in the well screen or casing. We have seen no areas which show up as holes or deep pits. We do not see any problems with the connecting area between the screen and casing. It is our opinion that the well casing and screen are in good structural condition.

We trust this is the information you require. Should you have any questions please contact us at your convenience.

Sincerely,

LAYNE - OHIO
A division of Layne Christensen Company

Edward S. Schlaack

Edward S. Schlaack P.E.
Branch Manager

Layne-Ohio
a Division of Layne Christensen Company
801 West Cherry Street
Sunbury, Ohio 43074
Phone 740-965-6191

WELL TEST DATA SHEET

Customer WEST CARROLTON, CITY OF Job Number _____ Tested by: SCOTT SHAFFER

City and State _____ Date of Test 04/12/99 Testing performed ☑ Before Service ☐ After Service

Well# 3 Well Dia. 16 Well Depth 83.30 Measured from _____ Feet above ground surface

Well type: ☐ Gravel Wall (dia.) _____ ☐ Tubular ☐ Rock

Screen: Length _____ Dia _____ Slot Size _____ Type _____ Depth to top _____

Water discharged _____ Feet from well into _____

Motor HP _____ Make _____ Name plate Amps _____ S.F. Amps _____ Voltage _____

Bowl size and stages _____ Manufacturer _____ Pump Serial Number _____

Suction pipe length _____ Column and Shaft size _____ Length _____

Overall pump length to the bottom of suction pipe: _____ Non-Pumping Level 26.00 Orifice Size 6x5

☐ Turbine ☐ Submersible ☐ Discharge Elbow / Head ☐ Pitless ☐ Tower Height ☐ Well House Test connection size _____

Time	Piezometer Reading (in.)	Gpm	Pumping Level	Drawdown	Discharge Pressure Lbs.	Discharge Pressure Feet	Total Pumping Head	Specific Capacity	Comments
12:00	Non-pumping	0	26.00	0.00	55	127.05	153.05		
12:55	19.5	549	39.60	13.60	30	69.3	108.90	40.40	
1:00	19.5	549	39.60	13.60	30	69.3	108.90	40.40	
1:05	19.5	549	39.60	13.60	30	69.3	108.90	40.40	
1:10	32	704	43.80	17.80	20	46.2	90.00	39.54	
1:15	32	704	43.80	17.80	20	46.2	90.00	39.54	
1:20	32	704	43.80	17.80	20	46.2	90.00	39.54	
1:25	44	825	47.50	21.50	10	23.1	70.60	38.39	
1:30	44	825	47.50	21.50	10	23.1	70.60	38.39	
1:35	44	825	47.50	21.50	10	23.1	70.60	38.39	
1:40	49	871	49.10	23.10	5	11.55	60.65	37.71	
1:45	49	871	49.10	23.10	5	11.55	60.65	37.71	
1:50	49	871	49.10	23.10	5	11.55	60.65	37.71	

Layne-Ohio
a Division of Layne Christensen Company
801 West Cherry Street
Sunbury, Ohio 43074
Phone 740-965-6191

WELL TEST DATA SHEET

Customer: WEST CARROLLTON | Job Number: 25-5722 | Tested by: SCOTT SHAFFER

City and State: WEST CARROLL,OHIO | Date of Test: 04/30/99 | Testing performed: ☐ Before Service ☑ After Service

Well# 3 | Well Dia. 16' | Well Depth 85' | Measured from _____ | Feet above ground surface

Well type: ☐ Gravel Wall (dia.) _____ ☑ Tubular ☐ Rock

Screen: Length 30' | Dia 16" | Slot Size _____ | Type _____ | Depth to top 64'

Water discharged 50' | Feet from well into FIELD

Motor HP 30 | Make _____ | Name plate Amps _____ | S.F. Amps _____ | Voltage _____

Bowl size and stages BYRON JACKSON 2 STAGE | Manufacturer B J | Pump Serial Number _____

Suction pipe length NONE | Column and Shaft size 8"x1 3/16" | Length 60'

Overall pump length to the bottom of suction pipe: 65'4" | Non-Pumping Level 24.67 | Orifice Size 6x5

☑ Turbine ☐ Submersible | ☐ Discharge Elbow / Head ☐ Pitless | ☐ Tower Height ☑ Well House | 3 MAN JOB | Test connection size 8"

Time	Piezometer Reading (in.)	Gpm	Pumping Level	Drawdown	Discharge Pressure Lbs.	Discharge Pressure Feet	Total Pumping Head	Specific Capacity	Comments
	Non-pumping	0	24.67	0.00	60	138.6	163.27		
3:30	5	278	27.17	2.50	45	103.95	131.12	111.29	
3:35	5	278	27.17	2.50	45	103.95	131.12	111.29	
3:40	5	278	27.17	2.50	45	103.95	131.12	111.29	
3:45	24"	610	32.58	7.91	30	69.3	101.88	77.12	
3:50	24"	610	31.75	7.08	30	69.3	101.05	86.16	
3:55	24"	610	31.75	7.08	30	69.3	101.05	86.16	
4:00	47.5	858	35.17	10.50	15	34.65	69.82	81.67	
4:05	47.5	858	35.25	10.58	15	34.65	69.90	81.06	
4:10	47.5	858	35.25	10.58	15	34.65	69.90	81.06	
4:15	57.5	944	36.58	11.91	8	18.48	55.06	79.22	WIDE OPEN
4:20	57.5	944	36.63	11.96	8	18.48	55.11	78.89	
4:25	57.5	944	36.67	12.00	8	18.48	55.15	78.63	
		TOP SHAFT 19 1/2x1 1/2 TURNED TO 1 3/16 ON BOTH ENDS 8 THREAD							

Layne-Ohio *a division of Layne Christensen Company*
801 West Cherry Street, Sunbury, Ohio 43074
(740) 965-6191 Fax: (740) 965-3688

JOB NO: 25-5722 **DATE:** 4/30/99

Owner:	CITY OF WEST CARROLLTON	**City:**	W. CARROLLTON	**State:**	OH
Well No:	3	**Well Location:**	WELL FIELD		
Pump Mfr:	PEERLESS/ B J	**Serial No:**			
Motor:	**Make:**	**Serial No:**		**Dia:**	
	HP: 30	**Volts:** 460	**Phase:** 3	**Frame:**	
Full Load Amps:		**Service Factor:**		**S.F. Amp:**	

PUMP INFORMATION

Discharge/Test Connection Size: 10' HEAD
Air Line Length:
Top Shaft Length: 19.5" 1-1/2"
Column Size: 8 Coated NO
Check ValveType: IN DISCHARGE
Shaft Size: 1 3/16 CS/SS: SS
Oil Tubing Size: NA
Power Cable: Size: Length:
Pump Bowl Type: BJ 11 MQ 2 STG.
Diameter: Stages:
Suction Size: NA Length: NA
Strainer Size: Length:

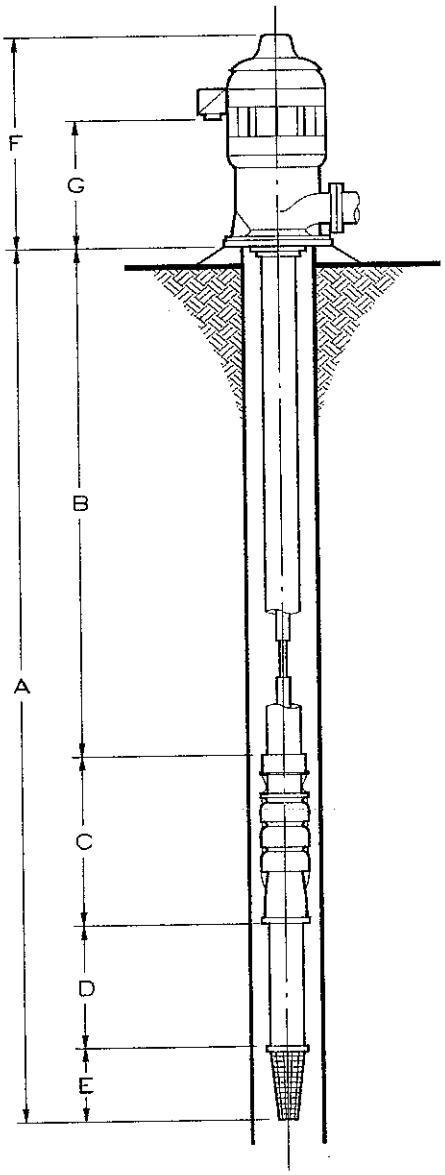
WELL INFORMATION

Well No: 3 Type: TUBULAR
Depth: 85' Screen Length: 20'
Diameter: 16" Static Water Level: 24.67'
Tower:

REMARKS:

THREE MAN JOB
PUMP HEAD MUST BE TURNED TO TEST
TOP SHAFT NECKED DOWN TO 1 3/16" ON BOTH ENDS

WELL APPEARS TO HAVE BEEN PLUGGED BACK TO 85'
BY OTHERS PREVIOUS TO THIS TIME



Dimensions:

A	65' 4"
B	61'
C	4' 4"
D	NA
E	NA
F	
G	

PUMP INSTALLER: SCOTT SHAFFER

MOULENBELT & SEIFERT
2305 Far Hills Avenue
Dayton, Ohio 45419

FILE:

DATE: MARCH 15, 1972

TO: CITY OF WEST CARROLLTON
41 E. CENTRAL
WEST CARROLLTON, OHIO

RE: COUNTY WATER STUDY - WELL LOGS

ATT'N: MR. MERLE NEYMAN

Gentlemen:

Please refer to (your) (our) (_____ Inc.)

letter dated _____.

(✓) Herewith ( ) Under separate cover, we are:

(✓) submitting ( ) returning ( ) requesting ( ) acknowledging

For: ( ) approval (✓) information ( ) distribution ( ) estimate of cost
( ) construction

With our: (*) approval (**) approval as noted (***) disapproval

_____ (prints) (copies) of the following:

INFORMATION FROM DIEHL PUMP & SUPPLY CO.
WELL NO. 3 DRILLING LOG WAS THE ONLY ONE LARRY BREWER COULD FIND. HE IS CHECKING LOUISVILLE RECORDS AND IF LOGS FOR WELLS NO 1 & 2 CAN BE FOUND WE WILL SEND A COPY.

( ) Please revise and resubmit drawings marked "Approved as Noted".
( ) Remarks on separate sheet attached.

Very truly yours,

MOULENBELT & SEIFERT

V.M.S.

cc: _____ w/ _____
_____ w/ _____
_____ w/ _____

TO: CINCINNATI OFFICE

FROM: R. B. DIEHL

DATE: JULY 3, 1961

SUBJECT: WEST CARROLLTON, OHIO

Dear Ed:

Do not know whether you have all the "dope" on the West Carrollton, Ohio Disposal Plant and the West Carrollton, Ohio Water Works, but the men turned in a report, so am giving it to you in case you do not have it.

At the Disposal Plant, this was a 12" well, 60' deep from grade, and contained 10' of 10" #100 slot strainer. There was a 14' static level. The pump tested at 500 GPM with a 3-1/2' drawdown and the log of the well was:

0 to 6'	Top soil
6 to 38'	Clay and gravel mixture
38 to 42'	Medium sand and gravel
42 to 46'	Coarse gravel and sand
46 to 60'	Medium sand and gravel

We originally had drilled a dry hole and the log of the dry hole is as follows:

0 to 1-1/2'	Filled gravel
1-1/2 to 5'	Black clay
5 to 8'	Sandy clay and gravel
8 to 23'	Good sand and gravel
23 to 30'	Soapstone

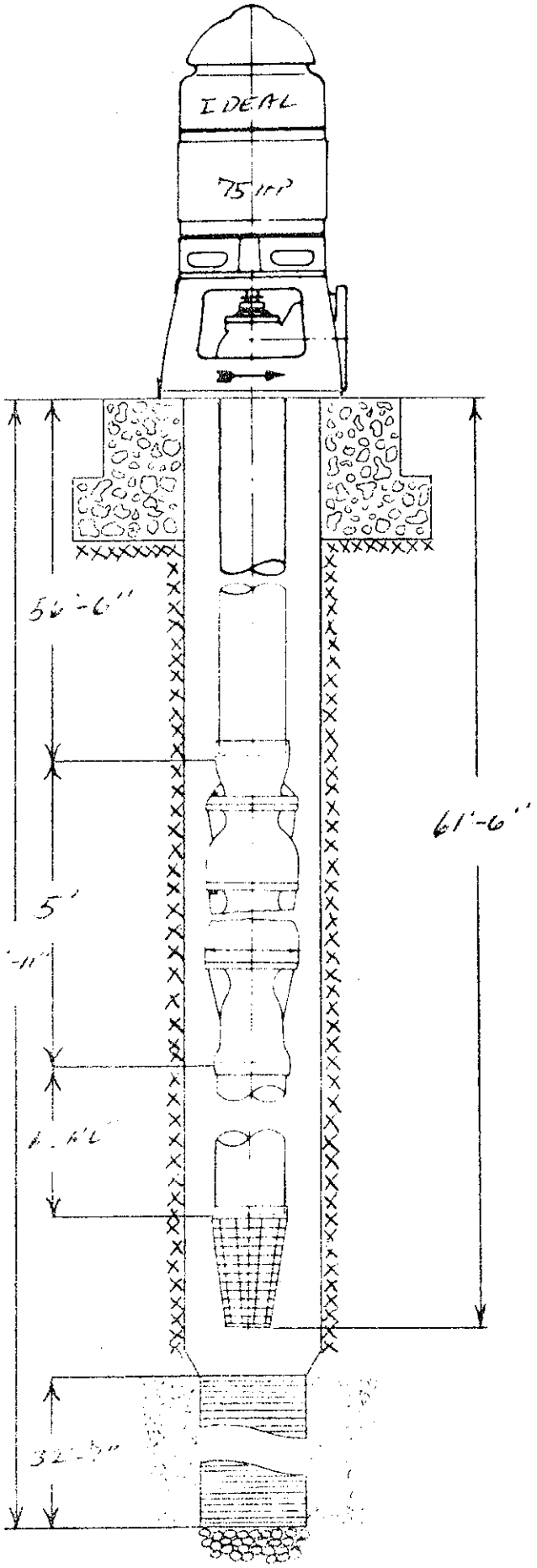
On the West Carrollton, Ohio Water Works, this was a 16" well finished at 93'-11" and contained 32'-7" of #125 slot strainer. The static level was 21' and this well was tested at 1500 GPM at a 7' drawdown over a 24-hour period. The log of the well was:

0 to 2'	Clay
2' to 24'	Gravel and boulders
24 to 33'	Hard pan and clay
33 to 91'	Coarse sand and gravel

RBD

RBD/p

DIEHL PUMP & SUPPLY CO.
INCORPORATED



WORTHINGTON
TURBINE PUMP INSTALLATION FOR:
CITY OF WESTCARROLLTON, OHIO

WELL DESIGNATION DL- 3

VTP5375 SERIAL NUMBER
1000 GALLONS PER MINUTE
236 TOTAL HEAD IN FEET
12H-11D 4 STAGES
1500 MOTOR SPEED
56'-6" FEET OF SETTING
8 SIZE COLUMN
NONE OIL TUBE
1¼ LINE SHAFT
NONE SUCTION PIPE
75 HP 220/440 VOLT AC CURRENT 3 PHASE
WATER LUBRICATION
52' FEET OF AIRLINE
6-21-61 DATE INSTALLED

16" I.D. OF WELL
93'-11" FEET DEEP FROM FOUNDATION
91' FEET DEEP FROM GRADE
32'-7" STRAINER LENGTH — SLOT
29'7" STATIC LEVEL — DATE 6-15-61
37 STATIC LEVEL — DATE 12-7-64
STATIC LEVEL — DATE
STATIC LEVEL — DATE
5-15-61 DATE DRILLED

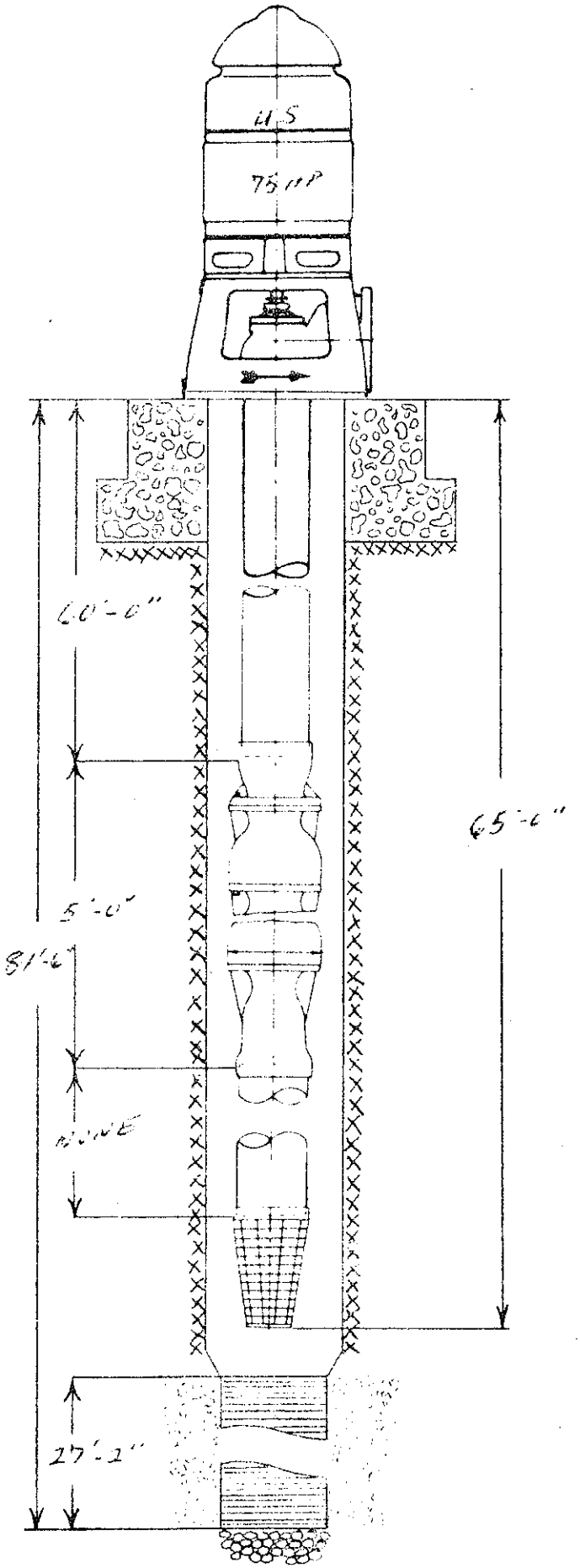
PUMP REPAIRED — DATE
PUMP REPAIRED — DATE
PUMP REPAIRED — DATE

WELL ACID TREATED — DATE
WELL ACID TREATED — DATE

COMMENTS —
600 GPM - 6' P.D. 12-7-64

DIEHL PUMP & SUPPLY CO.
INCORPORATED
PHONES — LOUISVILLE 454-4696
CINCINNATI 662-2991

DIEHL PUMP & SUPPLY CO.
INCORPORATED



WORTHINGTON
TURBINE PUMP INSTALLATION FOR:
CITY OF WEST CARROLLTON, OHIO

WELL DESIGNATION DL- 1

VTP 7497 SERIAL NUMBER
1000 GALLONS PER MINUTE
236 TOTAL HEAD IN FEET
12 4 STAGES
1800 MOTOR SPEED
60 FEET OF SETTING
8" SIZE COLUMN
NONE OIL TUBE
1-4" LINE SHAFT
NONE SUCTION PIPE
75 HP 220/440 VOLT AC CURRENT 3 PHASE
WATER LUBRICATION
60' FEET OF AIRLINE
DATE INSTALLED

16" I.D. OF WELL
81'-6" FEET DEEP FROM FOUNDATION
80 FEET DEEP FROM GRADE
27'-2" STRAINER LENGTH — SLOT 100
30' STATIC LEVEL — DATE 5-13-54
37' STATIC LEVEL — DATE 12-7-64
51' STATIC LEVEL — DATE 2-1-71
STATIC LEVEL — DATE
DATE DRILLED

PUMP REPAIRED — DATE
PUMP REPAIRED — DATE
PUMP REPAIRED — DATE

WELL ACID TREATED — DATE
WELL ACID TREATED — DATE

COMMENTS —
975 GPM - 7' D.D. 12-7-64

DIEHL PUMP & SUPPLY CO.
INCORPORATED

PHONES — LOUISVILLE 454-4696
CINCINNATI 662-1991
733-5161

WEST CARROLLTON, OHIO - DISPOSAL PLANT June 19, 1961

WELL #1

Dry Hole 12" Well

0'	to 1-1/2'	Filled in gravel
1-1/2'	to 5'	Black clay
5'	" 8'	Sandy clay, gravel
8'	" 23'	Good sand, gravel
23'	" 30'	Soap stone, stopped well pulled casing, moved to new location which is the following log. Second well o.k.

WELL #2

No Longer in use

12" Well

60'		Depty
10'		10" of 10" Screen #100 slot, 12" lead packer
14'		Static
		Test Pumped well 18 hours
500 GPM		3-1/2' drawdown 52' airline

0'	to	6'	Top soil
6'	"	38'	Clay and gravel mixture
38'	"	42'	Medium sand, gravel
42'	"	46'	Coarse gravel, sand
46'	"	60'	Medium sand, gravel

A. Wenning
J. Robinson
W. Parrish

PUMPS
COOLING TOWERS
PIPE LINES

DIEHL PUMP & SUPPLY CO.
INCORPORATED

Industrial Water Contracting

ROBARDS LANE
LOUISVILLE 18, KENTUCKY
CINCINNATI 37, OHIO

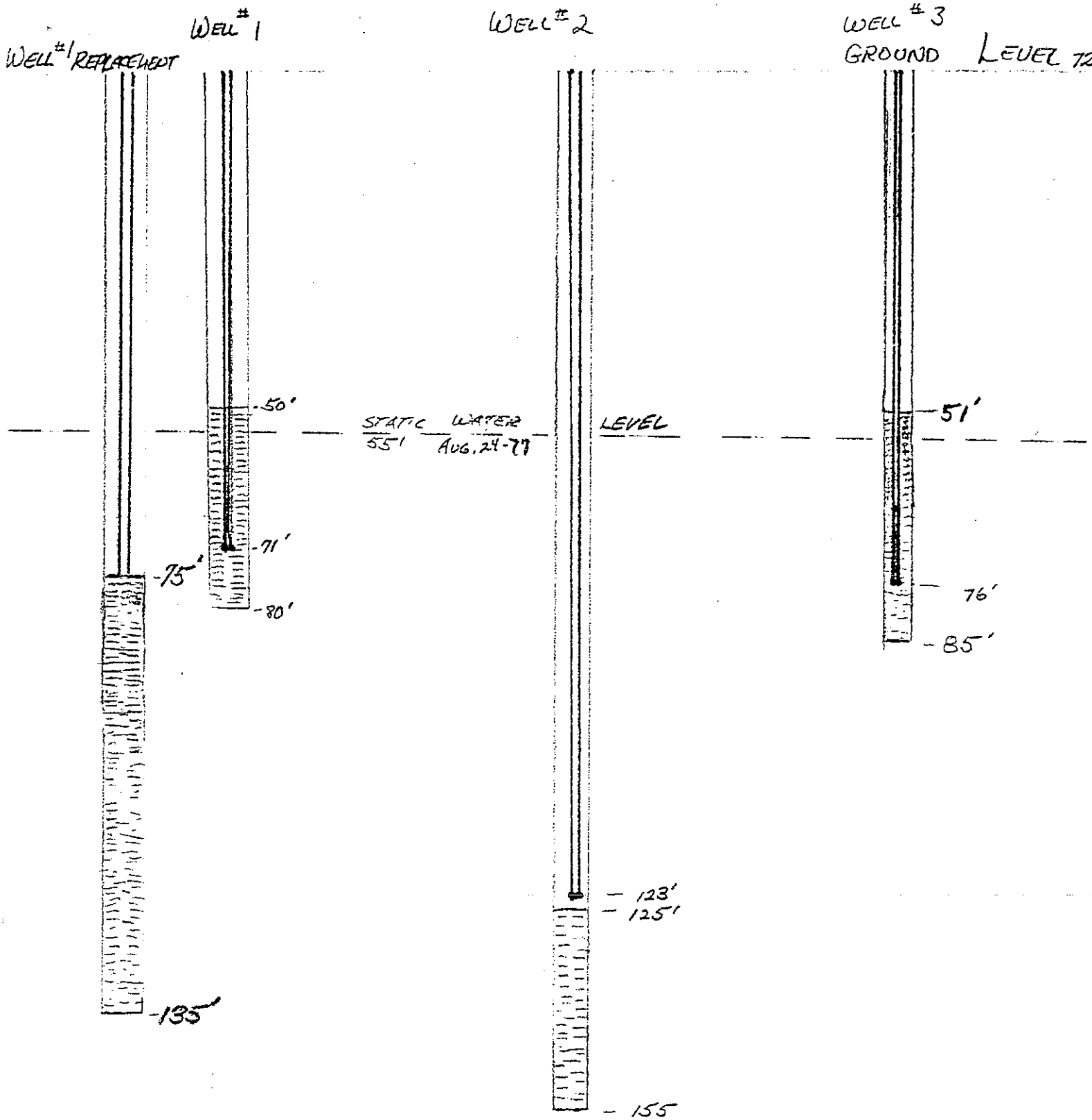
DREDGING
CONTRACTING
EXPLORATION

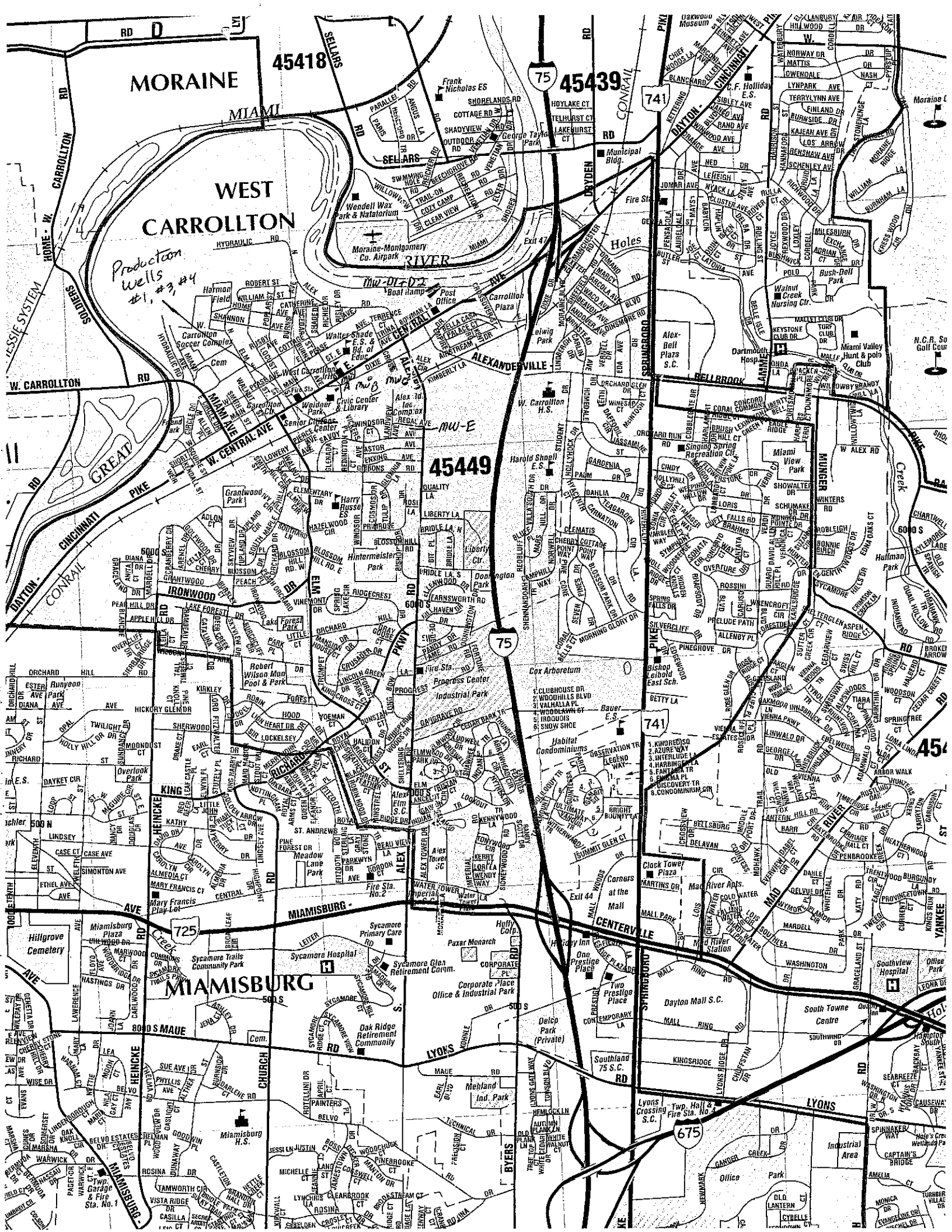
Log of Well No. 3 Size 16"

For Village of West Carrollton Location Date April 28, 1961

Formation Description	Depth to Top	Depth to Bottom	Thickness of Stratum	Feet of Casing	Length of Strainer	Slot Number
lay	0'	2'	2'			
ravel and Boulders	2'	24'	22'			
ard Pan and Clay	24'	33'	9'			
ood Sand and Coarse Gravel	33'	90'	57'			

esults of test	G P M	Drawdown


WELL #1 REPLACEMENT
WELL #1
WELL #2
WELL #3
GROUND LEVEL 72
-50'
-71'
-80'
-75'
-135'
STATIC WATER LEVEL
55' AUG. 24-77
-123'
-125'
-155
-51'
-76'
-85'
1" = 20'


MORAINE
WEST CARROLLTON
MIAMISBURG
45418
45439
45449
Production Wells #1, #3, #4
MW-DI-02
MW-A
MW-B
MW-E
Frank Nicholas ES
George Taylor Park
Municipal Bldg.
Wendell Wax Park & Natatorium
Moraine-Montgomery Co. Airpark
Boat Ramp
Post Office
Carrollton Plaza
Harman Field
Carrollton Soccer Complex
Carrollton Cem
Walter-Shade E.S. & Bd. of Educ.
Civic Center & Library
Senior Citizens Center
Weidner Park
Alex-Id Inc. Complex
Carrollton S.C.K.
Grantwood Park
Harry Russe ES
Hintermeister Park
Liberty Ctr.
Donnington Park
Lake Forest Park
Robert Wilson Mun Pool & Park
Runyeon Park
Overlook Park
Alex-Elm S.C.
Meadow Lane Park
Mary Francis Play Lot
Fire Sta. No.2
Progress Center Industrial Park
Alex Tower S.C.
Water Tower
Sycamore Primary Care
Sycamore Hospital
Sycamore Trails Community Park
Sycamore Glen Retirement Comm.
Corporate Place Office & Industrial Park
Oak Ridge Retirement Community
Miamisburg H.S.
Miamisburg Plaza
Hillgrove Cemetery
Twp. Garage & Fire Sta. No.1
Harold Shoell E.S.
W. Carrollton H.S.
Alex-Bell Plaza S.C.
Miami View Park
Singing Spring Recreation Ctr.
Dartmouth Hosp.
Miami Valley Hunt & polo Club
Walnut Creek Nursing Ctr.
Bush-Dell Park
Leiwig Park
Huffman Park
Cox Arboretum
Bishop Leibold East Sch.
Bauer E.S.
Habitat Condominiums
C.F. Holliday E.S.
Corners at the Mall
Clock Tower Plaza
Mad River Apts.
Mad River Station
Hilton Inn
One Prestige Place
Two Prestige Place
Dayton Mall S.C.
South Towne Centre
Southview Hospital
Delco Park (Private)
Southland 75 S.C.
Lyons Crossing S.C.
Twp. Hall & Fire Sta. No.4
Mehland Ind. Park
Industrial Area
Office Park
Exit 47
Exit 44
Holes
RIVER
Creek
CONRAIL
DAYTON - CINCINNATI PIKE
W. CENTRAL AVE
ALEXANDERSVILLE - BELLBROOK
MIAMISBURG - CENTERVILLE
SPRINGBORO
DRYDEN
SELLARS
SOLDIERS
HOME - W. CARROLLTON
CARROLLTON
MIAMI
CINCINNATI
DAYTON
IRONWOOD DR
ELM RD
ALEX BELL RD
HEINCKE
CHURCH
MAUE
LYONS
BYERS
RICHARD ST
KING
MAIN ST
W. CARROLLTON RD
741
725
675
75

DESCRIPTION OF SYSTEM

The City of West Carrollton is providing water from three systems. Montgomery County supplies water to the area east of US I-75 and south of elevation 910' (Indian Trail is generally considered the boundary). Jefferson Regional Water Authority will furnish water to annexed areas west of the Great Miami River. The West Carrollton Municipal System furnishes water to the rest of our constituents thru approximately 3200 services. Approximately 80% of our population is served by the West Carrollton Municipal System. The municipal system is composed of the following:

- Three Production Wells.
- Water Treatment Plant.
- Low Elevation Reservoir and Distribution System.
- High Elevation Reservoir and Distribution System.
- Telemetry Control, Alarm and/or Monitoring Equipment.

All of the above would be considered vulnerable during an emergency and are more specifically described as follows:

1. Wells (3) Rated Thus:

   Well #1, 1100 GPM at 30' Below Grade, T.D.H. 80'.
   Well #3, 1100 GPM at 30' Below Grade, T.D.H. 80'.
   Well #4, 1100 GPM at 30' Below Grade, T.D.H. 90'.

   All wells are monitored and automatically controlled Skyview Pump Station.

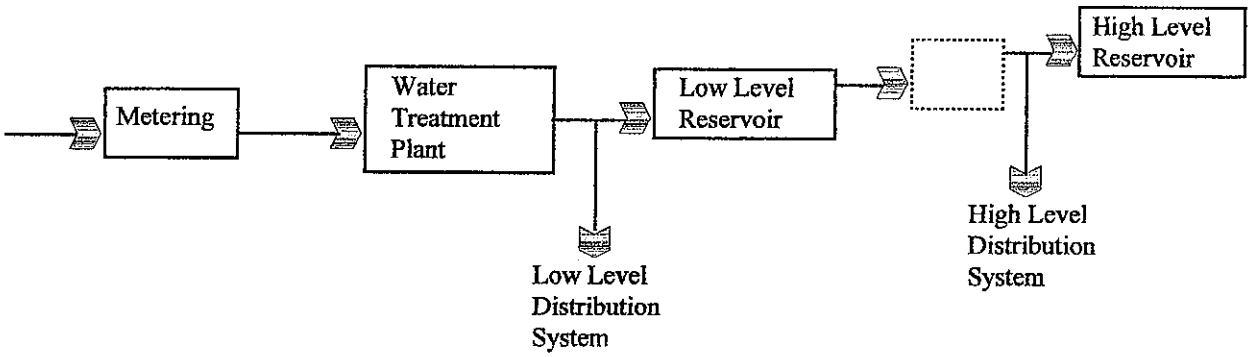
Present 2008 Data

Production Wells

2. Chemical Applications - Treatment Consists of Four (4)

   1) Disinfection - by Liquid Chlorination.
   2) Fluoridation - by Hydrofluosilicic Acid.
   3) Iron and Manganese Removal by Potassium Pe
   4) Hardness removal by membrane filtration usin
      Organic polymer anti-scaling agent

Raw Water From
Wells 1, 4, 3



Section 24

NCR Country Club
Well Field

Well No. 1
Well No. 2

RECEIVED

DEC 10 1990

STATE OF OHIO
WATER WITHDRAWAL FACILITY REGISTRATION

SEND TO: OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATER
WATER RESOURCES DEVELOPMENT SECTION
1939 FOUNTAIN SQUARE COURT, BLDG. E-3
COLUMBUS, OHIO 43224-1336
(614) 265-6750

AUTHORITY: Ohio Revised Code Section 1521.16 requires that any owner of a facility, or combination of facilities, with the capacity to withdraw more than 100,000 gallons of water daily, register such facilities with the Ohio Department of Natural Resources, Division of Water.

100,000 Gallons Per Day (GPD) = 0.1 Million Gallons Per Day (MGD) = 4200 Gallons Per Hour (GPH) = 70 Gallons Per Minute (GPM)

Detailed directions are on a separate instruction sheet. Please type or print the following information:

1. OWNER OF WATER WITHDRAWAL FACILITY

Owner's Name: NCR Corp.	Contact Person (If other than owner): William Job
Company Name: NCR Country Club	Company Name: NCR Country Club
Mailing Address: 4435 Dogwood Trail	Mailing Address: 4435 Dogwood Trail
City, State, Zip: Kettering, OH 45429	City, State, Zip: Kettering, OH 45429
SIC (Standard Industrial Classification)-4 digit: 7992 / Phone: (513) 299-3591	Phone: (513 299-4092

The annual withdrawal report form should be sent to : ☐ Owner ☑ Contact person (Check one)

2. WATER USE

Estimate percentage of the total water use from all sources for each type of use for both ground water and surface water. Total water use for both ground and surface water = 100%; GW = Ground water; SW = Surface water

WATER USE	GW%	SW%
Public Water Supply		
Community		
Non-community		
(OEPA # _____)		
Agricultural		
Livestock Watering		
Crop Irrigation		
Nursery/Turf/Landscaping		
Industrial		
Process Water		
Cooling Water		
Power Generation		
Nuclear		
Thermoelectric		
Hydroelectric		

WATER USE	GW%	SW%
Mineral Extraction		
Coal		
Oil		
Salt		
Sand and Gravel		
Limestone		
Other _____ (Please specify)		
Miscellaneous		
Recreation/Amusement		
Water Quality Remediation		
Heating/Cooling	1	
Domestic		
Fish Hatchery		
Dewatering		
Golf Course Irrigation	99	
Other _____ (Please specify)		

3. WATER WITHDRAWAL FACILITY CAPACITY

Total withdrawal capacity of the facility: 1 GPD or (MGD) (Circle one)

NOTE: Total withdrawal capacity is the sum of the withdrawal capacity for all wells and surface water intakes combined.

Was construction of this facility completed before January 1, 1990? ✓ Yes ____ No

Name of facility NCR Country Club well field

4. SUPPLY SOURCES

GROUND-WATER SOURCES

Total number of wells 2

Total withdrawal capacity of all wells 1

GPD or (MGD) (Circle one)

SURFACE-WATER SOURCES

Total number of surface-water intakes _____

Total withdrawal capacity of all intakes _____

GPD or MGD (Circle one)

FOR EACH WELL
PROVIDE THE FOLLOWING:

A. Owner's well number 1 (West)
Well capacity .5 GPD or (MGD) (Circle one)
Well log number (or copy of well log) _____
Well depth 107 (ft) Well diameter 12 (in)

AQUIFER UTILIZED (Check one)

- ☐ Sand
- ☐ Sandstone (SS)
- ☑ Sand and gravel
- ☐ Limestone (LS) /Dolomite
- ☐ Shale (Sh)
- ☐ Interbedded SS, LS, Sh
- ☐ Underground mine
- ☐ Other _____

LOCATION OF WELL

County Montgomery R-6
Township Miami Section T-1 Sec 40
Nearest City or Town Moraine
Provide written description of well location.
Rt 741 at Hole's Creek

FOR EACH SURFACE-WATER INTAKE
PROVIDE THE FOLLOWING:

A. Owner's intake number _____
Intake capacity _____ GPD or MGD (Circle one)
Name of body of water _____

SOURCE UTILIZED (Check one)

- ☐ River, stream, or drainage ditch
- ☐ Lake, pond, quarry, or reservoir
- ☐ Other _____

LOCATION OF INTAKE

County _____
Township _____ Section _____
Nearest City or Town _____
Provide written description of intake location.

B. Owner's well number 2 (East)
Well capacity .5 GPD or (MGD) (Circle one)
Well log number (or copy of well log) _____
Well depth 104 (ft) Well diameter 12 (in)

AQUIFER UTILIZED (Check one)

- ☐ Sand
- ☐ Sandstone (SS)
- ☑ Sand and gravel
- ☐ Limestone (LS) /Dolomite
- ☐ Shale (Sh)
- ☐ Interbedded SS, LS, Sh
- ☐ Underground mine
- ☐ Other _____

LOCATION OF WELL

County Montgomery R-6
Township Miami Section T-1 Sec 40
Nearest City or Town Moraine
Provide written description of well location.
Rt 741 at Hole's Creek

B. Owner's intake number _____
Intake capacity _____ GPD or MGD (Circle one)
Name of body of water _____

SOURCE UTILIZED (Check one)

- ☐ River, stream, or drainage ditch
- ☐ Lake, pond, quarry, or reservoir
- ☐ Other _____

LOCATION OF INTAKE

County _____
Township _____ Section _____
Nearest City or Town _____
Provide written description of intake location.

C. Owner's well number _____
Well capacity _____ GPD or MGD (Circle one)
Well log number (or copy of well log) _____
Well depth _____ (ft) Well diameter _____ (in)

AQUIFER UTILIZED (Check one)

- ☐ Sand
- ☐ Sandstone (SS)
- ☐ Sand and gravel
- ☐ Limestone (LS) /Dolomite
- ☐ Shale (Sh)
- ☐ Interbedded SS, LS, Sh
- ☐ Underground mine
- ☐ Other _____

LOCATION OF WELL

County _____
Township _____ Section _____
Nearest City or Town _____
Provide written description of well location.

(Note: Use additional sheets if necessary)

C. Owner's intake number _____
Intake capacity _____ GPD or MGD (Circle one)
Name of body of water _____

SOURCE UTILIZED (Check one)

- ☐ River, stream, or drainage ditch
- ☐ Lake, pond, quarry, or reservoir
- ☐ Other _____

LOCATION OF INTAKE

County _____
Township _____ Section _____
Nearest City or Town _____
Provide written description of intake location.

(Note: Use additional sheets if necessary)

Supply Sources Continued:

D. Owner's well number _____
Well capacity _____ GPD or MGD (Circle one)
Well log number (or copy of well log) _____
Well depth _____ (ft) Well diameter _____ (in)

AQUIFER UTILIZED (Check one)

- ☐ Sand
- ☐ Sandstone (SS)
- ☐ Sand and gravel
- ☐ Limestone (LS) /Dolomite
- ☐ Shale (Sh)
- ☐ Interbedded SS, LS, Sh
- ☐ Underground mine
- ☐ Other _____

LOCATION OF WELL

County _____
Township _____ Section _____
Nearest City or Town _____
Provide written description of well location.

D. Owner's intake number _____
Intake capacity _____ GPD or MGD (Circle one)
Name of body of water _____

SOURCE UTILIZED (Check one)

- ☐ River, stream, or drainage ditch
- ☐ Lake, pond, quarry, or reservoir
- ☐ Other _____

LOCATION OF INTAKE

County _____
Township _____ Section _____
Nearest City or Town _____
Provide written description of intake location.

5. LOCATION OF WATER USE

State Ohio County Montgomery Township _____ Section _____

Provide written description of location of water use. If more than one water use location exists, attach separate sheets providing the above information for each.

Course is in Washington Twp., Miami Twp. and City of Kettering
29% 1% 70%

6. TYPE AND LOCATION OF DISCHARGE POINTS

Estimate percentage of water discharged to the following:

- ___ Recharge Well
- 100 On Site Sewage Disposal
- ___ Ground-water Recharge Basin
- ___ Land Application
- ___ Recycling Basin
- ___ Wetland
- ___ Pond, Lake, or Reservoir Name _____
- ___ River, Stream, or Drainage Ditch Name _____
- ___ Other _____ (Please specify)

Location of Discharge Facility

State Ohio County Montgomery Township _____ Section _____

Provide written description of location of discharge facility. If more than one point of discharge exists, attach separate sheets providing the above information for each.

Please complete a water withdrawal facility location sketch on page 4.

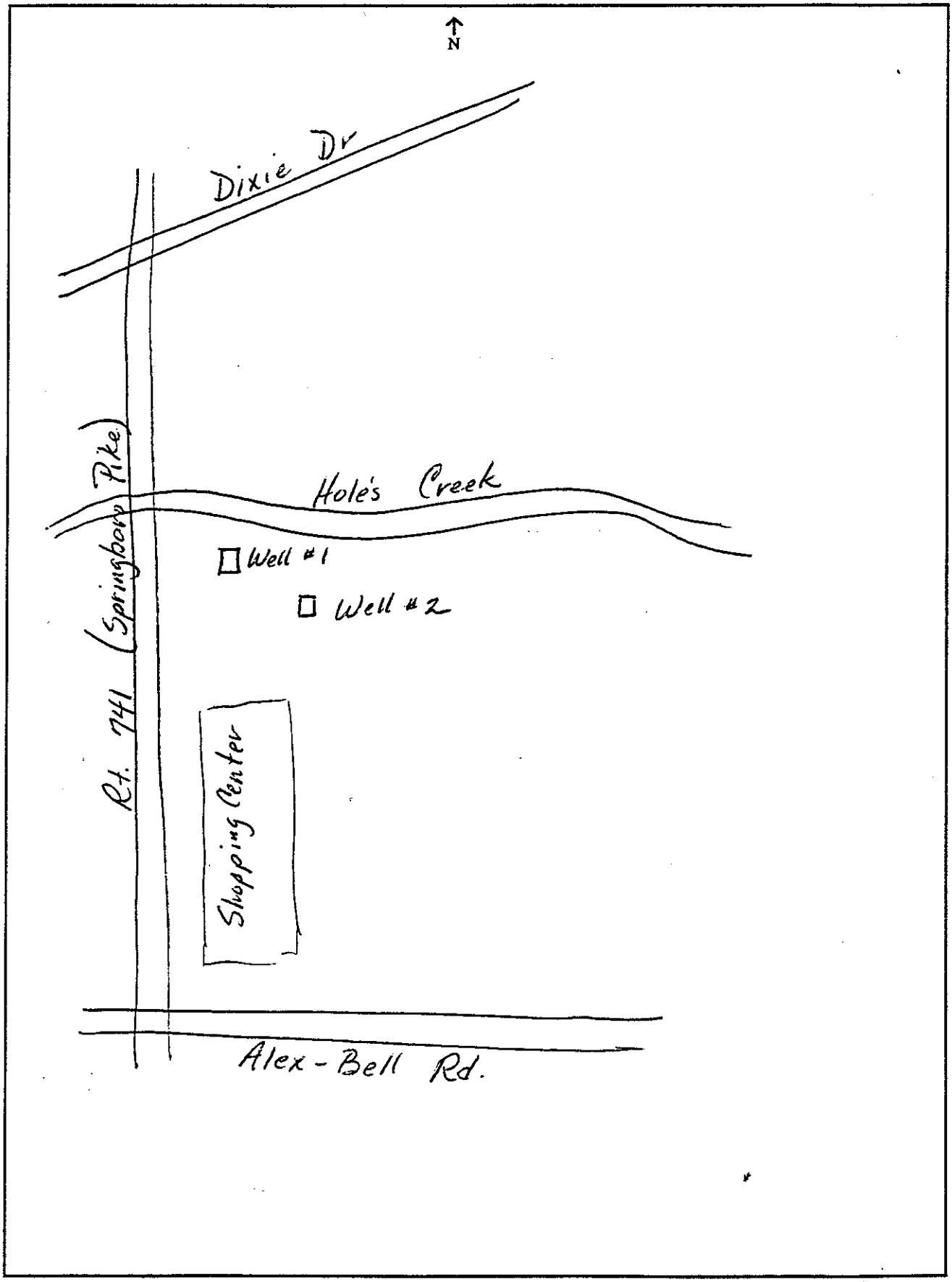
7. STATEMENT OF AFFIRMATION

I hereby certify that to the best of my knowledge the information submitted herein, is true, accurate and complete.

Owner or authorized representative's signature	Date
William A. Jr	12/6/90

DAYTON SOUTH K-6

WATER WITHDRAWAL FACILITY LOCATION SKETCH: Locate all wells, intake pipes, places of use, and discharge points with references to water sources, named roads, highways, buildings, or other distinctive landmarks. This section may be divided for additional maps or separate maps may be attached.



FOR OFFICE USE ONLY:

Date of Registration _____ Basin 05080002 Registration Number 0096 7 Latitude 39° 40' 50" Longitude 84° 13' 05"

NCR COUNTRY CLUB

December 6, 1990

To Whom It May Concern
Ohio Dept. of Natural Resources
Division of Water :

We have few records on file concerning these 2 wells. In an effort to update our records and to provide your office with correct information, we have contracted to have both wells checked and all pertinent information recorded. The information provided on the form is to the best of my knowledge.

William A. Job
William A. Job
Golf Course Superintendent

NCR COUNTRY CLUB, INC.
4435 Dogwood Trail — Kettering, Ohio 45429-1296 — (513) 299-3571

ARCADIS

Section 25

Lamme Road
Well Field

2
3
4
6

Lamme Road 2

Depth (ft.)	Well Diagram	Description of Material	Log
0		Ground	
10		Gravel, sand and clay	
20			
30		Gravel	
40		Gravel, sand and clay	
50			
60			
70		Gravel	
80			
90		Sand	
		Sand and gravel	
100		Coarse sand and gravel	
110		Sand and gravel	
120		Gravel	
130			
140		Coarse gravel	
150		Coarse sand and gravel	
160		Sand and gravel	
170		Coarse gravel	
180		Sand	
190		Sand and gravel	
200		Coarse gravel	
210		Brown clay	
220		Shale	

GREATER MORAINE WATER SYSTEM — WATER WELL DATA

Well No. 2 Location Lamme Road
Driller Layne-Ohio Company Equipment Drilling Rig
Date Started March, 1954 Completed June, 1954

CONSTRUCTION DETAILS

Type of Well Tubular Method Drilling Rig
Outside Casing:
I. D. 20 in. Length: 125.6 ft. Thickness - in.
Material Steel Connections Welded
Inside Casing: N/A
I. D. ____ in. Length: ____ ft. Thickness ____ in.
Material Steel Connections Flanged
Screen:
Type Cook I. D. 16 in. Length: 75 ft.
Openings No. 14 to 125 Material Bronze
Bottom Fitting ____ Top Fitting Lead packer
Gravel: Size - Quantity -
Well Development:
Method Surging Equipment Drilling Rig

PUMPING TEST

Date Feb. 5, 1968 Static W. L. 82 ft. Time 12:00 M. D.
Flow 1400 gpm Length of Test 0.50 hours
Min. pumping level 117 ft. Max. drawdown 34.6 ft.
Specific capacity 40.5 gpm/ft. Stabilized Yes
Transmissibility - gpd/ft. Storage Coefficient -
Well efficiency 87 % Wire-to-Water eff. 82 %

WATER ANALYSIS

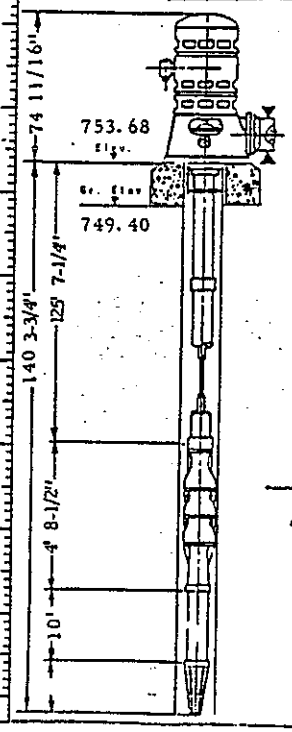
Date of Sample Feb. 5, 1968 Date of Analysis Feb. 5, 1968
Pumping 2.0 hrs. @ 1400 gpm Appearance Clear
Water Temperature 13.5°C Air Temperature 10.0°C
Specific Conductance 680 micromhos-cm @ 25° C.

Total Diss. Solids	442	mg/l	Calcium*	284	mg/l
Total Hardness*	460	mg/l	Iron, Fe	Tr.	mg/l
Alkalinity*	320	mg/l	Manganese, Mn	0.06	mg/l
Non-Carb. Hard.*	140	mg/l	Chloride, Cl	39	mg/l
CO_2	19	mg/l	Sulfate, SO_4	97.5	mg/l
Dissolved Oxygen	-	mg/l	H_2S	-	mg/l

pH 7.5 pHs 6.9 pH - pHs + 0.6
*As $CaCO_3$

PERMANENT PUMPING EQUIPMENT

Pump Layne vertical centrifugal Capacity 1500 gpm TDH 297 ft.
Motor 150 HP @ 1800 RPM
Material: Impellers Bronze Bowls 15" DRHC
Impeller No. Standard Number of Stages 3



Column: Length 130' 3" ID ____ in
OD 14-5/8 in. Material Steel
Threaded or flange 14-1/2" flange

Shaft: Lubrication Oil
Material Stainless Diam. 1-15/16 in
OD Oil Tube 3 in.
Material Steel

Suction Pipe Yes ID 10 in
OD ____ in. Length 125 ft.
Material Steel
Length of Air Line ~~128~~ ft.

REMARKS

Redeveloped by Moody's 3/64.
Redeveloped by Moodys 1/73
Total pump ~~ft~~ down at 125 ft from top of pad.
20 ft of pump will be added
TOST
Drawdown 18 ft = 1455 GPM
Drawdown 12 ft = 935 GPM

Compiled by BC&E
Date July, 1968

68-D1

Lamme Road 3

Depth (ft.)	Well Diagram	Description of Material	Log
0–30		Muddy sand and gravel	
30–50		Dirty sand and gravel	
50–80		Dry gravel	
80–90		Sand and gravel	
90–110		Sand	
110–120		Gravel	
120–130		Dirty sand and gravel	
130–140		Sand	
140–150		Sand gravel	
150–180		Sand	
170–190		Sand and gravel	
190–220		Hardpan	

GREATER MORAINE WATER SYSTEM — WATER WELL DATA

Well No. 3 Location Lamme Road
Driller Layne-Ohio Company Equipment Drilling Rig
Date Started February 8, 1952 Completed

CONSTRUCTION DETAILS

Type of Well Deep vertical Method Drilled
Outside Casing:
I. D. 18 in. Length: 157 ft. Thickness - in.
Material Steel Connections Welded
Inside Casing: N/A
I. D. ____ in. Length: ____ ft. Thickness ____ in.
Material ____ Connections ____
Screen:
Type Johnson I. D. 16 in. Length: 30 ft.
Openings 150 Material Bronze
Bottom Fitting ____ Top Fitting Lead Packer
Gravel: Size ____ Quantity ____
Well Development:
Method Surging Equipment Drilling Rig

PUMPING TEST

Date Feb. 6, 1968 Static W. L. 62 ft. Time 8:00 A.M.
Flow 925 gpm Length of Test 0.5 hours
Min. pumping level 87 ft. Max. drawdown 24.5 ft.
Specific capacity 37.8 gpm/ft. Stabilized Yes
Transmissibility - gpd/ft. Storage Coefficient -
Well efficiency 50 % Wire-to-Water eff. 55 %

WATER ANALYSIS

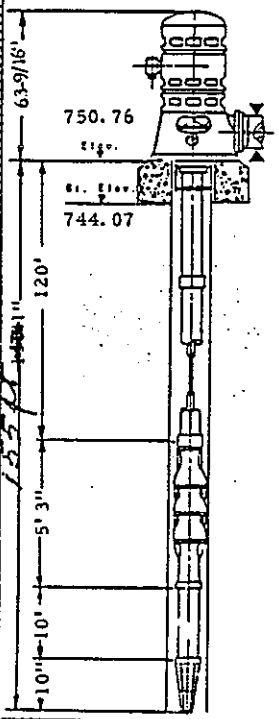
Date of Sample Feb. 5, 1968 Date of Analysis Feb. 5, 1968
Pumping 2.0 hrs. @ 950 gpm Appearance Clear
Water Temperature 13°C Air Temperature 8°C
Specific Conductance 575 micromhos-cm @ 25° C.

Total Diss. Solids	442	mg/l	Calcium*	232	mg/l
Total Hardness*	376	mg/l	Iron, Fe	0.04	mg/l
Alkalinity*	280	mg/l	Manganese, Mn	0.07	mg/l
Non-Carb. Hard.*	96	mg/l	Chloride, Cl	27	mg/l
CO_2	19	mg/l	Sulfate, SO_4	75.5	mg/l
Dissolved Oxygen	-	mg/l	H_2S	-	mg/l

pH 7.5 pHs 7.1 pH - pHs + 0.4
*As $CaCO_3$

PERMANENT PUMPING EQUIPMENT

Pump Layne vertical centrifugal Capacity 1400 gpm TDH 259 ft.
Motor U.S. 125 HP @ 1750 RPM
Material: Impellers Bronze Bowls 14" WMG
Impeller No. Standard Number of Stages 4



Column: Length 125' 3" ID ____ in.
OD 10 in. Material Steel
Threaded or flange Flange

Shaft: Lubrication Oil
Material Stainless Diam. 1-11/16 in.
OD Oil Tube 2-1/2 in.
Material Steel

Suction Pipe Yes ID 10 in.
OD ____ in. Length 10 ft.
Material Steel
Length of Air Line ⇨ 132 ft.

REMARKS

10" cone strainer.
WMC impeller trimmed to 9-31/32"
Well redeveloped by Woodtype Dec. 1973
20 ft. of pump column added.
Tested well 1/9/73
1120 GPM - 26 ft drawdown
1370 GPM - 33 ft drawdown
827 GPM 17 ft drawdown.

Compiled by BC&E
Date July, 1968

Lamme Road 4

Depth (ft.)	Well Diagram	Description of Material	Log
0–10		Muddy clay gravel	
10–40		Dry sand and gravel	
40–60		Sandy clay	
60–80		Clay and gravel mixed	
80–100		Sand and gravel	
100–110		Rusty sand and gravel Sand and gravel	
110–130		Fine sand	
130–140		Sand, gravel & dirty clay	
140–170		Sand, coarse gravel	
170–220		Hard pan	

GREATER MORAINE WATER SYSTEM — WATER WELL DATA

Well No. 4 Location Lamme Road
Driller Layne-Ohio Company Equipment Drilling Rig
Date Started ____ Completed Sept. 12, 1950
(1958 developed)

CONSTRUCTION DETAILS

Type of Well Tubular Method Drilled
Outside Casing:
I. D. 16 in. Length: 138.0 ft. Thickness - in.
Material Steel Connections Welded
Inside Casing: N/A
I. D. ____ in. Length: ____ ft. Thickness ____ in.
Material ____ Connections ____
Screen:
Type Johnson I. D. ____ in. Length: 28 ft.
Openings 187-1/2 slot Material Bronze
Bottom Fitting ____ Top Fitting Lead Packer
Gravel: Size N/A Quantity N/A
Well Development:
Method Surging Equipment Drill

PUMPING TEST

Date Feb. 6, 1968 Static W. L. 74 ft. Time 11:00 A. M.
Flow 1200 gpm Length of Test 0.5 hours
Min. pumping level 91 ft. Max. drawdown 16.8 ft.
Specific capacity 71.5 gpm/ft. Stabilized Yes
Transmissibility - gpd/ft. Storage Coefficient -
Well efficiency 86 % Wire-to-Water eff. 72 %

WATER ANALYSIS

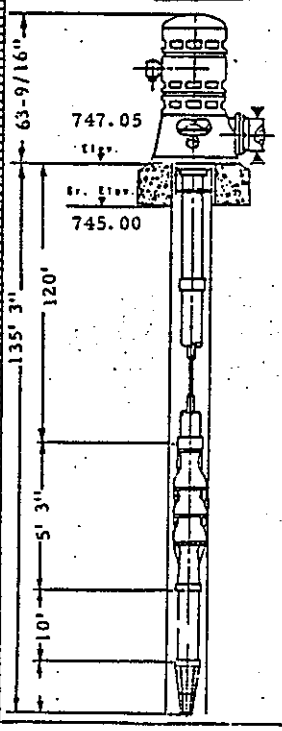
Date of Sample Feb. 6, 1968 Date of Analysis Feb. 6, 1968
Pumping 2 hrs. @ 1200 gpm Appearance Clear
Water Temperature 13°C Air Temperature 7°C
Specific Conductance 725 micromhos-cm @ 25° C.

Total Diss. Solids	471	mg/l	Calcium*	290	mg/l
Total Hardness*	462	mg/l	Iron, Fe	0.04	mg/l
Alkalinity*	304	mg/l	Manganese, Mn	0.07	mg/l
Non-Carb. Hard.*	158	mg/l	Chloride, Cl	45	mg/l
CO_2	24	mg/l	Sulfate, SO_4	142	mg/l
Dissolved Oxygen	-	mg/l	H_2S	-	mg/l

pH 7.4 pHs 7.0 pH - pHs + 0.4
*As $CaCO_3$

PERMANENT PUMPING EQUIPMENT

Layne
Pump Vertical Hollow shaft Capacity 1500 gpm TDH 251 ft.
Motor U.S. 125 HP @ 1750 RPM
Material: Impellers Bronze Bowls 13-1/8 OD
Impeller No. Standard Number of Stages 4



Column: Length 135 ft. ID 10 in
OD 14-1/2 in. Material Steel
Threaded or flange Flange

Shaft: Lubrication Oil
Material Stainless Diam. 1-11/16 in
OD Oil Tube 2-1/2 in.
Material Steel

Suction Pipe Yes ID 10 in
OD ____ in. Length 10 ft.
Material Steel
Length of Air Line 114 ft.

REMARKS

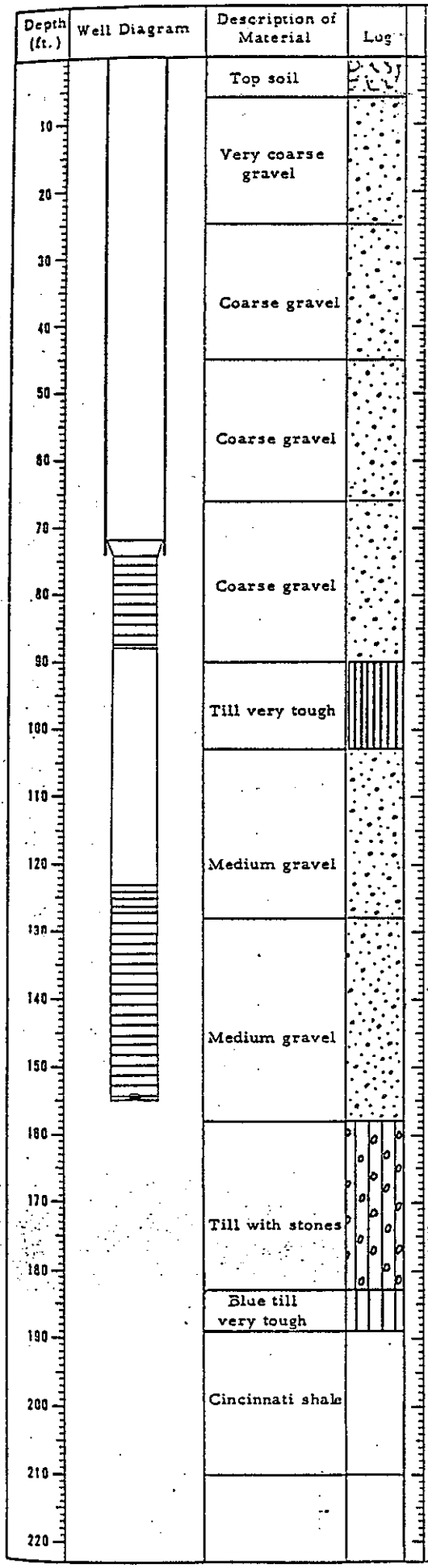
Emergency repair 1/67

Full size impeller added May 27, 1954

Compiled by BC&E
Date July, 1968

8-R1

Lamme Road 6



GREATER MORAINE WATER SYSTEM — WATER WELL DATA

Well No. 6 Location Lamme Road
Driller Layne-Ohio Company Equipment Drilling Rig
Date Started January 30, 1953 Completed 1953
(February 1, 1964)

CONSTRUCTION DETAILS

Type of Well Vertical Method Drilled
Outside Casing:
I. D. 20 in. Length: 73.8 ft. Thickness - in.
Material Steel Connections Welded
Inside Casing:
I. D. - in. Length: ft. Thickness in.
Material Connections
Screen:
Type Cook I. D. 16 in. Length: 47 ft.
Openings 15'-#100; 32'-#125 Material Cook WW red brass
Bottom Fitting Top Fitting Lead packer
Gravel: Size N/A Quantity N/A
Well Development:
Method Surging Equipment Drilling Rig

PUMPING TEST

Date Feb. 7, 1968 Static W. L. 63 Time 11:30A. M.
Flow 1170 gpm Length of Test 0.5 hours
Min. pumping level 79 ft. Max. drawdown 16.2 ft.
Specific capacity 72.2 gpm/ft. Stabilized Yes
Transmissibility - gpd/ft. Storage Coefficient -
Well efficiency 78 % Wire-to-Water eff. 75 %

WATER ANALYSIS

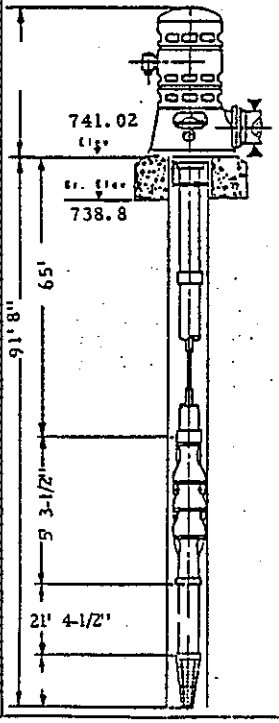
Date of Sample Feb. 7, 1968 Date of Analysis Feb. 7, 1968
Pumping 2.0 hrs. @ 1150 gpm Appearance Clear
Water Temperature 13°C Air Temperature 8.5°C
Specific Conductance 500 micromhos-cm @ 25° C.

Total Diss. Solids	325	mg/l	Calcium*	196	mg/l
Total Hardness*	318	mg/l	Iron, Fe	0.10	mg/l
Alkalinity*	238	mg/l	Manganese, Mn	0.04	mg/l
Non-Carb. Hard.*	80	mg/l	Chloride, Cl	31	mg/l
CO_2	19	mg/l	Sulfate, SO_4	62	mg/l
Dissolved Oxygen	-	mg/l	H_2S	-	mg/l

pH 7.5 pHs 7.2 pH - pHs + 0.3
*As $CaCO_3$

PERMANENT PUMPING EQUIPMENT

Pump Byron Jackson Bowl Assy. Capacity 1000 gpm TDH 310 ft.
Motor U.S. 125 HP @ 1800 RPM
Material: Impellers Bronze Bowls
Impeller No. Standard Number of Stages
45' 8"



Column: Length 110 ft. ID 65' 10"
OD in. Material Steel
Threaded or flange Flange

Shaft: Lubrication Oil
Material Stainless Diam. 1-7/16 in
OD Oil Tube 2-1/2 in. 1-1/2
Material Steel

Suction Pipe Yes ID 8 in
OD in. Length 10 ft.
Material Steel
Length of Air Line 117 ft.

REMARKS

Repair 8/66; also 2/1/64.

Compiled by BC&E
Date July, 1968

Section 26

Appleton Paper
Well Field

ODNR Well Information

1
3
4
6
7
8
9
10

ARCADIS

ODNR Information

RECEIVED

MAY 17 1990

DEPT. OF NATURAL RESOURCES
WATER RESOURCES DEVELOPMENT

STATE OF OHIO WATER WITHDRAWAL FACILITY REGISTRATION

SEND TO: OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATER
WATER RESOURCES DEVELOPMENT SECTION
1939 FOUNTAIN SQUARE COURT, BLDG. E-3
COLUMBUS, OHIO 43224-1336
(614) 265-6750

AUTHORITY: Ohio Revised Code Section 1521.16 requires that any owner of a facility, or combination of facilities, with the capacity to withdraw more than 100,000 gallons of water daily, register such facilities with the Ohio Department of Natural Resources, Division of Water.

100,000 Gallons Per Day (GPD) = 0.1 Million Gallons Per Day (MGD) = 4200 Gallons Per Hour (GPH) = 70 Gallons Per Minute (GPM)

Detailed directions are on a separate instruction sheet. Please type or print the following information:

1. OWNER OF WATER WITHDRAWAL FACILITY

Owner's Name: Appleton Papers Inc (Ruth per call 11/30/92)	Contact Person (If other than owner): Nancy McDonnell
Company Name: Appleton Papers Inc	Company Name: Same
Mailing Address: PO Box 68	Mailing Address: Same
City, State, Zip: West Carrollton, OH 45449	City, State, Zip
SIC (Standard Industrial Classification)-4 digit: 2672 / Phone: (513) 847-7310	Phone: ( )

The annual withdrawal report form should be sent to : ☐ Owner ☒ Contact person (Check one)

2. WATER USE

Estimate percentage of the total water use from all sources for each type of use for both ground water and surface water. Total water use for both ground and surface water = 100%; GW = Ground water; SW = Surface water

WATER USE	GW%	SW%
Public Water Supply		
Community		
Non-community		
(OEPA # _____)		
Agricultural		
Livestock Watering		
Crop Irrigation		
Nursery/Turf/Landscaping		
Industrial		
Process Water	88 %	
Cooling Water		
Power Generation		
Nuclear		
Thermoelectric	5%	
Hydroelectric		

WATER USE	GW%	SW%
Mineral Extraction		
Coal		
Oil		
Salt		
Sand and Gravel		
Limestone		
Other _____ (Please specify)		
Miscellaneous		
Recreation/Amusement		
Water Quality Remediation	3%	
Heating/Cooling		
Domestic		
Fish Hatchery		
Dewatering		
Golf Course Irrigation		
Other Steam generation (Please specify)	4%	

3. WATER WITHDRAWAL FACILITY CAPACITY

Total withdrawal capacity of the facility: 22.28 GPD or (MGD) (Circle one)

NOTE: Total withdrawal capacity is the sum of the withdrawal capacity for all wells and surface water intakes combined.

Was construction of this facility completed before January 1, 1990? X Yes ____ No

Name of facility Appleton Papers Inc - West Carrollton Mill

4. SUPPLY SOURCES

GROUND-WATER SOURCES

Total number of wells 10

Total withdrawal capacity of all wells 22.28

GPD or (MGD) (Circle one)

SURFACE-WATER SOURCES

Total number of surface-water intakes 0

Total withdrawal capacity of all intakes 0

GPD or (MGD) (Circle one)

FOR EACH WELL
PROVIDE THE FOLLOWING:

A. Owner's well number 1
Well capacity 1.10 GPD or (MGD) (Circle one)
Well log number (or copy of well log) log attached
Well depth 162 (ft) Well diameter 12 (in)

AQUIFER UTILIZED (Check one)

- ☐ Sand
- ☐ Sandstone (SS)
- ☒ Sand and gravel
- ☐ Limestone (LS) /Dolomite
- ☐ Shale (Sh)
- ☐ Interbedded SS, LS, Sh
- ☐ Underground mine
- ☐ Other _____

LOCATION OF WELL

County Montgomery
Township Miami Section 21
Nearest City or Town West Carrollton
Provide written description of well location.
1030 W. Alex-Bell Rd. In tunnel near power house.

B. Owner's well number 3
Well capacity 1.73 GPD or (MGD) (Circle one)
Well log number (or copy of well log) Z36115
Well depth 125 (ft) Well diameter 16 (in)

AQUIFER UTILIZED (Check one)

- ☐ Sand
- ☐ Sandstone (SS)
- ☒ Sand and gravel
- ☐ Limestone (LS) /Dolomite
- ☐ Shale (Sh)
- ☐ Interbedded SS, LS, Sh
- ☐ Underground mine
- ☐ Other _____

LOCATION OF WELL

County Montgomery
Township Miami Section 21
Nearest City or Town West Carrollton
Provide written description of well location.
1030 W. Alex-Bell Rd. Along entrance drive off Alex-Bell Rd.

C. Owner's well number 4
Well capacity 1.73 GPD or (MGD) (Circle one)
Well log number (or copy of well log) log attached
Well depth 129 (ft) Well diameter 16 (in)

AQUIFER UTILIZED (Check one)

- ☐ Sand
- ☐ Sandstone (SS)
- ☒ Sand and gravel
- ☐ Limestone (LS) /Dolomite
- ☐ Shale (Sh)
- ☐ Interbedded SS, LS, Sh
- ☐ Underground mine
- ☐ Other _____

LOCATION OF WELL

County Montgomery
Township Miami Section 21
Nearest City or Town West Carrollton
Provide written description of well location.
1030 W. Alex-Bell Rd. Along Kimberly Lane, near Alex-Bell Rd. next to RR tracks.

(Note: Use additional sheets if necessary)

FOR EACH SURFACE-WATER INTAKE
PROVIDE THE FOLLOWING:

A. Owner's intake number _____
Intake capacity _____ GPD or MGD (Circle one)
Name of body of water _____

SOURCE UTILIZED (Check one)

- ☐ River, stream, or drainage ditch
- ☐ Lake, pond, quarry, or reservoir
- ☐ Other _____

LOCATION OF INTAKE

County _____
Township _____ Section _____
Nearest City or Town _____
Provide written description of intake location.

B. Owner's intake number _____
Intake capacity _____ GPD or MGD (Circle one)
Name of body of water _____

SOURCE UTILIZED (Check one)

- ☐ River, stream, or drainage ditch
- ☐ Lake, pond, quarry, or reservoir
- ☐ Other _____

LOCATION OF INTAKE

County _____
Township _____ Section _____
Nearest City or Town _____
Provide written description of intake location.

C. Owner's intake number _____
Intake capacity _____ GPD or MGD (Circle one)
Name of body of water _____

SOURCE UTILIZED (Check one)

- ☐ River, stream, or drainage ditch
- ☐ Lake, pond, quarry, or reservoir
- ☐ Other _____

LOCATION OF INTAKE

County _____
Township _____ Section _____
Nearest City or Town _____
Provide written description of intake location.

(Note: Use additional sheets if necessary)

5. LOCATION OF WATER USE (part 2 of 2)

Appleton Papers Inc.'s wastewater treatment plant is located along the Great Miami River at 4000 Hydraulic Rd., in Section 21 of Miami Twp., Montgomery County, Ohio in the city of West Carrollton.

6. TYPE AND LOCATION OF WATER DISCHARGE POINTS (part 2 of 2)

Appleton Papers Inc.'s wastewater treatment facility is located as described above in item 5. It's treated water discharge flows through a pipe, east beneath Hydraulic Rd. and into the Great Miami River.

#1 Well

WELL & PUMP DATA

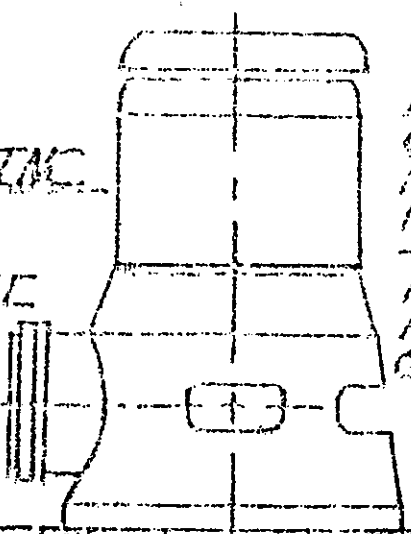
G.M. BAKER & SON INC.

Developers of Underground Water Supply

"Since 1885"

Columbus, O.

Date



U.L.

HP 40 RPM 1800 ø 3

CY 60 Volt 440

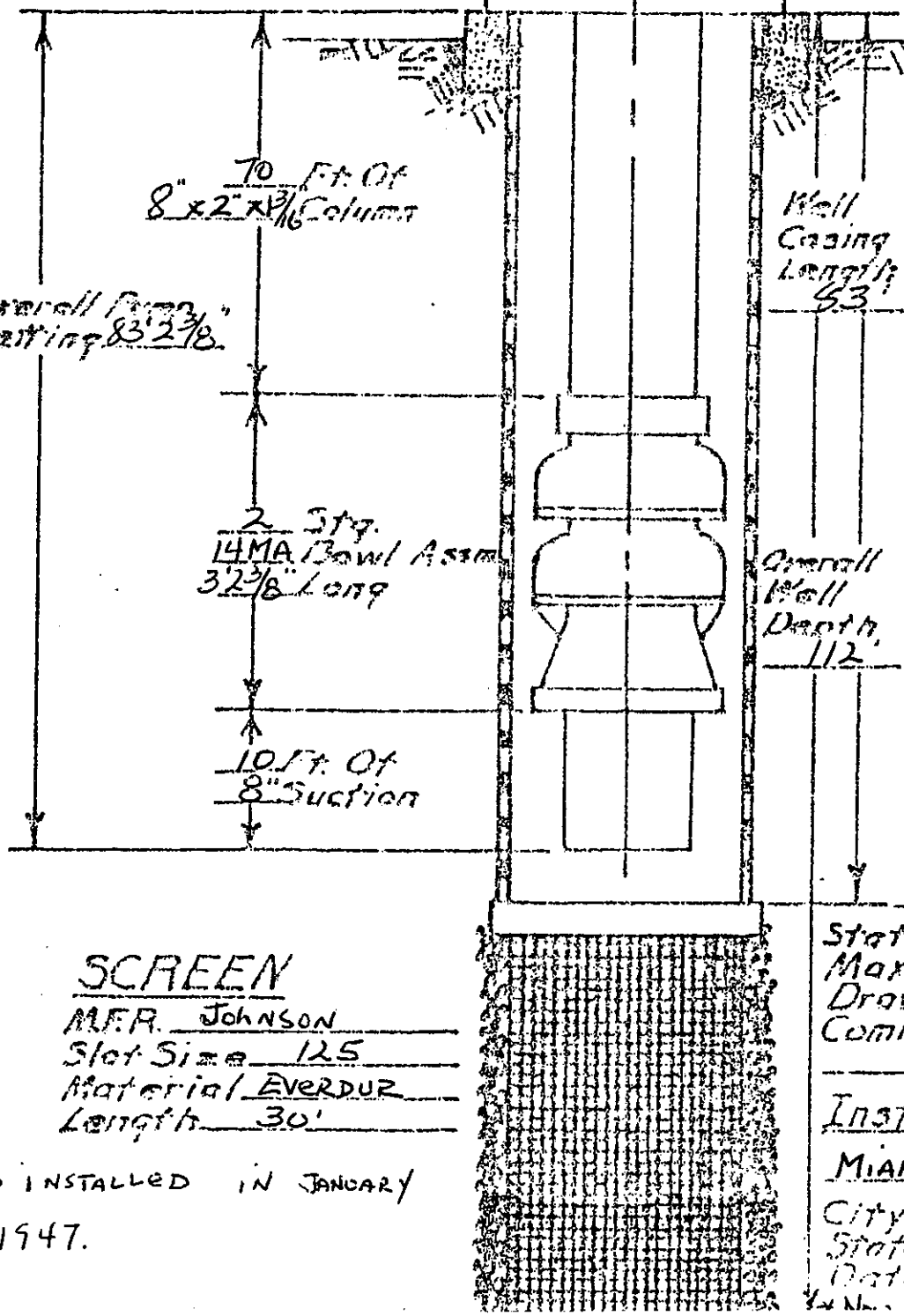
MFR. MOTURBO

Motor Serial No. ——

Pump Serial No. 50168

Pump Capacity 1500 G.P.M.

@ 73 Ft. Head



WELL LOG

0'-19' DRY GRAVEL

19'-52' COARSE SAND & GRAVEL

52'-58' SAND

58'-74' COARSE GRAVEL

74'-81' COARSE GRAVEL & SAND

81'-82' CLAY WITH SOME GRAVEL

82'-112' GRAVEL

SCREEN

MFR. JOHNSON

Slot Size 125

Material EVERDUR

Length 30'

TEST DATA

Static Water Level 14'

Max. Yield

Drawdown

Comments

Installation For

MIAMISBURG PAPER CO.*

City WEST CARROLLTON

State Ohio

Date

Pump Installed in January 1947.

No 4- WELL FILE PUMP M1872

WELL & PUMP DATA

G. M. BAKER & SON INC.

Developers of Underground Water Supply

"Since 1885"

Columbus, O.

Date

DRIVE

HP. 100 RPM 1800 ϕ 3

CY. 60 Volt 220/440

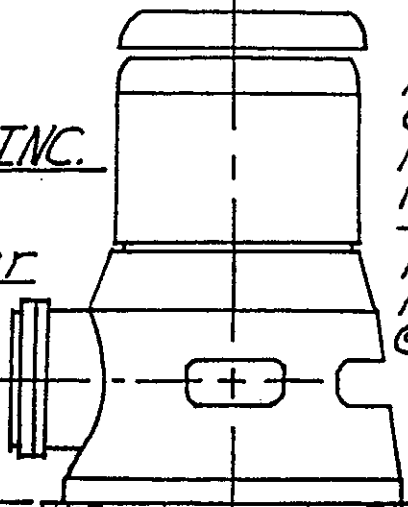
MFR. General Electric

Motor Serial No.

Pump Serial No. 136790

Pump Capacity 1200 G.P.M.

@ 170 Ft. Head



16"

50 Ft. Of 10 x 1½ x Column

90' as of 12-5-71

Overall Pump Setting 64' 1½"

3 Stg. 14MA Bowl Assm. 4' 1½" Long

10 Ft. Of 10" Suction

Well Casing Length 100

Overall Well Depth 129

WELL LOG

0' - 6' Fill

6' - 35' Clay & gravel

35' - 67' Sand & gravel - Wa

67' - 96' Sand & gravel - Clay ba

96' - 114' Sand & gravel - Coarse

114' - 129' Sand & gravel - Coars

SCREEN

M.F.R. Johnson

Slot Size 45 - 125

Material Everdur

Length 30'

Note: 20 ft. of liner was added to this well as of 9/2/66.

TEST DATA

Static Water Level 27'

Max. Yield 1450 G.P.M.

Drawdown 13½'

Comments Specific Yield 112 G.P.M.

Installation For

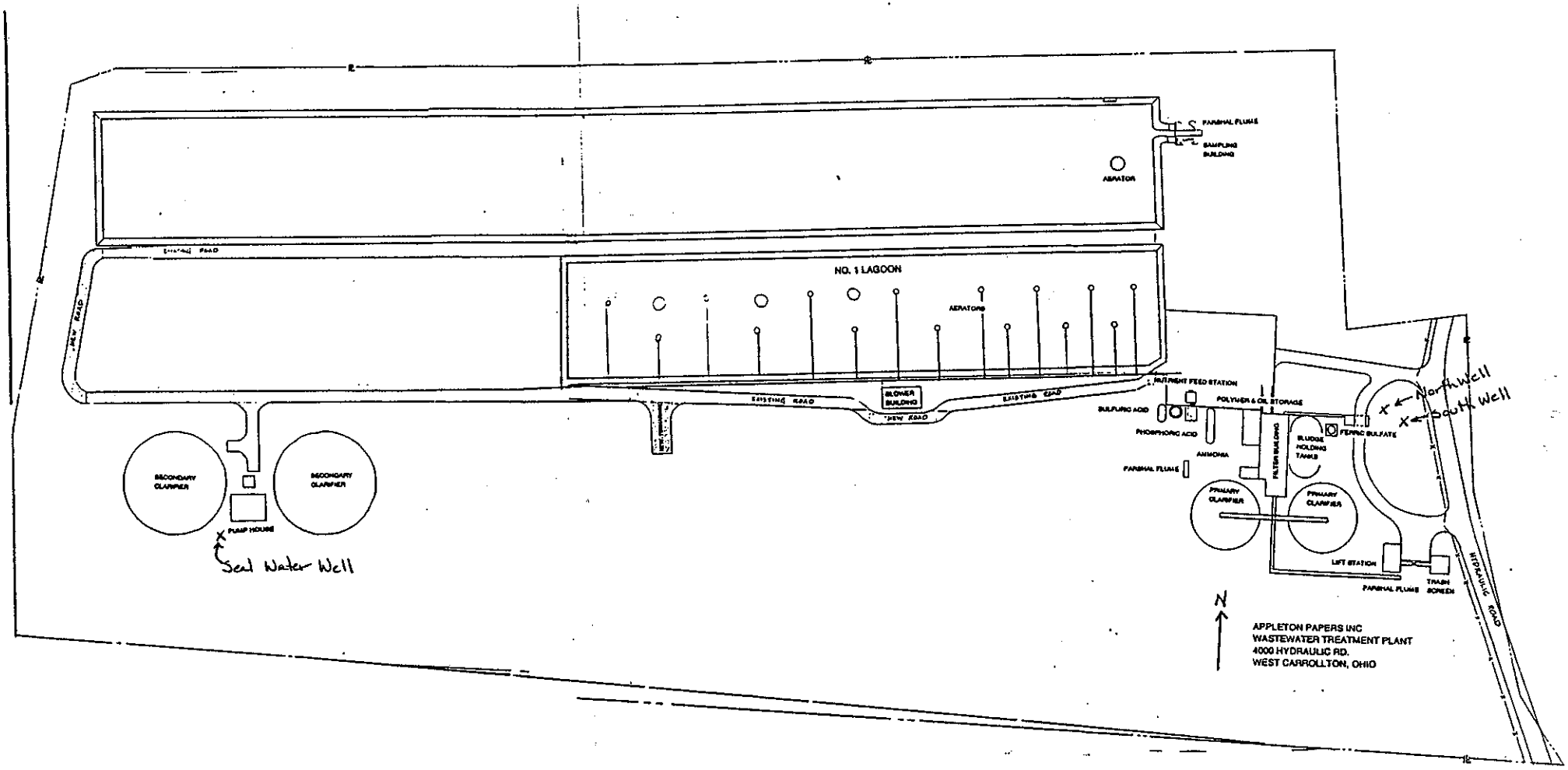
Kimberly-Clark Corp.*

City West Carrollton

State Ohio

Date October 1960

*Now owned by Appleton Papers Inc.


NO. 1 LAGOON
AERATORS
AERATOR
PARSHAL FLUME
SAMPLING BUILDING
BLOWER BUILDING
EXISTING ROAD
NEW ROAD
NUTRIENT FEED STATION
POLYMER & OIL STORAGE
SULFURIC ACID
PHOSPHORIC ACID
AMMONIA
FERRIC SULFATE
FILTER BUILDING
SLUDGE HOLDING TANKS
PARSHAL FLUME
PRIMARY CLARIFIER
PRIMARY CLARIFIER
LIFT STATION
PARSHAL FLUME
TRASH SCREEN
HYDRAULIC ROAD
SECONDARY CLARIFIER
SECONDARY CLARIFIER
PUMP HOUSE
Seal Water Well
North Well
South Well
N
APPLETON PAPERS INC
WASTEWATER TREATMENT PLANT
4000 HYDRAULIC RD.
WEST CARROLLTON, OHIO

RECEIVED

MAY 17 1990

DEPT. OF NATURAL RESOURCES
WATER RESOURCES DEVELOPMENT

STATE OF OHIO
WATER WITHDRAWAL FACILITY REGISTRATION

SEND TO: OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATER
WATER RESOURCES DEVELOPMENT SECTION
1939 FOUNTAIN SQUARE COURT, BLDG. E-3
COLUMBUS, OHIO 43224-1336
(614) 265-6750

AUTHORITY: Ohio Revised Code Section 1521.16 requires that any owner of a facility, or combination of facilities, with the capacity to withdraw more than 100,000 gallons of water daily, register such facilities with the Ohio Department of Natural Resources, Division of Water.

100,000 Gallons Per Day (GPD) = 0.1 Million Gallons Per Day (MGD) = 4200 Gallons Per Hour (GPH) = 70 Gallons Per Minute (GPM)

Detailed directions are on a separate instruction sheet. Please type or print the following information:

1. OWNER OF WATER WITHDRAWAL FACILITY

Owner's Name: Appleton Papers Inc (Ruth per call 11/30/92)	Contact Person (If other than owner): Nancy McDonnell
Company Name: Appleton Papers Inc	Company Name: Same
Mailing Address: PO Box 68	Mailing Address: Same
City, State, Zip: West Carrollton, OH 45449	City, State, Zip:
SIC (Standard Industrial Classification)-4 digit: 2672 / Phone: (513) 847-7310	Phone: ( )

The annual withdrawal report form should be sent to : ☐ Owner ☒ Contact person (Check one)

2. WATER USE

Estimate percentage of the total water use from all sources for each type of use for both ground water and surface water. Total water use for both ground and surface water = 100%; GW = Ground water; SW = Surface water

WATER USE	GW%	SW%
Public Water Supply		
Community		
Non-community		
(OEPA #)		
Agricultural		
Livestock Watering		
Crop Irrigation		
Nursery/Turf/Landscaping		
Industrial		
Process Water	88 %	
Cooling Water		
Power Generation		
Nuclear		
Thermoelectric	5%	
Hydroelectric		

WATER USE	GW%	SW%
Mineral Extraction		
Coal		
Oil		
Salt		
Sand and Gravel		
Limestone		
Other (Please specify)		
Miscellaneous		
Recreation/Amusement		
Water Quality Remediation	3%	
Heating/Cooling		
Domestic		
Fish Hatchery		
Dewatering		
Golf Course Irrigation		
Other Steam generation (Please specify)	4%	

3. WATER WITHDRAWAL FACILITY CAPACITY

Total withdrawal capacity of the facility: 22.28 GPD or (MGD) (Circle one)

NOTE: Total withdrawal capacity is the sum of the withdrawal capacity for all wells and surface water intakes combined.

Was construction of this facility completed before January 1, 1990? X Yes ____ No

Name of facility Appleton Papers Inc - West Carrollton Mill

4. SUPPLY SOURCES

GROUND-WATER SOURCES

Total number of wells 10

Total withdrawal capacity of all wells 22.28

GPD or (MGD) (Circle one)

SURFACE-WATER SOURCES

Total number of surface-water intakes 0

Total withdrawal capacity of all intakes 0

GPD or (MGD) (Circle one)

FOR EACH WELL
PROVIDE THE FOLLOWING:

A. Owner's well number 1
Well capacity 1.10 GPD or (MGD) (Circle one)
Well log number (or copy of well log) log attached
Well depth 162 (ft) Well diameter 12 (in)

AQUIFER UTILIZED (Check one)

- ☐ Sand
- ☐ Sandstone (SS)
- ☒ Sand and gravel
- ☐ Limestone (LS) /Dolomite
- ☐ Shale (Sh)
- ☐ Interbedded SS, LS, Sh
- ☐ Underground mine
- ☐ Other _____

LOCATION OF WELL

County Montgomery
Township Miami Section 21
Nearest City or Town West Carrollton
Provide written description of well location.
1030 W. Alex-Bell Rd. In tunnel near power house.

B. Owner's well number 3
Well capacity 1.73 GPD or (MGD) (Circle one)
Well log number (or copy of well log) 236115
Well depth 125 (ft) Well diameter 16 (in)

AQUIFER UTILIZED (Check one)

- ☐ Sand
- ☐ Sandstone (SS)
- ☒ Sand and gravel
- ☐ Limestone (LS) /Dolomite
- ☐ Shale (Sh)
- ☐ Interbedded SS, LS, Sh
- ☐ Underground mine
- ☐ Other _____

LOCATION OF WELL

County Montgomery
Township Miami Section 21
Nearest City or Town West Carrollton
Provide written description of well location.
1030 W. Alex-Bell Rd. Along entrance drive off Alex-Bell Rd.

C. Owner's well number 4
Well capacity 1.73 GPD or (MGD) (Circle one)
Well log number (or copy of well log) log attached
Well depth 129 (ft) Well diameter 16 (in)

AQUIFER UTILIZED (Check one)

- ☐ Sand
- ☐ Sandstone (SS)
- ☒ Sand and gravel
- ☐ Limestone (LS) /Dolomite
- ☐ Shale (Sh)
- ☐ Interbedded SS, LS, Sh
- ☐ Underground mine
- ☐ Other _____

LOCATION OF WELL

County Montgomery
Township Miami Section 21
Nearest City or Town West Carrollton
Provide written description of well location.
1030 W. Alex-Bell Rd. Along Kimberly Lane, near Alex-Bell Rd. next to RR tracks.

(Note: Use additional sheets if necessary)

FOR EACH SURFACE-WATER INTAKE
PROVIDE THE FOLLOWING:

A. Owner's intake number _____
Intake capacity _____ GPD or MGD (Circle one)
Name of body of water _____

SOURCE UTILIZED (Check one)

- ☐ River, stream, or drainage ditch
- ☐ Lake, pond, quarry, or reservoir
- ☐ Other _____

LOCATION OF INTAKE

County _____
Township _____ Section _____
Nearest City or Town _____
Provide written description of intake location.

B. Owner's intake number _____
Intake capacity _____ GPD or MGD (Circle one)
Name of body of water _____

SOURCE UTILIZED (Check one)

- ☐ River, stream, or drainage ditch
- ☐ Lake, pond, quarry, or reservoir
- ☐ Other _____

LOCATION OF INTAKE

County _____
Township _____ Section _____
Nearest City or Town _____
Provide written description of intake location.

C. Owner's intake number _____
Intake capacity _____ GPD or MGD (Circle one)
Name of body of water _____

SOURCE UTILIZED (Check one)

- ☐ River, stream, or drainage ditch
- ☐ Lake, pond, quarry, or reservoir
- ☐ Other _____

LOCATION OF INTAKE

County _____
Township _____ Section _____
Nearest City or Town _____
Provide written description of intake location.

(Note: Use additional sheets if necessary)

FOR EACH WELL
PROVIDE THE FOLLOWING:

A. Owner's well number 6
Well capacity 2.52 GPD or (MGD) (Circle one)
Well log number (or copy of well log) 374177 + 374178
Well depth _____ (ft) Well diameter _____ (in)

AQUIFER UTILIZED (Check one)

- ☐ Sand
- ☐ Sandstone (SS)
- ☒ Sand and gravel
- ☐ Limestone (LS) /Dolomite
- ☐ Shale (Sh)
- ☐ Interbedded SS, LS, Sh
- ☐ Underground mine
- ☐ Other _____

LOCATION OF WELL

County Montgomery
Township Miami Section 21
Nearest City or Town West Carrollton
Provide written description of well location.
1030 W. Alex-Bell Rd. By RR tracks on West side of Mill.

B. Owner's well number 7
Well capacity 2.88 GPD or (MGD) (Circle one)
Well log number (or copy of well log) 416949
Well depth 160 (ft) Well diameter 20 (in)

AQUIFER UTILIZED (Check one)

- ☐ Sand
- ☐ Sandstone (SS)
- ☒ Sand and gravel
- ☐ Limestone (LS) /Dolomite
- ☐ Shale (Sh)
- ☐ Interbedded SS, LS, Sh
- ☐ Underground mine
- ☐ Other _____

LOCATION OF WELL

County Montgomery
Township Miami Section 21
Nearest City or Town West Carrollton
Provide written description of well location.
1030 W. Alex-Bell Rd. East side of Mill just North of water tower.

C. Owner's well number 8
Well capacity 2.88 GPD or (MGD) (Circle one)
Well log number (or copy of well log) 705155
Well depth 113 (ft) Well diameter 20 (in)

AQUIFER UTILIZED (Check one)

- ☐ Sand
- ☐ Sandstone (SS)
- ☒ Sand and gravel
- ☐ Limestone (LS) /Dolomite
- ☐ Shale (Sh)
- ☐ Interbedded SS, LS, Sh
- ☐ Underground mine
- ☐ Other _____

LOCATION OF WELL

County Montgomery
Township Miami Section 21
Nearest City or Town West Carrollton
Provide written description of well location.
1030 W. Alex-Bell Rd. West side of Mill South of high density stock towers.

(Note: Use additional sheets if necessary)

FOR EACH SURFACE-WATER INTAKE
PROVIDE THE FOLLOWING:

A. Owner's intake number _____
Intake capacity _____ GPD or MGD (Circle one)
Name of body of water _____

SOURCE UTILIZED (Check one)

- ☐ River, stream, or drainage ditch
- ☐ Lake, pond, quarry, or reservoir
- ☐ Other _____

LOCATION OF INTAKE

County _____
Township _____ Section _____
Nearest City or Town _____
Provide written description of intake location.

B. Owner's intake number _____
Intake capacity _____ GPD or MGD (Circle one)
Name of body of water _____

SOURCE UTILIZED (Check one)

- ☐ River, stream, or drainage ditch
- ☐ Lake, pond, quarry, or reservoir
- ☐ Other _____

LOCATION OF INTAKE

County _____
Township _____ Section _____
Nearest City or Town _____
Provide written description of intake location.

C. Owner's intake number _____
Intake capacity _____ GPD or MGD (Circle one)
Name of body of water _____

SOURCE UTILIZED (Check one)

- ☐ River, stream, or drainage ditch
- ☐ Lake, pond, quarry, or reservoir
- ☐ Other _____

LOCATION OF INTAKE

County _____
Township _____ Section _____
Nearest City or Town _____
Provide written description of intake location.

(Note: Use additional sheets if necessary)

ARCADIS

Well Information

874304

DNR 7802.96

TYPE OR USE PEN
SELF TRANSCRIBING
PRESS HARD

WELL LOG AND DRILLING REPORT

Ohio Department of Natural Resources
Divison of Water, 1939 Fountain Square Drive
Columbus, Ohio 43224-9971 Voice (614) 265-6739 Fax (614) 447-9503

X 874304

WELL LOCATION

County Montgomery Township Miami

Owner/Builder (Circle One or Both) Appleton Papers (First / Last)

Address of Well Location Hydraulic Road (Number / Street Name)

City West Carrollton, Ohio Zip Code +4 45449

Permit No. Section/Lot No. (Circle One or Both)

Location of Well in State Plane coordinates, if available: Use of Well sludge press /non portable

N X +/- ft. or m

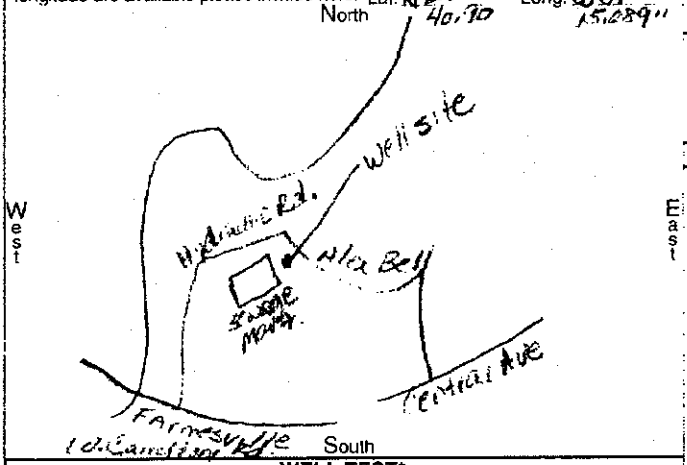
S Y +/- ft. or m

Elevation of Well +/- ft. or m

Datum Plain: [ ] NAD27 [ ] NAD83 Elevation Source

Source of Coordinates: [ ] GPS [ ] Survey [ ] Other

Sketch a map showing distance well lies from numbered state highways, street intersections, county roads, buildings or other notable landmarks. If latitude and longitude are available please include here: Lat: N 39° 40.70 Long: W 84° 15.289"



WELL TEST*

Pre-Pumping Static Level 24'6" ft. Date 2-28-01

Measured from: [ ] Top of Casing [X] Ground Level [ ] Other

[ ] Air [ ] Bailing [X] Pumping* [ ] Other

Test Rate 250 gpm Duration of Test 2 hrs.

Feet of Drawdown 9.5 ft. Sustainable Yield 250 gpm

*(Attach a copy of the pumping test record, per section 1521.05, ORC)

Is Copy Attached? [X] Yes [ ] No Flowing Well? [ ] Yes [ ] No

Quality clear, clean

PUMP/PITLESS

Type of pump Crown GM-250 Capacity 250 gpm

Pump set at 65 ft. Pitless Type MAAS

Pump installed by Larry Jones

I hereby certify the information given is accurate and correct to the best of my knowledge.

Drilling Firm Moody's of Dayton, Inc.

Address 4359 Infirmary Road

City, State, Zip Miamisburg, Ohio 45342

Signed Date

ODH Registration Number

CONSTRUCTION DETAILS

Rotary [X] Cable [ ] Augered [ ] Driven [ ] Other

BOREHOLE/CASING (measured from ground surface)

1 [X] Borehole Diameter 10 inches Depth 108 ft.

Casing Diameter 10 in. Length 108 ft. Thickness 3/8 in.

2 Borehole Diameter inches Depth ft.

Casing Diameter in. Length ft. Thickness in.

Casing Height Above Ground 1 1/2 ft

Type 1 [ ] Steel 1 [ ] Galv. 1 [ ] PVC 1 [ ] Other

Joints 1 [ ] Threaded 1 [ ] Welded 1 [ ] Solvent 1 [ ] Other

SCREEN

Diameter 10" V Slot Size .070" Screen Length 15 ft.

Type cook screen wrapped Material stainless steel

Set Between 93 ft. and 108 ft.

GRAVEL PACK (Filter Pack)

Material/Size n/a Volume/Weight Used

Method of Installation

Depth: Placed FROM ft. TO ft.

GROUT

Material n/a Volume/Weight Used

Method of Installation

Depth: Placed FROM ft. TO ft

DRILLING LOG*

INDICATE DEPTH(S) AT WHICH WATER IS ENCOUNTERED.

Show color, texture, hardness, and formation: sandstone, shale, limestone, gravel, clay, sand, etc.	From	To
Boulders & Clay	0	19
coarse gravel	19	38
clay & gravel	38	45
coarse gravel	45	68
coarse sand & gravel	68	75
coarse sand & gravel	75	88
gravel & sand	88	96
sand & good gravel	96	108

*(If more space is needed to complete drilling log, use next consecutively numbered form.)

Date of Well Completion 2-18-01 Total Depth of Well 108 ft.

Completion of this form is required by section 1521.05, Ohio Revised Code - file within 30 days after completion of drilling.

ORIGINAL COPY TO - ODNR, DIVISION OF WATER, 1939 FOUNTAIN SQ. DRIVE, COLS., OHIO 43224-9971

Blue - Customer's copy Pink - Driller's copy Green - Local Health Dept. copy

DNR 7802.06

TYPE OR USE PEN
SELF TRANSCRIBING
PRESS HARD

WELL LOG AND DRILLING REPORT

Ohio Department of Natural Resources
Divison of Water, 1939 Fountain Square Drive
Columbus, Ohio 43224-9971 Voice (614) 265-6739 Fax (614) 447-9503

#9 WELL 879110

WELL LOCATION

nty MONTGOMERY Township Miami

Owner/Builder (Circle One or Both) APPLETON PAPER (First / Last)

Address of Well Location 1030 W. ALEX-BELL ROAD (Number / Street Name)

City W. CARROLLTON Zip Code +4 45449

Permit No. _____ Section/Lot No. (Circle One or Both) _____

Location of Well in State Plane coordinates, if available: Use of Well PRODUCTION

N ☐ X _____ . _____ +/- _____ ft. or m

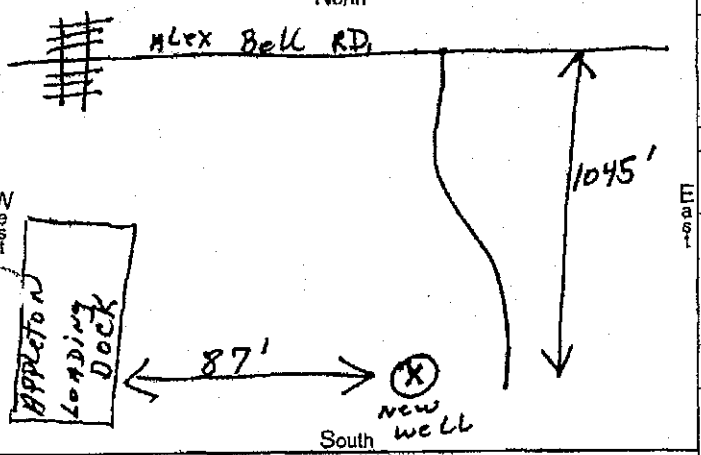
S ☐ Y _____ . _____ +/- _____ ft. or m

Elevation of Well _____ . _____ +/- _____ ft. or m

Datum Plain: ☐ NAD27 ☐ NAD83 Elevation Source _____

Source of Coordinates: ☐ GPS ☐ Survey ☐ Other _____

Sketch a map showing distance well lies from numbered state highways, street intersections, county roads, buildings or other notable landmarks. If latitude and longitude are available please include here: Lat: ____ ' ____ Long: ____



WELL TEST*

Pre-Pumping Static Level 24' 3" ft. Date 10-18-01

Measured from: ☒ Top of Casing ☐ Ground Level ☐ Other _____

☐ Air ☐ Bailing ☐ Pumping* ☐ Other _____

Test Rate 1750 gpm Duration of Test 7 hrs.

Feet of Drawdown 17.9 ft. Sustainable Yield 1200 gpm

*(Attach a copy of the pumping test record, per section 1521.05, ORC)

Is Copy Attached? ☒ Yes ☐ No Flowing Well? ☐ Yes ☐ No

Quality CLEAR

PUMP/PITLESS

Type of pump TURBINE Capacity 1200 gpm

Pump set at _____ ft. Pitless Type _____

Pump installed by REYNOLDS, INC.

I hereby certify the information given is accurate and correct to the best of my knowledge.

Drilling Firm REYNOLDS, INC.

Address 6451 GERMANTOWN ROAD

City, State, Zip MIDDLETOWN, OH 45042

Signed _____ Date _____

ODH Registration Number _____

CONSTRUCTION DETAILS

☐ Rotary ☐ Cable ☐ Augered ☐ Driven ☒ Other BUCKET

BOREHOLE/CASING (measured from ground surface)

1☐ Borehole Diameter 36 inches Depth 146 ft.

Casing Diameter 24 in. Length 106 ft. Thickness .375 in.

2☐ Borehole Diameter _____ inches Depth _____ ft.

Casing Diameter _____ in. Length _____ ft. Thickness _____ in.

Casing Height Above Ground 2 ft.

Type 1 ☒ Steel 2 ☐ | 1 ☐ Galv. 2 ☐ | 1 ☐ PVC 2 ☐ | 1 ☐ 2 ☐ Other _____

Joints 1 ☐ Threaded 2 ☐ | 1 ☒ Welded 2 ☐ | 1 ☐ Solvent 2 ☐ | 1 ☐ 2 ☐ Other _____

SCREEN

Diameter 24" Slot Size .070 Screen Length 40 ft.

Type V-WIRE WOUND Material STAINLESS

Set Between 106 ft. and 146 ft.

GRAVEL PACK (Filter Pack)

Material/Size PARRY # 4 Volume/Weight Used 21 TON

Method of Installation TREMIE

Depth: Placed FROM 146 ft. TO 25 ft.

GROUT

Material 9 BAG GROUT Volume/Weight Used 10 YDS.

Method of Installation TREMIE

Depth: Placed FROM 5' ft. TO 25' ft.

DRILLING LOG*

INDICATE DEPTH(S) AT WHICH WATER IS ENCOUNTERED. Show color, texture, hardness, and formation: sandstone, shale, limestone, gravel, clay, sand, etc.	From	To
BLACKTOP & CLAY W/ GRAVEL	0	3
BROWN CLAY, GRAVEL	3	6
SAND W/ LARGE GRAVEL & COBBLES	6	76
SAND & LARGE COARSE GRAVEL	76	86
MED. TO COARSE SAND W/ LG. GRAVEL	86	96
MED. TO COARSE SAND & GRAVEL	96	111
MED. GRAIN SAND W/ GRAVEL	111	126
FINE TO MED. SAND & GRAVEL	126	131
GRAY, MED. SAND W/ SOME GRAVEL	131	141
FINE TO MED. SAND & GRAVEL	141	146
FINE TO MED. SAND & GRAVEL W/ SOME LARGE COBBLES	146	156
GRAVEL & LARGE COBBLES	156	157
BROWN & GRAY CLAY	157	

*(If more space is needed to complete drilling log, use next consecutively numbered form.)

Date of Well Completion 10-18-01 Total Depth of Well 146 ft.

Completion of this form is required by section 1521.05, Ohio Revised Code - file within 30 days after completion of drilling.

ORIGINAL COPY TO - ODNR, DIVISION OF WATER, 1939 FOUNTAIN SQ. DRIVE, COLS., OHIO 43224-9971

Blue - Customer's copy Pink - Driller's copy Green - Local Health Dept. copy

Date: 10/17/01

REYNOLDS, INC.
PRODUCTION TEST

Job No.: 67437

Owner: Appleton Papers, Inc. City: West Carrollton State: Ohio

Well No.: New Well #9 Location: Beside Guard Shack

Measured from Ground Level: Total Depth 146' Inside Diam. 24" Static Level / Standing Water Level 27' 1"

Type Well: Gravel Wall X Tubular Rock New X

Old Cleaned Gravel Wall Diam. 36"

Screen: Length 40' Diam. 24" Slot Size 0.070

Type Johnson, 304 Stainless Steel Depth to top 106'

Driven By: Electric Engine Pump Bowl Stages

Length Suction Pipe Well Top to Bottom of Suction 128'

Orifice Size 10" By 8" Water Discharged 50 Feet from Well into Parking Lot

Well Top to Bottom or Air Line N/A Gauge Reads: Feet Pounds

TIME	INCHES ON ORIFICE	G.P.M.	P.S.I.	AMPS	PUMPING LEVEL	DRAW DOWN	SPECIFIC CAPACITY	COMMENTS
10:45 PM	34"	1757			44' 4"	17.3'		
11:00 PM	34"	1757			44' 7"	17.6'		
11:15 PM	34"	1757			44' 8"	17.6'		
11:30 PM	34"	1757			44' 8"	17.6'		
11:45 PM	34"	1757			44' 9"	17.7'		
12:00 AM	34"	1757			44' 9"	17.7'		
12:15 AM	34"	1757			44' 10"	17.8'		
12:30 AM	34"	1757			45'	17.9'		
12:45 AM	34"	1757			45'	17.9'		
1:15 AM	34"	1757			45'	17.9'		
1:45 AM	34"	1757			45'	17.9'		
2:45 AM	34"	1757			45'	17.9'		
3:45 AM	34"	1757			45'	17.9'		
4:45 AM	34"	1757			45'	17.9'		
5:45 AM	34"	1757			45'	17.9'	98 gpm/ft.	
	Recovery:	17 seconds	back	to static				

Tested and Witnessed By: Eldwin Roberts
Bill Wilson

Witnessed By For Purchaser:

RECEIVED
OCT 30 2001
ODNR/DIVISION OF WATER
WATER RESOURCES SECTION

DNR 7802.05e

WELL LOG AND DRILLING REPORT

Ohio Department of Natural Resources
Division of Water, 2045 Morse Road, Columbus, Ohio 43229-6605
Voice (614) 265-6740 Fax (614) 265-6767

Well Log Number: 2016541

Page 1 of 1 for this record.

WELL LOCATION

County MONTGOMERY Township MIAMI

APPLETON PAPERS
Owner/Builder

1030 W ALEX-BELL RD
Address of Well Location

City WEST CARROLLTON Zip Code +4 45449

Permit No. _____ Section: 15 and/or Lot No. _____

Use of Well MONITOR

Coordinates of Well (Use only one of the below coordinate systems)

State Plane Coordinates

N ☐ X _____ +/- _____ ft.

S ☐ Y _____ +/- _____ ft.

Latitude, Longitude Coordinates

Latitude: 39.74333 Longitude: 84.23655

Elevation of Well in feet: 720 +/- 5 ft.

Datum Plane: ☐ NAD27 ☐ NAD83 Elevation Source MAP-USGS 1:2400

Source of Coordinates: GPS

Well location written description:

Comments on water quality/quantity and well construction:

#10 WELL

WELL TEST *

Pre-Pumping Static Level 22.6 ft. Date 12/4/2007

Measured from TOP OF CASING

Pumping test method PUMPING

Test Rate 2392 gpm Duration of Test 5 hrs.

Feet of Drawdown 12.6 ft. Sustainable Yield 2000 gpm

*(Attach a copy of the pumping test record, per section 1521.05, ORC)

Is Copy Attached? ☐ Yes ☒ No Flowing Well? ☐ Yes ☒ No

PUMP/PITLESS

Type of pump TURBINE Capacity 2000 gpm

Pump set at 84 ft. Pitless Type _____

Pump Installed by DRILLING CONTRACTOR

I hereby certify the information given is accurate and correct to the best of my knowledge.

Drilling Firm REYNOLDS, INC.

Address 6451 GERMANTOWN RD

City, State, Zip MIDDLETOWN OH 45042

Signed RONALD E ALEXANDER Date 5/22/2008
(Filed Electronically)

ODH Registration Number 002289

CONSTRUCTION DETAILS

Drilling Method: BUCKET AUGER

BOREHOLE/CASING (Measured from ground surface)

1 Borehole Diameter 36 inches Depth 124 ft.
Casing Diameter 20 in. Length 84 ft. Thickness 0.375 in.

2 Borehole Diameter _____ inches Depth _____ ft.
Casing Diameter _____ in. Length _____ ft. Thickness _____ in.

Casing Height Above Ground 3 ft.

Type 1: Steel
Type 2: _____

Joints 1: Welded
Joints 2: _____

SCREEN

Diameter 20 in. Slot Size 0.07 in. Screen Length 40 ft.

Type CONTINOUS WIRE WOUND Material STAINLESS STEEL

Set Between 84 ft. and 124 ft.

GRAVEL PACK (Filler Pack)

Material/Size Parry #4 Vol/Wt. Used 18 yards

Method of Installation Tremie

Depth: Placed From: 26 ft. To: 124 ft.

GROUT

Material Neat cement Vol/Wt. Used 5 yards

Method of Installation Poured (gravity)

Depth: Placed From: 0 ft. To: 26 ft.

DRILLING LOG*

FORMATIONS INCLUDE DEPTH(S) AT WHICH WATER IS ENCOUNTERED.

Color	Texture	Formation	From	To
DARK BROWN	GRAVELLY	SOIL	0	3
GRAY-BROWN	DRY	CLAYSANDGRAVEL	3	18
GRAY-WHITE	MOIST	SAND AND GRAVEL	18	23
GRAY	COARSE	SANDGRAVELBOULDERS	23	124
		Water Encountered At	22.6	124

Aquifer Type (Formation producing the most water.) SAND/GRAVEL/BOULDERS

Date of Well Completion 3/4/2008 Total Depth of Well 124 ft.

Completion of this form is required by section 1521.05, Ohio Revised Code - file within 30 days after completion of drilling.
Distribute copies of this record to Customer, and Local Health Deptartment.

9957578

OHIO WATER SUPPLY BOARD

Well Record No. 152

57 — 70

Co. Montgomery Twp. Miami Sec. 15

Well Location Just E. of town. Size 16"

Map Miamisburg Waynesville

Owner Miamisburg Paper Co. Address W. Carrollton, O.

Driller G.M. Baker and Son, Inc. Date --

Well Head Elev. or M. P.

Elev. of Ground at Well

Pumping Test: —

Static Level 24 ft. Date

Normal Pumpage

Quality Use

Adequacy of supply

Owner's Well No. or Other Designation

Source of Data Baker

Collected by mt Date Oct. 1946

9957578 STRATA	DEPTH From	DEPTH To
Clay	0	2
Gravel and clay		17
Gravel and sand		40
Gravel and fine sand		62
Sand		68
Gravel and sand *		122
Length of casing: 90 ft.		
Length of screen: 50 ft.		
Type of screen: Johnson		
Type of pump: Turbine		
Capacity of pump: 1000 GPM		
Depth of pump setting: 80 ft.		
x = 1,511,000		
y = 613,700 - S		

* Chief Aquifer

9957579

OHIO WATER SUPPLY BOARD

Well Record No. 153

57 — 10

Co. Montgomery Twp. Miami Sec. 15
Well Location E. of town. Size 16"
Map ~~Miamisburg~~ Waynesville

Owner Miamisburg Paper Co. Address W. Carrollton, O
Driller C. M. Baker and Son, Inc. Date

Well Head Elev. or M. P.
Elev. of Ground at Well

Pumping Test:

Static Level 24 ft. Date
Normal Pumpage

Quality Use

Adequacy of supply

Owner's Well No. or Other Designation

Source of Data Baker
Collected by mt Date Oct. 1946

9957579 STRATA	DEPTH From	DEPTH To
Dry gravel	0	19
Gravel and sand		52
Sand		58
Gravel and sand		74
Gravel and clayballs		82
Gravel and sand 3		120
Length of casing: 90 ft.		
Length of screen: 30 ft.		
Type of screen: Johnson		
Type of pump: Turbine		
Capacity of pump: 1000 GPM		
Depth of pump setting: 80 ft.		
x = 1,511,300		
y = 614,200-S		

* Chief Aquifer

DNR 7810.04

WATER WELL SEALING REPORT
OHIO DEPARTMENT OF NATURAL RESOURCES
Division of Water
2045 Morse Rd., Bldg B
Columbus, OH 43229-6605
Voice: (614) 265-6740 Fax: (614) 265-6767

0159033

#3 WELL

LOCATION

County Montgomery Township Miami Section/Lot Number (Circle One or Both)

Owner/Builder (Circle One or Both) Appleton Papers

Address of Well Location 1030 (Number) W. Alex-Bell Rd. (Street Name)

City West Carrollton Zip Code 45449

Property Location Description ____ miles (n, e, s, w) ____ of (nearest intersection) on the (n, e, s, w) ____ side of (road name)

Location of Well in either: State Plane N ☐ S ☐ X ____ +/- ____ ft. or m Y ____ +/- ____ ft. or m

OR Latitude/Longitude (Check ONE ☑ In Decimal Degrees ☐ Degrees Minutes ☐ Degrees Min. Sec.) Latitude 39.67417° Longitude 84.23647°

Elevation of Well 726.[ ] +/- 5 ft. or m Datum Plain: ☐ NAD27 ☐ NAD83

Source of Coordinates: ☑ GPS ☐ Survey ☐ Other

ORIGINAL WELL ODNR Well Log Number ____ Copy attached? (circle one) Yes or (No)

MEASURED CONSTRUCTION DETAILS Date of measurements 12-4-07

Depth of Well 124' Static Water Level 21.4'

Size of Casing 16" Length of casing 90'

Well Condition Poor ; Deteriorated

SEALING PROCEDURE

Method of Placement Tremied

Placement:				Sealing Material	Volume
From	25	To	124	chlorinated quartz gravel	5 yds.
From	0	To	25	neat cement grout	1.3 yds.
From		To			

Was Casing Removed? Yes or (No) (circle one)

Condition of Casing Poor ; Deteriorated

Perforations: From n/a To ____

From ____ To ____

Date Sealing Performed 12-4-07

Reason(s) for Sealing Unsuitable for use - Reported holes in casing

CONTRACTOR

Name Reynolds, Inc. ODH Registration # 002289

Address 6451 Germantown Rd.

City/State/Zip Middletown, Ohio 45042

Signature [signature]

I hereby certify the information given is accurate and correct to the best of my knowledge.

Completion of this form is required by section 1521.05 (B) (9), Ohio Revised Code - file within 30 days after completion of sealing.

ORIGINAL COPY TO - ODNR, DIVISION OF WATER, 2045 MORSE ROAD, COLS., OHIO 43229-6605

Blue - Customer's copy Pink - Driller's copy Green - Local Health Dept. copy

ORIGINAL

WELL LOG AND DRILLING REPORT

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus, Ohio

PLEASE USE PENCIL OR TYPEWRITER. DO NOT USE INK.

No. 236115

#3 well

County Montgomery Township ~~Jackson~~ Miami Section of Township

Owner Moraine Paper Division Address West Carrollton, Ohio

Location of property Near entrance gate to above plant.

CONSTRUCTION DETAILS

Casing diameter 16" Length of casing 95

Type of screen Johnson Length of screen 30'

Type of pump D.W. Taxine

Capacity of pump 1500 G.P.M.

Depth of pump setting 80'

Date of completion 4/26/60

BAILING OR PUMPING TEST

Pumping rate 1450 G.P.M. Duration of test 8 hrs.

Drawdown 8 ft. Date 4/25/60

Developed capacity

Static level—depth to water 24' ft.

Pump installed by U.S.

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
Top Soil	0 Feet	1 Ft.
Clay & Sand	1	7
Sand & gravel-dry	7	30
" " -Water	30	39
Clay & gravel	39	40
Sand & gravel	40	70
Clay, Sand & gravel	70	72
Sand & gravel	72	110
Sand & gravel-Clay streaks	110	117
Sand & gravel	117	124

5026

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.

N.

W. E.

S.

See reverse side for instructions

Drilling Firm G. M. Baker & Son

Address Miamisburg, Ohio

Date 5/24/60

Signed W. A. Boger

40

WELL LOG AND DRILLING REPORT

705155

WELL #8

TYPE OR USE PEN
SELF-TRANSCRIBING
PRESS HARD!

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1939 Fountain Square Drive
Columbus, Ohio 43224
(614) 265-6739

RECEIVED
NOV 6 1989

Permit Number

COUNTY MONTGOMERY TOWNSHIP SECTION/LOT NO (CIRCLE ONE)

OWNER/BUILDER (CIRCLE ONE OR BOTH) APPLETON PAPER PROPERTY ADDRESS ALEX BELL RD. (ADDRESS OF WELL LOCATION)

LOCATION OF PROPERTY WEST CARROLLTON, OHIO

CONSTRUCTION DETAILS

CASING
Diameter 20 in. Length 73 ft. Wall Thickness 0.375 in.
Type: ☒ Steel ☐ Galv. ☐ PVC ☐ Other
Joints: ☐ Threaded ☒ Welded ☐ Solvent ☐ Other

SCREEN
Type (wire wrapped, louvered, etc.) Wrapped Material 304 SS
Length 40 ft. Diameter 20 in.
Set between 73 ft. and 113 ft. Slot 80
☐ Rotary ☐ Cable ☐ Augered ☐ Driven ☐ Dug ☒ Other Bucket
Date of completion 9/89

GROUT
Material None Volume used
Method of installation
Depth: placed from ft. to ft.

GRAVEL PACK
Material Quartz Volume used 40 ton
Method of installation Tremie
Depth: placed from 0 ft. to 113 ft.

Pitless Device ☐ Adapter ☐ Preassembled unit None

Use of Well Plant Use

PUMP
Type of pump Vertical Capacity 2000 gpm
Pump set at 65 ft.
Pump installed by Reynolds, Inc.

WELL TEST
Bailing ☐ or Pumping ☒
Test rate 1987 gpm Duration of test 8 hrs.
Drawdown 8.12 ft.
Measured from: ☐ top of casing ☒ ground level ☐ Other
Static Level (depth to water) 23.67 ft. Date: 9/89
Quality (clear, cloudy, taste, odor) Good water
(Attach a copy of the pumping test record, per 1521.05, ORC)

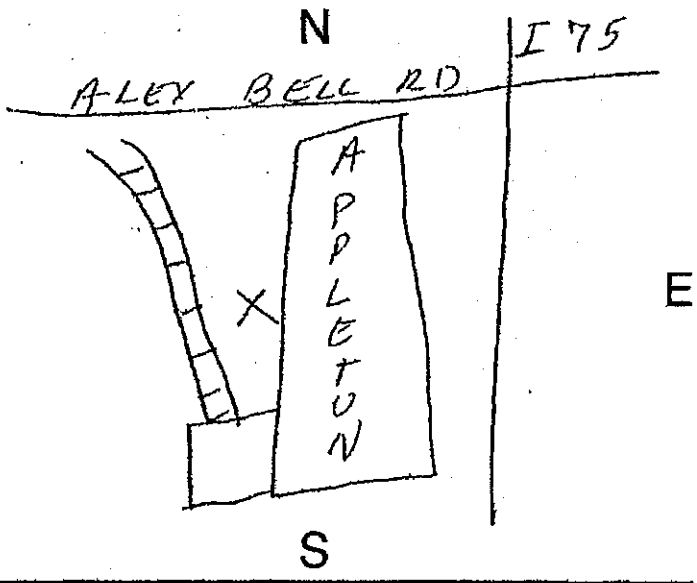
WELL LOG*

INDICATE DEPTH(S) AT WHICH WATER IS ENCOUNTERED.
Show color, texture, hardness, and formation: e.g. sandstone, shale, limestone, gravel, clay, sand, etc.

	From	To
Top soil	0 ft.	3 ft.
Brown sand & gravel	3	14
Sandy clay & gravel	14	30
Gravel	30	32
Sand & Pea gravel	32	52
Fine to medium sand & gravel	52	62
Fine to medium sand	63	87
Good sand & pea gravel	87	107
Good sand & pea Gravel - Big rock	107	120

SKETCH SHOWING LOCATION

Show distances well lies from numbered state highways, street intersections, county roads, etc.



If additional space is needed to complete well log, use next consecutively numbered form

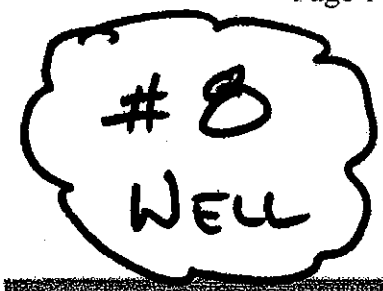
DNR 7802.88

DRILLING FIRM REYNOLDS, INC. SIGNED L F Brown
ADDRESS 6451 Germantown Rd. DATE Nov. 3, 1989
CITY, STATE, ZIP Middletown, Ohio 45042 ODH REGISTRATION NUMBER

Completion of this form is required by 1521.05, Ohio Revised Code - file within 30 days after completion of drilling.

ORIGINAL COPY - ODNR, DIVISION OF WATER, 1939 FOUNTAIN SQ. DRIVE, COLS., OHIO 43224

Blue - Customer's Copy Pink - Driller's Copy Green - Local Health Dept. Copy



Water Well Log and Drilling Report

Ohio Department of Natural Resources
Division of Water
Phone: 614-265-6740 Fax: 614-265-6767

Well Log Number: 705155

ORIGINAL OWNER AND LOCATION

Original Owner Name: *APPLETON PAPER*
County: *MONTGOMERY* Township: *MIAMI* Section Number:
Address: *ALEXANDERSVILLE-BELLBROOK RD* Lot Number:
City: State: *OH* Zip Code:
Location Number: Location Map Year: Location Area:
Latitude: Longitude:

CONSTRUCTION DETAILS

Borehole Diameter: 1: Borehole Depth: 1: *120 ft.* Depth to Bedrock:
2: 2: *120 ft.*
Casing Diameter: 1: *20 in.* Casing Length: 1: *73 ft.* Casing Thickness: 1:
2: 2: *73 ft.* 2:
Casing Height Above Ground: Aquifer Type: *ROCK*
Date of Completion: *11/3/1989* Total Depth: *120 ft.* Well Use:
Driller's Name: *REYNOLDS, INC.*
Screen Diameter: Slot Size: Screen Length:
Type: Material:
Set Between:
Gravel Pack Material/Size: Vol/Wt Used:
Method of Installation: Placed:
Grout Material/Size: Vol/Wt Used:
Method of Installation: Placed

WELL TEST DETAILS

Static Water Level: *23.7 ft.* Test Rate: *1987 gpm* Associated Reports
Drawdown: *8.1 ft.* Test Duration: *8 hrs.* *PUMPING TEST*

COMMENTS: *NONE*

WELL LOG

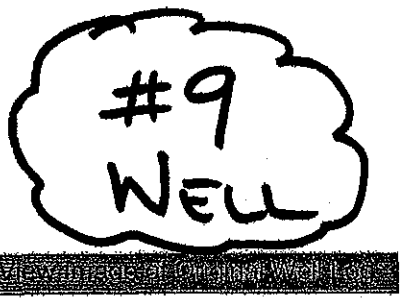
Formations	From	To
TOP SOIL	0	3
BROWN SAND & GRAVEL	3	14
SANDY GRAVEL & CLAY	14	30
GRAVEL	30	32
PEA SAND & GRAVEL	32	52
MIXED SAND & GRAVEL	52	62
MIXED SAND	62	87
PEA SAND & GRAVEL	87	107
ROCK	107	120
PEA SAND & GRAVEL	120	120

Printing Tips (opens in new window)

Well log questions - Web site questions - Web policies

Water Well Log and Drilling Report

Ohio Department of Natural Resources
Division of Water
Phone: 614-265-6740 Fax: 614-265-6767



Well Log Number: 879110

ORIGINAL OWNER AND LOCATION

Original Owner Name: *APPLETON PAPER*
County: *MONTGOMERY*
Township: *MIAMI*
Section Number:
Address: *1030 ALEX-BELL RD W*
Lot Number:
City:
State: *OH*
Zip Code: *45449*
Location Number:
Location Map Year:
Location Area:
Latitude:
Longitude:

CONSTRUCTION DETAILS

Borehole Diameter: 1: *36 in.*
2:
Borehole Depth: 1: *146 ft.*
2:
Depth to Bedrock:
Casing Diameter: 1: *24 in.*
2:
Casing Length: 1: *106 ft.*
2:
Casing Thickness: 1: *0.375 in.*
2:
Casing Height Above Ground: *2*
Aquifer Type: *ASPHALT*
Date of Completion: *10/18/2001*
Total Depth: *146 ft.*
Well Use:
Driller's Name: *REYNOLDS, INC.*
Screen Diameter:
Slot Size: *0.07 in.*
Screen Length: *70 ft.*
Type:
Material:
Set Between: *From: 106 ft. To: 146 ft.*
Gravel Pack Material/Size:
Vol/Wt Used:
Method of Installation:
Placed:
Grout Material/Size:
Vol/Wt Used:
Method of Installation:
Placed

WELL TEST DETAILS

Static Water Level: *24.2 ft.*
Test Rate: *1750 gpm*
Associated Reports
Drawdown: *17.9 ft.*
Test Duration: *7 hrs.*
PUMPING TEST

COMMENTS: *NONE*

WELL LOG

Formations	From	To
ASPHALT	0	3
BROWN CLAY & GRAVEL	3	6
COBBLES SAND & GRAVEL	6	76
COARSE SAND & GRAVEL	76	86
LARGE SAND & GRAVEL	86	96
COARSE SAND & GRAVEL	96	111
MEDIUM SAND & GRAVEL	111	126
FINE TO COURSE SAND & GRAVEL	126	131
GRAY MEDIUM SAND & GRAVEL	131	141
FINE TO COURSE SAND & GRAVEL	141	146
COBBLES GRAVEL	146	156
COBBLES SAND & GRAVEL	146	156
BROWN CLAY	157	157

Printing Tips (opens in new window)

Well log questions - Web site questions - Web policies

Section 27

Dryden South and North
Well Field

DS-7
DS-8
DS-9B
DN-11
DN-12
DN-13

DW-13

Depth (ft.)	Well Diagram	Description of Material	Log
0–10		Fill - Clay, sand and gravel	
10–30		Sand, gravel and water	
30–80		Sand and heavy gravel	
80–110		Sand and gravel	
110–130		Coarse sand some gravel	
130–150		Brown sand, medium	
150–160		Sand & gravel	
160–180		Sand & gravel lenses of clay	
180–220		Clay and gravel	

GREATER MORAINE WATER SYSTEM — WATER WELL DATA

Well No. 7 Location Dryden Road
Driller Layne-Ohio Company Equipment Drilling Rig
Date Started October 19, 1965 Completed October 17, 1966

CONSTRUCTION DETAILS

Type of Well Tubular Method Drilled
Outside Casing:
I. D. 26 in. Length: 77 ft. Thickness - in.
Material 26-inch steel I. D. Connections Welded
Inside Casing: N/A
I. D. - in. Length: - ft. Thickness - in.
Material - Connections -
Screen:
Type Cook I. D. 24 in. Length: 70 ft.
Openings 20' - #90, 50' - #70 Material Red brass
Bottom Fitting Steel shoe Top Fitting -
Gravel: Size - Quantity -
Well Development:
Method Surging Equipment Rig

PUMPING TEST

Date Feb. 19, 1968 Static W. L. 47 ft. Time 9:00 A. M.
Flow 2750 gpm Length of Test 0.50 hours
Min. pumping level 56.0 ft. Max. drawdown 9.2 ft.
Specific capacity 298 gpm/ft. Stabilized Yes
Transmissibility - gpd/ft. Storage Coefficient -
Well efficiency 92 % Wire-to-Water eff. 83 %

WATER ANALYSIS

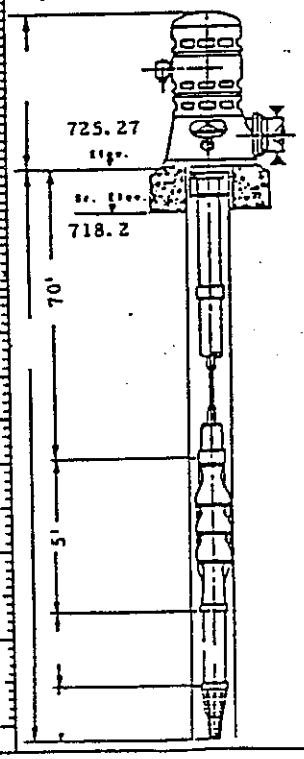
Date of Sample Feb. 19, 1968 Date of Analysis Feb. 19, 1968
Pumping 2.0 hrs. @ 2750 gpm Appearance Clear
Water Temperature 15°C Air Temperature -4°C
Specific Conductance 750 micromhos-cm @ 25° C.

Total Diss. Solids	487	mg/l	Calcium*	292	mg/l
Total Hardness*	452	mg/l	Iron, Fe	0.20	mg/l
Alkalinity*	396	mg/l	Manganese, Mn	0.06	mg/l
Non-Carb. Hard.*	56	mg/l	Chloride, Cl	43	mg/l
CO_2	28	mg/l	Sulfate, SO_4	57.5	mg/l
Dissolved Oxygen	-	mg/l	H_2S	-	mg/l

pH 7.3 pHs 6.8 pH - pHs + 0.5
*As $CaCO_3$

PERMANENT PUMPING EQUIPMENT

Pump Deming Byron-Jackson Capacity 1800 gpm TDH 305 ft.
Motor U.S. 200 HP @ 1770 RPM
Material: Impellers Bronze on gen. steel shaft Bowls 14" CGH
Impeller No. Number of Stages 3 5



Column: Length 70 ft. ID 12 in.
OD in. Material Steel pipe
Threaded or flange Flange

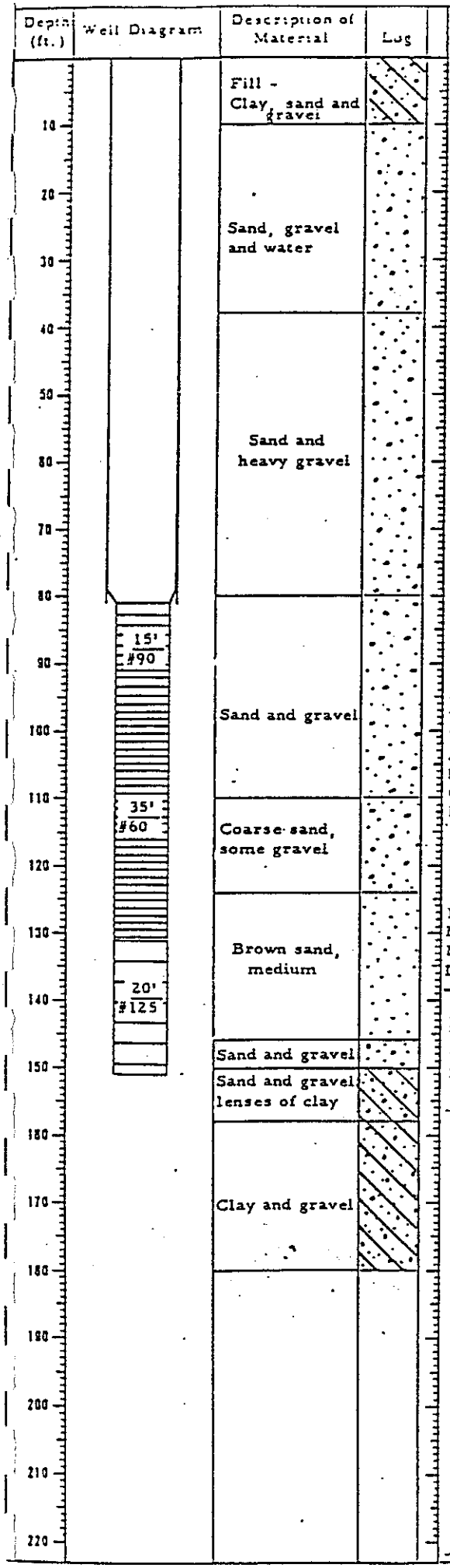
Shaft: Lubrication Oil
Material Genuine steel Diam. 1-15/16 in.
OD Oil Tube 3 in.
Material Extra heavy pipe

Suction Pipe None ID in.
OD in. Length ft.
Material
Length of Air Line 70 / 105 ft.

REMARKS

8/74 - New pump installed

Prepared by:
WOOLPERT CONSULTANTS



GREATER MORAINE WATER SYSTEM — WATER WELL DATA

Well No. 8 Location Dryden Road
Driller Layne-Ohio Company Equipment Drilling Rig
Date Started June 1 1965 Completed October 17, 1966

CONSTRUCTION DETAILS

Type of Well Tubular Method Drilled
Outside Casing:
I. D. 26 in. Length: 81 ft. Thickness - in.
Material Steel Connections Welded
Inside Casing: N/A
I. D. - in. Length: - ft. Thickness - in.
Material Connections
Screen:
Type Cook I. D. 24 in. Length: 70 ft.
Openings See diagram Material Red brass
Bottom Fitting - Top Fitting -
Gravel: Size - Quantity -
Well Development:
Method Surging Equipment Rig

PUMPING TEST

Date Feb. 19 1968 Static W. L. 46 ft. Time 1:00 P.M.
Flow 2900 gpm Length of Test 0.5 hours
Min. pumping level 55 ft. Max. drawdown 9.0 ft.
Specific capacity 321 gpm/ft. Stabilized Yes
Transmissibility - gpd/ft. Storage Coefficient -
Well efficiency 94 % Wire-to-Water eff. 74 %

WATER ANALYSIS

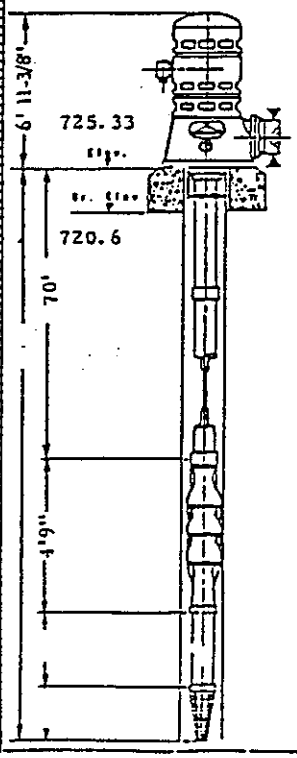
Date of Sample Feb. 19, 1968 Date of Analysis Feb. 19, 1968
Pumping 2.0 hrs. @ 2950 gpm Appearance Clear
Water Temperature 15°C Air Temperature 3°C
Specific Conductance 635 micromhos-cm @ 25° C.

Total Diss. Solids	413	mg/l	Calcium*	240	mg/l
Total Hardness*	386	mg/l	Iron, Fe	0.08	mg/l
Alkalinity*	316	mg/l	Manganese, Mn	0.04	mg/l
Non-Carb. Hard.*	70	mg/l	Chloride, Cl	37	mg/l
CO_2	23	mg/l	Sulfate, SO_4	67	mg/l
Dissolved Oxygen	-	mg/l	H_2S	-	mg/l

pH 7.4 pHs 7.0 pH - pHs +0.4
*As $CaCO_3$

PERMANENT PUMPING EQUIPMENT

Pump Byron Jackson Capacity ~~1720~~ 2000 gpm TDH 305 ft.
Motor U.S. 200 HP @ 1750 RPM
Material: Impellers Bronze Bowls 14" CGH
Impeller No. Standard Number of Stages 3



Column: Length 70 ft. ID 12 in.
OD 12 in. Material Steel pipe
Threaded or flange Flange

Shaft: Lubrication Oil
Material Genuine steel Diam. 1-15/16 in.
OD Oil Tube 3 in.
Material Extra heavy pipe

Suction Pipe None ID in.
OD in. Length ft.
Material
Length of Air Line ~~70~~ 105 ft.

REMARKS

Prepared by:
WOOLPERT CONSULTANTS

Depth (ft.)	Well Diagram	Description of Material	Log
10			
20			
30			
40			
50			
60			
70			
80			
90			
100			
110			
120			
130			
140			
150			
160			
170			
180			
190			
200			
210			
220			

Greater Moraine Water System
Montgomery County, Ohio

WATER WELL DATA

Well No. 98 Location Dryden Road
Driller Moody's of Dayton Equipment Drilling Rig
Date Started July 29, 1971 Completed

CONSTRUCTION DETAILS

Type of Well Method
Outside Casing: Depth of Well
I.D. in. Length: ft. Thickness in.
Material Connections
Inside Casing:
I.D. 18 in. Length: 148 ft. Thickness in.
Material Steel Connections
Screen:
Type Cook I.D. 12 in. Length: 53 ft.
Openings Material Red Brass
Bottom Fitting Bail Plug Top Fitting Lead Packer
Gravel: Size Quantity NA
Well Development:
Method Equipment

PUMPING TEST

Date Static W. L. 61' Time
Flow gpm Length of Test hours
Min. pumping level ft. Max. drawdown ft.
Specific Yield gpm/ft. Stabilized
Transmissibility gpd /ft. Storage Coefficient

WATER ANALYSIS

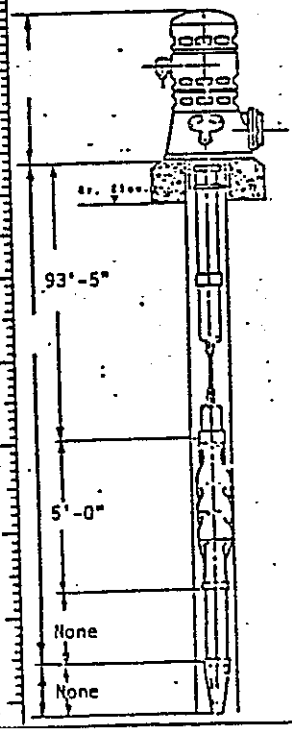
Date of Sample Date of Analysis
Pumping hrs. @ gpm Appearance
Water Temperature Air Temperature
Specific Conductance micromhos-cm @ 25° C.

Total Diss. Solids	mg/l	Calcium*	mg/l
Total Hardness*	mg/l	Iron, Fe	mg/l
Alkalinity*	mg/l	Manganese, Mn	mg/l
Non-Carb. Hard.*	mg/l	Chloride, Cl	mg/l
CO_2	mg/l	Sulfate, SO_4	mg/l
Dissolved Oxygen	mg/l	H_2S	mg/l

pH pHs pH - pHs

PERMANENT PUMPING EQUIPMENT

Byron Pump Bevan Jackson Capacity 850 gpm TDH 310 ft.
Motor 100 HP @ 1800 RPM
Material: Impellers Bronze Bowls 12 CX
Impeller No. Number of Stages 5



93'5"
Column: Length ~~98' 6"~~ ft. ID in
OD 10" in. Material Steel
Threaded or flange Flanged
Line
Shaft: Lubrication Oil
Material Stainless Steel Diam 1-11/16 in
OD Oil Tube 2-1/2 in.
Material

Suction Pipe ID in
OD in. Length ft.
Material
Length of Air Line 94 ft.

REMARKS

Prepared by:
WOOLPERT CONSULTANTS

Depth (ft.)	Well Diagram	Description of Material	Log
0		Top soil and boulders	
10		Coarse clean gravel	
20			
30			
40			
50		Blue till with stones	
60			
70			
80			
90			
100		Coarse clean gravel	
110			
120			
130			
140			
150			
160			
170			
180			
190			
200			
210			
220			

GREATER MORAINE WATER SYSTEM — WATER WELL DATA

Well No. 11 Location Dryden Road
Driller Layne-Ohio Company Equipment Drilling Rig
Date Started June 1956 Completed July 1956

CONSTRUCTION DETAILS

Type of Well Vertical drilled Method Drilled
Outside Casing:
I. D. 20 in. Length: 110 ft. Thickness - in.
Material Steel Connections Welded
Inside Casing: N/A
I. D. - in. Length: - ft. Thickness - in.
Material - Connections -
Screen:
Type Cook I. D. 18 in. Length: 50 ft.
Openings 4'-#60 46'-#125 Material Red brass
Bottom Fitting - Top Fitting Lead
Gravel: Size N/A Quantity N/A
Well Development:
Method Surging Equipment Drilling Rig

PUMPING TEST

Date Feb. 16 1968 Static W. L. 44 ft Time 9:00 A.M.
Flow 1600 gpm Length of Test 0.5 hours
Min. pumping level 62 ft. Max. drawdown 17.9 ft.
Specific capacity 89.4 gpm/ft. Stabilized Yes
Transmissibility - gpd/ft. Storage Coefficient -
Well efficiency 99 % Wire-to-Water eff. 77 %

WATER ANALYSIS

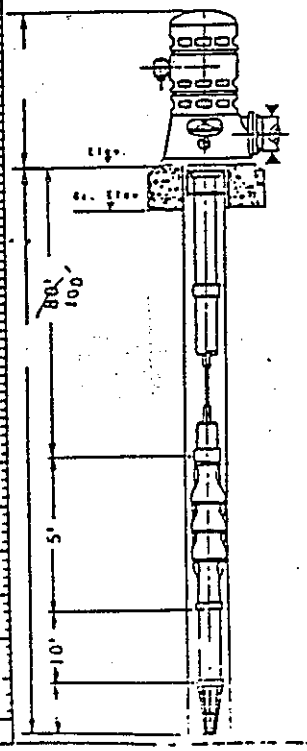
Date of Sample Feb. 16, 1968 Date of Analysis Feb. 16, 1968
Pumping 2 hrs. @ 1900 gpm Appearance Aerated
Water Temperature 14.5°C Air Temperature 6°C
Specific Conductance 625 micromhos-cm @ 25° C.

Total Diss. Solids	406 mg/l	Calcium*	240 mg/l
Total Hardness*	380 mg/l	Iron, Fe	0.15 mg/l
Alkalinity*	312 mg/l	Manganese, Mn	0.06 mg/l
Non-Carb. Hard.*	68 mg/l	Chloride, Cl	40 mg/l
CO_2	23 mg/l	Sulfate, SO_4	73 mg/l
Dissolved Oxygen	- mg/l	H_2S	- mg/l

pH 7.4 pHs 6.9 pH - pHs + 0.5
*As $CaCO_3$

PERMANENT PUMPING EQUIPMENT

Layne 1500 253
Pump Deming-Turbine Capacity ~~1600~~ gpm TDH ~~300~~ ft.
Motor U.S. 150 HP @ 1750 RPM 1-4 WMC
Material: Impellers Bronze Bowls ~~11"~~ bronze
Impeller No. Standard Number of Stages 5 4



Column: Length ~~80~~ 100 ft. ID ~~1 15/16~~ 10" in
OD in. Material Steel
Threaded or flange ~~Sleeve coupled~~ flanged
Shaft: Lubrication ~~Water~~ Oil
Material Stainless Diam. ~~1"~~ 1 11/16 in
OD Oil Tube 2" in.
Material steel
Suction Pipe Yes ID 10 in
OD in. Length 10 ft.
Material Steel
Length of Air Line ~~105~~ 120 ft.

REMARKS

3/57 Emergency repair
8/66 Emergency repair
9/69 Installed new pump
5/73 Repairs - 2-10' sections of column added

Prepared by:
WOOLPERT CONSULTANTS

Depth (ft.)	Well Diagram	Description of Material	Log
10		Sand and Gravel, Medium Boulders	
20			
30			
40			
50			
60			
70			
80			
90			
100		Fine to Coarse Sand, Medium Gravel	
110			
120		Coarse Sand, Large Gravel	
130			
140			
150		Coarse Sand and Gravel Boulders	
160			
170		Red Sand	
180		Coarse Red Sand, Large Gravel	
190			
200		Coarse Red Sand, Large Gravel, Boulders	
210			

Greater Moraine Water System
Montgomery County, Ohio

WATER WELL DATA

Well 12 Location Dryden Road
Driller Donald J. Roe Equipment Drilling Rig
Date Started _____ Completed July 1958

CONSTRUCTION DETAILS

Type of Well Vertical Method _____
Outside Casing: Depth of Well
I.D. 16 in. Length: 165 ft. Thickness _____ in.
Material steel Connections welded
Inside Casing:
I.D. ___ in. Length: ___ ft. Thickness _____ in.
Material Steel Connections _____
Screen:
Type Cook I.D. ___ in. Length: 60' ft.
Openings ~~XXXXX~~ 60' -#125 Material Red Brass
Bottom Fitting _____ Top Fitting _____
Gravel: Size NIA Quantity NIA
Well Development Method SURGING Equipment Drilling Rig

PUMPING TEST

Date _____ Static W. L. _____ Time _____
Flow _____ gpm Length of Test _____ hours
Min. pumping level _____ ft. Max. drawdown _____ ft.
Specific Yield _____ gpm/ft. Stabilized _____
Transmissibility _____ gpd /ft. Storage Coefficient _____

WATER ANALYSIS

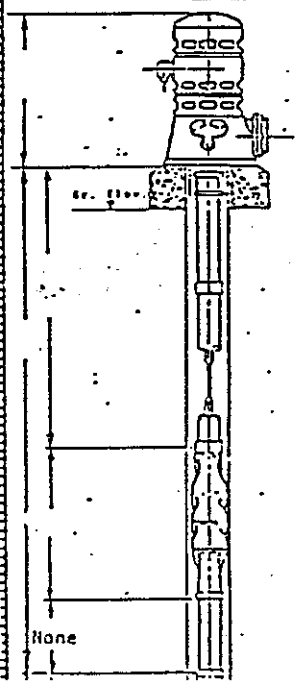
Date of Sample _____ Date of Analysis _____
Pumping _____ hrs. @ _____ gpm Appearance _____
Water Temperature _____ Air Temperature _____
Specific Conductance _____ micromhos-cm @ 25° C.

Total Diss. Solids	mg/l	Calcium*	mg/l
Total Hardness*	mg/l	Iron, Fe	mg/l
Alkalinity*	mg/l	Manganese, Mn	mg/l
Non-Carb. Hard.*	mg/l	Chloride, Cl	mg/l
CO_2	mg/l	Sulfate, SO_4	mg/l
Dissolved Oxygen	mg/l	H_2S	mg/l

pH _____ pHs _____ pH - pHs _____

PERMANENT PUMPING EQUIPMENT

Pump Layne Vert. Cent. Capacity 904 gpm TDH 270 ft.
Motor 150 us HP @ 1800 RPM 15" DRHC
Material: Impellers Bronze Bowls _____
Impeller No. Open Number of Stages 3



Column: Length 100 ft. ID ___ in
OD 10 in. Material Steel
Threaded or flange Flanged
Line
Shaft: Lubrication Oil
Material stainless Diam 1-15/16
OD Oil Tube 3 in.
Material steel

Suction Pipe yes ID 10 in
OD ___ in. Length 10 ft.
Material _____
Length of Air Line 105 ft.

REMARKS

11/67 - Repairs
10/79 - Revitalizing - Repair

Prepared by

Depth (ft.)	Well Diagram	Description of Material	Log
10		Top soil sandy till with stones drilled	
20			
30		Very coarse, clean gravel, bailed, large stones	
40			
50			
60		Till, dense drilled, no stones	
70			
80		Medium gravel very clean Bailed easy	
90			
100			
110		Fine gravel and coarse sand bailed, some silt	
120			
130		Coarse sand with beds of very large stones	
140			
150			
160			
170		Fine uniform gravel, bailed easy, drank water	
180		Till, very dense drilled	
190			
200			
210			
220			

GREATER MORAINE WATER SYSTEM — WATER WELL DATA

Well No. 13 Location Dryden Road
Driller Layne-Ohio Company Equipment Drilling Rig
Date Started - Completed June, 1964

CONSTRUCTION DETAILS

Type of Well Vertical Method Drilling
Outside Casing:
I. D. 20 in. Length: 108 ft. Thickness - in.
Material Steel Connections Welded
Inside Casing: N/A
I. D. ____ in. Length: ____ ft. Thickness ____ in.
Material ____ Connections ____
Screen:
Type Cook I. D. ~~18~~ 20" in. Length: 60 ft.
Openings 60'-#125 Material Cook red brass
Bottom Fitting ____ Top Fitting Lead packer
Gravel: Size N/A Quantity N/A
Well Development:
Method Surging Equipment Drilling Rig

PUMPING TEST

Date Feb. 16 1968 Static W. L. 41 ft. Time 11:00 A.M.
Flow 2100 gpm Length of Test 0.50 hours
Min. pumping level 51 ft. Max. drawdown 9.9 ft.
Specific capacity 212 gpm/ft. Stabilized Yes
Transmissibility - gpd/ft. Storage Coefficient -
Well efficiency 100 % Wire-to-Water eff. 69 %

WATER ANALYSIS

Date of Sample Feb. 16 1968 Date of Analysis Feb. 16 1968
Pumping 2 hrs. @ 2100 gpm Appearance Clear
Water Temperature 15°C Air Temperature 6°C
Specific Conductance 600 micromhos-cm @ 25° C.

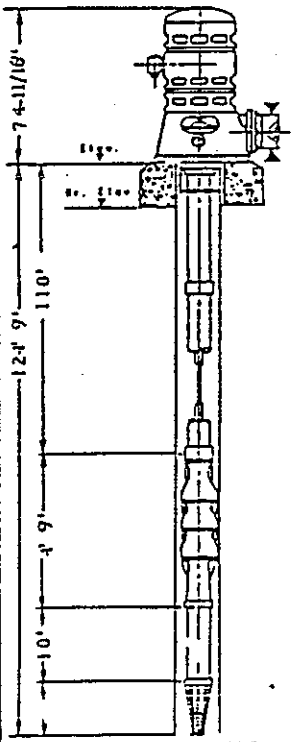
Total Diss. Solids	390	mg/l	Calcium*	226	mg/l
Total Hardness*	370	mg/l	Iron, Fe	0.08	mg/l
Alkalinity*	290	mg/l	Manganese, Mn	0.04	mg/l
Non-Carb. Hard.*	80	mg/l	Chloride, Cl	33	mg/l
CO_2	23	mg/l	Sulfate, SO_4	78	mg/l
Dissolved Oxygen	-	mg/l	H_2S	-	mg/l

pH 7.4 pHs 7.1 pH - pHs + 0.3
*As $CaCO_3$

PERMANENT PUMPING EQUIPMENT

~~2000~~ 300

Pump Layne vertical centrifugal Capacity ~~1500~~ gpm TDH ~~340~~ ft.
Motor U.S. 150 HP @ 1800 RPM
Material: Impellers Bronze Bowls 15" DRHC
Impeller No. Open Number of Stages 3



Column: Length 110 ft. ID ____ in.
OD 10 in. Material Steel
Threaded or flange Flange

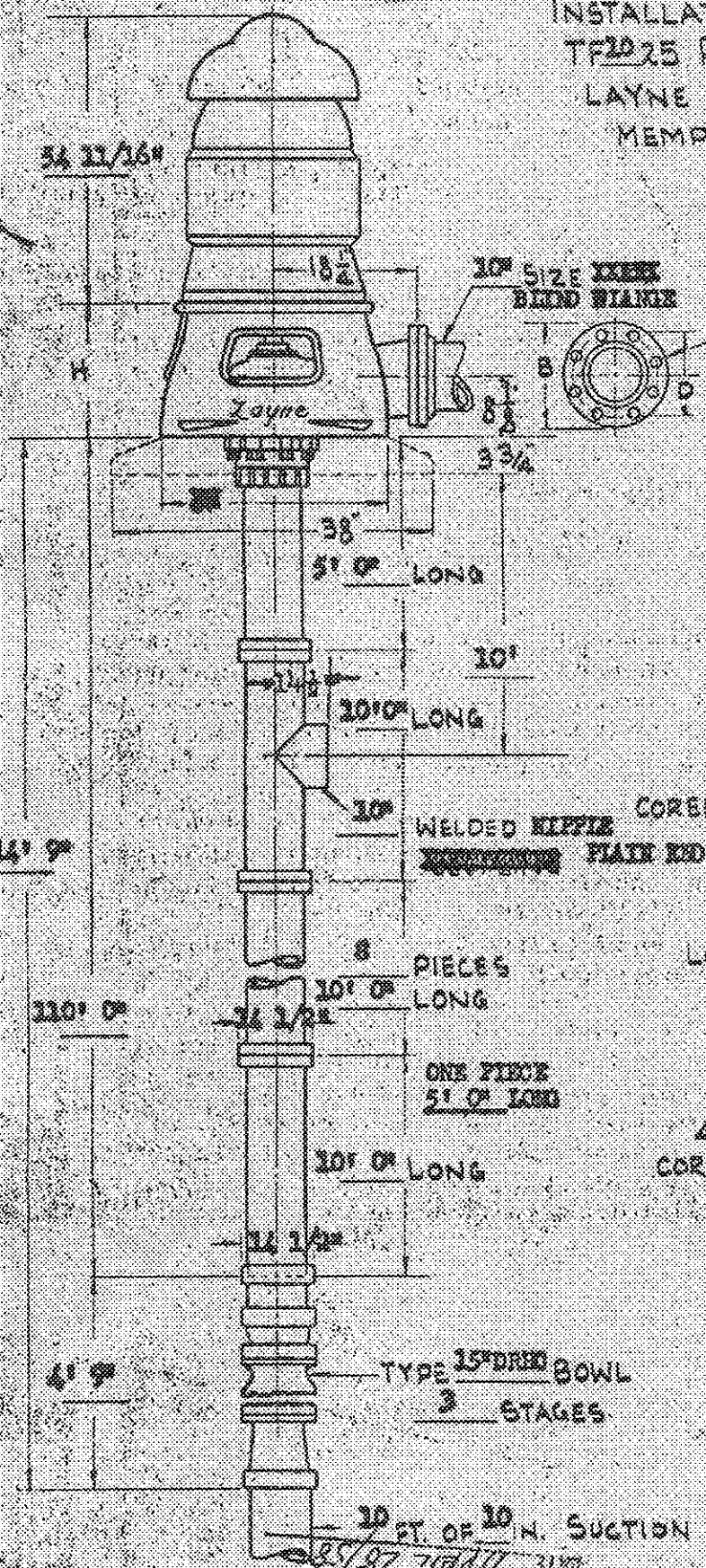
Shaft: Lubrication Oil
Material Stainless Diam. 1-15/16 in.
OD Oil Tube 3 in.
Material Steel

Suction Pipe Yes ID 10 in.
OD ____ in. Length 10 ft.
Material Steel
Length of Air Line ~~80~~ 100 ft.

REMARKS

Prepared by:
WOOLPERT CONSULTANTS

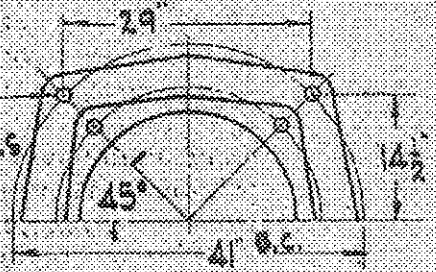
INSTALLATION PLAN #39063
TF1025 PUMP HEAD
LAYNE & BOWLER, INC. #13
MEMPHIS, TENN.



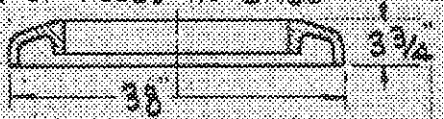
USE THESE DIMENSIONS ONLY WHEN CERTIFIED BY FACTORY.

"C" CORED HOLES 10" Flange of

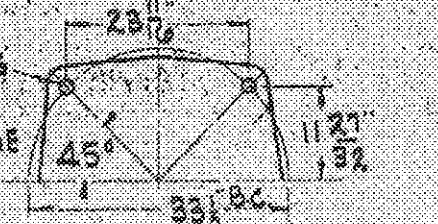
HEAD	PATT. No.	B	C	D	H	R
TF1025	T304	10"	12-1"	14 1/2	20	16"



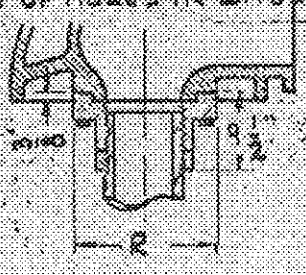
LOCATION OF HOLES IN BASE PLATE



SECTION THRU BASE PLATE



LOCATION OF HOLES IN BASE OF ELL



SECTION THRU BASE OF ELL

APPROVED
RALPH L. WOOLPERT CO.
BY
DATE 2/5/58

8488

SPECIFICATIONS FOR CLEANING AND REPAIR OF
Dryden Road WELL FIELD PUMP #13

Montgomery County is in need of pump repairs for well number thirteen at the Dryden Road Well Field. The pump has a bad wobble at top shaft bearing.

Montgomery County is requesting a proposal in two (2) parts to repair this pump. The award will be made on the lump sum total.

Information on the pump is as follows:

1. Layne Model TF 1025 3 stage oil lube pump, 15" bowls
2. Approx. 125' setting
3. Column pipe - 10" flanged
4. Oil tube - 3" x 5'
5. Line shaft - 1 15/16" x 10'
6. Bearings - 3" x 1 15/16"

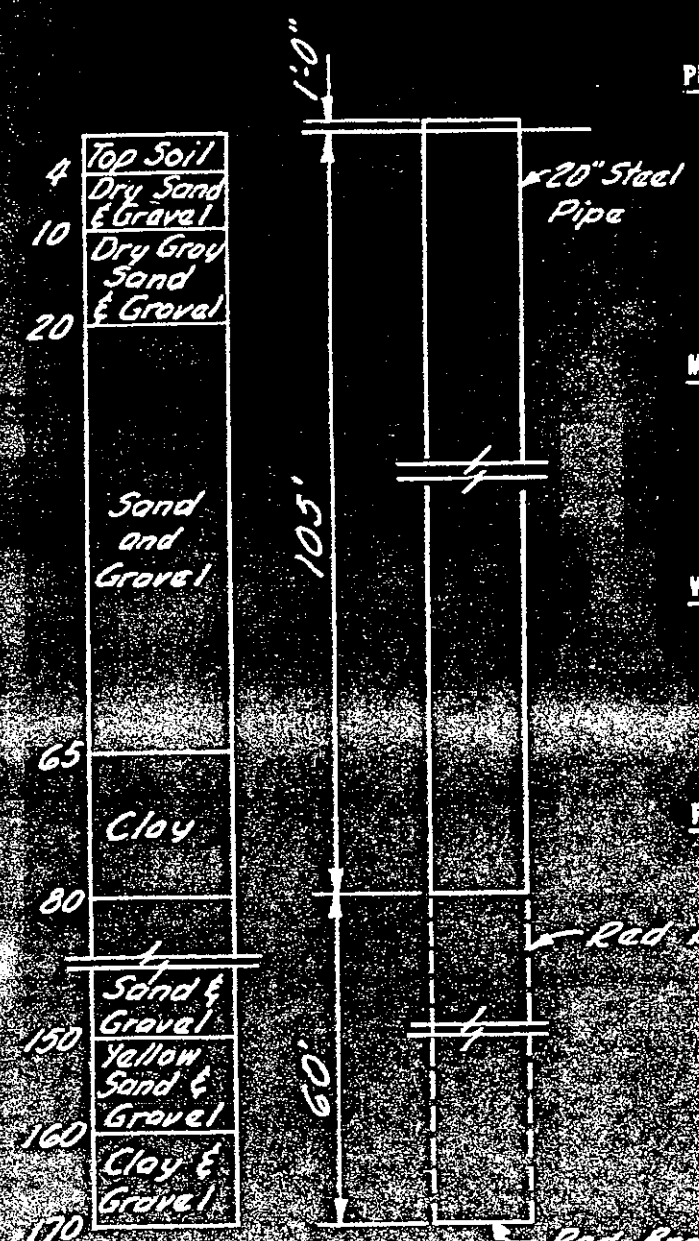
SCOPE OF WORK

The work to be done hereunder includes the furnishing of all labor, materials, transportation, tools, supplies, equipment, and appurtenances, unless herein after accepted, necessary for the complete and satisfactory cleaning and repair of Well No. 13 Under this contract, the Contractor shall remove, dismantle, and inspect the existing pump and replace such parts and make such repairs as authorized by the County and then re-install the repaired pump.

PULLING AND RE-INSTALLING PUMP:

The Contractor shall be paid a lump sum for rig mobilization. The sum shall include moving onto the job site and returning to the shop upon completion of the job.

The charge for pulling and re-installing the pump shall include all costs incidental to the pulling, dismantling, transporting, reassembly, and reinstalling of the pump. The Contractor shall be paid for the authorized work performed at the unit price-hourly rat as indicated on the bid form.



MATERIAL:

Pit: 105' of 20" Steel Casing

Screen: 60' of 20" Red Brass Cook Screen

Cone: Red Brass Bottom

PUMP: Customer's

No.		Shop No.	
Type		Size	
Setting		Stages	
Suction		Impellers	
Discharge		Head	
Tubing		Press. H. P.	
Shafting			

MOTOR: Customer's

Make		Type	
Volts		Cycle	
Phase		Amp.	
H. P.		R. P. M.	
Frame		Serial	

WELL:

Capacity	2000 GPM	Static Level	43'
Guarantee	None	P. Level	52'-8"
Started	8-17-64	Pressure	
Finished	9-25-64	Pumped	2005
Accepted	9-25-64	Depth	165'

REMARKS:

Driller: Toledo Rodgers

Installer:

THE LAYNE OHIO CO.
WATER SUPPLY CONTRACTORS
COLUMBUS OHIO

MONTGOMERY COUNTY
DAYTON, OHIO

DRAWN BY R.F.J. - O.L.M.S. APPROVED BY
WELL NO. 13 DRAWING NO. 1527

Section 28

Box Sewer Boring Logs

BS/BH01 through BS/BH06

ARCADIS G&M

Log of Boring: BS/BH01

Box Sewer Investigation

General Motors, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	-	-	-					FILL 18' of concrete; 6" of gravel fill	
2	-,4,4,6	18	0.0				CL	CLAY soft; medium plasticity; moist; brown-reddish brown; clay (70%)	
4	4,6,9,9	18	0.0				SW	SAND & GRAVEL medium dense; moist; light brown; well graded; medium-coarse sand (75%); medium gravel (20%); silt (<5%)	
6	8,14,11,11	14	0.0				SW	SAND & GRAVEL medium dense; moist; light brown; well graded; medium-coarse sand (75%); medium gravel (20%); silt (<5%)	
8	-,9,14,20	12	0.0				SW	SAND & GRAVEL medium dense; moist; light brown; well graded; medium-coarse sand (75%); medium gravel (20%); silt (<5%)	
10	21,50/5	12	0.0				SW	SAND & GRAVEL medium dense; moist; light brown; well graded; medium-coarse sand (75%); medium gravel (20%); silt (<5%)	
12									

Sample Analysis: ☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Darrell
Drilling Method: Hollow stem auger
Drilling Fluid: None

Geologist: Cindy Capell
Total Depth: 30
Surface Elev.: 732.27
Datum: Ground Level

Begin Drilling: 11/26/01 @ 13:44
End Drilling: 11/26/01 @ 15:59
North Coor.: 3136.943
East Coor.: 6451.992

Remarks: Samples sent to STL for analysis of TCL VOCs and TCL PCBs. Converted to Well: N Well I.D.:

Project No.: OH000294.0004.00010 Filename: Nov 2001 Soil Logs

ARCADIS G&M

Log of Boring: BS/BH01

Box Sewer Investigation

General Motors, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
12	17,45,40,17	18	0.0				SW	SAND & GRAVEL medium dense; moist; light brown; well graded; medium-coarse sand (75%); medium gravel (20%); silt (<5%)	
14	15,50/3	10	0.0				SW	SAND & GRAVEL medium dense; moist; light brown; well graded; medium sand (85%); fine-medium gravel (10%); silt (<5%)	
16	15,21,19,21	19	0.0				SP	SAND medium dense; moist; light brown; poorly graded; fine-medium sand (95%); silt (<5%)	
18	30,30,16,20	22	0.0				SW	SAND & GRAVEL medium dense; moist; light brown; well graded; medium-coarse sand (80%); small-medium gravel (15%); silt (<5%)	
20	16,12,40,16	18	0.0				SW	SAND & GRAVEL medium dense; moist; light brown; well graded; medium-coarse sand (80%); medium-coarse gravel (15%); silt (<5%)	
22	26,40,40,40	20	0.0				SW	SAND & GRAVEL medium dense; moist; light brown; well graded; medium-coarse sand (80%); medium-large gravel (15%); silt (<5%)	
24									

Sample Analysis: ☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Darrell
Drilling Method: Hollow stem auger
Drilling Fluid: None

Geologist: Cindy Capell
Total Depth: 30
Surface Elev.: 732.27
Datum: Ground Level

Begin Drilling: 11/26/01 @ 13:44
End Drilling: 11/26/01 @ 15:59
North Coor.: 3136.943
East Coor.: 6451.992

Remarks: Samples sent to STL for analysis of TCL VOCs and TCL PCBs. Converted to Well: N Well I.D.:

Project No.: OH000294.0004.00010 Filename: Nov 2001 Soil Logs

ARCADIS G&M

Log of Boring: BS/BH01

Box Sewer Investigation

General Motors, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
24	25,48,35,28	18	0.0				SW	SAND & GRAVEL medium dense; moist; light brown; well graded; medium-coarse sand (80%); medium-coarse gravel (15%); silt (<5%)	
26	40,46,50/6	12	0.0				SW	SAND & GRAVEL medium dense; moist; light brown; well graded; medium-coarse sand (80%); medium-large gravel (15%); silt (<5%)	
28	21,50/5	10	0.0				SW	SAND & GRAVEL medium dense; wet; light brown; well graded; medium-coarse sand (80%); medium-coarse gravel (15%); silt (<5%)	▼
30								Bottom of boring	
32									
34									
36									

Sample Analysis: ☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Darrell
Drilling Method: Hollow stem auger
Drilling Fluid: None

Geologist: Cindy Capell
Total Depth: 30
Surface Elev.: 732.27
Datum: Ground Level

Begin Drilling: 11/26/01 @ 13:44
End Drilling: 11/26/01 @ 15:59
North Coor.: 3136.943
East Coor.: 6451.992

Remarks: Samples sent to STL for analysis of TCL VOCs and TCL PCBs. Converted to Well: N Well I.D.:

Project No.: OH000294.0004.00010 Filename: Nov 2001 Soil Logs

ARCADIS G&M

Log of Boring: BS/BH02

Box Sewer Investigation

General Motors, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	-	-	-					FILL 4" of asphalt; 14" of concrete; 6" of gravel fill	
2	-,3,4,6	18	0.0					6" of concrete	
							CL	CLAY sandy soft; medium plasticity moist; brown-red brown; clay (70%); coarse sand (25%); silt (5%)	
4	4,6,4,4	18	0.0				CL	CLAY soft; medium plasticity moist; brown-red brown; clay (70%); coarse sand (25%); silt (5%)	
6	7,4,6,5	16	0.0				SW	SAND & GRAVEL medium dense; moist; light brown; well graded; medium coarse sand (75%); gravel (20%); silt (5%)	
8	4,3,3,4	12	0.0				CL	CLAY sandy; soft; medium plasticity; moist; light brown; clay (70%); medium-coarse sand (25%); silt (5%)	
10	4,6,8,14	12	0.0				CL	CLAY sandy; soft; medium plasticity; moist; light brown; clay (70%); medium-coarse sand (25%); silt (5%)	
12									

Sample Analysis: ☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Darrell
Drilling Method: Hollow stem auger
Drilling Fluid: None

Geologist: Cindy Capell
Total Depth: 28
Surface Elev.: 732.31
Datum: Ground Level

Begin Drilling: 11/27/01 @ 7:45
End Drilling: 11/27/01 @ 9:34
North Coor.: 3411.014
East Coor.: 6452.948

Remarks: Samples sent to STL for analysis of TCL VOCs and TCL PCBs. Converted to Well: N Well I.D.:

Project No.: OH000294.0004.00010 Filename: Nov 2001 Soil Logs

ARCADIS G&M

Log of Boring: BS/BH02

Box Sewer Investigation

General Motors, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
12	13,17,17,25	12	0.0				SP	SAND medium dense; moist; light brown; poorly graded; medium-coarse sand (90%); fine gravel (5%); silt (5%)	
14	32,32,25,15	18	0.0				SP	SAND medium dense; moist; light brown; poorly graded; medium-coarse sand (90%); fine gravel (5%); silt (5%)	
16	13,14,14,14	18	0.0				SP	SAND medium dense; moist; light brown; poorly graded; medium-coarse sand (90%); fine gravel (5%); silt (5%)	
18	10,20,25,25	14	0.0				SW	SAND & GRAVEL medium dense; moist; light brown; well graded; medium-coarse sand (80%); fine-medium gravel (15%); silt (5%)	
20	20,12,50/5	10	0.0				SW	SAND & GRAVEL medium dense; moist; light brown; well graded; medium-coarse sand (85%); fine -medium gravel (10%); silt (5%)	
22	21,30,50/5	12	0.0				SW	SAND & GRAVEL medium dense; moist; light brown; well graded; medium-coarse sand (85%); fine -medium gravel (10%); silt (5%)	
24									

Sample Analysis: ☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Darrell
Drilling Method: Hollow stem auger
Drilling Fluid: None

Geologist: Cindy Capell
Total Depth: 28
Surface Elev.: 732.31
Datum: Ground Level

Begin Drilling: 11/27/01 @ 7:45
End Drilling: 11/27/01 @ 9:34
North Coor.: 3411.014
East Coor.: 6452.948

Remarks: Samples sent to STL for analysis of TCL VOCs and TCL PCBs. Converted to Well: N Well I.D.:

Project No.: OH000294.0004.00010 Filename: Nov 2001 Soil Logs

ARCADIS G&M

Log of Boring: BS/BH02

Box Sewer Investigation

General Motors, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
24	14,25,38,32	20	0.0				SW	SAND & GRAVEL medium dense; moist; light brown; well graded; medium-coarse sand (85%); fine-medium gravel (10%); silt (5%)	
26	7,32,35,38	19	0.0				SP	SAND medium dense; wet; light brown; poorly graded; medium-coarse sand (90%); fine gravel (5%); silt (5%)	▼
28								Bottom of boring	
30									
32									
34									
36									

Sample Analysis: ☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Darrell
Drilling Method: Hollow stem auger
Drilling Fluid: None

Geologist: Cindy Capell
Total Depth: 28
Surface Elev.: 732.31
Datum: Ground Level

Begin Drilling: 11/27/01 @ 7:45
End Drilling: 11/27/01 @ 9:34
North Coor.: 3411.014
East Coor.: 6452.948

Remarks: Samples sent to STL for analysis of TCL VOCs and TCL PCBs. Converted to Well: N Well I.D.:

Project No.: OH000294.0004.00010 Filename: Nov 2001 Soil Logs

ARCADIS G&M

Log of Boring: BS/BH03

Box Sewer Investigation

General Motors, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	-	-	-					FILL 4" asphalt; 14" concrete; 6" gravel fill	
2	5,9,12,16	12	0.1				SW	SAND & GRAVEL medium dense; moist; light brown; well graded; medium-coarse sand (80%); fine-medium gravel (15%); silt (5%)	
4	28,17,28,23	16	0.1				SW	SAND & GRAVEL medium dense; moist; light brown; well graded; medium-coarse sand (80%); fine-coarse gravel (15%); silt (5%)	
6	12,10,8,10	12	0.1				SW	SAND & GRAVEL medium dense; moist; light brown; well graded; medium-coarse sand (80%); coarse gravel (15%); silt (5%)	
8	50/5,-,-	7	0.0				SW	SAND & GRAVEL medium dense; moist; light brown; well graded; medium-coarse sand (80%); fine-medium gravel (15%); silt (5%)	
10	21,50/5	12	0.0				SW	SAND & GRAVEL medium dense; moist; light brown; well graded; medium-coarse sand (80%); fine-medium gravel (15%); silt (5%)	
12									

Sample Analysis: ☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Darrell
Drilling Method: Hollow stem auger
Drilling Fluid: None

Geologist: C. Capell/S. Brown
Total Depth: 30
Surface Elev.: 732.28
Datum: Ground Level

Begin Drilling: 11/27/01 @ 11:04
End Drilling: 11/29/01 @ 10:05
North Coor.: 3738.272
East Coor.: 6444.663

Remarks: Samples sent to STL for analysis of TCL VOCs and TCL PCBs. Converted to Well: N Well I.D.:

Project No.: OH000294.0004.00010 Filename: Nov 2001 Soil Logs

ARCADIS G&M

Log of Boring: BS/BH03

Box Sewer Investigation

General Motors, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
12	18,23,50/5	12	0.0				SW	SAND & GRAVEL medium dense; moist; light brown; well graded; medium-coarse sand (80%); fine-medium gravel (15%); silt (5%)	
14	20,19,17,23	18	0.0				SP	SAND brown; fine-coarse sand; fine gravel (5%); moist; poorly graded; loose	
16	14,18,19,20	20	0.0				SP	SAND brown; fine-coarse sand; fine gravel (5%); moist; poorly graded; loose	
18	14,50/4	12	0.0				SP	SAND brown; fine-coarse sand; fine gravel (5%); moist; poorly graded; loose	
20	16,25,30,30	18	0.0				SW	SAND & GRAVEL fine-coarse sand (50%); fine-coarse gravel (50%); well graded; loose; light brown; moist	
22	13,15,50/5	12	0.0				SW	SAND & GRAVEL fine-coarse sand (50%); fine-coarse gravel (50%); well graded; loose; light brown; moist	
24									

Sample Analysis: ☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Geologist: C. Capell/S. Brown
Begin Drilling: 11/27/01 @ 11:04
Driller: Darrell
Total Depth: 30
End Drilling: 11/29/01 @ 10:05
Drilling Method: Hollow stem auger
Surface Elev.: 732.28
North Coor.: 3738.272
Drilling Fluid: None
Datum: Ground Level
East Coor.: 6444.663
Remarks: Samples sent to STL for analysis of TCL VOCs and TCL PCBs.
Converted to Well: N
Well I.D.:
Project No.: OH000294.0004.00010
Filename: Nov 2001 Soil Logs

ARCADIS G&M

Log of Boring: BS/BH03

Box Sewer Investigation

General Motors, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
24	11,27,28,50/4	10	0.0				SW	SAND & GRAVEL fine-coarse sand (50%); fine-coarse gravel (50%); well graded; loose; light brown; moist	
26	25,50/4	10	2.0				SW	SAND & GRAVEL fine-coarse sand (50%); fine-coarse gravel (50%); well graded; loose; light brown; moist	
28	16,18,22,22	18	0.0				SW	SAND & GRAVEL fine-coarse sand (80%); coarse-fine gravel (20%); well graded; loose; light brown; wet	▼
30								Bottom of boring	
32									
34									
36									

Sample Analysis: ☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Geologist: C. Capell/S. Brown
Begin Drilling: 11/27/01 @ 11:04

Driller: Darrell
Total Depth: 30
End Drilling: 11/29/01 @ 10:05

Drilling Method: Hollow stem auger
Surface Elev.: 732.28
North Coor.: 3738.272

Drilling Fluid: None
Datum: Ground Level
East Coor.: 6444.663

Remarks: Samples sent to STL for analysis of TCL VOCs and TCL PCBs.
Converted to Well: N
Well I.D.:

Project No.: OH000294.0004.00010
Filename: Nov 2001 Soil Logs

ARCADIS G&M

Log of Boring: BS/BH04

Box Sewer Investigation

General Motors, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	-	-	-					FILL 4" asphalt; 14" concrete; 6" gravel fill	
2	20,10,13,14	20	0.0				CL	CLAY-FILL fill (pieces of brick present); sandy; soft; medium plasticity; moist; brown-red brown; clay (70%); medium-coarse sand (25%); silt (<5%)	
4	6,50/0	6	0.4				SC	SAND-FILL medium dense; moist; brown; well graded; medium-coarse sand (70%); clay (20%); small gravel (5%); silt (5%)	
6	-	-	-				SC	SAND-FILL medium dense; moist; brown; well graded; medium-coarse sand (70%); clay (20%); small gravel (5%); silt (5%)	
							SW	SAND & GRAVEL fill; fine-coarse sand (80%); fine-coarse gravel (20%); moist; brown; well graded; loose	
8	-	-	-					SAND & GRAVEL fill; fine-coarse sand (80%); fine-coarse gravel (20%); moist; brown; well graded; loose	
10	50/5	12	0.1					SAND & GRAVEL fill; fine-coarse sand (80%); fine-coarse gravel (20%); moist; brown; well graded; loose	
12									

Sample Analysis: ☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Darrell
Drilling Method: Hollow stem auger
Drilling Fluid: None

Geologist: C. Capell/S. Brown
Total Depth: 28
Surface Elev.: 732.26
Datum: Ground Level

Begin Drilling: 11/27/01 @ 15:18
End Drilling: 11/28/01 @ 9:30
North Coor.: 3947.641
East Coor.: 6449.843

Remarks: Samples sent to STL for analysis of TCL VOCs and TCL PCBs. Converted to Well: N Well I.D.:

Project No.: OH000294.0004.00010 Filename: Nov 2001 Soil Logs

ARCADIS G&M

Log of Boring: BS/BH04

Box Sewer Investigation

General Motors, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
12	50/3	0	NR				SW	SAND & GRAVEL fill; fine-coarse sand (80%); fine-coarse gravel (20%); moist; brown; well graded; loose	
14	22,21,19,23	14	3.8				SP	SAND fine-coarse sand (90%); fine gravel (10%); moist; brown; poorly graded; loose	
16	15,19,19,23	10	1.2				SP	SAND fine-coarse sand; fine gravel (10%); moist; brown; poorly graded; angular; loose	
18	10,15,13,13	12	2.0				SW	SAND & GRAVEL fine-coarse sand (70%); fine-coarse gravel (20%); moist; brown; well graded; loose	
20	50/4	-	NR				SW	SAND & GRAVEL fine-coarse sand (70%); fine-coarse gravel (20%); moist; brown; well graded; loose	
22	15,43,50/3	12	1.1				SW	SAND & GRAVEL fine-coarse sand (70%); fine-coarse gravel (20%); moist; brown; well graded; loose	
24									

Sample Analysis: ☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Darrell
Drilling Method: Hollow stem auger
Drilling Fluid: None

Geologist: C. Capell/S. Brown
Total Depth: 28
Surface Elev.: 732.26
Datum: Ground Level

Begin Drilling: 11/27/01 @ 15:18
End Drilling: 11/28/01 @ 9:30
North Coor.: 3947.641
East Coor.: 6449.843

Remarks: Samples sent to STL for analysis of TCL VOCs and TCL PCBs. Converted to Well: N Well I.D.:

Project No.: OH000294.0004.00010 Filename: Nov 2001 Soil Logs

ARCADIS G&M

Log of Boring: BS/BH04

Box Sewer Investigation

General Motors, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
24	25,35,55	14	1.0				SW	SAND & GRAVEL fine-coarse sand (70%); fine-coarse gravel (20%); moist; brown; well graded; loose	
26	28,35,48,30	24	0.2				SW	SAND & GRAVEL fine-coarse sand (70%); fine-coarse gravel (20%); moist; brown; well graded; loose	
28								Bottom of boring	
30									
32									
34									
36									

Sample Analysis: ☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Geologist: C. Capell/S. Brown
Begin Drilling: 11/27/01 @ 15:18

Driller: Darrell
Total Depth: 28
End Drilling: 11/28/01 @ 9:30

Drilling Method: Hollow stem auger
Surface Elev.: 732.26
North Coor.: 3947.641

Drilling Fluid: None
Datum: Ground Level
East Coor.: 6449.843

Remarks: Samples sent to STL for analysis of TCL VOCs and TCL PCBs.
Converted to Well: N
Well I.D.:

Project No.: OH000294.0004.00010
Filename: Nov 2001 Soil Logs

ARCADIS G&M

Log of Boring: BS/BH05

Box Sewer Investigation

General Motors, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	-	-	-					FILL 7" asphalt; 15" concrete; 4" fill	
2	24,50/5	14	0.0				SW	SAND & GRAVEL-FILL fine-coarse sand (50%); fine-coarse gravel (50%)	
4	50/1	-	-					No recovery	
6	4,7,10,17	16	0.0				SP	SAND-FILL fine-coarse sand; fine gravel (5%); dry; brown; poorly graded	
8	22,19,22,22	24	0.0				SW	SAND & GRAVEL fine-coarse sand (70%); coarse-fine gravel (30%); well graded; brown; dry; loose	
10	8,17,28,38	18	0.0				SW	SAND & GRAVEL fine-coarse sand (70%); coarse-fine gravel (30%); well graded; brown; dry; loose	
12									

Sample Analysis: ☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Darrell
Drilling Method: Hollow stem auger
Drilling Fluid: None

Geologist: Sean Brown
Total Depth: 28
Surface Elev.: 732.31
Datum: Ground Level

Begin Drilling: 11/28/01 @ 10:19
End Drilling: 11/28/01 @ 11:59
North Coor.: 4222.098
East Coor.: 6448.600

Remarks: Samples sent to STL for analysis of TCL VOCs and TCL PCBs. Converted to Well: N Well I.D.:

Project No.: OH000294.0004.00010 Filename: Nov 2001 Soil Logs

ARCADIS G&M

Log of Boring: BS/BH05

Box Sewer Investigation

General Motors, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
12	28,50/5	12	0.0				SW	SAND & GRAVEL fine-coarse sand (70%); coarse-fine gravel (30%); well graded; brown; dry; loose	
14	50/3	-						No recovery	
16	20,25,20,25	18	0.0				SW	SAND & GRAVEL coarse sand (70%); coarse-fine gravel (30%); well graded; brown; dry; loose; clay (5%)	
18	14,22,21,28	20	0.0				SW	SAND & GRAVEL coarse sand (70%); coarse-fine gravel (30%); well graded; brown; dry; loose; trace clay	
20	18,20,22,22	20	0.0				SW	SAND & GRAVEL fine-coarse sand (80%); coarse-fine gravel (20%); well graded; gray-brown; moist; loose	
22	18,20,24,22	20	0.0				SW	SAND & GRAVEL fine-coarse sand (80%); coarse-fine gravel (20%); well graded; gray-brown; moist; loose	
24									

Sample Analysis: ☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Darrell
Drilling Method: Hollow stem auger
Drilling Fluid: None

Geologist: Sean Brown
Total Depth: 28
Surface Elev.: 732.31
Datum: Ground Level

Begin Drilling: 11/28/01 @ 10:19
End Drilling: 11/28/01 @ 11:59
North Coor.: 4222.098
East Coor.: 6448.600

Remarks: Samples sent to STL for analysis of TCL VOCs and TCL PCBs. Converted to Well: N Well I.D.:

Project No.: OH000294.0004.00010 Filename: Nov 2001 Soil Logs

ARCADIS G&M

Log of Boring: BS/BH05

Box Sewer Investigation

General Motors, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
24	10,20,25,35	10	0.0	■	■	▒	SW	SAND & GRAVEL fine-coarse sand (80%); coarse-fine gravel (20%); well graded; gray-brown; moist; loose	
26	25,23,16,16	24	0.0	▯	■	▒	SW	SAND & GRAVEL fine-coarse sand (80%); coarse-fine gravel (20%); well graded; gray-brown; moist; loose	▼
28								Bottom of boring	
30									
32									
34									
36									

Sample Analysis: ☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Geologist: Sean Brown
Begin Drilling: 11/28/01 @ 10:19
Driller: Darrell
Total Depth: 28
End Drilling: 11/28/01 @ 11:59
Drilling Method: Hollow stem auger
Surface Elev.: 732.31
North Coor.: 4222.098
Drilling Fluid: None
Datum: Ground Level
East Coor.: 6448.600
Remarks: Samples sent to STL for analysis of TCL VOCs and TCL PCBs.
Converted to Well: N
Well I.D.:
Project No.: OH000294.0004.00010
Filename: Nov 2001 Soil Logs

ARCADIS G&M

Log of Boring: BS/BH06

Box Sewer Investigation

General Motors, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
0	2,4,4	20	0.0					6" asphalt; 12" concrete; 6" sand and gravel fill	
2	12,50/2	8	0.0				SW	SAND & GRAVEL-FILL coarse-fine sand (75%); fine gravel (20%); moist; brown; well sorted; loose; silt (<5%)	
4	10,15,15,23	8	0.0				SW	SAND & GRAVEL-FILL coarse-fine sand (75%); fine gravel (20%); moist; brown; well sorted; loose; silt (5%)	
6	16,35,50/5	0	0.0					No recovery	
8	7,7,19,21	20	0.0				SP	SAND fine-coarse sand (90%); fine gravel (10%); brown; moist; poorly graded; loose	
10	12,16,16,22	14	0.0				SP	SAND fine-coarse sand (90%); fine gravel (10%); brown; moist; poorly graded; loose	
12									

Sample Analysis: ☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Darrell
Drilling Method: Hollow stem auger
Drilling Fluid: None

Geologist: Sean Brown
Total Depth: 26
Surface Elev.: 732.25
Datum: Ground Level

Begin Drilling: 11/28/01 @ 13:50
End Drilling: 11/28/01 @ 15:14
North Coor.: 4876.839
East Coor.: 6451.453

Remarks: Samples sent to STL for analysis of TCL VOCs and TCL PCBs. Converted to Well: N Well I.D.:

Project No.: OH000294.0004.00010 Filename: Nov 2001 Soil Logs

ARCADIS G&M

Log of Boring: BS/BH06

Box Sewer Investigation

General Motors, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
12	12,18,38,38,	14	0.0				SP	SAND fine-coarse sand (90%); fine gravel (10%); brown; moist; poorly graded; loose	
14	16,28,33,30	18	0.0				SP	SAND fine-coarse sand (90%); fine gravel (10%); brown; moist; poorly graded; loose	
16	16,25,35,25	18	0.0				SP	SAND fine-coarse sand (90%); fine gravel (10%); brown; moist; poorly graded; loose	
18	18,20,28,41	15	0.0				SP	SAND fine-coarse sand (90%); fine gravel (10%); brown; moist; poorly graded; loose	
20	14,25,25,35	20	0.5				SW	SAND & GRAVEL fine-coarse sand (70%); fine-coarse gravel (25%); well sorted; brown; moist; loose; silt (5%)	
22	10,14,20,26	16	0.8				SW	SAND & GRAVEL fine-coarse sand (70%); fine-coarse gravel (25%); well sorted; brown; moist; loose; silt (5%)	
24									

Sample Analysis: ☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Darrell
Drilling Method: Hollow stem auger
Drilling Fluid: None

Geologist: Sean Brown
Total Depth: 26
Surface Elev.: 732.25
Datum: Ground Level

Begin Drilling: 11/28/01 @ 13:50
End Drilling: 11/28/01 @ 15:14
North Coor.: 4876.839
East Coor.: 6451.453

Remarks: Samples sent to STL for analysis of TCL VOCs and TCL PCBs. Converted to Well: N Well I.D.:

Project No.: OH000294.0004.00010 Filename: Nov 2001 Soil Logs

ARCADIS G&M

Log of Boring: BS/BH06

Box Sewer Investigation

General Motors, Moraine, Ohio

Depth (feet)	Blows (/6 in.)	Recovery (Inches)	OVA (PPM)	Sample Analysis	Sample Type	Graphic Log	Soil Class.	Description	Depth to Water
24	14,20,24,48	20	4.5				SW	SAND & GRAVEL fine-coarse sand (75%); fine-coarse gravel (20%); well graded; brown; moist; loose; silt (5%) Wet at 25.5'	▼
26								Bottom of boring	
28									
30									
32									
34									
36									

Sample Analysis: ☒ Composite Sample to Lab ■ Grab Sample to Lab ▯ Split-Spoon Not Analyzed

Drilling Co.: Wright Drilling
Driller: Darrell
Drilling Method: Hollow stem auger
Drilling Fluid: None

Geologist: Sean Brown
Total Depth: 26
Surface Elev.: 732.25
Datum: Ground Level

Begin Drilling: 11/28/01 @ 13:50
End Drilling: 11/28/01 @ 15:14
North Coor.: 4876.839
East Coor.: 6451.453

Remarks: Samples sent to STL for analysis of TCL VOCs and TCL PCBs. Converted to Well: N Well I.D.:

Project No.: OH000294.0004.00010 Filename: Nov 2001 Soil Logs

Section 29

Vapor Intrusion Verification Soil Boring Logs

SGP-1 through SGP-12

SOIL BORING LOG

BORING NO.: **SGP-1**

TOTAL DEPTH: **25** **feet bgs**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Vapor Intrusion Investigation**
CITY, STATE:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.0018**
LOGGED BY:	**Joe Rumschlag**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller**
DRILLING METHOD:	**Direct Push**
DATE STARTED:	**10/26/2010**
DATE COMPLETED:	**10/26/2010**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0	N/A	N/A		TOPSOIL	(0.0 - 0.3) TOPSOIL.
					(0.3 - 9.8) Utility clearance.
10	18	0.6		SW	(9.8 - 25.0) SAND with gravel, olive brown, well graded, medium to coarse, 15 to 25% fine to coarse gravel (2 inch), subrounded, trace silt, medium dense, moist to dry.
12		0.6			
14	28	0.6			Note: 15 to 25% fine gravel (1 inch) at 13 feet.
16		0.9			
18	18	0.6			Note: coarse sand at 17 feet.
20		0.9			Note: 2 inch layer moist to wet then cobbles (3 inch).

Notes:

bgs: below ground surface
in.: inch
NM: Not Measured
USCS: Unified Soil Classification System
*Indicates sample submitted for laboratory analysis.
ppm: parts per million
PID: Photo-ionization Detector
ft: feet

SOIL BORING LOG

BORING NO.: **SGP-1**

TOTAL DEPTH: **25** **feet bgs**

PROJECT INFORMATION		DRILLING INFORMATION	
CLIENT:	**RACER Trust**	DRILLING CO.:	**EnviroCore**
PROJECT:	**Vapor Intrusion Investigation**	DRILLER:	**Chris Rismiller**
CITY, STATE:	**Moraine, Ohio**	DRILLING METHOD:	**Direct Push**
PROJECT NUMBER:	**OH000294.0018**	DATE STARTED:	**10/26/2010**
LOGGED BY:	**Joe Rumschlag**	DATE COMPLETED:	**10/26/2010**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
20					
22	24	1.2			Note: increase silt content 10 to 20% at 22 feet. Note: soil becomes saturated at 22.5 feet.
24					End of boring at 25 feet. * Note: Screen set from 22.5 to 26.5 feet below land surface and groundwater sampled via low-flow methodology on 10/26/2010 at 1015.

Notes:

bgs: below ground surface
in.: inch
NM: Not Measured
USCS: Unified Soil Classification System
*Indicates sample submitted for laboratory analysis.
ppm: parts per million
PID: Photo-ionization Detector
ft: feet

SOIL BORING LOG

BORING NO.: **SGP-2**

TOTAL DEPTH: **25** **feet bgs**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Vapor Intrusion Investigation**
CITY, STATE:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.0018**
LOGGED BY:	**Joe Rumschlag**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller**
DRILLING METHOD:	**Direct Push**
DATE STARTED:	**10/25/2010**
DATE COMPLETED:	**10/25/2010**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0	N/A	N/A		TOPSOIL	(0.0 - 0.3) TOPSOIL. (0.3 - 9.0) Utility clearance.
10	19	0.7		SW	(9.0 - 25.0) Silty SAND with gravel, olive brown, well graded, medium to coarse, 15 to 25% fine gravel (1.5 inch subrounded), 10 to 20% silt, dense, dry.
12		1.1			
14	12	1.4			Note: coarse gravel in liner (2 inch) at 13.5 feet.
16		NM			
18	NM	NM			
20		NM			

Notes:

bgs: below ground surface
in.: inch
NM: Not Measured
USCS: Unified Soil Classification System
*Indicates sample submitted for laboratory analysis.
ppm: parts per million
PID: Photo-ionization Detector
ft: feet

SOIL BORING LOG

BORING NO.: **SGP-2**

TOTAL DEPTH: **25** **feet bgs**

PROJECT INFORMATION		DRILLING INFORMATION	
CLIENT:	**RACER Trust**	DRILLING CO.:	**EnviroCore**
PROJECT:	**Vapor Intrusion Investigation**	DRILLER:	**Chris Rismiller**
CITY, STATE:	**Moraine, Ohio**	DRILLING METHOD:	**Direct Push**
PROJECT NUMBER:	**OH000294.0018**	DATE STARTED:	**10/25/2010**
LOGGED BY:	**Joe Rumschlag**	DATE COMPLETED:	**10/25/2010**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
20					
22	11				Note: wet at 22 feet.
24					End of boring at 25 feet. * Note: Screen set from 22 to 26 feet below land surface and groundwater sampled via low-flow methodology on 10/25/2010 at 1117.

Notes:

bgs: below ground surface
in.: inch
NM: Not Measured
USCS: Unified Soil Classification System
*Indicates sample submitted for laboratory analysis.
ppm: parts per million
PID: Photo-ionization Detector
ft: feet

SOIL BORING LOG

BORING NO.: **SGP-3**

TOTAL DEPTH: **25** **feet bgs**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Vapor Intrusion Investigation**
CITY, STATE:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.0018**
LOGGED BY:	**Joe Rumschlag**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller**
DRILLING METHOD:	**Direct Push**
DATE STARTED:	**10/20/2010**
DATE COMPLETED:	**10/20/2010**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0	N/A	N/A		TOPSOIL	(0.0 - 0.3) TOPSOIL. (0.3 - 9.0) Utility clearance.
10	22	0.5		SW	(9.0 - 25.0) SAND with gravel, olive brown, well graded, medium, 20 to 30% fine to coarse gravel (1.5 inch), trace silt, dense, dry to moist.
12		0.8			
14	27	0.5			
16		0.2			
18	32	0.2			
20		0.2			

Notes:

bgs: below ground surface
in.: inch
NM: Not Measured
USCS: Unified Soil Classification System
*Indicates sample submitted for laboratory analysis.
ppm: parts per million
PID: Photo-ionization Detector
ft: feet

SOIL BORING LOG

BORING NO.: **SGP-3**

TOTAL DEPTH: **25** **feet bgs**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Vapor Intrusion Investigation**
CITY, STATE:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.0018**
LOGGED BY:	**Joe Rumschlag**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller**
DRILLING METHOD:	**Direct Push**
DATE STARTED:	**10/20/2010**
DATE COMPLETED:	**10/20/2010**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
20					
22	26	0.2			Note: soil becomes saturated, increase in silt content to 10 to 15% at 21 feet.
24		0.2			End of boring at 25 feet. * Note: Screen set from 21 to 25 feet below land surface and groundwater sampled via low-flow methodology on 10/20/10 at 1125.

Notes:

bgs: below ground surface
in.: inch
NM: Not Measured
USCS: Unified Soil Classification System
*Indicates sample submitted for laboratory analysis.
ppm: parts per million
PID: Photo-ionization Detector
ft: feet

SOIL BORING LOG

BORING NO.: **SGP-4**

TOTAL DEPTH: **25** **feet bgs**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Vapor Intrusion Investigation**
CITY, STATE:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.0018**
LOGGED BY:	**Joe Rumschlag**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller**
DRILLING METHOD:	**Direct Push**
DATE STARTED:	**10/22/2010**
DATE COMPLETED:	**10/22/2010**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0	N/A	N/A		TOPSOIL	(0.0 - 0.3) TOPSOIL. (0.3 - 8.5) Utility clearance.
10	12	0.0		SW	(8.5 - 21.0) Silty SAND with gravel, olive brown, well graded, coarse, 20 to 30% fine gravel (1 inch), subrounded, 10 to 15% silt, moist.
		0.1			
12					
14	22	0.1			Note: trace coarse gravel (2 inch) at 13 feet.
		0.1			
16					Note: 3 inch layer with 30 to 40% fine gravel (0.5 inch) at 16.5 feet.
18	NM	0.4			Note: increase silt content to 10 to 20% at 18 feet.
		0.4			
20					

Notes:

bgs: below ground surface
in.: inch
NM: Not Measured
USCS: Unified Soil Classification System
*Indicates sample submitted for laboratory analysis.
ppm: parts per million
PID: Photo-ionization Detector
ft: feet

SOIL BORING LOG

BORING NO.: **SGP-4**

TOTAL DEPTH: **25** **feet bgs**

PROJECT INFORMATION		DRILLING INFORMATION	
CLIENT:	**RACER Trust**	DRILLING CO.:	**EnviroCore**
PROJECT:	**Vapor Intrusion Investigation**	DRILLER:	**Chris Rismiller**
CITY, STATE:	**Moraine, Ohio**	DRILLING METHOD:	**Direct Push**
PROJECT NUMBER:	**OH000294.0018**	DATE STARTED:	**10/22/2010**
LOGGED BY:	**Joe Rumschlag**	DATE COMPLETED:	**10/22/2010**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
20					
22	20	0.8		SW	(21.0 - 23.5) SAND with gravel, olive brown, well graded, fine to medium, 10 to 20% fine gravel, subrounded, trace coarse gravel, subrounded, moist.
24				SW	(23.5 - 25.0) Silty SAND with gravel, olive brown, well graded, 30 to 40% fine gravel, 10 to 20% silt, wet.
					End of boring at 25 feet. *Note: Screen set from 23.5 to 27.5 feet below land surface and groundwater sampled via low-flow methodology on 10/22/2010 at 1053.

Notes:
bgs: below ground surface
in.: inch
NM: Not Measured
USCS: Unified Soil Classification System
*Indicates sample submitted for laboratory analysis.
ppm: parts per million
PID: Photo-ionization Detector
ft: feet

SOIL BORING LOG

BORING NO.: **SGP-5**

TOTAL DEPTH: **25** **feet bgs**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Vapor Intrusion Investigation**
CITY, STATE:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.0018**
LOGGED BY:	**Trey Fortner**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller**
DRILLING METHOD:	**Direct Push**
DATE STARTED:	**10/29/2010**
DATE COMPLETED:	**10/29/2010**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0	N/A	N/A		TOPSOIL	(0.0 - 0.3) TOPSOIL.
					(0.3 - 9.3) Utility clearance.
10	6	N/A			(9.3 - 13.0) Very little recovery, borken limestone cobbles, little sand, medium to coarse (subangular), dry.
14	21	1.0		SW	(13.0 - 19.6) SAND with cobbles, brown, medium to coarse sand (subangular), broken up cobbles, little silt, dry, loose.
16		13			
18	24	1.0			
20		0.4		SW	(19.6 - 25.0) Gravelly SAND, brown, fine to coarse sand (subangular), 30% fine to medium

Notes:

bgs: below ground surface
in.: inch
NM: Not Measured
USCS: Unified Soil Classification System
*Indicates sample submitted for laboratory analysis.
ppm: parts per million
PID: Photo-ionization Detector
ft: feet

SOIL BORING LOG

BORING NO.: **SGP-5**

TOTAL DEPTH: **25** **feet bgs**

PROJECT INFORMATION		DRILLING INFORMATION	
CLIENT:	**RACER Trust**	DRILLING CO.:	**EnviroCore**
PROJECT:	**Vapor Intrusion Investigation**	DRILLER:	**Chris Rismiller**
CITY, STATE:	**Moraine, Ohio**	DRILLING METHOD:	**Direct Push**
PROJECT NUMBER:	**OH000294.0018**	DATE STARTED:	**10/29/2010**
LOGGED BY:	**Trey Fortner**	DATE COMPLETED:	**10/29/2010**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
20					
22	2	NM			gravel (subangular to subrounded), dry, loose, well graded. Note: very little recovery, wet broken cobbles.
24					End of boring at 25 feet. * Note: Screen set from 23 to 27 feet below land surface and groundwater sampled via low-flow methodology on 10/29/2010 at 1015.

Notes:
bgs: below ground surface
in.: inch
NM: Not Measured
USCS: Unified Soil Classification System
*Indicates sample submitted for laboratory analysis.
ppm: parts per million
PID: Photo-ionization Detector
ft: feet

SOIL BORING LOG

BORING NO.: **SGP-6**

TOTAL DEPTH: **25** **feet bgs**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Vapor Intrusion Investigation**
CITY, STATE:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.0018**
LOGGED BY:	**Trey Fortner**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller**
DRILLING METHOD:	**Direct Push**
DATE STARTED:	**10/28/2010**
DATE COMPLETED:	**10/28/2010**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0	N/A	N/A		TOPSOIL	(0.0 - 0.3) TOPSOIL.
					(0.3 - 10.0) Utility clearance.
10	10	0.0		SW	(10.0 - 13.0) SAND with gravel, brown, medium to coarse sand (subangular), fine to medium gravel (subrounded to subangular), loose, well graded, dry.
12	4	NM			(13.0 - 13.5) Hit cobble, broken limestone cobble. Refusal, return push slight offset.
14	7	0.0		SW	(13.5 - 15.0) SAND with gravel, light brown, fine to coarse sand (subangular to subrounded), 30% fine to medium gravel (subrounded to subangular), trace silt, dry, medium dense, well graded.
16	NR	NM			(15.0 - 17.0) No recovery, cobbles.
18	6	0.0		SW	(17.0 - 25.0) SAND with gravel, light brown, fine to coarse sand (subangular to subrounded), 30% fine to coarse gravel (subrounded to subangular), trace silt, dry, medium dense, well graded.
20		0.0			

Notes:

bgs: below ground surface
in.: inch
NM: Not Measured
USCS: Unified Soil Classification System
*Indicates sample submitted for laboratory analysis.
ppm: parts per million
PID: Photo-ionization Detector
ft: feet

SOIL BORING LOG

BORING NO.: **SGP-6**

TOTAL DEPTH: **25** **feet bgs**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Vapor Intrusion Investigation**
CITY, STATE:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.0018**
LOGGED BY:	**Trey Fortner**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller**
DRILLING METHOD:	**Direct Push**
DATE STARTED:	**10/28/2010**
DATE COMPLETED:	**10/28/2010**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
20					
22	NR	NM			
24					End of boring at 25 feet. * Note: Screen set from 22 to 26 feet below land surface and groundwater sampled via low-flow methodology on 10/28/2010 at 1115.

Notes:

bgs: below ground surface
in.: inch
NM: Not Measured
USCS: Unified Soil Classification System
*Indicates sample submitted for laboratory analysis.
ppm: parts per million
PID: Photo-ionization Detector
ft: feet

SOIL BORING LOG

BORING NO.: **SGP-7**

TOTAL DEPTH: **25** **feet bgs**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Vapor Intrusion Investigation**
CITY, STATE:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.0018**
LOGGED BY:	**Joe Rumschlag**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller**
DRILLING METHOD:	**Direct Push**
DATE STARTED:	**10/21/2010**
DATE COMPLETED:	**10/21/2010**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0	N/A	N/A		TOPSOIL	(0.0 - 0.3) TOPSOIL.
2					(0.3 - 10.0) Utility clearance. Note: silty sand with gravel and clay at 0.25 feet.
4					Note: silty sand with gravel at 4 feet.
6					Note: sand with gravel at 6 feet.
8					
10	12	0.8		SW	(10.0 - 25.0) Silty SAND with gravel, olive brown, well graded, medium, 15 to 25% gravel (1.5 inch), trace coarse gravel, trace silt, moist to dry.
12					
14	14	1.1			
16		0.8			
18	19	1.1			Note: coarse gravel increases to 10 to 15% at 17 feet.
20		1.1			

Notes:

bgs: below ground surface
in.: inch
NM: Not Measured
USCS: Unified Soil Classification System
*Indicates sample submitted for laboratory analysis.
ppm: parts per million
PID: Photo-ionization Detector
ft: feet

SOIL BORING LOG

BORING NO.: **SGP-7**

TOTAL DEPTH: **25** **feet bgs**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Vapor Intrusion Investigation**
CITY, STATE:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.0018**
LOGGED BY:	**Joe Rumschlag**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller**
DRILLING METHOD:	**Direct Push**
DATE STARTED:	**10/21/2010**
DATE COMPLETED:	**10/21/2010**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
20					
22	NR				Note: drilling changer, easier push, confirmed water at this level with water level meter.
24					End of boring at 25 feet. * Note: Screen set from 21 to 25 feet below land surface and groundwater sampled via low-flow methodology on 10/21/2010 at 1122.

Notes:

bgs: below ground surface
in.: inch
NM: Not Measured
USCS: Unified Soil Classification System
*Indicates sample submitted for laboratory analysis.
ppm: parts per million
PID: Photo-ionization Detector
ft: feet

SOIL BORING LOG

BORING NO.: **SGP-8**

TOTAL DEPTH: **25** **feet bgs**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Vapor Intrusion Investigation**
CITY, STATE:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.0018**
LOGGED BY:	**Joe Rumschlag**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller**
DRILLING METHOD:	**Direct Push**
DATE STARTED:	**11/1/2010**
DATE COMPLETED:	**11/1/2010**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0	N/A	N/A		TOPSOIL	(0.0 - 0.3) TOPSOIL. (0.3 - 9.7) Utility clearance.
10	19	0.6		SW-SM	(9.7 - 25.0) SILTY SAND with gravel, olive brown, well graded, medium, 20 to 30% fine coarse gravel (2 inch) subrounded, 10 to 20% silt, medium dense, moist to dry.
12					
14	23	0.3			Note: silt content decrease to 10 to 15% at 13.5 feet.
16		0.6			
18	16	1.0			
20		1.3			

Notes:

bgs: below ground surface
in.: inch
NM: Not Measured
USCS: Unified Soil Classification System
*Indicates sample submitted for laboratory analysis.
ppm: parts per million
PID: Photo-ionization Detector
ft: feet

SOIL BORING LOG

BORING NO.: **SGP-8**

TOTAL DEPTH: **25** **feet bgs**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Vapor Intrusion Investigation**
CITY, STATE:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.0018**
LOGGED BY:	**Joe Rumschlag**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller**
DRILLING METHOD:	**Direct Push**
DATE STARTED:	**11/1/2010**
DATE COMPLETED:	**11/1/2010**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
20					
22	NR				Note: moist to wet at 21 feet. Note: soil becomes wet at 21.5 feet.
24					End of boring at 25 feet. * Note: Screen set from 21.5 to 25.5 feet below land surface and groundwater sampled via low-flow methodology on 11/01/2010 at 1010.

Notes:

bgs: below ground surface
in.: inch
NM: Not Measured
USCS: Unified Soil Classification System
*Indicates sample submitted for laboratory analysis.
ppm: parts per million
PID: Photo-ionization Detector
ft: feet

SOIL BORING LOG

BORING NO.: **SGP-9**

TOTAL DEPTH: **25** **feet bgs**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Vapor Intrusion Investigation**
CITY, STATE:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.0018**
LOGGED BY:	**Trey Fortner**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller**
DRILLING METHOD:	**Direct Push**
DATE STARTED:	**10/27/2010**
DATE COMPLETED:	**10/27/2010**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0	N/A	N/A		TOPSOIL	(0.0 - 0.3) TOPSOIL.
2					(0.3 - 11.3) Utility clearance.
4					
6					
8					
10					
12	12	0.0		SW	(11.3 - 21.0) SAND with gravel, brown, medium to coarse sand (subangular), 20% fine to medium gravel (subrounded to subangular), dry, loose.
14	16	0.0			
16		0.0			
18	16	0.0			
20		0.0			

Notes:

bgs: below ground surface
in.: inch
NM: Not Measured
USCS: Unified Soil Classification System
*Indicates sample submitted for laboratory analysis.
ppm: parts per million
PID: Photo-ionization Detector
ft: feet

SOIL BORING LOG

BORING NO.: **SGP-9**

TOTAL DEPTH: **25** **feet bgs**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Vapor Intrusion Investigation**
CITY, STATE:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.0018**
LOGGED BY:	**Trey Fortner**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller**
DRILLING METHOD:	**Direct Push**
DATE STARTED:	**10/27/2010**
DATE COMPLETED:	**10/27/2010**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
20					
22	12	1.1		SW	(21.0 - 25.0) Silty gravelly SAND, brown, fine to coarse sand (subangular), little silt, 10% fine to medium gravel (subrounded to subangular), wet, dense.
24		1.0			
					End of boring at 25 feet. * Note: Screen set from 21 to 25 feet below land surface and groundwater sampled via low-flow methodology on 10/27/2010 at 1430.

Notes:

bgs: below ground surface
in.: inch
NM: Not Measured
USCS: Unified Soil Classification System
*Indicates sample submitted for laboratory analysis.
ppm: parts per million
PID: Photo-ionization Detector
ft: feet

SOIL BORING LOG

BORING NO.: **SGP-10**

TOTAL DEPTH: **31.5 feet bgs**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Vapor Intrusion Investigation**
CITY, STATE:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.0018**
LOGGED BY:	**Joe Rumschlag**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller**
DRILLING METHOD:	**Direct Push**
DATE STARTED:	**10/26/2010**
DATE COMPLETED:	**10/27/2010**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0	N/A	N/A		TOPSOIL	(0.0 - 0.3) TOPSOIL.
2					(0.3 - 8.5) Utility clearance.
4					
6					
8					
10	28	0.0		SW-SM	(8.5 - 12.5) SILTY SAND with gravel, olive brown, well graded, medium, 15 to 25% fine gravel (1.5 inch) subrounded, 15 to 25% silt, dense, moist.
12		0.0			
		0.0		CL-ML	(12.5 - 13.5) CLAYEY SILT with gravel, olive brown, low plasticity, stiff to very stiff, 10 to 20%, fine gravel, moist to dry.
14	12			SW-SM	(13.5 - 30.5) Limestone cobbles, then SILTY SAND with gravel, olive brown, well graded, medium, 20 to 30% fine to coarse gravel (2.5 inch), 10 to 20% silt, trace cobbles,
		0.2			
16	48	0.0			
18		0.0			
20					

Notes:

bgs: below ground surface
in.: inch
NM: Not Measured
USCS: Unified Soil Classification System
*Indicates sample submitted for laboratory analysis.
ppm: parts per million
PID: Photo-ionization Detector
ft: feet

SOIL BORING LOG

BORING NO.: **SGP-10**

TOTAL DEPTH: **31.5 feet bgs**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Vapor Intrusion Investigation**
CITY, STATE:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.0018**
LOGGED BY:	**Joe Rumschlag**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller**
DRILLING METHOD:	**Direct Push**
DATE STARTED:	**10/26/2010**
DATE COMPLETED:	**10/27/2010**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
20					
22	44	0.0			
		0.2			
24		0.0			
26	18	0.0			
28		0.2			
30	24			CL	(30.5 - 31.5) Silty CLAY, dark gray, low to medium plasticity, very stiff, 10 to 15% coarse sand to fine gravel, subangular, moist to dry.
					End of boring at 31.5 feet.

Notes:

bgs: below ground surface
in.: inch
NM: Not Measured
USCS: Unified Soil Classification System
*Indicates sample submitted for laboratory analysis.
ppm: parts per million
PID: Photo-ionization Detector
ft: feet

SOIL BORING LOG

BORING NO.: **SGP-11**

TOTAL DEPTH: **19.25 feet bgs**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Vapor Intrusion Investigation**
CITY, STATE:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.0018**
LOGGED BY:	**Joe Rumschlag**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller**
DRILLING METHOD:	**Direct Push**
DATE STARTED:	**11/2/2010**
DATE COMPLETED:	**11/2/2010**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0	N/A	N/A		TOPSOIL	(0.0 - 0.3) TOPSOIL. (0.3 - 9.3) Utility clearance.
10	23	0.1		SW-SM	(9.3 - 19.3) SILTY SAND with gravel, olive brown, well graded, medium, 15 to 25% coarse sand to fine gravel, subrounded, 10 to 20% silt, trace coarse gravel (1.5 inch), loose, moist.
12		0.8			
14	27	0.1			Note: 15 to 25% fine to coarse gravel, 15 to 25% silt at 13.5 feet.
16		0.8			
18	33	1.1			Probe refusal at 19.25 feet.

Notes:

bgs: below ground surface
in.: inch
NM: Not Measured
USCS: Unified Soil Classification System
*Indicates sample submitted for laboratory analysis.
ppm: parts per million
PID: Photo-ionization Detector
ft: feet

SOIL BORING LOG

BORING NO.: **SGP-12**

TOTAL DEPTH: **33** **feet bgs**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Vapor Intrusion Investigation**
CITY, STATE:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.0018**
LOGGED BY:	**Joe Rumschlag**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller**
DRILLING METHOD:	**Direct Push**
DATE STARTED:	**11/1/2010**
DATE COMPLETED:	**11/2/2010**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0	N/A	N/A		TOPSOIL	(0.0 - 0.3) TOPSOIL. (0.3 - 9.6) Utility clearance.
10	33	1.0		SW-SM	(9.6 - 16.0) SILTY SAND with gravel, olive brown, well graded, medium, 20 to 30% fine gravel, subrounded, 10 to 20% silt, dense, moist.
12					
14	17	0.3			Note: 10 to 20% fine gravel (0.5 inch), trace to 10% silt, loose at 13 feet.
16		0.6		SP	(16.0 - 23.0) SAND, olive brown, poorly graded, medium, trace silt, trace fine gravel, subrounded, moist.
18	26	1.0			
20		0.3			

Notes:

bgs: below ground surface
in.: inch
NM: Not Measured
USCS: Unified Soil Classification System
*Indicates sample submitted for laboratory analysis.
ppm: parts per million
PID: Photo-ionization Detector
ft: feet

SOIL BORING LOG

BORING NO.: **SGP-12**

TOTAL DEPTH: **33** **feet bgs**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Vapor Intrusion Investigation**
CITY, STATE:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.0018**
LOGGED BY:	**Joe Rumschlag**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller**
DRILLING METHOD:	**Direct Push**
DATE STARTED:	**11/1/2010**
DATE COMPLETED:	**11/2/2010**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
20					
22	30	0.3			
24		0.3		SW-SM	(23.0 - 30.0) SILTY SAND with gravel, olive brown, well graded, medium to coarse, 15 to 25% fine gravel, subangular to subrounded, 10 to 20% silt, medium dense, moist.
26	24	1.0			Note: increase in fine gravel to 20 to 30% at 25 feet.
28		0.3			
30	28	0.6		CL	Note: wet at 29.5 feet. (30.0 - 33.0) Silty CLAY, brown, low to medium plasticity, very stiff to hard, trace subangular gravel, moist. Note: color change to gray at 30.5 feet.
32					End of boring at 33 feet. * Note: Screen set from 27 to 31 feet below land surface and groundwater sampled via low-flow methodology on 11/02/2010 at 0950.

Notes:

bgs: below ground surface
in.: inch
NM: Not Measured
USCS: Unified Soil Classification System
*Indicates sample submitted for laboratory analysis.
ppm: parts per million
PID: Photo-ionization Detector
ft: feet

Section 30

Landfill L1 Investigation Boring Logs

LF-1 through LF-14
LF-16 through LF-37

LF-3A
LF-4A
LF-7A
LF-9A through LF-13A
LF-15/A
LF-29A

HA-LF-1
HA-LF-3A
HA-LF-5
HA-LF-7A
HA-LF-29A

BORING LOG

BORING NO.: LF-1

TOTAL DEPTH: 24 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**11/14/2011**
DATE COMPLETED:	**11/14/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller/Adam Whitt**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**727.98** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**620192.972813**
EASTING:	**1482953.402492**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0	26	0.1		FILL	(0.0 - 4.0) FILL: Silty sand, fine to coarse, some large pebbles, black, moist, (waste includes: glass [1 inch], wood, metal fiberous material).
2		*6.0			
4	26	*0.2		FILL	(4.0 - 8.3) FILL: Clay, medium plasticity, moist, medium stiff, some sand, fine to medium grain, some silt, dark yellowish brown, moist.
6		0.0			
8	28	0.0		SW	(8.3 - 20.0) SAND: Medium to coarse, moderately sorted, some medium to large pebbles, trace silt, grayish brown, dry.
10		0.0			
12	30	0.0			
14		0.0			
16	34	0.0			NOTE: Dry to moist from 16 to 20 feet.
18		0.7			
20	30	0.6		SW	(20.0 - 24.0) SAND: Fine to coarse, well sorted, some small pebbles, trace silt, grayish brown, moist from 20 to 22 feet.
22		0.3			NOTE: Wet from 22 to 24 feet. End of boring at 24 feet.
24					Note: Soil-gas sampling point LF-SGP-1 installed with screens at 4 ft 10.5 inches to 9 ft 10.5 inches and 17 ft 2 inches to 17 ft 8 inches. Screen set from 22-24 feet below land surface and groundwater sampled via low-flow methodology on 11/14/2011.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: **HA-LF-1**

TOTAL DEPTH: **5** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**11/30/2011**
DATE COMPLETED:	**11/30/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Jeremy Amick**
DRILLING METHOD:	**Hand Auger**
GROUND ELEVATION:	**727.00** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**NM**
EASTING:	**NM**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0					
2	60	NM		FILL	(1.0 - 4.5) FILL: Silty clay, soft, brown, trace sand, trace gravel, (waste includes: glass). NOTE: Waste includes: nails from 2 to 4 feet.
4				SW	(4.5 - 5.0) SAND: Medium grain, well sorted, loose, moist, red-brown. Refusal at 5 feet. Note: Boring location directly west of LF-1 along the fence.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System

ppm: parts per million
NR: No Recovery
bls: below land surface

PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: LF-2

TOTAL DEPTH: 28 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**11/21/2011**
DATE COMPLETED:	**11/21/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Adam Whitt/Jeremy Amick**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**730.72** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**620093.182026**
EASTING:	**1482947.235601**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0	24	0.7		FILL	(0.0 - 8.0) FILL: Sand, medium to coarse, some medium pebbles, poorly sorted, some silt, pulverized rock, brown-red, moist, (waste includes: metal).
2		6.8			
4	10	*12.9			NOTE: Black-brown, moist from 4 to 8 feet.
6					
8	12	4.5		FILL	(8.0 - 12.0) FILL: Sand, fine to coarse, some angular large pebbles, some clay, soft, reddish brown to light tan, poorly sorted, moist to dry, loose.
10					
12	28	*9.8		SW	(12.0 - 28.0) SAND: Fine to coarse, poorly sorted, medium to large rounded pebbles, brown-tan, dry, loose to moderately dense.
14		4.5			
16	32	3.7			NOTE: Tan from 16 to 24 feet.
18		2.2			
20	26	6.0			
22		4.7			
24	20	4.3			NOTE: Wet at 25 feet.
26					End of boring at 28 feet.
28					Note: Screen set from 26-28 feet below land surface and groundwater sampled via low-flow methodology on 11/21/2011.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: LF-3

TOTAL DEPTH: 28 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**11/22/2011**
DATE COMPLETED:	**11/22/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Adam Whitt/Jeremy Amick**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**730.89** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619993.364423**
EASTING:	**1482941.072201**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0	22	0.0		FILL	(0.0 - 4.0) FILL: Silt, sand, medium, well sorted, moderately stiff, some medium pebbles, rounded to angular, brown-red, moist, (waste includes: glass, brick).
2		0.0			
4	28	2.4		FILL	(4.0 - 7.0) FILL: Clay, some medium sand, trace medium pebbles, round to angular, well sorted, moist, dark brown, (waste includes: wire).
6		*4.0			(7.0 - 8.0) FILL: Sand, could have been pulverized rock, well sorted, medium grain, color change from yellow-orange-black, moist.
8	12	0.0		FILL	(8.0 - 12.0) FILL: Clay, soft, medium plasticity, trace small pebbles, brown, moist.
10					
12	30	*0.0		SW	(12.0 - 28.0) SAND: Fine to coarse, small to medium round pebbles, poorly sorted, tan-brown, dry.
14		0.0			
16	30	0.0			NOTE: Tan from 16 to 20 feet.
18		1.2			
20	28	0.0			NOTE: Dense from 20 to 24 feet.
22		0.8			
24	30	0.0			NOTE: More large pebbles, round, slight odor, wet at 25 feet.
26		0.8			End of boring at 28 feet.
28					Note: Screen set from 26-28 feet below land surface and groundwater sampled via low-flow methodology on 11/22/2011.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: **LF-3A**

TOTAL DEPTH: **24** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**12/14/2011**
DATE COMPLETED:	**12/14/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Adam Whitt/Jeremy Amick**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**727.98** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619994.6180**
EASTING:	**1482919.3800**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0 – 2	26	*NM		FILL	(0.0 - 4.0) FILL: Silt, some medium sand, few small angular pebbles, moist, brown, (waste includes: brick, wood, glass).
4					
4 – 6	26	NM		CL	(4.0 - 6.0) CLAY: Soft, brown, trace medium sand, moist.
6 – 8				SW	(6.0 - 24.0) SAND: Medium to coarse, some medium to large pebbles, round, dry.
8 – 10	33	NM			NOTE: Tan, dry from 8 to 16 feet.
12					
14	32	NM			
16					NOTE: Moist to wet from 16 to 20 feet.
18	21	NM			
20					NOTE: Wet at 21 feet.
22	NM	NM			
24					End of boring at 24 feet.

Note: Soil-gas sampling point LF-SGP-3A installed with screens at 7 ft 1 inch to 12 ft 1 inch and 14 ft 11 inches to 15 ft 4 inches.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System

ppm: parts per million
NR: No Recovery
bls: below land surface

PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: **HA-LF-3A**

TOTAL DEPTH: **5.5** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**11/30/2011**
DATE COMPLETED:	**11/30/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Jeremy Amick**
DRILLING METHOD:	**Hand Auger**
GROUND ELEVATION:	**727.98** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**NM**
EASTING:	**NM**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0	66	NM		FILL	(0.0 - 5.0) FILL: Silt, clay, soft, trace angular medium pebbles, (waste includes: glass, metal, valves), dry.
2					
4				CL	(5.0 - 5.5) CLAY: Trace medium sand, some pebbles, large, subrounded, odor, dry. Refusal at 5.5 feet. Note: Boring located directly west of LF-3A along the fence.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: **LF-4**

TOTAL DEPTH: **12** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**11/22/2011**
DATE COMPLETED:	**11/22/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Adam Whitt/Jeremy Amick**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**730.59** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619893.569448**
EASTING:	**1482934.963878**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0					
2	46	0.0 0.0		FILL	(0.0 - 12.0) FILL: Clay, medium sand, trace large round pebbles, moderately stiff, low plasticity, some silt, brown, moist, (waste includes: brass valves, wire, glass, brick).
4					
6	6	0.0			NOTE: Wet, black, slight odor from 4 to 8 feet.
8					
10	4	NM			NOTE: Strong odor from 8 to 12 feet.
12					End of boring at 12 feet, stopped drilling due to strong odor.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System

ppm: parts per million
NR: No Recovery
bls: below land surface

PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: LF-4A

TOTAL DEPTH: 16 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**12/8/2011**
DATE COMPLETED:	**12/8/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Adam Whitt/Jeremy Amick**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**727.98** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619894.0110**
EASTING:	**1482915.0900**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0 – 8	38 / 16	1.2 / 1.1 / 3.5 / *7.8		FILL	(0.0 - 8.0) FILL: Silt, clay, stiff, low plasticity, some medium sand, trace angular medium pebbles, moist, (waste includes: glass, wood, metal, wire, black-brown). NOTE: Black from 4 to 8 feet.
8 – 12	10	0.5		CL	(8.0 - 12.0) CLAY: Trace sand, wood, medium plasticity, soft, reddish-brown, moist.
12 – 16	6	*0.6		SW	(12.0 - 16.0) SAND: Medium to coarse, medium to large round pebbles, trace silt, tan, loose, dry. End of boring at 16 feet.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

Date: 9/27/2012

BORING LOG

BORING NO.: **HA-LF-7A**

TOTAL DEPTH: **6** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**12/1/2011**
DATE COMPLETED:	**12/1/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Jeremy Amick**
DRILLING METHOD:	**Hand Auger**
GROUND ELEVATION:	**727.50** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**NM**
EASTING:	**NM**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0	72	NM		CL	(0.0 - 3.5) CLAY: Trace medium sand, some small round pebbles, dark brown, dry.
2					
4				CL	(3.5 - 6.0) CLAY: Trace medium to coarse sand, some small round pebbles, reddish-brown, some round cobbles, dry.
6					End of boring at 6 feet.
					Note: Boring located directly west of LF-7A along the fence.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: LF-5

TOTAL DEPTH: 24 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**12/14/2011**
DATE COMPLETED:	**12/14/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Adam Whitt/Jeremy Amick**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**727.98** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619794.0150**
EASTING:	**1482911.0790**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0	32	*0.3		FILL	(0.0 - 4.0) FILL: Silt, clay, moderately dense, little medium sand, some medium to large angular pebbles, brown, tan, dry, (waste includes: wood, metal, glass).
4	30	0.3		CL	(4.0 - 6.0) CLAY: Soft, brown, moist.
6		*0.3		SW	(6.0 - 24.0) SAND: Medium to coarse, medium to large pebbles, tan, dry, loose.
8	31	0.7			
10		0.2			
12	27	0.6			
14		0.7			
16	24	0.6			
18		0.4			NOTE: Moist at 18 feet.
20	28	0.7			NOTE: Wet at 20 feet.
22		0.3			End of boring at 24 feet.
24					Note: Soil-gas sampling point LF-SGP-5 installed with screens at 7 ft 1 inch to 12 ft 1 inch and 14 ft 9 inches to 15 ft 3 inches. Screen set from 22-24 feet below land surface and groundwater sampled via low-flow methodology on 12/14/2011.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: **HA-LF-5**

TOTAL DEPTH: **3** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**12/1/2011**
DATE COMPLETED:	**12/1/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Jeremy Amick**
DRILLING METHOD:	**Hand Auger**
GROUND ELEVATION:	**727.98** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**NM**
EASTING:	**NM**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0	36	NM		CL	(0.0 - 0.3) CLAY: Medium sand, well sorted, soft, dark brown, dry.
2				SW	(0.3 - 3.0) SAND: Medium to coarse, well sorted, loose, small pebbles to large cobbles, dry.
					End of boring at 3 feet.
					Note: Boring located directly west of LF-5 along the fence.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: LF-6

TOTAL DEPTH: 12 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**12/8/2011**
DATE COMPLETED:	**12/8/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Adam Whitt/Jeremy Amick**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**727.57** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619693.942289**
EASTING:	**1482922.618364**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0 – 4	0				(0.0 - 4.0) No recovery from 0 to 4 feet.
4 – 8	58	0.0 *0.3		CL	(4.0 - 8.0) CLAY: Stiff, some silt, little sand, medium to coarse from 7 to 8 feet, medium subround pebbles, brown, low plasticity, moist.
8 – 12	31	*0.4 0.0		SW	(8.0 - 12.0) SAND: Medium to coarse, medium to large round pebbles, trace silt, loose, dry, tan. End of boring at 12 feet.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: LF-7

TOTAL DEPTH: 28 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**11/22/2011**
DATE COMPLETED:	**11/22/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Adam Whitt/Jeremy Amick**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**729.84** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619594.106850**
EASTING:	**1482916.519610**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0	20	0.0		FILL	(0.0 - 4.0) FILL: Clay, soft, medium plasticity, some medium to coarse sand, round medium to large pebbles, poorly sorted, brown to tan, moist.
2		0.0			
4	38	*0.3		FILL	(4.0 - 8.0) FILL: Clay, some silt, moderately stiff, trace medium sand, brown, moist, (waste includes: brick).
6		0.0			
8	28	0.0		CL	(8.0 - 11.0) CLAY: Brown-red, moist.
10		*0.0		SW	(11.0 - 24.0) SAND: Medium to coarse, medium round pebbles, poorly sorted, loose, tan-brown, dry. NOTE: Tan from 12 to 20 feet.
12	28	0.1			
14		0.0			
16	30	0.0			
18		0.4			
20	26	0.0			NOTE: Larger pebbles to cobbles from 20 to 24 feet.
22		0.0			
24	12	0.0		SW	(24.0 - 28.0) SAND: Medium to coarse, medium round pebbles, well sorted, dry.
26					NOTE: Wet at 25 feet. End of boring at 28 feet. Note: Screen set from 26-28 feet below land surface and groundwater sampled via low-flow methodology on 11/22/2011.
28					

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: **LF-7A**

TOTAL DEPTH: **20** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**12/8/2011**
DATE COMPLETED:	**12/8/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller/Jeremy Amick**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**727.50** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619595.1010**
EASTING:	**1482899.1050**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0 – 4	16	NM		FILL	(0.0 - 4.0) FILL: Silt, some medium sand, large angular pebbles, stiff, some clay, brown, moist, (waste includes: glass).
4 – 6	14	NM		SW	(4.0 - 20.0) SAND: Medium to coarse, round medium to large pebbles, brown-tan, dry.
8 – 10	24	NM			
12 – 14	20	NM			
16 – 18	36	NM			
20					NOTE: Wet at 20 feet. End of boring at 20 feet. Note: Soil-gas sampling point LF-SGP-7A installed with screens at 8 ft 10 inches to 13 ft 10 inches and 16 ft 9 inches to 17 ft 3 inches.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System

ppm: parts per million
NR: No Recovery
bls: below land surface

PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: LF-8

TOTAL DEPTH: 16 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**11/15/2011**
DATE COMPLETED:	**11/15/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller/Adam Whitt**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**729.29** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**620186.87033**
EASTING:	**1483053.15082**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0	36	0.1		FILL	(0.0 - 1.5) FILL: Silty sand, fine to coarse, few large pebbles, very dark gray, moist, slight odor, (waste includes: coal, glass).
2		*13.0		FILL	(1.5 - 3.0) FILL: Silt some fine sand, dark gray, wet.
4	24	10.2		FILL	(3.0 - 3.7) FILL: Silt some coarse sand, trace large pebbles, dark gray, moist, slight odor.
6		1.1		FILL	(3.7 - 4.0) FILL: Silt trace fine sand, light gray, moist, slight odor.
8	24	2.8		FILL	(4.0 - 8.4) FILL: Clay, medium plasticity, medium stiff, trace silt, trace medium pebbles, subrounded, very dark grayish brown, moist, (waste includes: rubber, metal, glass).
10		*1.3		SW	(8.4 - 16.0) SAND: Fine to coarse, subround, small to large pebbles, subround, loose, trace silt, dark grayish brown, dry.
12	36	0.2			NOTE: Wet at 13 feet.
14		1.1			End of boring at 16 feet.
16					

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: **LF-9**

TOTAL DEPTH: **20.3** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**11/15/2011**
DATE COMPLETED:	**11/15/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller/Adam Whitt**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**731.49** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**620087.02331**
EASTING:	**1483047.05312**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0	36	1.2		FILL	(0.0 - 2.0) FILL: Sand, fine to coarse, subround, some medium pebbles, angular, trace silt, reworked material, moist, dark brown, (waste includes: brick, coal, metal).
2		36.3		FILL	(2.0 - 3.0) FILL: Sand, trace fine sand, round, gray, slight odor, dense, wet.
4	18	9.8		FILL	(3.0 - 4.0) FILL: Sand, medium to coarse, angular, some medium pebbles, subangular, trace silt, loose, black, slight odor, moist.
6		8.5		FILL	(4.0 - 8.0) FILL: Silt, trace very fine sand, subround, soft, dark gray, moist, odor.
8	28	4.1		FILL	(8.0 - 16.0) FILL: Silt, some medium to coarse sand, some small pebbles, subrounded, moist, dark gray, dense, (waste includes: glass, metal, wood, fiber).
10		7.4			
12	16	7.7			NOTE: No recovery from 12 to 16 feet, offset boring 1.5 feet northeast of original location, dense, moist, (waste includes: glass, fiber).
14		6.9			
16	0	NM			(16.0 - 20.3) No recovery.
18					
20					Refusal at 20.3 feet.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: LF-9A

TOTAL DEPTH: 21 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**11/15/2011**
DATE COMPLETED:	**12/9/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Adam Whitt/Jeremy Amick**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**731.49** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**620087.02331**
EASTING:	**1483047.05312**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0	28	0.6		FILL	(0.0 - 3.0) FILL: Sand, medium angular pebbles, medium to large, loose, trace silt, pulverized rock, black-reddish, moist, slight odor, (waste includes: wood, glass, metal).
2		1.2			
4	6	*108.2		FILL	(3.0 - 16.0) FILL: Silt, loose, gray, dry.
6					
8	24	6.4			NOTE: Wet, glass from 8 to 12 feet.
10		*1.1			
12	0	NM			
14					
16	0	NM			(16.0 - 21.0) No recovery.
18					
20					Refusal at 21 feet.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: **LF-10**

TOTAL DEPTH: **29.5** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**11/15/2011**
DATE COMPLETED:	**11/15/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller/Jeremy Whitt**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**731.05** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619987.20122**
EASTING:	**1483040.87726**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0	38	5.9		FILL	(0.0 - 5.0) FILL: Sand, medium to coarse, subangular, some medium to large pebbles, poorly sorted, trace silt, moist to wet, dark reddish brown, (waste includes: glass, coal).
2		40.8			
4	24	324		FILL	(5.0 - 20.0) FILL: Silt, moderately loose, gray, dry.
6		2.8			
8	26	4.3			
10		11.6			NOTE: Dark grayish brown, (waste includes: wood, fiber/fabric) from 11.6 to 12 feet.
12	26	3.8			
14		9.8			NOTE: Moist to wet from 16 to 20 feet.
16	12	6.5			
18		6.9			NOTE: Wet at 19.8 feet.
20	24	0.4		FILL	(20.0 - 29.5) FILL: Silt, sand medium to coarse, small to large pebbles, subround to subangular, dense, stiff, very dark gray, wet, (waste includes: wood, glass).
22		1.4			
24	6	0.8			
26					
28	4	0.8			NOTE: Unable to sample due to low recovery from 28 to 29.5 feet. Refusal at 29.5 feet.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: LF-10A

TOTAL DEPTH: 33 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**12/12/2011**
DATE COMPLETED:	**12/12/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Adam Whitt/Jeremy Amick**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**731.05** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619987.20122**
EASTING:	**1483040.87726**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0 – 4	29	2.2 68.5		FILL	(0.0 - 4.0) FILL: Silt, moderately dense, some medium sand, some medium to large angular pebbles, brown, wet, (waste includes: metal, glass, cinders).
4 – 8	0	NM			(4.0 - 8.0) No recovery.
8 – 12	15	*135.6		FILL	(8.0 - 12.0) FILL: Silt, loose, gray, dry, (waste includes: wood, clay like material, white-yellow).
12 – 16	10	*49.1		FILL	(12.0 - 20.0) FILL: Silt, loose, dry, dark brown, slight odor, (waste includes: fabric, wood). NOTE: Brown from 16 to 20 feet.
16 – 20	8	93.1			
20 – 32	0	NM			(20.0 - 33.0) No recovery. Refusal at 33 feet.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: **LF-11**

TOTAL DEPTH: **19.3** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**11/17/2011**
DATE COMPLETED:	**11/17/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller/Adam Whitt**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**731.57** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619887.38937**
EASTING:	**1483034.70314**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0	40	3.4		FILL	(0.0 - 7.0) FILL: Sand, medium to coarse, medium to large pebbles, subangular, silt, moist to wet, brown to black, slight odor, dense, (waste includes: wood, glass).
2		12.7			
4	36	29.0			NOTE: More silt, gray to black, moist from 4 to 7 feet.
6		251			(7.0 - 8.0) FILL: Sand, fine to coarse, large angular pebbles, rock fragments, dry, (waste includes: brick).
8	8	439		FILL FILL	(8.0 - 16.0) FILL: Sand, coarse, large cobbles and pulverized rock, poorly sorted, loose, wet, black to brown. NOTE: Unable to sample due to low recovery, field screen.
10					
12	12	457			NOTE: Black-gray, moist, large angular cobbles from 12 to 16 feet. NOTE: Unable to sample due to low recovery.
14					
16	0	NM			(16.0 - 19.3) No recovery. Refusal at 19.3 feet.
18					

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: LF-11A

TOTAL DEPTH: 35 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**12/12/2011**
DATE COMPLETED:	**12/12/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Adam Whitt/Jeremy Amick**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**731.57** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619887.38937**
EASTING:	**1483034.70314**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0 – 4	17	2.1		FILL	(0.0 - 4.0) FILL: Silt, stiff, trace medium sand, some medium to large angular pebbles, pulverized rock, brown-gray, slight odor, wet, (waste includes: wood, metal).
4 – 8	27	9.8 34.8		FILL	(4.0 - 12.0) FILL: Silt, some medium angular pebbles, little sand, moderately dense, gray, moist, (waste includes: light blue and yellow silt material).
8 – 12	2	105.1			NOTE: More large angular pebbles, black-yellow, dry from 8 to 12 feet.
12 – 16	0	NM			(12.0 - 16.0) No recovery.
16 – 20	0	NM			(16.0 - 20.0) No recovery.
20 – 24	0	NM			(20.0 - 24.0) No recovery.
24 – 28	9	*776		FILL	(24.0 - 32.0) FILL: Silt, soft, large angular pebbles, sheen, strong odor, wet, black (waste includes: wood, nails).
28 – 32	36	515 191.5			
32 – 34	10	*218.4		SW	(32.0 - 35.0) SAND: medium to coarse grain, medium to large pebbles, tan-black, wet, sheen. Refusal at 35 feet.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: **LF-12**

TOTAL DEPTH: **21.4** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**11/17/2011**
DATE COMPLETED:	**11/17/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller/Jeremy Amick**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**731.79** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619787.58524**
EASTING:	**1483028.58462**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0 – 2	44	6.2 21.2		FILL	(0.0 - 4.0) FILL: Sand, fine to coarse, angular, poorly sorted, some silt, angular medium pebbles, black-gray, moist, some pulverized rock.
4 – 6	44	68.9 47.9		FILL	(4.0 - 12.0) FILL: Silt, medium sand, angular, poorly sorted, medium to large angular pebbles, dense, black-gray, moist, (waste includes: wood, glass, nails, fiber, wire).
8 – 10	8	6419			NOTE: Waste includes: plastic bag, strong odor from 8 to 12 feet.
12 – 14	0	NM			(12.0 - 16.0) No recovery.
16 – 18	0	NM			(16.0 - 20.0) No recovery.
20					(20.0 - 21.4) No recovery. Note: Metal shards found in shoe with white sludge. Refusal at 21.4 feet.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: LF-12A

TOTAL DEPTH: 33 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**12/9/2011**
DATE COMPLETED:	**12/9/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Adam Whitt/Jeremy Amick**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**731.79** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619787.58524**
EASTING:	**1483028.58462**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0 – 8	33	1.4 *1.6 7.8		FILL	(0.0 - 8.0) FILL: Silt, trace medium sand, dense, stiff, medium to large pebbles, gray-black, pulverized rock, dry, (waste includes: rubber, wire, glass). NOTE: Moist, black from 4 to 8 feet.
	6	26.8			
8 – 10	0	NM			(8.0 - 12.0) No recovery.
12 – 14	0	NM			(12.0 - 16.0) No recovery.
16 – 18	0	NM			(16.0 - 20.0) No recovery.
20 – 22	0	NM			(20.0 - 24.0) No recovery.
24 – 26	0	NM			(24.0 - 28.0) No recovery.
28 – 30	7	*686.4		FILL	(28.0 - 33.0) FILL: Clay material, very soft, sticky, black, strong odor, wet, (waste includes: fabric, nails).
32	2	656			Refusal at 33 feet.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: LF-13

TOTAL DEPTH: 32 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**11/17/2011**
DATE COMPLETED:	**11/17/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller/Adam Whitt**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**729.42** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619687.79914**
EASTING:	**1483022.51078**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0 – 4	36	25.1 76.7		FILL	(0.0 - 4.0) FILL: Silt, fine to medium sand, angular, poorly sorted, medium pebbles, subround, dense, loose at 3 feet, moist, brown to black, (waste includes: glass, wood, pulverized rock).
4 – 8	0	NM			(4.0 - 8.0) No recovery.
8 – 12	8	310		FILL	(8.0 - 12.0) FILL: Silt, very fine sand, gray, strong odor, trace small pebbles.
12 – 16	0	NM			(12.0 - 16.0) No recovery.
16 – 20	0	NM			(16.0 - 20.0) No recovery.
20 – 24	18	112		FILL	(20.0 - 27.0) FILL: Black waste, tar like, very dense, immisible fluid, sheen, wet.
24 – 26	6	51.7			NOTE: Tar like, black from 24 to 27 feet.
26 – 28				SW	(27.0 - 28.0) SAND: Fine to coarse, some small pebbles, wet, brown-tan.
28 – 32	39	*19.8		SW	(28.0 - 32.0) SAND: Fine to coarse, poorly sorted, medium pebbles, subround, wet, brown-tan. End of boring at 32 feet.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

Date: 9/27/2012

BORING LOG

BORING NO.: **LF-13A**

TOTAL DEPTH: **28** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**12/13/2011**
DATE COMPLETED:	**12/13/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Adam Whitt/Jeremy Amick**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**729.42** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619687.79914**
EASTING:	**1483022.51078**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0	31	NM		FILL	(0.0 - 4.0) FILL: Silt, some medium sand, some medium to large angular gravel, pulverized rock, black gray, moderately dense, moist, (waste includes: metal and fabric).
2		86			
4	20	*16.4		FILL	(4.0 - 10.5) FILL: Silt, gray, loose, dry, little sand, medium to small pebbles, angular, (waste includes: metal).
6					
8	26	0.2			NOTE: Gray, dry, dense.
10		4.3		FILL	(10.5 - 12.0) FILL: Medium sand, few small pebbles, angular, loose, dry, pulverized rock, (waste includes: metal, fabric).
12	0	NM			(12.0 - 16.0) No recovery.
14					
16	0	NM			(16.0 - 20.0) No recovery.
18					
20	0	NM			(20.0 - 28.0) No recovery.
22					
24					
26					End of boring at 28 feet.
28					Soil-gas sampling point LF-SGP-13A installed with screen at 7 ft to 12 ft .

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: LF-14

TOTAL DEPTH: 24 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**11/30/2011**
DATE COMPLETED:	**11/30/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller/Jeremy Amick**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**732.46** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**620080.93236**
EASTING:	**1483146.87455**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0 – 4	19	6.0 77.3		FILL	(0.0 - 4.0) FILL: Sand, medium to coarse, medium pebbles, angular, some silt, dry, black-brown-red, loose, (waste includes: wood, metal, wire).
4 – 8	21	229 *300		FILL	(4.0 - 8.0) FILL: Silt, trace fine sand, loose, moist, black, odor.
8 – 12	0	123			(8.0 - 12.0) No recovery.
12 – 16	33	141 130		FILL	(12.0 - 16.0) FILL: Medium sand, some large angular pebbles, some silt, loose, black, dry, odor (waste includes: metal, wood, glass). NOTE: Pulverized rock, yellow-black at 14 feet.
16 – 20	12	0		FILL	(16.0 - 24.0) FILL: Silt, moderately dense, trace medium sand, trace large angular pebbles, black-dark gray, moist, dry.
20 – 24	4	*30.2			NOTE: More dense, black from 20 to 24 feet. Refusal at 24 feet.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: LF-15/A

TOTAL DEPTH: 24 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Kari Eldridge**
DATE STARTED:	**12/9/2011**
DATE COMPLETED:	**12/9/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Adam Whitt/Jeremy Amick**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**732.08** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619981.15121**
EASTING:	**1483140.66329**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0	45	1.6		FILL	(0.0 - 2.0) FILL: Silt and sand with large gravel and pulverized rock, black-brown-gray, moist, (waste includes: glass, metal).
2		37.2		FILL	(2.0 - 4.0) FILL: Silt and coarse sand, small to large gravel, angular to round, moist, sheen, (waste includes: metal, wood).
4	19	107.7		FILL	(4.0 - 6.0) FILL: Silt and sand with small to large angular to round gravel, gray and black, moist, (waste includes: metal, glass).
6		290		FILL	(6.0 - 8.0) FILL: Silt and sand with some small medium round gravel, moist, black, (waste includes: fiberglass, cloth, cardboard, paper, metal).
8	14	*223.9		FILL	(8.0 - 12.0) FILL: Silt, loose, dry, trace sand and medium angular gravel, odor, black, (waste includes: cloth, very small metal fibers).
12	30	134.4		FILL	(12.0 - 24.0) FILL: Silt, loose, moist, black, gray, (waste includes: metal, plastic like yellow waste, cloth, and metal).
14		47.2			NOTE: Waste includes: some white-green plastic like material at 14 feet.
16	27	19.4			
18		14.8			NOTE: Water at 19 feet.
20	48	5.9			NOTE: Wet from 20 to 22 feet.
22		*3.9			NOTE: Gravel, glass, yellow plastic, nails at 23 feet. Some white clay at 23.5 feet. Refusal at 24 feet.
24					Note: Soil-gas sampling point LF-SGP-15A installed with screen at 6 ft to 11 ft .

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: LF-16

TOTAL DEPTH: 16.1 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Kari Eldridge**
DATE STARTED:	**12/9/2011**
DATE COMPLETED:	**12/9/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Adam Whitt/Jeremy Amick**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**729.80** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619881.26622**
EASTING:	**1483134.59406**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0 – 2	24	*89.6		FILL	(0.0 - 2.0) FILL: Sand and silt, medium sand, some angular and rounded medium and large gravel, gray-brown, moist, (waste includes: metal and wood).
2 – 4	24	68.7		FILL	(2.0 - 4.0) FILL: Silt and sand, medium sand with pulverized rock, medium and large angular gravel, black, moist, (waste includes: metal and wood).
4 – 6	18	45.2		FILL	(4.0 - 6.0) FILL: Silt, moist, odor, white to light pink-tan, (waste includes: glass, fiberglass).
6 – 8		*127.6		FILL	(6.0 - 8.0) FILL: Silt, moist, odor, (waste includes: glass, fiberglass, coal). NOTE: Light gray, black 1" thick seam at 6.2 feet.
8 – 10	4	1020		FILL	(8.0 - 12.0) FILL: Silt with some medium sand, trace angular medium gravel, black-gray, moist, odor, (waste includes: metal, nails, screws, wood).
12 – 14	0	NM			(12.0 - 16.1) No recovery. Refusal at 16.1 feet.
16					

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: LF-17

TOTAL DEPTH: 20 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**12/5/2011**
DATE COMPLETED:	**12/5/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller/Jeremy Amick**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**729.36** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619781.50779**
EASTING:	**1483128.49512**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0 – 2	21	2.4 7.5		FILL	(0.0 - 8.0) FILL: Silt, trace medium sand, trace large round pebbles, trace clay, soft, brown, moist, (waste includes: wood, metal, glass). NOTE: Trace clay, odor, gray-black, cobbles, wet (waste includes: large twisted metal) from 4 to 8 feet.
4 – 6	48	87.7			
8 – 10	39	284 *612		FILL	(8.0 - 12.0) FILL: Silt, trace sand, trace gravel, wet, white-pink-black-gray, (waste includes: plastic sheeting with paint, insulator, metal, plastic, wire, wood).
12 – 14	12	NM		FILL	(12.0 - 16.0) FILL: Solidified paint, white, strong odor.
16 – 18	48	*741 *246.7		FILL	(16.0 - 20.0) FILL: Clay, sludge, soft, white-gray, moist-wet, strong odor. Refusal at 20 feet.
20					

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System

ppm: parts per million
NR: No Recovery
bls: below land surface

PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: LF-18

TOTAL DEPTH: 28 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**11/18/2011**
DATE COMPLETED:	**11/18/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller/Adam Whitt**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**727.14** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619681.62764**
EASTING:	**1483122.27943**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0	26	*580		FILL	(0.0 - 4.0) FILL: Sand, fine to coarse, well sorted, few angular pebbles, black, slight odor, dry.
2		*899			
4	12	*NM		FILL	(4.0 - 12.0) FILL: Silt, dense, medium to coarse sand, well sorted, some medium angular gravel, (waste includes: rubber, degraded product, brown liquid, strong odor, saturated by brown thick liquid, tar like-asphalt).
6					
8	8	*4935			NOTE: Strong odor, tar like, black, wet from 8 to 12 feet.
10					
12	38	*NM		FILL	(12.0 - 20.0) FILL: Clay sludge, soft, white and black, strong odor, moist.
14		*402			
16	16	*NM			
18		*NM			
20		*NM		SW	(20.0 - 24.0) SAND: Medium to coarse, large pebbles, round, poorly sorted, strong odor, wet, black.
22		*NM			
24				SW	(24.0 - 28.0) SAND: Medium, medium pebbles, rounded, well sorted, wet, gray-black, strong odor.
26					End of boring at 28 feet.
28					

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

Date: 9/27/2012

BORING LOG

BORING NO.: LF-19

TOTAL DEPTH: 24 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**12/7/2011**
DATE COMPLETED:	**12/7/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller/Adam Whitt**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**732.00** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619569.9260**
EASTING:	**1483114.1260**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0	36	0.3		FILL	(0.0 - 8.0) FILL: Silt, medium to coarse sand, some medium to large angular pebbles, pulverized rock, stiff, brown-black, dry.
2		9.0			
4	23	*20.2			NOTE: Odor, moist from 4 to 8 feet (waste includes: metal, wire, green plastic fragment).
6		14.6			
8	14	2.2		FILL	(8.0 - 12.0) FILL: Clay, silt, brown-tan, some medium pebbles, moist, more silt from 10 to 12 feet.
10					
12	24	*1.2		SW	(12.0 - 24.0) SAND: Medium to coarse, some medium to large round pebbles, trace silt, loose, well sorted, tan, dry.
14		0.7			
16	36	0.3			NOTE: Moist from 16 to 20 feet.
18		1.1			
20	36	0.5			NOTE: More medium pebbles, wet from 20 to 24 feet.
22		0.7			End of boring at 24 feet.
24					Note: Soil-gas sampling point LF-SGP-19 installed with screens at 12 ft 8.5 inches to 17 ft 8.5 inches and 10 ft 4.5 inches to 10 ft 10.5 inches. Screen set from 22-24 feet below land surface and groundwater sampled via low-flow methodology on 12/7/2011.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: LF-20

TOTAL DEPTH: 2 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**11/29/2011**
DATE COMPLETED:	**11/29/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Adam Whitt/Jeremy Amick**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	(ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	
EASTING:	

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0	0	NM			(0.0 - 2.0) No recovery due to concrete.
2					End of boring at 2 feet.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: LF-21

TOTAL DEPTH: 36.1 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**11/29/2011**
DATE COMPLETED:	**11/30/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller/Jeremy Amick**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**733.00** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619974.96219**
EASTING:	**1483240.53798**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0	40	NM		FILL	(0.0 - 7.0) FILL: Silt, trace medium sand, well sorted, trace small pebbles, pulverized rock present, moist, moderately dense, slight odor, black-gray, (waste includes: wood, glass).
2					
4		NM			NOTE: Dense from 4 to 7 feet.
6	32	*NM			
8				FILL	(7.0 - 8.0) FILL: Silt, red-green-yellow, dense, moist.
10	24	NM		FILL	(8.0 - 20.0) FILL: Silt, trace medium sand, well sorted, light gray, soft, loose, dry.
12					
14	6	NM			NOTE: Gray-black, odor, unable to sample due to low recovery from 12 to 16 feet.
16					
18	8	NM			NOTE: More dense, black-orange, waste, odor from 16 to 20 feet.
20					
22	29	NM		FILL	(20.0 - 24.0) FILL: Silt, moderately dense, trace medium sand, well sorted, trace medium gravel, subround, black-gray, moist, odor, (waste includes: plastic, wood).
24					
26	0	NM			(24.0 - 28.0) No recovery.
28					
30	0	NM			(28.0 - 32.0) No recovery.
32					
34	46	*NM		FILL	(32.0 - 36.1) FILL: Sand, fine to coarse, poorly sorted, medium to large gravel, round, some clay (reworked material), strong odor and sheen, wet, black, dense, (waste includes: metal latch, copper wire, glass).
36					Refusal at 36.1 feet. Note: Unable to collect PID readings due to equipment malfunction.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System

ppm: parts per million
NR: No Recovery
bls: below land surface

PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: LF-22

TOTAL DEPTH: 20 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**12/6/2011**
DATE COMPLETED:	**12/6/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Adam Whitt/Jeremy Amick**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**729.11** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619875.16445**
EASTING:	**1483234.39488**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0	36	6.9		FILL	(0.0 - 8.0) FILL: Silt, trace medium sand, few small pebbles, angular, loose, black, (waste includes: wood, metal).
2		*120.6			
4	14	26.4			
6					
8	12	*8.3		FILL	(8.0 - 12.0) FILL: Silt, medium sand, black, moist (waste includes: paper, metal, wood, light brown, sand).
10					
12	0	NM			(12.0 - 14.0) No recovery.
14					(14.0 - 20.0) No recovery.
16	0	NM			
18					End of boring at 20 feet.
20					

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: LF-23

TOTAL DEPTH: 33 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**12/6/2011**
DATE COMPLETED:	**12/6/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Adam Whitt/Jeremy Amick**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**730.21** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619775.29108**
EASTING:	**1483228.56529**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0	26	0.7		FILL	(0.0 - 20.0) FILL: Silt, trace medium sand, few large angular pebbles, small amount of white clay sludge, moist, black-brown, (waste includes: wood, metal).
2		11.4			
4	18	303.3			NOTE: Black, (waste includes: large amount of wood, styrofoam from 4 to 8 feet).
6					
8	15	240.7			
10		206.9			NOTE: Dense powder at 10 feet.
12	20	*317			NOTE: Black-green staining from 12 to 16 feet.
14		294			
16	3	599			NOTE: Black, (waste includes: large amount of wood), unable to sample from 16 to 20 feet).
18					
20	38	54.2		FILL	(20.0 - 28.0) FILL: Silt, trace medium angular pebbles, moist, black, thick tar, (waste includes: wood, nails).
22		*25.0			
24	38	16.5			NOTE: Wet, black sheen at 26 feet.
26		25.0			
28	11	*12.4		FILL	(28.0 - 32.0) FILL: Sand, medium to coarse, angular large pebbles, silt, sheen, wet, (waste includes: metal, wood).
30					(32.0 - 33.0) No recovery.
32					Refusal at 33 feet.
					Soil-gas sampling point LF-SGP-23 installed with screen at 14 ft to 19 ft.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: LF-24

TOTAL DEPTH: 28 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**12/6/2011**
DATE COMPLETED:	**12/6/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Adam Whitt/Jeremy Amick**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**728.17** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619675.57783**
EASTING:	**1483222.08377**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0	25	5.4		FILL	(0.0 - 12.0) FILL: Silt, some medium sand, trace large angular pebbles, trace clay, soft, brown-black, pulverized rock at bottom, moist, (waste includes: plastic, metal, wood, wire).
2		20.2			
4	16	24.7			NOTE: Black from 4 to 8 feet.
6					
8	12	*141.3			NOTE: Wet from 8 to 12 feet.
10					
12	48	71.2		FILL	(12.0 - 14.0) FILL: Clay, soft, sticky, white-black, wet.
14		70.7		FILL	(14.0 - 20.0) FILL: Silt, trace medium sand, few pebbles, angular, wet, (waste includes: wood).
16	24	2.7			NOTE: Gray, sheen from 16 to 20 feet.
18		1.7			
20	0	0			(20.0 - 24.0) No recovery.
22					
24	36	0.3		FILL	(24.0 - 26.0) FILL: Silt, black, wet, sheen.
26		*0.4		SW	(26.0 - 28.0) SAND: Medium to coarse, some small round pebbles, tan-light brown, wet.
28					End of boring at 28 feet.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: LF-25

TOTAL DEPTH: 28 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**11/29/2011**
DATE COMPLETED:	**11/29/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller/Jeremy Amick**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**729.19** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619968.79617**
EASTING:	**1483340.27886**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0 – 2	36	NM		FILL	(0.0 - 4.0) FILL: Silt, loose, trace medium sand, well sorted, few medium pebbles, brown-black, dry, (waste includes: wood, nails, metal scraps, cardboard). NOTE: More dense, wet, black-gray from 2 to 4 feet.
4 – 6	22	NM		FILL	(4.0 - 12.0) FILL: Silt, moderately dense, some medium to large pebbles, round to angular, poorly sorted, gray, wet. NOTE: Waste includes: metal, styrofoam like material and wood from 8 to 12 feet.
8 – 10	8	*NM			
12 – 14	0	NM			(12.0 - 16.0) No recovery.
16 – 18	12	NM		FILL	(16.0 - 24.0) FILL: Silt, some medium sand, trace large pebbles, black, wet, (waste includes: metal, wood).
20 – 22	4	NM			
24 – 26	32	*NM		SW	(24.0 - 28.0) SAND: Medium to coarse, small to medium pebbles, well sorted, brown-tan, wet. End of boring at 28 feet. Note: Unable to collect PID readings due to equipment malfunction.
28					

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System

ppm: parts per million
NR: No Recovery
bls: below land surface

PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: LF-26

TOTAL DEPTH: 24.5 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**11/29/2011**
DATE COMPLETED:	**11/29/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller/Jeremy Amick**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**730.23** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619869.01106**
EASTING:	**1483334.17735**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0 – 2	35	149.3 *328		FILL	(0.0 - 3.0) FILL: Silt, loose, some medium to coarse sand, medium angular pebbles, well sorted, black, moist, (waste includes: plastic, wood).
2 – 4				FILL	(3.0 - 16.0) FILL: Silt, gray, loose, dry.
4 – 6	26	12.2 138			
6 – 8					
8 – 10	22	7.3 4.0			
10 – 12					
12 – 14	8	5.7			
14 – 16					
16 – 18	0				(16.0 - 19.5) No recovery.
18 – 20					
20 – 22	24	*97.1		FILL	(19.5 - 24.5) FILL: Silt, black, wet. Refusal at 24.5 feet.
22 – 24					

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: LF-27

TOTAL DEPTH: 15.5 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**11/29/2011**
DATE COMPLETED:	**11/29/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller/Jeremy Amick**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**730.80** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619769.12166**
EASTING:	**1483328.07685**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0 – 6	36	37.5 NM		FILL	(0.0 - 6.0) FILL: Silt, dense, some medium to coarse sand, poorly sorted, some medium to large pebbles, angular, moist, black-gray, odor. NOTE: Waste includes: paper, plastic, wood from 4 to 6 feet. White clay present at 4 feet.
6 – 15.5	15 30 12	*271.4 36.7 126.5 79.9 *151.4		FILL	(6.0 - 15.5) FILL: Silt, soft, light gray, dry. NOTE: Wet at 8 feet. Refusal at 15.5 feet.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: LF-28

TOTAL DEPTH: 28 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**11/28/2011**
DATE COMPLETED:	**11/28/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller/Jeremy Amick**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**730.86** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619669.37633**
EASTING:	**1483321.89822**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0 – 4	32	23.6 43.2		FILL	(0.0 - 4.0) FILL: Silt, dense, some medium sand with trace small angular pebbles around 3 to 4 feet, black-gray, wet, odor, (waste includes: plastic).
4 – 8	8	*363		FILL	(4.0 - 20.0) FILL: Sand, fine to medium, well sorted, small angular pebbles, loose, black, odor, dry.
8 – 12	17	89.7			
12 – 16	4	235.5 0			
16 – 20	6	13.8			NOTE: Large pebbles to cobbles preventing recovery from 16 to 20 feet.
20 – 24	30	0 0		FILL	(20.0 - 24.0) FILL: Clay, silt, soft, some medium to coarse sand, some angular medium pebbles, strong odor, white-gray-black, wet.
24 – 28	15	*0		SW	(24.0 - 28.0) SAND: Fine to coarse, well sorted, small to large pebbles round, trace silt, tan-brown, wet. End of boring at 28 feet.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: LF-29

TOTAL DEPTH: 26 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**11/28/2011**
DATE COMPLETED:	**11/28/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller/Jeremy Amick**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**729.56** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619569.548113**
EASTING:	**1483315.805753**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0	20	0.0		FILL	(0.0 - 8.0) FILL: Fine to coarse sand, well sorted, medium to large pebbles, angular, some silt, moderately dense, brown-light gray, moist, slight odor.
2		0.0			
4	6	0.0			NOTE: Gray, slight odor from 4 to 8 feet.
6		0.0			
8	20	*0.0		FILL	(8.0 - 11.0) FILL: Sand, medium, well sorted, some medium to large pebbles, angular, moderately dense, some silt, trace clay (white), gray-brown, moist, (waste includes: wood).
10		0.0		SW	(11.0 - 14.0) SAND: Medium to coarse, well sorted, some clay, trace medium gravel, soft, brown, moist.
12	18	0.0			
14		*0.0		SW	(14.0 - 16.0) SAND: Medium to coarse, well sorted, medium to large pebbles, round, loose, brown-tan, dry.
16	24	0.0		SW	(16.0 - 20.0) SAND: Medium, well sorted, trace medium pebbles, round, brown-tan, moist.
18		0.0			
20	0	NM			(20.0 - 24.0) No recovery.
22					NOTE: Wet at 22 feet.
24	6	0.0		SW	(24.0 - 26.0) SAND: Medium, well sorted, trace medium pebbles-round, moderately dense, brown, wet.
26					End of boring at 26 feet.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: LF-29A

TOTAL DEPTH: 28 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**12/7/2011**
DATE COMPLETED:	**12/7/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller/Jeremy Amick**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**731.50** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619555.6050**
EASTING:	**1483315.0760**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0	34	0.3		FILL	(0.0 - 8.0) FILL: Silt, clay, medium sand, trace small round pebbles, brown, moist, loose, (waste includes: plastic, metal, nails).
2		0.1			
4	8	0.2			NOTE: More clay, loose, yellow, brown, soft, wood from 4 to 8 feet.
6					
8	15	0.3		FILL	(8.0 - 12.0) FILL: Clay, soft, trace medium to coarse sand, few angular, small to large pebbles, white clay throughout, brown-gray, moist.
10		*0.5			
12	14	0.0		FILL	(12.0 - 14.0) FILL: Clay, soft, brown, moist, (waste includes: wood).
14		0.0		SW	(14.0 - 28.0) SAND: Medium to coarse, small to medium pebble, round, tan, moist.
16	32	*0.0			NOTE: Dry from 16 to 20 feet.
18		0.0			
20	26	0.0			NOTE: Moist from 20 to 24 feet.
22		0.0			
24	36	0.0			NOTE: Wet at 24 feet.
26		0.0			End of boring at 28 feet.
28					Note: Soil-gas sampling point LF-29A installed with screens at 12 ft. 4 inches to 17 ft 4 inches and 18 ft 11 inches to 19 ft 5 inches. Screen set from 24-26 feet below land surface and groundwater sampled via low-flow methodology on 12/7/2011.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: **HA-LF-29A**

TOTAL DEPTH: **2.5** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**12/1/2011**
DATE COMPLETED:	**12/1/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Jeremy Amick**
DRILLING METHOD:	**Hand Auger**
GROUND ELEVATION:	**731.50** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**NM**
EASTING:	**NM**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0	30	NM		CL	(0.0 - 0.5) CLAY: Trace sand, medium grain, soft, brown, some small pebbles, dry.
2				SW	(0.5 - 2.5) SAND: Medium to coarse grain, small to large pebbles, rounded, loose, brown-tan, moist. End of boring at 2.5 feet. Note: Boring located directly south of LF-29A along the fence.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: LF-30

TOTAL DEPTH: 13 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**11/16/2011**
DATE COMPLETED:	**11/16/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller/Adam Whitt**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**727.60** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**620062.53145**
EASTING:	**1483446.27466**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0	42	0.4		FILL	(0.0 - 2.0) FILL: Silt, soft, some clay, some sand, medium grain, some angular medium pebbles, poorly sorted, moist-wet, dark brown.
2		*43.9		FILL	(2.0 - 8.0) FILL: Silt, dense, some sand, medium grain, white silt like material throughout, slight odor, well sorted, very dark gray, moist. NOTE: Increasing sand and pebbles, angular, wet from 4 to 8 feet.
4	28	0.6			
6		1.6			
8	NM	*3.1		CL	(8.0 - 9.0) CLAY: Moderately stiff, low plasticity, some sand, medium grain, some round medium to large pebbles, very dark grayish brown.
10		NM		SW	(9.0 - 13.0) SAND: Fine to coarse grain, some medium to large pebbles, round, loose, brown, moist.
12		NM			End of boring at 13 feet.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: **LF-31**

TOTAL DEPTH: **12** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**11/16/2011**
DATE COMPLETED:	**11/16/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller/Adam Whitt**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**730.85** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619962.70124**
EASTING:	**1483440.16778**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0	18	0.9		FILL	(0.0 - 6.0) FILL: Sand, medium to coarse, small to large pebbles, subangular, poorly sorted, loose to moderately stiff, dark grayish brown, dry, (waste includes: brick fragments).
2		0.8			
4	22	2.1			NOTE: Wood from 4 to 6 feet.
6		*141		FILL	(6.0 - 7.0) FILL: Silt, dense, white, dry, odor, (waste includes: wood).
8	36	*3.6		FILL	(7.0 - 8.0) FILL: Silt, dense, some clay, medium stiff, moist, black.
10		4.1		CL	(8.0 - 10.5) CLAY: Moderately stiff, medium plasticity, trace medium sand, few angular small pebbles, moist, brown.
12				SW	(10.5 - 12.0) SAND: Fine to coarse, small pebbles, rounded, poorly sorted, moist, brown. End of boring at 12 feet.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: LF-32

TOTAL DEPTH: 16 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**11/16/2011**
DATE COMPLETED:	**11/16/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller/Adam Whitt**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**732.84** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619862.84954**
EASTING:	**1483434.12141**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0	41	0.1		FILL	(0.0 - 2.0) FILL: Sand, medium, subangular, some silt, some medium pebbles, dense, moderately sorted, reddish brown.
2		118		FILL	(2.0 - 3.0) FILL: Silt, stiff, trace sand, fine grain, black, moist.
4	22	*32.1		FILL	(3.0 - 4.0) FILL: Sand, medium, some white silt, brown, dry.
6		79.6			(4.0 - 8.0) FILL: Sand, fine to coarse, poorly sorted, large pebbles, angular, silt, dense, white to pink, slight odor, moist, brown, reddish brown, white, slight odor, (waste includes: wood).
8	36	27.6		FILL	(8.0 - 12.0) FILL: Clay, soft, some silt, slight odor, very dark gray, wet.
10		13.5			
12	38	*11.4		CL	(12.0 - 14.0) CLAY: Wet, very dark gray.
14		1.6		SW	(14.0 - 16.0) SAND: Fine to coarse, small to large subrounded pebbles, some clay, stiff, poorly sorted, wet, grayish brown.
16					End of boring at 16 feet.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: LF-33

TOTAL DEPTH: 16 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**11/16/2011**
DATE COMPLETED:	**11/16/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller/Adam Whitt**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**732.24** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619763.09047**
EASTING:	**1483427.90380**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0	34	0.0		FILL	(0.0 - 1.5) FILL: Silt, dense, trace sand, fine grain, slight odor, white and dark gray, moist.
2		2.3		FILL	(1.5 - 5.0) FILL: Silt, very dense, some medium to coarse grain sand, moderately sorted, small to large pebbles, subround, very dark grayish brown.
4	23	8.8		FILL	(5.0 - 6.0) FILL: Silt, dense, white and gray, dry, purple-blue staining.
6		*30.0		FILL	(6.0 - 8.5) FILL: Silt, dense, some waste, red fiberous, slight odor, slight sheen, black, dry. NOTE: Wet, (waste includes: wood) from 8 to 8.5 feet.
8	38	23.6		FILL	(8.5 - 12.0) FILL: Clay, soft, sticky, brown, moist-wet at 8.5 feet.
10		0.1			
12	36	*0.3		CL	(12.0 - 14.0) CLAY: Moderately stiff, trace coarse angular sand, brown, moist to wet.
14		0.2		SW	(14.0 - 16.0) SAND: Fine to coarse, subangular, small to large angular pebbles, poorly sorted, wet, brown.
16					End of boring at 16 feet.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: LF-34

TOTAL DEPTH: 16 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**11/16/2011**
DATE COMPLETED:	**11/16/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller/Adam Whitt**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**731.97** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619663.28653**
EASTING:	**1483421.72575**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0	33	0.0		FILL	(0.0 - 2.0) FILL: Sand, medium to coarse, medium to large pebbles, moderately dense, poorly sorted, some silt, dense, dark grayish brown, wet.
2		0.0		FILL	(2.0 - 3.0) FILL: Silt, dense, large pulverized rock, angular, some medium sand, well sorted, pale yellowish green, moist, odor.
4	26	*23.3		FILL	(3.0 - 4.0) FILL: Sand, medium to coarse, some medium to large pebbles, loose, moist, dark grayish brown, (waste includes: glass, fibers).
6		3.5		FILL	(4.0 - 8.0) FILL: Silt, trace medium sand, few small pebbles, moist, sorted, loose, very dark gray, dry.
8	48	0.3		FILL	(8.0 - 12.0) FILL: Clay, soft, sticky, odor, trace small pebbles, black, wet, (waste includes: cardboard).
10		0.0			
12	34	0.0		CL	(12.0 - 14.0) CLAY: Moderately stiff, some pulverized rock, dark brown, moist.
14		*0.0		SW	(14.0 - 16.0) SAND: Fine to coarse, some small to large pebbles, moderately loose, poorly sorted, brown, moist.
16					End of boring at 16 feet.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: LF-35

TOTAL DEPTH: 24 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2011.00005**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**11/16/2011**
DATE COMPLETED:	**11/16/2011**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Chris Rismiller/Adam Whitt**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**726.56** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**619760.058101**
EASTING:	**1483477.777844**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0	24	0.0		FILL	(0.0 - 4.0) FILL: Silt, some medium sand, some medium angular pebbles, poorly sorted, moist, very dark gray, (waste includes: wood, glass.
2		*0.8			NOTE: Some white silt, dry to moist from 2 to 4 feet.
4	48	0.2		FILL	(4.0 - 6.0) FILL: Clay, soft, medium plasticity, trace small round pebbles, brown, moist.
6		*0.1		CL	(6.0 - 8.0) CLAY: Moderately stiff, trace medium sand, trace small gravel, brown, moist.
8	28	3.4		SW	(8.0 - 20.0) SAND: Fine to medium, some medium pebbles, round, poorly sorted, tan, dry.
10		0.4			
12	24	0.0			
14		0.0			
16	22	0.0			
18		0.0			
20	0				(20.0 - 24.0) No recovery.
22					End of boring at 24 feet.
24					Note: Soil-gas sampling point LF-SGP-35 installed with screens at 7 ft to 12 ft and 14 ft 11 inches to 15 ft 5 inches. Screen set from 20-22 feet below land surface and groundwater sampled via low-flow methodology on 11/16/2011.

Notes:

*Sample submitted for laboratory analysis.
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
NR: No Recovery
bls: below land surface
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

BORING LOG

BORING NO.: **LF-36**

TOTAL DEPTH: **42** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0005A**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**9/19/2012**
DATE COMPLETED:	**9/19/2012**

DRILLING INFORMATION

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**732.40 feet AMSL**
NORTHING:	**620038.1295**
EASTING:	**1483112.5999**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0	58	3.6		FILL	(0.0 - 11.0) FILL, silt with medium sand, few small to medium pebbles, loose to moderate stiff, dry, black, odor, (waste includes: metal, fabric, wire, plastic).
2		95.9			Note: negative result for NAPL test from 2 to 4 feet.
4	35	121			Note: negative result for NAPL test from 4 to 6 feet.
6		243			Note: oil substance, odor, moist from 5 to 10 feet.
8		*481			Note: negative result for NAPL test from 6 to 8 feet.
10	54	327			Note: negative result for NAPL test from 8 to 10 feet.
12		38.4		FILL	Note: waste includes: metal, odor, dry from 10 to 11 feet.
14	57	20.6			(11.0 - 20.0) FILL, silt, loose to moderate stiff, dry, gray, odor, (waste includes: wire, metal).
16		26.9			Note: stiff to hard, odor from 15 to 20 feet.
18		8.1			
20	58	8.1		FILL	(20.0 - 30.0) FILL, silt with medium sand, few small to medium round pebbles, poorly sorted, stiff, black, odor, (waste includes: metal, wire, wood).
22		6.3			
24	60	11.6			
26		9.5			
28		*6.8			

Notes:
bls: below land surface
NR: No Recovery
*Sample submitted for laboratory analysis.
NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife
AMSL: Above mean sea level

BORING LOG

BORING NO.: **LF-36**

TOTAL DEPTH: **42** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0005A**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**9/19/2012**
DATE COMPLETED:	**9/19/2012**

DRILLING INFORMATION

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**732.40 feet AMSL**
NORTHING:	**620038.1295**
EASTING:	**1483112.5999**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
30					
32	62	16.8		FILL	(30.0 - 37.0) FILL, sand, medium to coarse grain, some silt, little small to medium round pebbles, poorly sorted, stiff, wet at 30 feet, black, (waste includes: wood, metal, wire).
34		5.6			
36		*4.2			
38	70	1.3		SW	(37.0 - 42.0) SAND, medium to coarse grain, some silt, some small to medium round pebbles, poorly sorted, loose, wet, olive brown. Note: Screen set from 37 to 42 feet below land surface and groundwater sample via low flow methodology on 9/19/2012.
40		*0.5			
42	NM	NM			End of boring at 42 feet.

Notes:
bls: below land surface
NR: No Recovery
*Sample submitted for laboratory analysis.
NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife
AMSL: Above mean sea level

BORING LOG

BORING NO.: **LF-37**

TOTAL DEPTH: **40** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0005A**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**9/20/2012**
DATE COMPLETED:	**9/20/2012**

DRILLING INFORMATION

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**727.73 feet AMSL**
NORTHING:	**619722.3249**
EASTING:	**1483090.8531**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
0	29	3.0		FILL	(0.0 - 3.0) FILL, sand with silt, medium grain, some small round pebbles, poorly sorted, loose, dry, olive brown, odor (waste includes: wood, brick). Note: negative result for NAPL test from 2 to 4 feet.
2		150			
4		*289		FILL	(3.0 - 5.0) FILL, coal fragments, loose to stiff, dry, black, odor.
6	NR	NR			(5.0 - 10.0) NO RECOVERY.
8		NR			
10	38	*14.6		FILL	(10.0 - 16.0) FILL, white to gray clay with some black silt, wet, (waste includes: metal, wire). Note: some brown fluid. Note: postitive result for NAPL test from 10 to 12 feet.
12		36.4			
14		57.4			Note: sand sized fragments from 14 to 16 feet.
16	29	*>8000		FILL	(16.0 - 20.0) FILL, silt with medium sand, stiff, dry, black, (waste includes: metal, wood, wire). Note: positive result for NAPL test from 16 to 18 feet. Note: red and white fibers at 18 feet. Note: positive result for NAPL test from 18 to 20 feet.
18		908			
20	38	317		FILL	(20.0 - 24.0) FILL, silt with medium sand, some white clay, moderate stiff, wet at 20 feet, black, (waste includes: wood, wire, metal).
22		241			
24	42	*78		FILL	(24.0 - 26.0) FILL, silt with white clay, some black tar substance, soft to medium stiff, some brown fluid, wet, (waste includes: metal).
26		*2.0		FILL	(26.0 - 28.0) FILL, silt with medium sand, some medium round pebbles, poorly sorted, stiff, wet, black, (waste includes: metal, wire, brick).
28		*10.0		GW	(28.0 - 33.0) PEBBLES, small round with medium to coarse sand, some silt, poorly sorted, loose, wet, brown to black.
30	51	9.7			
32		3.1			

Notes:
bls: below land surface
NR: No Recovery
*Sample submitted for laboratory analysis.
NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife
AMSL: Above mean sea level

BORING LOG

BORING NO.: **LF-37**

TOTAL DEPTH: **40** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Landfill L1 Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0005A**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**9/20/2012**
DATE COMPLETED:	**9/20/2012**

DRILLING INFORMATION

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**727.73 feet AMSL**
NORTHING:	**619722.3249**
EASTING:	**1483090.8531**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	DESCRIPTION
34				SW	(33.0 - 39.0) SAND, medium grain, few small to medium round pebbles, poorly sorted, loose, wet, brown.
		0.5			
36					(39.0 - 40.0) SILT, few small round pebbles, poorly sorted, stiff, wet, olive brown. Note: crushed cobbles at 39 feet.
	50	1.5			
38					Note: Screen set from 28 to 33 feet below land surface and groundwater samled via low flow methodology on 9/20/2012.
		3.6			
40				ML	End of boring at 40 feet.

Notes:
bls: below land surface
NR: No Recovery
*Sample submitted for laboratory analysis.
NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife
AMSL: Above mean sea level

Section 31

Closed South Settling Lagoon
Vapor Intrusion Investigation Soil
Boring Logs

SSL-1 through SSL-3

SOIL BORING LOG

BORING NO.: SSL-1

TOTAL DEPTH: 24 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**V.I. Investigation: South Settling Lagoon**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0007A**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**1/31/2012**
DATE COMPLETED:	**2/1/2012**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Adam Whitt/Jeremy Amick**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**724.99** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**620394.287960**
EASTING:	**1482266.010987**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0–10	102	NM 0.2		SW	(0.0 - 10.0) Sand, medium to coarse grain, some medium to large round pebbles, trace clay, few small cobbles, brown, moist. Note: utility clearance using air/hydro knife to 8.5 feet.
10–16	18	1.2		SW	(10.0 - 16.0) Sand, medium to coarse grain, trace silt, some small to medium round pebbles, pulverized rock, dry, brown.
	22	1.3 1.3			
16–24	16	1.4 1.4		SW	(16.0 - 24.0) Sand, medium to coarse grain, small to large rounded pebbles, trace silt, wet at 18 feet, brown. Note: more pebbles at 20 feet.
	8	1.9			End of boring at 24 feet.

Soil-gas sampling point SSL-1 installed with a 6-inch screen at: 5 feet 6 inches to 6 feet; 10 feet 6 inches to 11 feet; and 13 feet 8 inches to 14 feet 2 inches; groundwater table sample collected from 22-24 feet.

Notes: *Sample submited for laboratory analysis.
**Sample submited for laboratory analysis in addition with duplicate and/or MS/MSD.
NM: Not Measured
NR: No Recovery
USCS: Unified Soil Classification System
bls: below land surface
ppm: parts per million
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

SOIL BORING LOG

BORING NO.: SSL-2

TOTAL DEPTH: 24 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**V.I. Investigation: South Settling Lagoon**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0007A**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**1/31/2012**
DATE COMPLETED:	**1/31/2012**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Adam Whitt/Jeremy Amick**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**725.49** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**620359.287484**
EASTING:	**1482560.679116**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0	115	NM		SW	(0.0 - 10.0) Sand, medium to coarse grain, some medium to large pebbles, few cobbles up to 8" diameter, trace clay, dark brown, dry. Note: utility clearance using air/hydro vac truck from 0 to 9.6 feet.
10		0.2			
10	20	0.5		SW	(10.0 - 20.0) Sand, medium to coarse grain, medium round pebbles, pulverized rock, dry, tan/white.
12		0.5			
14	23	0.5			
16		0.6			
18	11				
20					Note: wet at 19.5 feet.
20		1.0		SW	(20.0 - 24.0) Sand, fine to coarse grain, poorly sorted, trace small round pebbles, brown, wet.
22	40	1.0			End of boring at 24 feet.
24					Soil-gas sampling point SSL-2 installed with a 6-inch screen at: 5 feet 6 inches to 6 feet; 10 feet 6 inches to 11 feet; and 13 feet 8 inches to 14 feet 2 inches; groundwater table sample collected from 22-24 feet.

Notes: *Sample submited for laboratory analysis.
**Sample submited for laboratory analysis in addition with duplicate and/or MS/MSD.
NM: Not Measured
NR: No Recovery
USCS: Unified Soil Classification System
bls: below land surface
ppm: parts per million
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

SOIL BORING LOG

BORING NO.: SSL-3

TOTAL DEPTH: 24 feet bls

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**V.I. Investigation: South Settling Lagoon**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0007A**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**1/30/2012**
DATE COMPLETED:	**1/30/2012**

DRILLING INFORMATION

DRILLING CO.:	**EnviroCore**
DRILLER:	**Adam Whitt/Jeremy Amick**
DRILLING METHOD:	**Direct Push**
GROUND ELEVATION:	**723.66** (ft. AMSL)
COORDINATES, STATE PLANE:	
NORTHING:	**620653.732267**
EASTING:	**1482809.284825**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0 – 8	108	NM		SW	(0.0 - 9.0) Sand, medium to coarse grain, some medium to large pebbles, few cobbles up to 3" diameter, trace clay, dark brown. Note: utility clearance using air/hydro vac truck from 0 to 9 feet.
10	16	0.1		SW	(9.0 - 24.0) Sand, medium to coarse grain, some medium round pebbles, dry, tan, pulverized rock.
		0.2			
12	38	0.4			Note: moist from 12 to 20 feet.
14		0.7			
16	22	1.0			
18		1.2			
20	22	1.5			Note: wet at 20 feet.
22		1.6			End of boring at 24 feet.
24					Soil-gas sampling point SSL-3 installed with a 6-inch screen at: 5 feet 6 inches to 6 feet; 10 feet 6 inches to 11 feet; and 13 feet 8 inches to 14 feet 2 inches; groundwater table sample collected from 22-24 feet.

Notes: *Sample submited for laboratory analysis.
**Sample submited for laboratory analysis in addition with duplicate and/or MS/MSD.
NM: Not Measured
NR: No Recovery
USCS: Unified Soil Classification System
bls: below land surface
ppm: parts per million
PID: Photo-ionization Detector
ft: feet
AMSL: Above Mean Sea Level

ARCADIS

Section 32

Pre-Design Investigation Soil Boring and Well Construction Logs

BOX-1
BOX-2
BOX-4

HFA-1 through HFA-3

WTANKF-1
WTANKF-2
RMW-87/WTANKF-3
WTANKF-4

RMW-86/BLDG21-1
BLDG21-2 through BLDG21-4

NP-1
RMW-88/NP-2
NP-3

PSA-1 through PSA-4
RMW-85/PSA-5
PSA-6 through PSA-10

SOIL BORING LOG

BORING NO.: **BOX-1**

TOTAL DEPTH: **60** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Secondary Source Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002B**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/28/2012**
DATE COMPLETED:	**8/9/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**731.57 feet AMSL**
NORTHING:	**623061.8209**
EASTING:	**1484899.1967**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0				CONCRETE	(0.0 - 1.0) CONCRETE removed by coring.
2	HK	NM		FILL	(1.0 - 10.0) SAND, medium to coarse grain, small to large gravel, trace silt, some small cobbles poorly sorted, loose, dry, brown, fill includes: metal.
4		NM			
6		NM			
8		NM			
10		NM			
12	28	1.3		SM	(10.0 - 14.5) SAND, medium grain with silt, some medium to large round pebbles, few small cobbles, moist (due to rainfall), poorly sorted, loose to moderately stiff, moist, olive brown.
14		1.2			
16	38	9.0		CL	*Soil sample submitted for laboratory analysis from 14 to 16 feet.
18		1.2		SM	(14.5 - 15.0) SILTY CLAY, some medium round pebbles, trace medium sand, poorly sorted, hard, dry, light gray.
20		4.6			(15.0 - 26.0) SAND, medium grain, some silt, few small round pebbles, poorly sorted, loose, dry.
22	36	6.5			Note: small pebble bed, wet, well sorted from 21.5 to 21.8 feet.
24		6.0			
26		5.6			
28	37	4.8		SM	(26.0 - 33.5) SAND, medium to coarse grain, some small to medium round pebbles, some silt, poorly sorted, loose, wet, olive brown. *Groundwater sample submitted for laboratory analysis from 26 to 31 feet.
30		5.7			Note: higher silt content from 29 to 30 feet.
		8.2			

Notes:
bls: below land surface
HA: Hand Auger
*Indicates sample submitted for laboratory analysis.
NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
HK: Hydroknife
AMSL: Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **BOX-1**

TOTAL DEPTH: **60** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Secondary Source Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002B**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/28/2012**
DATE COMPLETED:	**8/9/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**731.57 feet AMSL**
NORTHING:	**623061.8209**
EASTING:	**1484899.1967**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
32	42	9.7			
34		24		ML	(33.5 - 35.0) SILT, moderately stiff, wet, dark gray.
36	40	6.8		ML	(35.0 - 38.0) SANDY SILT, medium grain, reworked silt material, moderately loose to stiff, wet, gray to very dark grayish brown.
38		8.6		SW	(38.0 - 40.0) SAND, medium to coarse grain, some medium round pebbles, few small cobbles, trace silt, poorly sorted, loose, wet, olive brown. *Groundwater sample submitted for laboratory analysis from 38 to 43 feet.
40	40	11.2		SM	(40.0 - 42.5) SILTY SAND, medium grain, some clay, some medium round pebbles to small cobbles, poorly sorted, stiff, wet, grayish brown.
42		21.4		CL	(42.5 - 44.0) SILTY CLAY, few small round pebbles, poorly sorted, very hard, dry, very dark gray.
44	44	14.2		SM	(44.0 - 50.0) SILTY SAND, fine grain, loose, wet, olive brown. Note: little clay, soft, moderate plasticity from 45 to 50 feet. *Groundwater sample submitted for laboratory analysis from 49 to 54 feet.
46		41.0			
48		43.0			
50	41	111.3		SM	(50.0 - 54.0) SAND, medium grain, silt, few small to medium round pebbles, wet.
52		151.7			
54	48	239.2		SW	(54.0 - 54.5) SAND, fine grain, trace silt, poorly sorted, loose, wet.
56		11.2		CL	(54.5 - 60.0) SILTY CLAY, few small round pebbles, poorly sorted, hard, dry.
58		6.9			
60					End of boring 60 feet.
62					

Notes:
bls: below land surface
HA: Hand Auger
*Indicates sample submitted for laboratory analysis.
NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
HK: Hydroknife
AMSL: Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **BOX-2**

TOTAL DEPTH: **58** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Secondary Source Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002B**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/28/2012**
DATE COMPLETED:	**8/13/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**731.57 feet AMSL**
NORTHING:	**622256.3639**
EASTING:	**1484709.4647**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0					
		NM		CONCRETE	(0.0 - 1.0) CONCRETE removed by coring.
2		NM		FILL	(1.0 - 10.0) SAND, medium to coarse grain, small to large pebbles, small cobbles, trace silt, poorly sorted, loose, brown, fill includes metal.
4	HK	NM			
6		NM			
8		NM			
10		0.3		SM	(10.0 - 14.0) SAND, medium grain, some small round pebbles, some clay, some silt, trace small cobbles, poorly sorted, moderately stiff to loose, moist, olive brown.
12	68	0.4			
14		1.1		CL	(14.0 - 16.0) SILTY CLAY, few small round pebbles, poorly sorted, hard, dry, light brownish gray.
16		3.0		SM	(16.0 - 24.0) SAND, medium grain, some silt, few small to medium pebbles, poorly sorted, loose, dry, light olive brown. *Soil sample submitted for laboratory analysis from 16 to 18 feet.
18	50	0.3			
20		1.2			
22		0.1			
24		2.1		CL	(24.0 - 35.0) SILTY CLAY, some small to medium round pebbles, poorly sorted, hard, dry, dark gray. Note: during advancement into the clay unit and the borehole began to collect groundwater so a sample was collected. *Groundwater sample submitted for laboratory analysis from 24 to 29 feet.
26	72	2.6			
28		1.1			
30					

Notes:
bls: below land surface
HA: Hand Auger
*Indicates sample submitted for laboratory analysis.
NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
HK: Hydroknife
AMSL: Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **BOX-2**

TOTAL DEPTH: **58** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Secondary Source Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002B**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/28/2012**
DATE COMPLETED:	**8/13/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**731.57 feet AMSL**
NORTHING:	**622256.3639**
EASTING:	**1484709.4647**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
30					
32	75	0.0			
		0.0			
34		0.1			
36	68	0.0		SW	(35.0 - 51.0) SAND, medium to coarse grain, some small to medium round pebbles, little silt, poorly sorted, loose, wet.
38		0.1			
40	52	0.0			Note: trace clay from 40 to 45 feet.
42		0.0			*Groundwater sample submitted for laboratory analysis from 40 to 45 feet.
44		4.5			
46	73	17.9			Note: increase in clay and silt from 45 to 51 feet.
48		19.2			*Groundwater sample submitted for laboratory analysis from 46 to 51 feet.
50		19.4			
52	NM	26.1		CL	(51.0 - 58.0) SILTY CLAY, some small round pebbles, hard, dry, orange brown mottling from 51 to 52 feet, dark gray from 52 to 53 feet.
54		14.1			
56		4.4			
58					End of boring at 58 feet.
60					

Notes:
bls: below land surface
HA: Hand Auger
*Indicates sample submitted for laboratory analysis.
NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
HK: Hydroknife
AMSL: Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **BOX-4**

TOTAL DEPTH: **65** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Secondary Source Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002B**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**7/6/2012**
DATE COMPLETED:	**8/14/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**731.64 feet AMSL**
NORTHING:	**621398.0590**
EASTING:	**1484496.3252**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0					
2	HK	NM		CONCRETE	(0.0 - 1.0) CONCRETE removed by coring.
4		NM		SW	(1.0 - 10.0) SAND, medium to coarse grain, medium to large pebbles, some small cobbles, poorly sorted, dry, brown.
6		NM			
8		NM			
10		NM			
12	41	4.2		SM	(10.0 - 14.0) SAND, fine to medium grain, silt, few small to medium round pebbles, poorly sorted, loose, dry to moist.
14		2.1			
16	43	6.8		CL	(14.0 - 15.5) SILTY CLAY, few small round pebbles, cobble fragments, moderately stiff, hard, dry.
18		7.1		SM	(15.5 - 30.0) SAND, medium grain, silt, few small to medium round pebbles, trace small cobbles, dry.
20		6.6			
22	43	4.5			Note: higher silt content from 20 to 25 feet.
24		3.6			
26	42	5.1			Note: more small round pebbles from 25 to 30 feet.
28		5.7			
30		17.3			*Soil sample submitted for laboratory analysis from 28 to 30 feet.
32	42	14.1		SW	(30.0 - 36.0) SAND, medium to coarse grain, few small round pebbles, little silt, poorly sorted, loose, wet, olive brown.
34		6.5			*Groundwater sample submitted for laboratory analysis from 30 to 35 feet.
		7.1			

Notes:
bls: below land surface
HA: Hand Auger
*Indicates sample submitted for laboratory analysis.
NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
HK: Hydroknife
AMSL: Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **BOX-4**

TOTAL DEPTH: **65** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Secondary Source Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002B**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**7/6/2012**
DATE COMPLETED:	**8/14/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**731.64 feet AMSL**
NORTHING:	**621398.0590**
EASTING:	**1484496.3252**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
36					
38	45	6.2		SM	(36.0 - 40.0) SILTY SAND, medium to coarse grain, some small to medium round pebbles, trace clay, loose to moderately stiff, wet, olive brown.
40		3.1			
42	50	0.9		CL	(40.0 - 62.0) SILTY CLAY, some small round pebbles, poorly sorted, hard, dry, dark gray. Note: olive brown from 40 to 40.3 feet.
44		0.5			
46		1.3			Note: little fine sand from 43 to 44 feet.
48	48	3.3			Note: dark gray from 45 to 50 feet.
50		4.7			
52	48	4.1			
54		8.4			Note: becomes slightly sandy from 53 to 54 feet.
56		5.1			Note: more small round pebbles from 55 to 60 feet.
58	124	3.6			
60		2.8			
62		5.0			
64		4.6		ML	(62.0 - 64.0) SILT, little fine sand, moderately stiff, dry, dark gray.
66		3.1		CL	(64.0 - 65.0) SILTY CLAY, some small round pebbles, poorly sorted, hard, dry, dark gray. End of boring at 65 feet.

Notes:
bls: below land surface
HA: Hand Auger
*Indicates sample submitted for laboratory analysis.
NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
HK: Hydroknife
AMSL: Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **HFA-1**

TOTAL DEPTH: **55** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Secondary Source Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002B**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**7/9/2012**
DATE COMPLETED:	**8/8/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**731.99 feet AMSL**
NORTHING:	**623089.9746**
EASTING:	**1484513.0188**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0					
		NM		CONCRETE	(0.0 - 1.0) CONCRETE removed by coring.
2		NM		SW	(1.0 - 10.0) SAND, medium to coarse grain, small to large round pebbles, flat and round cobbles >8 inches in diameter, trace silt, poorly sorted, loose, dry, olive brown.
4	HK	NM			
6		NM			
8		NM			
10					
		24.3		SM	(10.0 - 20.0) SAND, medium grain, some silt, few small to medium round pebbles, poorly sorted, loose, dry, olive brown.
12	35	33.6			
14		38.6			
16	33	42.5			
18		45.9			
20					
		42.9		SM	(20.0 - 28.0) SAND, fine to medium grain, some silt, few small pebbles, poorly sorted, loose, dry, olive brown.
22	41	46.5			
24		47.5			
26	42	49.6			*Soil sample submitted for laboratory analysis from 26 to 28 feet.
28					(28.0 - 30.0) SILTY SAND, medium to coarse grain, few small pebbles, round, poorly sorted, moderately stiff, wet.
		49.7		SM	Note: small amount of silty clay at 30 feet.

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.
MSL: Above Mean Sea Level
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife

SOIL BORING LOG

BORING NO.: **HFA-1**

TOTAL DEPTH: **55** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Secondary Source Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002B**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**7/9/2012**
DATE COMPLETED:	**8/8/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**731.99 feet AMSL**
NORTHING:	**623089.9746**
EASTING:	**1484513.0188**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
30					*Groundwater sample submitted for laboratory analysis from 28 to 32 feet.
32	NR	NM			(30.0 - 40.0) NO RECOVERY. Note: <1 inch silty clay in shoe at 30 feet.
34		NM			
36		NM			
38		NM			
40		NM			
42	24	3.8		CL	(40.0 - 45.0) SILTY CLAY, few small round pebbles, poorly sorted, hard, dry, very dark gray brown.
44		2.0			
46		3.0		SW	Note: trace silt in bottom 6 inches. (45.0 - 52.0) SAND, medium to coarse grain with small round pebbles, few medium round pebbles, trace silt, poorly sorted, loose, wet.
48	58	7.8			*Groundwater sample submitted for laboratory analysis from 47 to 52 feet.
50		11.7			
52		5.9			
54	NM	5.4		CL	(52.0 - 55.0) SILTY CLAY, trace medium sand, some small to medium round pebbles, poorly sorted, hard, dry.
56		5.4			End of boring at 55 feet.

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.
MSL: Above Mean Sea Level
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife

SOIL BORING LOG

BORING NO.: **HFA-2**

TOTAL DEPTH: **56** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Secondary Source Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002B**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**7/9/2012**
DATE COMPLETED:	**8/10/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**732.05 feet AMSL**
NORTHING:	**623032.0561**
EASTING:	**1484499.6284**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0		NM		CONCRETE	(0.0 - 1.5) CONCRETE and asphalt removed by coring.
2	HK	NM		SW	(1.5 - 10.0) SAND, medium to coarse grain, some small to large round pebbles, few small to medium cobbles, poorly sorted, loose, dry.
4		NM			
6		NM			
8		NM			
10		31.2		SW	(10.0 - 11.0) SAND, medium grain, some small to medium pebbles, little silt, few small cobbles, poorly sorted, loose, wet. Note: clay fragments with black viscous material, staining, odor. *Soil sample submitted for laboratory analysis from 10 to 12 feet.
12	42	0.1		SW	(11.0 - 20.0) SAND, medium to coarse grain, some small to medium pebbles, round, poorly sorted, loose, dry, olive brown.
14		3.2			
16	40	4.1			
18		5.8			
20		1.2		SW	(20.0 - 24.0) SAND, medium to coarse grain, few small pebbles, trace silt, poorly sorted, loose, dry, olive brown.
22	44	3.1			
24		4.2		SW	(24.0 - 25.0) SAND, medium grain, little silt, poorly sorted, loose, dry to moist, olive brown.
26	45	5.7		SM	(25.0 - 33.0) SAND, medium grain, some small round pebbles, little clay, some silt, poorly sorted, moderately loose, wet, soft, olive brown. *Groundwater sample submitted for laboratory analysis from 25 to 30 feet.
28		4.3			

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.
MSL: Above Mean Sea Level
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife

SOIL BORING LOG

BORING NO.: **HFA-2**

TOTAL DEPTH: **56** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Secondary Source Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002B**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**7/9/2012**
DATE COMPLETED:	**8/10/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**732.05 feet AMSL**
NORTHING:	**623032.0561**
EASTING:	**1484499.6284**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
30					
	14	5.2			Note: some fine sand, higher silt content from 30 to 33 feet.
32					
	48	3.1			
34				CL	(33.0 - 45.0) SILTY CLAY, some small round pebbles, poorly sorted, hard, dry, dark gray brown.
		3.3			
36					
	61	2.1			
38					
		2.7			
40					Note: softer clay from 40 to 45 feet.
		2.8			
42	63				
		3.5			
44					
		8.5			
46				SM	(45.0 - 52.5) SAND, coarse grain with small to medium round pebbles, some silt, trace clay, poorly sorted, loose, dry, olive brown.
		10.6			
48	43				*Groundwater sample submitted for laboratory analysis from 45 to 50 feet.
		9.8			
50					
		5.9			
52					
	48	4.8		CL	(52.5 - 56.0) SILTY CLAY, few small to medium round pebbles, poorly sorted, hard, dry, dark gray.
54					
		3.2			
56					End of boring at 56 feet.
58					

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.
MSL: Above Mean Sea Level
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife

SOIL BORING LOG

BORING NO.: **HFA-3**

TOTAL DEPTH: **55** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Secondary Source Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002B**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**7/10/2012**
DATE COMPLETED:	**8/12/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**732.18 feet AMSL**
NORTHING:	**623062.7460**
EASTING:	**1484488.5266**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0	HK	NM		CONCRETE	(0.0 - 1.5) CONCRETE removed by coring.
2		NM		FILL	(1.5 - 10.0) SAND, medium to coarse, small to large gravel, some medium cobbles, trace silt, poorly sorted, loose, dry, brown, fill includes: metal, asphalt.
4		NM			
6		NM			
8		NM			
10	NM	3.2		SW	(10.0 - 14.0) SAND, medium grain, some small to medium round pebbles, little silt, trace small cobbles, poorly sorted, loose, dry.
12		5.3			
14		4.5		CL	(14.0 - 15.5) SILTY CLAY, pulverized rock, small to medium round pebbles, hard, dry.
16	NM	4.5		SM	(15.5 - 25.5) SILTY SAND, medium grain, few small round pebbles, poorly sorted, loose, dry.
18		2.5			
20	43	3.4			
22		6.7			*Soil sample submitted for laboratory analysis from 22 to 24 feet.
24		7.9			Note: becomes moist at 24.8 feet.
26	41	7.6		SW	(25.5 - 29.6) SAND, medium to coarse grain, some small round pebbles, little silt, trace clay, poorly sorted, loose, wet. *Groundwater sample submitted for laboratory analysis from 25 to 30 feet.
28		6.7			
30					(29.6 - 30.0) SILTY CLAY, few small round pebbles, poorly sorted, hard, dry, dark gray.

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.
MSL: Above Mean Sea Level
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife

SOIL BORING LOG

BORING NO.: **HFA-3**

TOTAL DEPTH: **55** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Secondary Source Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002B**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**7/10/2012**
DATE COMPLETED:	**8/12/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**732.18 feet AMSL**
NORTHING:	**623062.7460**
EASTING:	**1484488.5266**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
30	30	4.1		CL	(30.0 - 38.0) SAND, medium to coarse grain, some silt, few small to medium round pebbles, little clay, poorly sorted, loose, soft, wet, olive brown.
32		6.4		SM	
34	41	NM			
36		12.5			
38	59	16.8		SM	(38.0 - 40.0) SAND, fine grain, silt, poorly sorted, loose, wet, olive brown.
40		7.1		CL	(40.0 - 46.0) SILTY CLAY, few small round pebbles, poorly sorted, hard, dry, dark gray.
42		6.6			
44	61	26.6			
46		19.1		SM	*Groundwater sample submitted for laboratory analysis from 46 to 51 feet.
48	48	4.1		SW	(46.0 - 48.0) SILTY SAND, medium to coarse grain, trace small round pebbles, poorly sorted, moderately stiff, wet, gray.
50		1.9			(48.0 - 55.0) SAND, medium to coarse grain, some small round pebbles, little silt, poorly sorted, loose, wet.
52	63	1.8			
54		1.2			
56					End of boring at 55 feet.

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.
MSL: Above Mean Sea Level
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife

SOIL BORING LOG

BORING NO.: **WTANKF-1**

TOTAL DEPTH: **65** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Secondary Source Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002B**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/28/2012**
DATE COMPLETED:	**9/4/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**729.29 feet AMSL**
NORTHING:	**621690.6718**
EASTING:	**1483354.0145**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0				CONCRETE	(0.0 - 0.5) CONCRETE removed by coring.
2		NM		SW	(0.5 - 10.0) SAND, medium to coarse grain, medium to large pebbles, trace silt, poorly sorted, loose, dry, brown.
4	HK	NM			
6		NM			
8		NM			
10		NM			
12	34	4.0		CL	(10.0 - 12.0) SANDY CLAY with silt, some small to medium round pebbles, poorly sorted, stiff, moist, olive brown.
14		5.1	⊠ ⊠ ⊠	GM	(12.0 - 13.0) PEBBLES, small round with medium to coarse sand, some silt, few medium pebbles, poorly sorted, moist to wet, olive brown.
16	50	12.5		SM	(13.0 - 20.0) SAND, medium to coarse, some small round pebbles, some silt, poorly sorted, loose, dry, light olive brown. Note: higher silt content from 15 to 20 feet.
18		6.2			
20		5.8			
22	62	9.7		SM	(20.0 - 27.0) SANDY SILT, medium grain, some small to medium round pebbles, poorly sorted, loose, dry, light olive gray.
24		10.6			
26		6.8			
28	64	12.9			*Soil sample submitted for laboratory analysis from 26 to 28 feet.
30		8.9		SM	(27.0 - 32.0) SAND, medium grain, silt, some small to medium round pebbles, trace clay, poorly sorted, moderately loose, moist, olive brown. *Groundwater sample submitted for laboratory analysis from 30 to 35 feet. Note: wet from 30 to 32 feet.
32	72	8.0			
34		3.5	⊠ ⊠ ⊠	GM	(32.0 - 36.0) PEBBLES, small round, some silt, few medium to large round pebbles, trace medium sand, loose, poorly sorted, wet, olive brown.
		4.7	⊠ ⊠ ⊠		

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.
MSL: Above Mean Sea Level
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife

SOIL BORING LOG

BORING NO.: **WTANKF-1**

TOTAL DEPTH: **65** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Secondary Source Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002B**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/28/2012**
DATE COMPLETED:	**9/4/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**729.29 feet AMSL**
NORTHING:	**621690.6718**
EASTING:	**1483354.0145**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
36			⊠ ⊠ ⊠		
38	68	10.4		CL	(36.0 - 46.0) SILTY CLAY, trace medium sand, some small round medium pebbles, poorly sorted, hard, wet, dark gray.
		7.6			
40	84	5.1			Note: dry from 40 to 46 feet.
42		4.2			
44		7.9			
46		10.1		SM	(46.0 - 50.0) SAND, medium to coarse grain, some small round pebbles, some silt, trace clay, poorly sorted, loose, wet, olive brown.
48		6.1			*Groundwater sample submitted for laboratory analysis from 46 to 51 feet.
50	71	3.2		GW	(50.0 - 60.0) PEBBLES, small round, with medium sand, trace silt, poorly sorted, loose, wet, olive brown.
52		2.2			
54		2.5			
56	70	4.3			*Groundwater sample submitted for laboratory analysis from 55 to 60 feet.
58		1.9			Note: well sorted pebbles from 57 to 58 feet.
60					Note: <1 inch silty clay in bottom of core barrel.
62	64	1.8		CL	(60.0 - 65.0) SILTY CLAY, some small to medium round pebbles, trace sand, dry, gray.
64		2.1			
66		1.9			End of boring at 65 feet.

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.
MSL: Above Mean Sea Level
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife

SOIL BORING LOG

BORING NO.: **WTANKF-2**

TOTAL DEPTH: **65** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Secondary Source Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002B**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/29/2012**
DATE COMPLETED:	**9/10/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**728.65 feet AMSL**
NORTHING:	**621772.2486**
EASTING:	**1483325.4789**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0	HK	NM		CONCRETE	(0.0 - 0.3) CONCRETE removed by coring.
2		NM		FILL	(0.3 - 9.0) FILL, medium to coarse grain, small gravel, trace silt, poorly sorted, loose, dry, brown.
4		NM			
6		NM			
8		NM			
10		NM		FILL	(9.0 - 10.0) FILL, loose, wet to moist.
12	52	1.3		FILL	(10.0 - 20.0) SILTY SAND, medium to coarse grain, some clay, some medium to small round pebbles, poorly sorted, stiff, moist, reddish olive brown.
14		1.6			
16	52	3.6			Note: fill includes: brick fragments at 14 feet.
18		2.8			Note: dry from 15 to 20 feet.
20		4.0			Note: some staining and odor at approximately 15 feet.
22	54	2.4		SM	(20.0 - 25.0) SILTY SAND, medium grain, some small to medium round pebbles, poorly sorted, loose, dry, olive brown.
24		4.9			*Soil sample submitted for laboratory analysis from 22 to 24 feet.
26	53	8.3		SW	(25.0 - 35.5) SAND, medium to coarse grain, some small round pebbles, trace silt, poorly sorted, loose, wet, olive brown.
28		1.7			*Groundwater sample submitted for laboratory analysis from 25 to 30 feet.
30		5.6			
32	72	1.5			Note: more small round pebbles from 32 to 35.5 feet.
34		0.9			
		3.7			

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.
MSL: Above Mean Sea Level
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife

SOIL BORING LOG

BORING NO.: **WTANKF-2**

TOTAL DEPTH: **65** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Secondary Source Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002B**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/29/2012**
DATE COMPLETED:	**9/10/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**728.65 feet AMSL**
NORTHING:	**621772.2486**
EASTING:	**1483325.4789**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
36					
38	69	0.6		CL	(35.5 - 50.0) SILTY CLAY, some small to medium round pebbles, poorly sorted, hard, dry, gray.
		1.9			
40		2.8			
42	49	4.7			
44		3.1			
46	38	8.9			
48		9.2			
50					Note: some sand and few small cobbles from 49 to 50 feet.
		4.5		SM	(50.0 - 51.0) SILTY SAND, coarse grain, some small to medium round pebbles, poorly sorted, stiff, wet, olive brown. *Groundwater sample submitted for laboratory analysis from 50 to 55 feet.
52	51	2.8		SM	
54		3.0			(51.0 - 59.0) SAND, medium to coarse grain, some silt, few small to medium round pebbles, poorly sorted, loose, wet, olive brown. Note: larger pebbles from 55 to 59 feet.
56		1.3			
58	62	1.8			
60		0.8		CL	(59.0 - 65.0) SILTY CLAY, some small round pebbles, poorly sorted, hard, dry, gray.
62	71	2.1			
64		2.9			
66					End of boring at 65 feet.

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.
MSL: Above Mean Sea Level
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife

BORING/WELL CONSTRUCTION LOG

WELL NO.: **RMW-87/WTANKF-3**

TOTAL DEPTH: **100 feet bls**

PROJECT INFORMATION

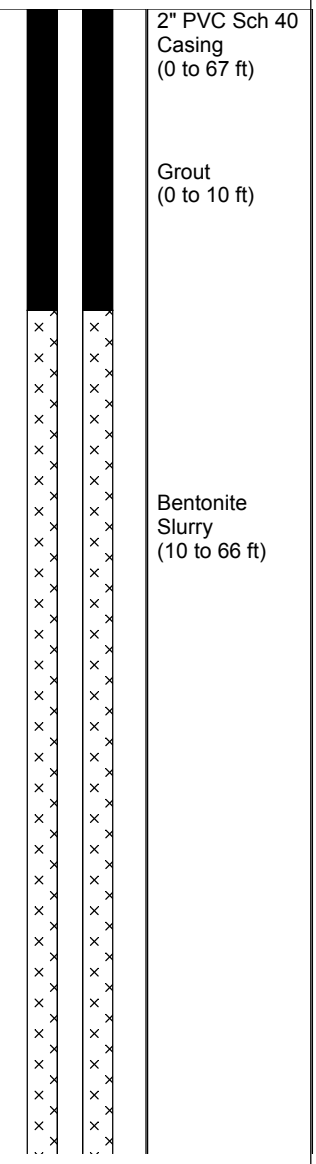
CLIENT:	**RACER Trust**
PROJECT:	**Secondary Source Area Investigation**
CITY, STATE:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002B**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/28/2012**
DATE COMPLETED:	**9/06/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
TOP OF CASING:	**728.01 feet AMSL**
GROUND ELEVATION:	**728.44 feet AMSL**
NORTHING:	**621671.6198**
EASTING:	**1483277.4116**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0		NM		CONCRETE	(0.0 - 0.3) CONCRETE removed by coring.
2		NM		SW	(0.3 - 12.0) SAND, medium to coarse grain, small to medium pebbles, round, trace silt, poorly sorted, dry, brown.
4		NM			
6	HK	NM			
8		NM			
10		0.2			
12	64	4.2		SM	(12.0 - 20.0) SILTY SAND, medium grain, some small to medium round pebbles, trace small cobbles, poorly sorted, loose, dry, light gray. *Soil sample submitted for laboratory analysis from 12 to 14 feet. Note: olive brown and dry from 15 to 18 feet. Note: higher silt content, color variations from white, tan, gray from 18 to 20 feet.
14		0.4			
16	54	1.7			
18		0.8			
20		1.0		SW	(20.0 - 25.0) SAND, medium grain with silt, some small to medium round pebbles, poorly sorted, loose, dry, olive brown.
22	72	1.3			
24		1.2			*Groundwater sample submitted for laboratory analysis from 24 to 29 feet. Note: moist at 24.5 feet.
26		2.5		SW	
28	64	1.8			(25.0 - 30.0) SAND, medium grain, some medium round pebbles, little silt, poorly sorted, loose, wet, olive brown.
30		2.3		GW	(30.0 - 35.0) PEBBLES, small round, some medium round pebbles, little coarse sand, little silt, poorly sorted, loose, wet, olive brown.
32	62	1.0			
34		1.6			
36		0.3		CL	(35.0 - 43.0) SILTY CLAY, some small round pebbles, trace medium sand, poorly sorted, hard, dry, gray.
38	65				

WELL CONSTRUCTION DETAILS



Notes:
bls: below land surface
HA: Hand Auger
NR: Not Recorded
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
HK: Hydroknife
AMSL: Above Mean Sea Level

BORING/WELL CONSTRUCTION LOG

WELL NO.: **RMW-87/WTANKF-3**

TOTAL DEPTH: **100 feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Secondary Source Area Investigation**
CITY, STATE:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002B**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/28/2012**
DATE COMPLETED:	**9/06/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
TOP OF CASING:	**728.01 feet AMSL**
GROUND ELEVATION:	**728.44 feet AMSL**
NORTHING:	**621671.6198**
EASTING:	**1483277.4116**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION	WELL CONSTRUCTION DETAILS
38		1.1				Bentonite Slurry (10 to 66 ft)
40	56	0.7				
42		2.2		GW	(43.0 - 56.0) PEBBLES, small round, few medium round pebbles, trace medium to coarse sand, poorly sorted, loose, wet, olive brown. *Groundwater sample submitted for laboratory analysis from 45 to 50 feet.	
44		2.1				
46	62	2.2				
48		3.0				
50		2.3				
52	64	1.2				
54		1.0				
56		0.6		SM	(56.0 - 59.0) SILTY SAND, medium to coarse grain, some clay, few small to medium round pebbles, poorly sorted, moderate stiff, wet to moist, gray.	
58	49	0.3				
60		0.2		CL	(59.0 - 65.0) SILTY CLAY, some small to medium round pebbles, poorly sorted, hard, dry, gray. Note: trace sand from 60 to 65 feet.	
62	62	0.3				
64		0.2				
66		0.4		SM	(65.0 - 75.0) SILTY SAND, medium to coarse grain, some small round pebbles, few medium round pebbles, loose to moderate stiff, wet, olive brown. *Groundwater sample submitted for laboratory analysis from 65 to 70 feet. Note: less silt from 70 to 75 feet.	Sand Pack (66 to 77 ft)
68	60	0.3				
70		0.1				
72	64	0.3				2" Screen slot size 0.10 (67 to 77 ft)
74		1.4				
76				SM	(75.0 - 78.0) SILTY SAND, medium to coarse grain, few small to	

Notes:
bls: below land surface
HA: Hand Auger
NR: Not Recorded
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
HK: Hydroknife
AMSL: Above Mean Sea Level

BORING/WELL CONSTRUCTION LOG

WELL NO.: **RMW-87/WTANKF-3**

TOTAL DEPTH: **100 feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Secondary Source Area Investigation**
CITY, STATE:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002B**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/28/2012**
DATE COMPLETED:	**9/06/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
TOP OF CASING:	**728.01 feet AMSL**
GROUND ELEVATION:	**728.44 feet AMSL**
NORTHING:	**621671.6198**
EASTING:	**1483277.4116**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION	WELL CONSTRUCTION DETAILS
76						
78	62	1.0			medium round pebbles, poorly sorted, loose, olive brown, wet.	Formation Collapsed (77 to 100 ft)
		0.9		ML	(78.0 - 80.0) SILT, dense, moist, gray.	
80		1.1		SW	(80.0 - 85.0) SAND, coarse with small round pebbles, trace silt, poorly sorted, loose, wet, olive brown. *Groundwater sample submitted for laboratory analysis from 80 to 85 feet.	
82	70	1.0				
84		1.1			Note: 2 inch pebble seam at 82 and 84 feet.	
86		0.2		SP	(85.0 - 95.0) SAND, medium to coarse grain, trace silt, well sorted, loose, wet, olive brown.	
88	68	0.3				
90		0.6			Note: more medium sand from 90 to 95 feet.	
92	65	1.0				
94		0.8		SM	(95.0 - 100.0) SAND, medium to coarse grain, some small round pebbles, some silt, few small cobbles towards end of borehole, poorly sorted, loose, wet, olive brown.	
96		0.8				
98	71	0.6			*Groundwater sample submitted for laboratory analysis from 95 to 100 feet.	
100					End of boring at 100 feet.	
102						

Notes:
bls: below land surface
HA: Hand Auger
NR: Not Recorded
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
HK: Hydroknife
AMSL: Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **WTANKF-4**

TOTAL DEPTH: **70** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Secondary Source Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002B**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/28/2012**
DATE COMPLETED:	**9/17/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**732.85 feet AMSL**
NORTHING:	**621636.1699**
EASTING:	**1483412.6859**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0					
2	HK	NM		CONCRETE	(0.0 - 1.0) CONCRETE removed by coring.
4		NM		SW	(1.0 - 10.0) SAND, medium to coarse grain, small to large rounded gravel, medium cobbles, trace silt, poorly sorted, loose, brown.
6		NM			
8		NM			
10		NM			
12	52	2.4		SM	(10.0 - 14.0) SAND, medium to coarse grain, some small to medium round pebbles, some silt, poorly sorted, loose, moist, olive brown.
14		6.9			
16		6.0		ML	(14.0 - 16.0) SILT, some medium sand, few small to medium round pebbles, poorly sorted, loose, dry, light gray.
18	54	5.7		SM	(16.0 - 30.0) SILTY SAND, medium grain, some small round pebbles, poorly sorted, loose, dry, olive brown.
20		5.9			
22	50	3.8			
24		5.5			
26	58	3.3			Note: higher silt content from 25 to 30 feet.
28		9.4			
30		10.2			*Soil sample submitted for laboratory analysis from 28 to 30 feet.
32	62	5.0		SM	Note: slightly moist from 29.5 to 30 feet.
34		4.2			(30.0 - 35.0) SILTY SAND, medium grain, some small to medium round pebbles, poorly sorted, loose to moderate stiff, wet at 30 feet, olive brown. *Groundwater sample submitted for laboratory analysis from 30 to 35 feet.
36		3.5		GM	(35.0 - 40.0) PEBBLES, small round with some medium sand, some silt, poorly sorted, loose, wet,

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.
MSL: Above Mean Sea Level
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife

SOIL BORING LOG

BORING NO.: **WTANKF-4**

TOTAL DEPTH: **70** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Secondary Source Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002B**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/28/2012**
DATE COMPLETED:	**9/17/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**732.85 feet AMSL**
NORTHING:	**621636.1699**
EASTING:	**1483412.6859**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
36					
38	60	1.6			olive brown.
		0.6			
40					
42	52	4.2		CL	(40.0 - 45.0) SILTY CLAY, some small to medium round pebbles, poorly sorted, hard, wet, gray.
		2.1			
44		2.0			
46	65	1.4		GM	(45.0 - 57.0) PEBBLES, small round with medium sand, some silt, poorly sorted, loose, wet, olive brown. *Groundwater sample submitted for laboratory analysis from 45 to 50 feet.
48		2.5			
50		1.7			
52	60	1.9			
54		2.3			
56	66	2.2			
58		1.1		ML	(57.0 - 62.0) SILT, small to medium round pebbles, little fine to medium sand, poorly sorted, stiff, moist, gray.
60		0.6			*Groundwater sample submitted for laboratory analysis from 60 to 65 feet.
62	60	1.0		SM	(62.0 - 65.0) SILTY SAND, medium to coarse grain, some clay, some small to medium round pebbles, poorly sorted, moderately stiff, wet, gray. Note: small amount of silty clay in the shoe.
64		0.2			
66	74	0.1		CL	(65.0 - 70.0) SILTY CLAY, some small to medium round pebbles, poorly sorted, hard, dry, gray. Note: medium sand, moist, tan from 69.5 to 70 feet.
68		0.5			
70					End of boring at 70 feet.
72					

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.
MSL: Above Mean Sea Level
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife

BORING/WELL CONSTRUCTION LOG

WELL NO.: **RMW-86/BLDG21-1**

TOTAL DEPTH: **105 feet bls**

PROJECT INFORMATION

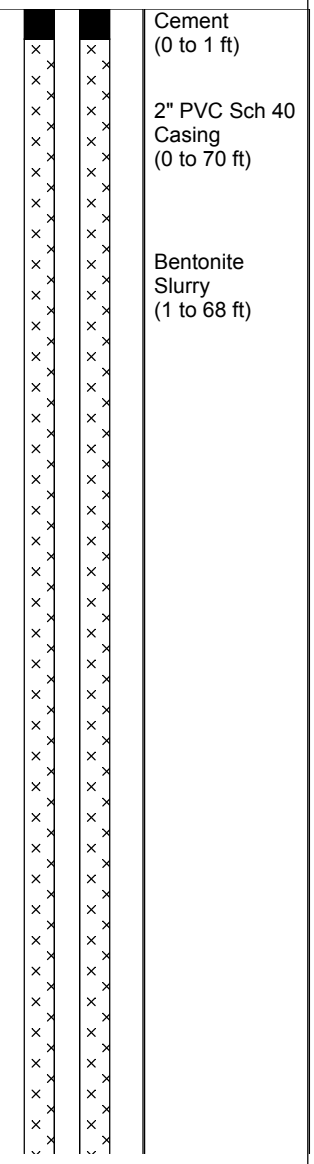
CLIENT:	**RACER Trust**
PROJECT:	**Secondary Source Area Investigation**
CITY, STATE:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002B**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/28/2012**
DATE COMPLETED:	**8/24/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
TOP OF CASING:	**729.22 feet AMSL**
GROUND ELEVATION:	**729.60 feet AMSL**
NORTHING:	**620409.7071**
EASTING:	**1483253.2715**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0	HK	NM		CONCRETE	(0.0 - 0.6) CONCRETE removed by coring.
2		NM		SW	(0.6 - 10.0) SAND, medium to coarse grain, medium to large round pebbles, some small cobbles, trace silt, poorly sorted, loose, dry, brown.
4		NM			
6		NM			
8		NM			
10	48	0.0		SM	(10.0 - 14.0) SAND, medium grain, silt, some small to medium pebbles, little clay, poorly sorted, loose, moist, very dark grayish brown.
12		0.0			
14	42	0.2		CL	Note: wood fill at 13.5 feet.
16		0.0		SM	(14.0 - 16.5) SILTY CLAY, some medium sand, few small pebbles, poorly sorted, moderately stiff, moist, dark olive brown.
18		1.0			(16.5 - 26.0) SILTY SAND, medium grain, few small to medium pebbles, poorly sorted, loose, dry, light gray. *Soil sample submitted for laboratory analysis from 18 to 20 feet. Note: dry, olive brown from 20 to 25 feet.
20	60	0.5			
22		0.4			
24		0.1			Note: cobble, white at 24.5 feet.
26	52	0.0		SC	(26.0 - 27.0) SAND, medium grain with clay, some silt, few small pebbles, poorly sorted, moderately loose, moist, olive brown.
28		0.2		SM	(27.0 - 31.0) SAND with small round pebbles, some silt, trace clay, poorly sorted, loose, wet at 27 feet. dark olive brown. *Groundwater sample submitted for laboratory analysis from 27 to 32 feet.
30	40	0.0			
32	86	0.4		CL	
34		0.7		SM	(31.0 - 32.0) SANDY CLAY, medium grain, poorly sorted, moderately loose, moist, olive brown.
36		0.8		SM	(32.0 - 35.0) SAND, coarse grain with small round pebbles, some silt, trace clay, poorly sorted, loose, wet, olive brown.
38				SM	

WELL CONSTRUCTION DETAILS



Notes:
bls: below land surface
HA: Hand Auger
NR: Not Recorded
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
HK: Hydroknife
AMSL: Above Mean Sea Level

BORING/WELL CONSTRUCTION LOG

WELL NO.: **RMW-86/BLDG21-1**

TOTAL DEPTH: **105 feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Secondary Source Area Investigation**
CITY, STATE:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002B**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/28/2012**
DATE COMPLETED:	**8/24/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
TOP OF CASING:	**729.22 feet AMSL**
GROUND ELEVATION:	**729.60 feet AMSL**
NORTHING:	**620409.7071**
EASTING:	**1483253.2715**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION	WELL CONSTRUCTION DETAILS
38		0.1			(35.0 - 36.0) SANDY SILT, some clay, some medium round pebbles, poorly sorted, loose, moist, olive brown.	
40	54	0.3			(36.0 - 47.0) SAND, medium to coarse grain, silt, some small round pebbles increasing with depth, trace clay, poorly sorted, loose, wet, olive brown. Note: higher clay content from 40 to 45 feet. *Groundwater sample submitted for laboratory analysis from 40 to 45 feet.	Bentonite Slurry (1 to 68 ft)
42		0.3				
44		0.4				
46	61	0.7		SC	(47.0 - 48.0) SAND with clay, coarse grain, poorly sorted, dense, wet, olive brown.	
48		2.1		SW	(48.0 - 53.0) SAND, medium to coarse grain, few small round pebbles, poorly sorted, loose, wet, olive brown.	
50	60	0.1				
52		0.3			*Groundwater sample submitted for laboratory analysis from 51 to 56 feet.	
54		0.5		SM	(53.0 - 56.0) SILTY SAND, medium to coarse grain, little clay, poorly sorted, moderately stiff, wet, olive brown.	
56	33	1.2		SC	(56.0 - 60.5) SILTY CLAY, sand, medium grain, some small to medium round pebbles, poorly sorted, stiff to moderately stiff, olive brown.	
58		3.2				
60		0.1			Note: dry from 60 to 60.5 feet.	
62	56	0.0		ML	(60.5 - 61.0) SILT, moderately loose, moist, dark gray.	
64		0.1		CL	(61.0 - 68.0) SILTY CLAY, some small to medium round pebbles, poorly sorted, hard, dry, dark gray.	
66	78	0.1				Bentonite Chips (68 to 69 ft)
68		0.0		SW	(68.0 - 75.0) SAND, medium to coarse grain, some small round pebbles, little silt, poorly sorted, loose, wet, olive brown. *Groundwater sample submitted for laboratory analysis from 68 to 73 feet.	Sand Pack (69 to 80 ft)
70		0.0				
72	65	0.4				
74		0.2		SW	(75.0 - 85.0) SAND, fine to medium grain, some silt, few small round	2" Screen slot
76						

Notes:
bls: below land surface
HA: Hand Auger
NR: Not Recorded
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
HK: Hydroknife
AMSL: Above Mean Sea Level

BORING/WELL CONSTRUCTION LOG

WELL NO.: **RMW-86/BLDG21-1**

TOTAL DEPTH: **105 feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Secondary Source Area Investigation**
CITY, STATE:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002B**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/28/2012**
DATE COMPLETED:	**8/24/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
TOP OF CASING:	**729.22 feet AMSL**
GROUND ELEVATION:	**729.60 feet AMSL**
NORTHING:	**620409.7071**
EASTING:	**1483253.2715**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
76					pebbles, poorly sorted, loose, wet, olive brown.
78	70	0.1			
		0.2			
80		0.6			Note: more fine sand from 80 to 85 feet.
82		1.2			
84	103	0.3			
86		0.1		SW	(85.0 - 94.0) SAND, medium to coarse grain, some small round pebbles, trace silt, poorly sorted, loose, wet, olive brown. *Groundwater sample submitted for laboratory analsysis from 85 to 90 feet.
88		0.1			
90		0.3			
92	48	0.2			
94		0.1		SM	(94.0 - 95.0) SILT with medium sand, some clay, some small round pebbles, poorly sorted, stiff to dense, moist, gray.
96		0.0		SM	(95.0 - 105.0) SILTY SAND, medium to coarse grain, some small to medium round pebbles, poorly sorted, loose, dry, light gray.
98	50	0.0			
100		0.2			Note: less silt, wet from 100 to 105 feet. *Groundwater sample submitted for laboratory analysis from 100 to 105 feet.
102	53	0.3			
104		0.2			
106					End of boring at 105 feet.

WELL CONSTRUCTION DETAILS

size 0.10 (70 to 80 ft)

Formation Collapsed (80 to 105 ft)

Notes:
bls: below land surface
HA: Hand Auger
NR: Not Recorded
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
HK: Hydroknife
AMSL: Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **BLDG21-2**

TOTAL DEPTH: **65** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Secondary Source Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002B**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/27/2012**
DATE COMPLETED:	**8/20/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**730.01 feet AMSL**
NORTHING:	**620508.0325**
EASTING:	**1483367.7447**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0	HK	NM		SW	(0.0 - 10.0) SAND, medium to coarse grain, small to large round pebbles, poorly sorted, loose, dry, brown to tan.
2		NM			
4		NM			
6		NM			
8		NM			
10	41	1.3		CL	Note: hydroknifed to 10 feet but collapsed at 9.6 feet. (10.0 - 16.0) SANDY CLAY, some silt, medium to coarse grain, few small round pebbles, poorly sorted, soft, medium plasticity, moist, olive brown.
12		2.6			
14		4.8			
16	42	4.0		SP	(16.0 - 22.0) SAND, fine grain, trace small round pebbles, loose, dry, olive brown. *Soil sample submitted for laboratory analysis from 18 to 20 feet.
18		10.2			
20	36	5.7			
22		8.2		SM	(22.0 - 25.0) SAND, medium to coarse grain, some small to medium round pebbles, some silt, poorly sorted, loose, dry, olive brown.
24		7.2			Note: moist from 24 to 25 feet.
26	47	4.2		SW	(25.0 - 30.0) SAND, medium to coarse grain with small to medium round pebbles, little silt, poorly sorted, loose, wet. *Groundwater sample submitted for laboratory analysis from 25 to 30 feet.
28		5.8			
30	125	0.2		SW	(30.0 - 34.0) SAND, coarse grain with small round pebbles, trace silt, loose, poorly sorted, wet, olive brown.
32		0.2			
34		0.6		SW	(34.0 - 36.0) SAND, medium to coarse grain, few small round pebbles, trace silt, poorly sorted, loose, wet, olive brown.
36		0.2		GW	(36.0 - 43.0) PEBBLES, small round, few medium with medium to coarse grain sand, little silt, trace clay, poorly sorted, loose, wet, olive brown.
38		0.0			
40					

Notes:
bls: below land surface
HA: Hand Auger
*Indicates sample submitted for laboratory analysis.
NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
HK: Hydroknife
AMSL: Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **BLDG21-2**

TOTAL DEPTH: **65** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Secondary Source Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002B**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/27/2012**
DATE COMPLETED:	**8/20/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**730.01 feet AMSL**
NORTHING:	**620508.0325**
EASTING:	**1483367.7447**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
40	40	0.0			*Groundwater sample submitted for laboratory analysis from 40 to 45 feet.
42		0.0			
44		0.0		SW	(43.0 - 55.0) SAND, medium to coarse grain, some small to medium round pebbles, trace silt, few small cobbles, poorly sorted, loose, wet, olive brown.
46	38	0.1			
48		3.6			
50	83	0.6			Note: higher silt content from 50 to 55 feet. *Groundwater sample submitted for laboratory analysis from 50 to 55 feet.
52		0.1			
54		0.8		ML	(55.0 - 57.0) SILT, trace fine grain sand, dense, wet, gray.
56		0.6		CL	(57.0 - 59.0) SILTY CLAY, few small round pebbles, poorly sorted, hard, dry, gray.
58		0.2		ML	(59.0 - 60.0) SILT, trace clay, trace small round pebbles, poorly sorted, dense, gray.
60	64	0.3		SM	(60.0 - 60.5) SAND, fine grain with silt, loose, wet, gray.
62		0.2		CL	(60.5 - 65.0) SILTY CLAY, few small to medium round pebbles, poorly sorted, hard, dry, gray.
64		0.2			
66					End of boring at 65 feet.

Notes:
bls: below land surface
HA: Hand Auger
*Indicates sample submitted for laboratory analysis.
NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
HK: Hydroknife
AMSL: Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **BLDG21-3**

TOTAL DEPTH: **65** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Secondary Source Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002B**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/27/2012**
DATE COMPLETED:	**8/21/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**729.86 feet AMSL**
NORTHING:	**620649.9905**
EASTING:	**1483394.8308**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0	HK	NM		FILL	(0.0 - 9.6) SAND, medium to coarse grain with small to large rounded gravel to cobbles, poorly sorted, loose, dry. Fill includes: concrete and wood. Note rebar found at 4 inches, offset to avoid.
2		NM			
4		NM			
6		NM			Note: sheet metal at 5 feet. Note: more fill debris, concrete and wood from 6 to 9.6 feet.
8		NM			
10	51	0.1		CL	(9.6 - 12.5) SANDY SILTY CLAY, some small round pebbles, poorly sorted, moderately stiff, moist to dry with depth, black to gray to brown with depth. *Soil sample submitted for laboratory analysis from 10 to 12 feet.
12		0.1		SM	(12.5 - 21.0) SAND, medium grain with silt, some small to medium round pebbles, poorly sorted, loose, dry, olive brown.
14		0.0			
16	62	0.1			Note: few small cobbles from 15 to 20 feet.
18		0.1			
20		0.1		GW	(21.0 - 22.0) SMALL PEBBLES, round, little medium grain sand, poorly sorted, wet, olive brown.
22	60	0.2		SM	(22.0 - 26.5) SILTY SAND, medium grain, some small to medium round pebbles, poorly sorted, loose, dry, olive brown.
24		0.3			*Soil sample submitted for laboratory analysis from 24 to 26 feet.
26	58	0.0		GM	(26.5 - 33.5) PEBBLES, small and round with silt, some medium grain sand, poorly sorted, moderately loose, wet, olive brown. *Groundwater sample submitted for laboratory analysis from 27 to 32 feet.
28		0.4			
30	56	0.0			
32		0.0			
34					

Notes:
bls: below land surface
HA: Hand Auger
*Indicates sample submitted for laboratory analysis.
NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
HK: Hydroknife
AMSL: Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **BLDG21-3**

TOTAL DEPTH: **65** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Secondary Source Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002B**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/27/2012**
DATE COMPLETED:	**8/21/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**729.86 feet AMSL**
NORTHING:	**620649.9905**
EASTING:	**1483394.8308**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
34		0.1		ML	(33.5 - 35.0) SILT, few small round pebbles, trace sand, poorly sorted, dense, wet, olive brown.
36	56	0.4		ML	(35.0 - 41.0) SANDY SILT, interbedded lenses of silt and medium grain sand, trace small round pebbles, well sorted, dense, wet, olive brown.
38		0.1			
40	56	0.1			
42		0.2		CL	(41.0 - 44.0) SILTY CLAY, some small to medium round pebbles, trace sand, poorly sorted, hard, dry, dark gray.
44	53	0.1		SW	(44.0 - 52.5) SAND with small round pebbles, coarse grain, poorly sorted, loose, wet, olive brown. *Groundwater sample submitted for laboratory analysis from 45 to 50 feet.
46		0.3			
48		0.2			
50	60	0.2			
52		0.1		ML	(52.5 - 55.0) SILT, dense, wet, gray.
54		0.0			
56	42	0.1		CL	(55.0 - 65.0) SILTY CLAY, small to medium round pebbles, trace sand, medium grain, poorly sorted, hard to moderately hard, dry, dark gray.
58		0.1			
60	36	0.0			Note: dry, harder from 60 to 65 feet.
62		0.0			
64		0.1			
66					End of boring at 65 feet.

Notes:
bls: below land surface
HA: Hand Auger
*Indicates sample submitted for laboratory analysis.
NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
HK: Hydroknife
AMSL: Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **BLDG21-4**

TOTAL DEPTH: **75** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Secondary Source Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002B**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**7/09/2012**
DATE COMPLETED:	**8/22/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**729.63 feet AMSL**
NORTHING:	**620649.9905**
EASTING:	**1483394.8308**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0	HK	NM		FILL	(0.0 - 9.8) FILL, medium to coarse grain sand, large gravel, some small to medium cobbles, poorly sorted, loose, dry. Fill includes: metal, plastic, wood, pipes, rebar.
2		NM			
4		NM			
6		NM			
8		NM			
10	47	0.0		ML	(9.8 - 15.0) SANDY SILT, medium grain, some small to medium round pebbles, poorly sorted, loose, moist to dry, olive brown. Note: light gray, few small cobbles from 12 to 15 feet. *Soil samples submitted for laboratory analysis from 14 to 15 feet and 15 to 16 feet.
12		0.1			
14		0.7			
16	51	6.3		CL	(15.0 - 16.5) SILTY CLAY with some medium grain sand, some medium round pebbles, poorly sorted, moderately dense, moist, olive brown.
18		17.1		ML	(16.5 - 20.0) SANDY SILT, medium grain, some small to medium round pebbles, poorly sorted, loose, dry, light olive brown. Note: more sand with depth. *Soil sample submitted for laboratory analysis from 18 to 20 feet.
20	58	2.7		ML	(20.0 - 22.0) SILT, some small to medium round pebbles, poorly sorted, loose, dry, pale brown.
22		4.9		SM	(22.0 - 25.3) SAND, fine to medium grain with silt, some medium round pebbles, trace small cobbles, poorly sorted, loose, dry, light olive brown.
24		2.3			
26	56	0.7		ML ▽	(25.3 - 27.5) SILT with medium grain sand, some small to medium round pebbles, poorly sorted, moderately dense, wet, light gray. *Groundwater sample submitted for laboratory analysis from 27 to 32 feet.
28		0.6		SW	(27.5 - 38.0) SAND, medium to coarse grain with small round pebbles, little silt, poorly sorted, loose, wet, olive brown.
30					

Notes:
bls: below land surface
HA: Hand Auger
*Indicates sample submitted for laboratory analysis.
NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
HK: Hydroknife
AMSL: Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **BLDG21-4**

TOTAL DEPTH: **75** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Secondary Source Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002B**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**7/09/2012**
DATE COMPLETED:	**8/22/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**729.63 feet AMSL**
NORTHING:	**620649.9905**
EASTING:	**1483394.8308**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
30					
	28	0.0			
32		0.0			Note: more small round pebbles from 32 to 38 feet.
34		0.0			
36	94	0.0			
38		0.0		SM	(38.0 - 50.0) SAND with small round pebbles, medium to coarse grain, silt, poorly sorted, loose, wet, olive brown.
40		0.1			Note: more silt with depth.
42	42	0.0			
44		0.0			
46	46	0.1			*Groundwater sample submitted for laboratory analysis from 45 to 50 feet.
48		0.0			
50		0.4		SM	Note: small amount of clay from 49.5 to 50 feet. (50.0 - 58.0) SILTY SAND, medium grain, trace small round pebbles, poorly sorted, moderately stiff, moist, olive brown.
52	44	0.2			
54		0.6			Note: cobbles at 55 feet.
56		0.6			
58	50	0.6		ML	(58.0 - 60.0) SILT, moderately stiff, slight black staining at 58 feet, moist, gray. *Saturated soil sample submitted for laboratory analysis from 58 to 60 feet.
60					

Notes:
bls: below land surface
HA: Hand Auger
*Indicates sample submitted for laboratory analysis.
NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
HK: Hydroknife
AMSL: Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **BLDG21-4**

TOTAL DEPTH: **75** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Secondary Source Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002B**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**7/09/2012**
DATE COMPLETED:	**8/22/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**729.63 feet AMSL**
NORTHING:	**620649.9905**
EASTING:	**1483394.8308**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
60					
62	62	0.1		CL	(60.0 - 64.0) SILTY CLAY, some small to medium round pebbles, trace sand, poorly sorted, hard, dry, dark gray.
		0.2			
64		0.5		SM	(64.0 - 65.0) SILTY SAND with pebbles, clay, medium to coarse grain, small sub-rounded pebbles, poorly sorted, moderate stiff, dry, gray.
66	NM	0.1		CL	(65.0 - 69.0) SILTY CLAY, few small to medium round pebbles, poorly sorted, hard, dry, dark gray.
68		0.1			
70		0.1		SW	(69.0 - 75.0) SAND with small round pebbles, coarse grain, trace silt, poorly sorted, loose, wet, olive brown.
72		0.1			
		0.0			
74		0.0			
76					End of boring at 75 feet.

Notes:
bls: below land surface
HA: Hand Auger
*Indicates sample submitted for laboratory analysis.
NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
HK: Hydroknife
AMSL: Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **NP-1**

TOTAL DEPTH: **100** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Northern Perimeter Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002C**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**9/7/2012**
DATE COMPLETED:	**9/8/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**735.73 feet AMSL**
NORTHING:	**625085.6992**
EASTING:	**1483936.5303**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0	Hand Auger	NM		SW	(0.0 - 10.0) SAND, coarse grain, some small to medium round pebbles, some silt, poorly sorted, loose, dry, light olive brown.
2		2.0			
4	58	0.6			Note: dry, more fine sand and silt from 3 to 10 feet.
6		2.8			
8		1.0			
10	50	0.6		SM	(10.0 - 20.0) SILTY SAND, medium grain, some small to medium round pebbles, poorly sorted, loose, dry, olive brown.
12		0.4			
14	46	0.9			Note: dry, light olive brown, higher silt content from 15 to 20 feet.
16		2.3			
18		1.2			
20	52	6.6		ML	(20.0 - 30.0) SILT, some small round pebbles, little medium sand, poorly sorted, loose, dry, light gray.
22		5.2			
24	51	0.9			Note: slightly wet from 26 to 28 feet.
26		6.3			
28		2.6			
30	50	6.4		SM	(30.0 - 40.0) SILTY SAND, medium grain, some small to medium round pebbles, poorly sorted, loose, dry.
32		10.8			Note: wet, trace clay, moderately stiff from 33 to 35 feet. *Groundwater sample submitted for laboratory analysis from 33 to 38 feet.
34		6.9			
36	NM	1.3			Note: coarse sand from 36 to 40 feet.
38		0.7			
40					

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.
NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife
AMSL: Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **NP-1**

TOTAL DEPTH: **100** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Northern Perimeter Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002C**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**9/7/2012**
DATE COMPLETED:	**9/8/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**735.73 feet AMSL**
NORTHING:	**625085.6992**
EASTING:	**1483936.5303**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
40					
42	52	3.8		SP	(40.0 - 45.0) SAND, coarse grain, few small round pebbles, trace silt, well sorted, loose, wet, olive brown.
44		2.9			
46		2.4		SM	(45.0 - 50.0) SILTY SAND, coarse to medium grain, some small to medium round pebbles, trace clay, loose to moderate stiff, wet, olive brown.
48	54	1.9			
50		0.11			
52	59	3.3		SP	(50.0 - 60.0) SAND, coarse grain, few small round pebbles, trace silt, well sorted, loose, wet, olive brown. *Groundwater sample submitted for laboratory analysis from 50 to 55 feet.
54		1.3			
56		1.3			
58	NM	1.4			
60		1.2			Note: more silt from 58 to 60 feet.
62	68	2.6		CL	(60.0 - 65.0) SILTY CLAY, some small to medium round pebbles, poorly sorted, hard, dry, gray.
64		3.2			
66		1.3		SM	(65.0 - 75.0) SILTY SAND with clay, coarse grain, some small to medium round pebbles, poorly sorted, stiff, wet, light gray-brown. *Groundwater sample submitted for laboratory analysis from 65 to 70 feet.
68	59	0.2			
70		0.5			
72	61	1.1			
74		0.6			
76		1.4		SW	(75.0 - 85.0) SAND, medium grain, some small round pebbles, trace silt, poorly sorted, loose, wet, olive brown.
78	59	0.9			
80		1.3			

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.
NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife
AMSL: Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **NP-1**

TOTAL DEPTH: **100** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Northern Perimeter Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002C**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**9/7/2012**
DATE COMPLETED:	**9/8/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**735.73 feet AMSL**
NORTHING:	**625085.6992**
EASTING:	**1483936.5303**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
80					
82	53	0.3			*Groundwater sample submitted for laboratory analysis from 80 to 85 feet.
84		0.9			
		0.5			
86	54	1.1		GW	(85.0 - 97.0) PEBBLES, small round, some medium to coarse sand, some silt, poorly sorted, loose, wet, olive brown.
88		1.2			
90	50	0.6			
92		0.2			
94		1.1			
96	56	1.0			*Groundwater sample submitted for laboratory analysis from 95 to 100 feet.
98		0.7		SW	(97.0 - 100.0) SAND, medium to coarse grain, few small round pebbles, trace silt, poorly sorted, loose, wet, olive brown.
100					End of boring at 100 feet.
102					

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.
NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife
AMSL: Above Mean Sea Level

BORING/WELL CONSTRUCTION LOG

WELL NO.: **RMW-88/NP-2**

TOTAL DEPTH: **100 feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Northern Perimeter Investigation**
CITY, STATE:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002C**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**9/17/2012**
DATE COMPLETED:	**9/18/2012**

DRILLING INFORMATION

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
TOP OF CASING:	**739.11 feet AMSL**
GROUND ELEVATION:	**739.32 feet AMSL**
NORTHING:	**625051.9881**
EASTING:	**1484580.6683**

DEPTH (feet)	Soil Symbols	USCS Classification	PID (ppm)	Recovery (inches)	SOIL DESCRIPTION
0					
2		SW	0.0	Hand Auger	(0.0 - 5.0) SAND, medium to coarse grain, some silt, some small to medium round pebbles, poorly sorted, loose, dry, brown.
			0.1		
4			0.0		Note: hard, dense, coal fragments from 3 to 5 feet.
6		SM	0.0		(5.0 - 10.0) SILTY SAND, medium grain, some small round pebbles, poorly sorted, loose, dry, light gray.
			0.3	50	
8			0.0		
10		ML	2.1		(10.0 - 25.0) SILT, some medium sand, small round pebbles, poorly sorted, loose, dry, light gray.
12			1.0		Note: few small cobbles from 12 to 14 feet.
14			0.1	71	
16			0.6		Note: more sand from 16 to 18 feet.
18			0.4		
20			0.1		Note: more small pebbles from 20 to 25 feet.
22			0.9	55	
24			0.1		
26		SM	0.0		(25.0 - 30.0) SILTY SAND, medium grain, some small round pebbles, poorly sorted, loose, dry, olive brown.
28			0.6	56	
30		SM	1.0		(30.0 - 37.0) SILTY SAND, medium to coarse grain, some small to medium round pebbles, trace clay, poorly sorted, moderate stiff to loose, moist.
32			0.5	61	
34			0.7		
36			0.7		Note: wet at 35 feet. *Groundwater sample submitted for laboratory analysis from 35 to 40 feet.
38		SW		57	

WELL CONSTRUCTION DETAILS

- Concrete (0 to 1 ft)
- 2" PVC Sch 40 Casing (0 to 90 ft)
- Bentonite Slurry (1 to 75 ft)

Notes:
bls: below land surface
HA: Hand Auger
NR: Not Recorded
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
HK: Hydroknife

BORING/WELL CONSTRUCTION LOG

WELL NO.: **RMW-88/NP-2**

TOTAL DEPTH: **100 feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Northern Perimeter Investigation**
CITY, STATE:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002C**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**9/17/2012**
DATE COMPLETED:	**9/18/2012**

DRILLING INFORMATION

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
TOP OF CASING:	**739.11 feet AMSL**
GROUND ELEVATION:	**739.32 feet AMSL**
NORTHING:	**625051.9881**
EASTING:	**1484580.6683**

DEPTH (feet)	Soil Symbols	USCS Classification	PID (ppm)	Recovery (inches)	SOIL DESCRIPTION	WELL CONSTRUCTION DETAILS
38			0.5		(37.0 - 40.0) SAND, medium grain, trace silt, trace small round pebbles, well sorted, loose, wet, olive brown.	
40		GW	0.0	50	(40.0 - 50.0) PEBBLES, small round with medium sand, trace silt, poorly sorted, loose, wet, olive brown. Note: sand lense from 41 to 42 feet.	Bentonite Slurry (1 to 75 ft)
42			0.1			
44			0.2	48	Note: few small cobbles, higher silt content, wet from 45 to 50 feet.	
46			0.3			
48			0.0			
50		SW	0.1	50	(50.0 - 55.0) SAND with very small round pebbles, coarse grain, little silt, poorly sorted, loose, wet, olive brown. *Groundwater sample submitted for laboratory analysis from 50 to 55 feet.	
52			0.0			
54			0.0	65	(55.0 - 61.5) PEBBLES, small round with medium to coarse sand, some silt, trace clay, poorly sorted, loose, wet, olive brown.	
56		GW	0.0			
58			0.2			
60			0.0	60	(61.5 - 76.0) SAND, fine to medium grain, little silt, little clay, trace small round pebbles, poorly sorted, loose, wet, olive brown.	
62		SW	0.0			
64			0.0	63	*Groundwater sample submitted for laboratory analysis from 65 to 70 feet.	
66			0.1			
68			0.0			
70			0.0	60	Note: higher silt content from 70 to 75 feet.	
72			0.2			
74			0.1			Bentonite
76						

Notes:
bls: below land surface
HA: Hand Auger
NR: Not Recorded
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
HK: Hydroknife

BORING/WELL CONSTRUCTION LOG

WELL NO.: **RMW-88/NP-2**

TOTAL DEPTH: **100 feet bls**

PROJECT INFORMATION

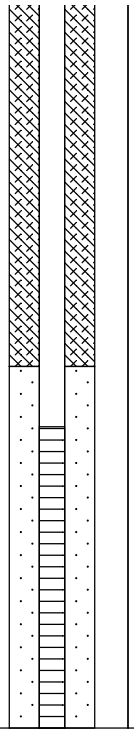
CLIENT:	**RACER Trust**
PROJECT:	**Northern Perimeter Investigation**
CITY, STATE:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002C**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**9/17/2012**
DATE COMPLETED:	**9/18/2012**

DRILLING INFORMATION

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
TOP OF CASING:	**739.11 feet AMSL**
GROUND ELEVATION:	**739.32 feet AMSL**
NORTHING:	**625051.9881**
EASTING:	**1484580.6683**

DEPTH (feet)	Soil Symbols	USCS Classification	PID (ppm)	Recovery (inches)	SOIL DESCRIPTION
76		ML	0.0	59	(76.0 - 78.0) SILT, trace fine to medium sand, well sorted, stiff, wet, gray.
78		SW	0.1		(78.0 - 87.0) SAND, medium grain, little silt, few small round pebbles, poorly sorted, loose, wet, olive brown.
80			0.1	61	*Groundwater sample submitted for laboratory analysis from 80 to 85 feet.
82			0.0		
84			0.0		
86			0.0	65	
88		GW	0.1		(87.0 - 92.0) PEBBLES, small to medium round with medium to coarse grain sand, some silt, poorly sorted, loose, wet, olive brown.
90			0.0	70	Note: trace small cobbles from 90 to 92 feet.
92		SW	0.3		(92.0 - 100.0) SAND, medium to coarse grain, some silt, few small to medium round pebbles, poorly sorted, loose, wet, olive brown.
94			0.0		
96			0.0	67	*Groundwater sample submitted for laboratory analysis from 95 to 100 feet.
98			0.0		
100					End of boring at 100 feet.

WELL CONSTRUCTION DETAILS



Pellets (75 to 88 ft)

Sand Pack (88 to 100 ft)

2" Screen slot size 0.10 (90 to 100 ft)

Notes:
bls: below land surface
HA: Hand Auger
NR: Not Recorded
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
HK: Hydroknife

SOIL BORING LOG

BORING NO.: **NP-3**

TOTAL DEPTH: **100** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Northern Perimeter Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002C**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/28/2012**
DATE COMPLETED:	**7/12/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**740.39 feet AMSL**
NORTHING:	**625700.4597**
EASTING:	**1485254.9732**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0					
2	HK	NM		GRASS	(0.0 - 0.2) GRASS
4		NM		SW	(0.2 - 10.0) SAND, brown, medium to coarse grain with small to large rounded gravel, poorly sorted, loose, dry.
6		NM			
8		NM			
10		NM			
12	60	1.0		SW	(10.0 - 20.0) SAND, medium grain, some small to large round pebbles, poorly sorted, loose, dry, dark grayish brown.
14		0.2			
16		0.6			
18	60	0.7			
20		2.3			Note: some small to medium cobbles from 18 to 20 feet.
22	60	4.1		SW	(20.0 - 30.0) SAND, fine to medium grain, some small to medium pebbles, rounded, few small round cobbles, trace silt, poorly sorted, dry, loose, light brownish gray.
24		3.3			
26		0.2			
28	60	1.0			Note: moist from 26 to 30 feet.
30		2.2			
32	120	0.9		SW	*Groundwater sample submitted for laboratory analysis from 30 to 35 feet.
34		0.0			(30.0 - 40.0) SAND, medium to coarse grain with small to large pebbles, rounded, some medium cobbles, poorly sorted, loose, wet, very dark gray.
36		1.5			
38		2.5			
40		3.2			

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.
NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife
AMSL: Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **NP-3**

TOTAL DEPTH: **100** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Northern Perimeter Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002C**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/28/2012**
DATE COMPLETED:	**7/12/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**740.39 feet AMSL**
NORTHING:	**625700.4597**
EASTING:	**1485254.9732**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
40					
42		0.0		CL	(40.0 - 41.0) SILTY CLAY, hard, dry, olive brown.
					*Groundwater sample submitted for laboratory analysis from 41 to 46 feet.
44	84	0.0		SW	(41.0 - 60.0) SAND medium to coarse grain, small to medium pebbles, poorly sorted, loose, wet, dark gray.
46		0.0			
		0.0			
48		0.2			
50		0.3			
52		0.0			
54	NM	0.0			Note: small cobbles from 54 to 60 feet.
56		0.0			*Groundwater sample submitted for laboratory analysis from 55 to 60 feet.
58		0.0			
60					
62		0.0		SW	(60.0 - 75.0) SAND, medium to coarse grain, round small to large pebbles, some small cobbles round to sub-angular, poorly sorted, loose, wet, dark grayish brown.
		0.1			
64		1.1			
66		0.9			
68	180	0.3			
70		0.0			*Groundwater sample submitted for laboratory analysis from 70 to 75 feet.
72		0.8			
74		0.1			
76		0.3		SW	(75.0 - 80.0) SAND, medium to coarse grain, some small pebbles, round, poorly sorted, loose, wet, dark grayish brown.
78		0.6			
80					

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.
NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife
AMSL: Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **NP-3**

TOTAL DEPTH: **100** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Northern Perimeter Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0002C**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/28/2012**
DATE COMPLETED:	**7/12/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**740.39 feet AMSL**
NORTHING:	**625700.4597**
EASTING:	**1485254.9732**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
80	180	0.8		SW	(80.0 - 90.0) SAND, medium to coarse grain, some small pebbles, round, poorly sorted, loose, wet, dark grayish brown.
82		1.5			
84		1.7			
86		1.4			*Groundwater sample submitted for laboratory analysis from 85 to 90 feet.
88		1.9			
90	NM	1.6		GW	(90.0 - 100.0) PEBBLES, small to large pebbles, sand, medium to coarse grain, some small cobbles, trace silt, poorly sorted, loose, wet, dark grayish brown.
92		3.2			
94		3.3			
96		1.4			
98		2.9			
100					End of boring at 100 feet.
102					

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.
NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife
AMSL: Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **PSA-1**

TOTAL DEPTH: **65** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Process Sump Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0006A**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/27/2012**
DATE COMPLETED:	**7/13/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**736.52 feet AMSL**
NORTHING:	**622710.4301**
EASTING:	**1485392.9152**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0					
2		NM		CONCRETE	(0.0 - 0.6) CONCRETE removed by coring.
4	HK	NM		SW	(0.6 - 10.0) SAND, medium to coarse grain, small to large rounded gravel, some cobble (6 in.), trace silt, poorly sorted, loose, dry, brown.
6		NM			
8		NM			
10		NM			
12	30	1.0		CL	(10.0 - 11.0) SILTY CLAY, some fine to medium sand, few small pebbles, soft, moist, very dark grayish brown.
14		1.8		SW	(11.0 - 20.0) SAND, fine to medium grain, trace silt, few small round pebbles, poorly sorted, loose, dry, light olive brown.
16		2.4			
18	39	2.5			
20		2.6			*Soil sample submitted for laboratory analysis from 18 to 20 feet.
22	41	0.7		SW	(20.0 - 33.5) SAND, fine to medium grain, trace silt, few small round pebbles, poorly sorted, loose, dry, light olive brown.
24		1.6			
26	58	1.0			Note: some medium cobbles from 24 to 25 feet.
28		1.2			Note: Wet at 27 feet.
30		1.3			*Groundwater sample submitted for laboratory analysis from 27 to 32 feet.
32	NM	1.7			
34		0.5			Note: some small angular pebbles from 33 to 33.5 feet.
36	39	0.6		CL	(33.5 - 42.0) SILTY CLAY, low plasticity, stiff, dry, light olive brown to very dark gray.
38		0.5			Note: very dark gray from 35 to 40 feet.

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.

NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System

ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife AMSL - Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **PSA-1**

TOTAL DEPTH: **65** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Process Sump Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0006A**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/27/2012**
DATE COMPLETED:	**7/13/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**736.52 feet AMSL**
NORTHING:	**622710.4301**
EASTING:	**1485392.9152**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
38					
40		1.2			
		0.2			
42		0.4		CL	*Groundwater sample submitted for laboratory analysis from 42 to 47 feet.
44	102	0.5		SP	(42.0 - 44.0) SILTY CLAY, small angular pebbles, low plasticity, stiff, dry, light olive brown.
46		1.1		CL	(44.0 - 45.0) SAND, medium to coarse grain, some small to medium pebbles, silt, poorly sorted, loose, wet, light olive brown.
48		1.3			(45.0 - 65.0) SILTY CLAY, small angular pebbles, low plasticity, hard, dry, very dark gray.
50	50	2.2			Note: some large cobbles from 50 to 55 feet.
52		2.4			
54		1.1			
56	60	1.2			
58		1.0			
60		1.0			
62	58	1.0			
64		0.9			
66					End of boring at 65 feet.

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.
NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife AMSL - Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **PSA-2**

TOTAL DEPTH: **53** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Process Sump Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0006A**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/27/2012**
DATE COMPLETED:	**7/14/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**737.37 feet AMSL**
NORTHING:	**622748.0730**
EASTING:	**1485231.7515**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0	HK	NM		CONCRETE	(0.0 - 0.6) CONCRETE removed by coring.
2		NM		SW	(0.6 - 10.0) SAND, medium to coarse grain, small to large gravel rounded, cobble (7 in.), trace silt, poorly sorted, loose, dry, brown.
4		NM			
6		NM			
8		NM			
10	40	0.2		SM	(10.0 - 15.0) SAND, medium to coarse grain, some silt, some small to large round pebbles, poorly sorted, loose, dry, olive brown.
12		0.4			
14		1.1			
16	34	7.6		SM	(15.0 - 34.5) SAND, medium grain, some silt, few small to medium round pebbles, poorly sorted, loose, dry, light yellowish brown.
18		6.2			
20	68	6.7			
22		4.5			
24		10.1			*Soil sample submitted for laboratory analysis from 24 to 26 feet.
26	50	9.6			
28		6.6			
30	50	4.2			*Groundwater sample submitted for laboratory analysis from 30 to 35 feet.
32		2.4			
34		1.4		CL	Note: wet from 33 to 34.5 feet. (34.5 - 40.0) SILTY CLAY, few small angular pebbles, hard, dry, very dark gray.
36	42	1.2			
38					

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.

NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System

ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife AMSL - Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **PSA-2**

TOTAL DEPTH: **53** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Process Sump Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0006A**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/27/2012**
DATE COMPLETED:	**7/14/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**737.37 feet AMSL**
NORTHING:	**622748.0730**
EASTING:	**1485231.7515**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
38					
40		1.2			
		0.1		SM	*Groundwater sample submitted for laboratory analysis from 40 to 45 feet.
42	52	0.0			(40.0 - 52.0) SAND, medium to coarse grain, some silt, some small to large pebbles, poorly sorted, loose, wet, dark grayish brown.
44		0.6			
46		0.5			
48	80	0.4			
50		0.4			
52		0.3		CL	(52.0 - 53.0) SILTY CLAY, small angular pebbles, hard, dry, very dark gray.
54					End of boring at 53 feet.

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.
NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife AMSL - Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **PSA-3**

TOTAL DEPTH: **65** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Process Sump Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0006A**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/27/2012**
DATE COMPLETED:	**7/16/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**737.83 feet AMSL**
NORTHING:	**622777.1622**
EASTING:	**1485105.5065**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0					
2	HK	NM		CONCRETE	(0.0 - 0.6) CONCRETE, removed by coring.
4		NM		SM	(0.6 - 9.5) SAND medium to coarse grain, some silt, some small to large pebbles, few small cobbles, poorly sorted, loose, dry, dark grayish brown.
6		NM			
8		NM			
10		NM			
12	36	0.0		SM	(9.5 - 25.0) SAND medium to coarse grain, some silt, some small to large round pebbles, poorly sorted, loose, dry, very dark grayish brown.
14		0.0			
16	54	0.2			
18		0.7			
20		0.7			
22	50	0.1			Note: few small cobbles from 20 to 25 feet.
24		0.0			
26		0.0		SM	(25.0 - 27.0) SAND, fine to medium grain, few small round pebbles, silt, poorly sorted, loose, dry, olive brown.
28	49	0.7		SM	(27.0 - 35.0) SAND, medium to coarse grain, some silt, some small to medium round pebbles, poorly sorted, loose, dry, olive brown.
30		0.9			
32	44	0.9			*Soil sample submitted for laboratory analysis from 32 to 34 feet.
34		1.4			
36		0.4			*Groundwater sample submitted for laboratory analysis from 34 to 39 feet.
38	48	0.3		GW	(35.0 - 56.0) PEBBLES, small to large with medium to coarse sand, silt, poorly sorted, loose, wet,

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.

NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System

ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife AMSL - Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **PSA-3**

TOTAL DEPTH: **65** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Process Sump Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0006A**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/27/2012**
DATE COMPLETED:	**7/16/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**737.83 feet AMSL**
NORTHING:	**622777.1622**
EASTING:	**1485105.5065**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
38					
40		NM			olive brown.
42	52	0.2			Note: some large round pebbles from 40 to 45 feet.
44		0.3			
46		0.1			
48	52	0.2			
50		0.4			*Groundwater sample submitted for laboratory analysis from 49 to 54 feet.
52	54	1.0			
54		1.2			Note: light olive brown from 53 to 54 feet.
56		1.5			Note: dry from 55 to 56 feet.
58		15000		SM	*Saturated soil sample submitted for laboratory analysis from 56 to 58 feet. (56.0 - 63.0) SAND, very fine grain with silt, well sorted, dense, wet, olive brown.
60	84	8599			
62		1906			
64		1072		CL	(63.0 - 65.0) SILTY CLAY, few small angular pebbles, hard, dry, very dark gray.
66		82.7			End of boring at 65 feet.

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.
NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife AMSL - Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **PSA-4**

TOTAL DEPTH: **64** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Process Sump Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0006A**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/27/2012**
DATE COMPLETED:	**7/26/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**736.79 feet AMSL**
NORTHING:	**622809.6554**
EASTING:	**1484968.8079**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0				CONCRETE	(0.0 - 0.6) CONCRETE removed by coring.
2		NM		SM	(0.6 - 10.0) SAND medium to coarse grain, some silt, some small to medium round pebbles, poorly sorted, loose, dry, olive brown.
4	HK	NM			
6		NM			
8		NM			
10		NM			
12	34	0.1		SM	(10.0 - 32.0) SAND medium to coarse grain, silt, some small to medium round pebbles, poorly sorted, loose, moist, olive brown.
14		0.3			
16		0.5			
18	30	2.8			
20		0.5			
22	48	3.9			Note: more small cobbles from 20 to 25 feet.
24		2.7			
26		3.5			
28	46	1.3			Note: more fine to medium sand from 26 to 29.5 feet.
30		2.0			
32	45	4.0			*Soil sample submitted for laboratory analysis from 30 to 32 feet.
34		1.4		SM	(32.0 - 35.0) SAND, fine to medium grain, silt, some medium round pebbles, some coarse sand to small round pebbles, poorly sorted, loose, wet.
36		6.6			(35.0 - 40.0) NO RECOVERY.

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.

NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System

ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife AMSL - Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **PSA-4**

TOTAL DEPTH: **64** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Process Sump Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0006A**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/27/2012**
DATE COMPLETED:	**7/26/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**736.79 feet AMSL**
NORTHING:	**622809.6554**
EASTING:	**1484968.8079**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
36					
38	NR	NM			
		NM			(40.0 - 41.0) SAND, fine to medium grain, silt, few small round pebbles, poorly sorted, loose, wet, brown. *Groundwater sample submitted for laboratory analysis from 40 to 45 feet.
40		1.1		SM	
42		2.1		SM	(41.0 - 50.0) SAND, medium to coarse grain, small to medium round pebbles, silt, poorly sorted, loose, wet, olive brown.
44	89	2.2			
46		7.9			
48		31.4			
50		45.9		GW	(50.0 - 52.0) PEBBLES, small round, silt, poorly sorted, loose, wet, olive brown.
52	40	9.4		CL	(52.0 - 57.0) SILTY CLAY, few small round pebbles, poorly sorted, hard, dry, very dark gray (2.5Y 3/1).
54		2.2			
56		2.3			
58	51	5.2		ML	(57.0 - 60.0) SILT, very fine to medium sand, medium stiff, wet, dark grayish brown (2.5Y 4/2). *Saturated soil sample submitted for laboratory analysis from 58 to 60 feet. *Groundwater sample submitted for laboratory analysis from 58 to 63 feet.
60		2.3		SM	(60.0 - 63.0) SAND, fine, silt, moderately loose, wet, dark grayish brown.
62	30	1.8			
64				CL	(63.0 - 64.0) SILTY CLAY, few medium round pebbles, hard, very dark gray. End of boring at 64 feet.
66					

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.

NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System

ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife AMSL - Above Mean Sea Level

BORING/WELL CONSTRUCTION LOG

WELL NO.: **RMW-85/PSA-5**

TOTAL DEPTH: **105 feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Process Sump Area Investigation**
CITY, STATE:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0006A**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/27/2012**
DATE COMPLETED:	**7/23/2012**

DRILLING INFORMATION

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
TOP OF CASING:	**736.65 feet AMSL**
GROUND ELEVATION:	**737.03 feet AMSL**
NORTHING:	**622914.0083**
EASTING:	**1484978.1674**

DEPTH (feet)	Soil Symbols	USCS Classification	PID (ppm)	Recovery (inches)	SOIL DESCRIPTION	WELL CONSTRUCTION DETAILS
0		CONCRETE	NM	HK	(0.0 - 0.5) CONCRETE removed by coring.	2" PVC Sch 40 Casing (0 to 85 ft)
2		SM	NM		(0.5 - 16.0) SAND, medium to coarse grain, some silt, some small to large round pebbles few small cobbles, poorly sorted, loose, light olive brown.	
4			NM			
6			NM			Grout (0 to 15 ft)
8			NM			
10			192.6	25		
12			553.5			
14			226.9	15	Note: large cobble at 13 feet. Note: rock fragments from 13 to 15 feet.	
16		SM	212.7	62	(16.0 - 16.5) SILTY SAND, medium to coarse grain, small round pebbles, poorly sorted, stiff, dry, dark grayish brown.	Bentonite Slurry (15 to 83 ft)
18		SM	136.0		(16.5 - 25.0) SAND, medium to coarse grain, some silt, some small to large round pebbles, poorly sorted, loose, light yellowish brown.	
20			125.4			
22			390.1	51		
24			980.6		Note: more fine to medium sand from 24 to 25 feet.	
26		SM	1242	60	(25.0 - 30.0) SAND, fine to medium grain, some silt, poorly sorted, loose, moist, olive brown. *Soil sample submitted for laboratory analysis from 28 to 30 feet.	
28			2791			
30		SM	142.6	60	(30.0 - 35.0) SAND, medium to coarse grain, some silt, some small round pebbles, poorly sorted, loose, olive brown. *Groundwater sample submitted for laboratory analysis from 30 to 35 feet.	
32			225.1			
34			112.4			
36		GW	128.2	60	(35.0 - 45.0) PEBBLES, small and round with medium to coarse grain sand, some silt, poorly sorted, loose, wet, odor, olive brown.	
38						

Notes:
bls: below land surface
HA: Hand Auger
NR: Not Recorded
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
HK: Hydroknife

BORING/WELL CONSTRUCTION LOG

WELL NO.: **RMW-85/PSA-5**

TOTAL DEPTH: **105 feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Process Sump Area Investigation**
CITY, STATE:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0006A**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/27/2012**
DATE COMPLETED:	**7/23/2012**

DRILLING INFORMATION

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
TOP OF CASING:	**736.65 feet AMSL**
GROUND ELEVATION:	**737.03 feet AMSL**
NORTHING:	**622914.0083**
EASTING:	**1484978.1674**

DEPTH (feet)	Soil Symbols	USCS Classification	PID (ppm)	Recovery (inches)	SOIL DESCRIPTION	WELL CONSTRUCTION DETAILS
38			394.5			Bentonite Slurry (15 to 83 ft)
40			1048	60		
42			>15000			
44			>15000		(45.0 - 50.0) SAND, medium to coarse grain with small round pebbles, few large round pebbles, silt, poorly sorted, loose, wet, olive brown.	
46		SM	>15000	58		
48			>15000		*Groundwater sample submitted for laboratory analysis from 45 to 50 feet.	
50			>15000	8	(50.0 - 58.0) SILTY CLAY, few small pebbles, hard, dry.	
52		CL	221.3	120		
54			>15000		*Saturated soil sample submitted for laboratory analysis from 54 to 56 feet.	
56			117.2			
58		SM	891.2	120	(58.0 - 62.0) SAND, very fine with silt, dense, wet, olive brown.	
60			491.2		*Saturated soil sample submitted for laboratory analysis from 60 to 62 feet.	
62		CL	379.2		(62.0 - 69.0) SILTY CLAY, hard, some small round pebbles, dry, very dark gray.	
64			303.5	75	Note: higher silt content from 65 to 69 feet.	
66			185.5			
68			15.2			
70		SM	10.1	42	(69.0 - 74.0) SAND, medium to fine grain, silt, some small to medium round pebbles, poorly sorted, loose, wet, dark grayish brown.	
72			205.5		*Groundwater sample submitted for laboratory analysis from 69 to 74 feet.	
74		ML	245.8		(74.0 - 75.0) SILT, moderately stiff, wet, light olive brown.	
76						

Notes:
bls: below land surface
HA: Hand Auger
NR: Not Recorded
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
HK: Hydroknife

BORING/WELL CONSTRUCTION LOG

WELL NO.: **RMW-85/PSA-5**

TOTAL DEPTH: **105 feet bls**

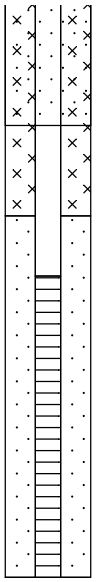
PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Process Sump Area Investigation**
CITY, STATE:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0006A**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/27/2012**
DATE COMPLETED:	**7/23/2012**

DRILLING INFORMATION

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
TOP OF CASING:	**736.65 feet AMSL**
GROUND ELEVATION:	**737.03 feet AMSL**
NORTHING:	**622914.0083**
EASTING:	**1484978.1674**

DEPTH (feet)	Soil Symbols	USCS Classification	PID (ppm)	Recovery (inches)	SOIL DESCRIPTION
76					
78		SM	78.1	150	(75.0 - 85.0) SAND, fine to medium grain, silt, few small to medium round pebbles, poorly sorted, loose, wet, light olive brown.
			449		
80			13.5	NM	
82			31.2		
84			20.5		
86		GW	10.2	NM	(85.0 - 105.0) PEBBLES, small, sand medium to coarse grain, silt, few medium to large pebbles, poorly sorted, loose, wet, dark olive brown.
88			7.9		* Groundwater sample submitted for laboratory analysis from 85 to 90 feet.
90			9.9	160	
92			15.2		Note: more fine to medium sand from 90 to 100 feet.
94			3.8		
96			3.4		
98			3.0		
100			2.1		*Groundwater sample submitted for laboratory analysis from 100 to 105 feet.
102			2.1		
104			2.0		
106					End of boring at 105 feet.



WELL CONSTRUCTION DETAILS

- Bentonite Slurry (15 to 83 ft)
- Sand Pack (83 to 95 ft)
- 2" Screen slot size 0.10 (85 to 95 ft)
- Formation collasped from (95 to 105 ft)

Notes:
bls: below land surface
HA: Hand Auger
NR: Not Recorded
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
HK: Hydroknife

SOIL BORING LOG

BORING NO.: **PSA-6**

TOTAL DEPTH: **70** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Process Sump Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0006A**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/27/2012**
DATE COMPLETED:	**7/27/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**736.66 feet AMSL**
NORTHING:	**632011.4770**
EASTING:	**148500.9137**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0				CONCRETE	(0.0 - 0.5) CONCRETE, removed by coring.
2		NM		SM	(0.5 - 10.0) SAND, medium to coarse grain, silt, small to medium pebbles, few small cobbles, poorly sorted, loose, dry.
4	HK	NM			Note: at 0.5 feet 3-inch layer of tar like substance is observed on the east side of the borehole.
6		NM			
8		NM			
10		NM			
12	41	0.0		SW	(10.0 - 20.0) SAND, medium grain, some small round pebbles, trace silt, poorly sorted, loose, dry, light olive brown.
14		0.7			
16		0.0			Note: cobble (6 inches) at 16 feet.
18	43	0.0			
20		0.0			
22	89	0.1		SM	(20.0 - 30.0) SAND, medium grain, some small pebbles, trace small cobbles, silt, poorly sorted, loose, dry, light olive brown.
24		1.1			Note: increase in small pebbles from 22 to 24 feet.
26		1.0			*Soil sample submitted for laboratory analysis from 22 to 24 feet.
28		0.5			
30		2.3			Note: moist from 29 to 30 feet.
32	40	5.2			*Groundwater sample submitted for laboratory analysis from 29 to 34 feet.
34		7.8		SC	(30.0 - 33.0) SAND with silty clay, some small pebbles, poorly sorted, low plasticity, soft, moist, olive brown.
36	36	36.2		CL	(33.0 - 38.0) SILTY CLAY, few small rounded pebbles, poorly sorted, hard, dry, very dark, grayish brown.

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.

NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System

ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife
AMSL - Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **PSA-6**

TOTAL DEPTH: **70** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Process Sump Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0006A**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/27/2012**
DATE COMPLETED:	**7/27/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**736.66 feet AMSL**
NORTHING:	**632011.4770**
EASTING:	**148500.9137**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
36		32.4			Note: cobble from 36 to 37 feet.
38	24	38.7		SC	(38.0 - 42.0) SAND with silty clay, medium to coarse grained sand, some small pebbles, poorly sorted, moist, grayish brown.
40		158.2			
42	48	345.8		CL	(42.0 - 46.0) SILTY CLAY, few to some small to medium angular pebbles, hard, low plasticity, dry, grayish brown. Note: negative result for NAPL test from 42 to 44 feet.
44		18.8			*Groundwater sample submitted for laboratory analysis from 42 to 47 feet.
46	54	55.3		CL-ML	(46.0 - 50.0) CLAYEY SILT with sand, medium grained sand, some small to large pebbles, low plasticity, dry, light gray.
48		1.2			Note: cobble at 48 feet.
50	84	1487		CL	(50.0 - 54.0) SILTY CLAY, few to some small angular pebbles, hard, low plasticity, dry, dark grayish brown.
52		229.7			*Saturated soil sample sumbitted for laboratory analysis from 50 to 52 feet. *Groundwater sample submitted for laboratory analysis from 52 to 57 feet.
54		89.1		SW	Note: negative result for NAPL test from 50 to 54 feet. (54.0 - 56.0) SILTY SAND, medium grained sand, few to some medium to large rounded pebbles, poorly sorted, moist, olive brown.
56		178.4		ML	
58	36	11,094		SM	(56.0 - 58.0) SILT, some fine to medium grained sand, some small rounded pebbles, poorly sorted, moist, olive brown.
60	56	9,882		CL	(58.0 - 60.0) SAND with gravel, some silt, some small to medium rounded pebbles, poorly sorted, wet, strong odor, olive-brown. Note: positive result for NAPL test from 58 to 60. *Saturated soil sample submitted for laboratory analysis from 58 to 60 feet.
62		2,782			
64		378.5			(60.0 - 68.0) SILTY CLAY, few to small angular pebbles, hard, low plasticity, dry, dark grayish brown. Note: Negative result for NAPL test from 60 to 66 feet. *Saturated soil sample submitted for laboratory analysis from 66 to 68 feet.
66	54	49.1			
68		13.8		SM	Note: increasing silt content, brown at 67 feet. (68.0 - 70.0) SAND with gravel, some silt, some rounded small pebbles, poorly sorted, loose, wet, olive brown.
70					End of boring at 70 feet.

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.
NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife AMSL - Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **PSA-7**

TOTAL DEPTH: **65** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Process Sump Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0006A**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/28/2012**
DATE COMPLETED:	**7/29/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**737.04 feet AMSL**
NORTHING:	**623107.7413**
EASTING:	**1485023.3387**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0		NM		CONCRETE	(0.0 - 0.6) CONCRETE removed by coring.
2		NM		SM	(0.6 - 10.0) SAND, medium to coarse grain, silt, small to medium, pebbles, few small cobbles, poorly sorted, loose, dry.
4	HK	NM			
6		NM			
8		NM			
10		4.9		SW	(10.0 - 20.0) SAND, medium grained, some small round pebbles, trace silt, poorly sorted, loose, dry, light olive brown.
12	57	34.6			*Soil sample submitted for laboratory analysis from 12 to 14 feet.
14		4.2			Note: cobble at 14 feet.
16	42	3.9			
18		4.4			
20		1.0		SM	(20.0 - 32.0) SAND, medium grained, some small to medium pebbles, trace small cobbles, silt, poorly sorted, loose, dry, light olive brown.
22	50	2.3			
24		4.9			Note: decrease in pebbles from 25 to 30 feet.
26	44	7.8			Note: moist from 26 to 30 feet.
28		8.3			
30		7.7			*Grounwater sample submitted for laboratory analysis from 29 to 34 feet. Note: increase in small to medium rounded pebbles at 30 feet.
32	60	18.2		SC	(32.0 - 34.0) SAND with silty clay, some small rounded pebbles, poorly sorted, loose, moist, olive brown.
34		21.7		CL	(34.0 - 38.0) SILTY CLAY, few small round pebbles, hard, low plasticity, dry, very dark grayish brown.
36					

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.

NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System

ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife AMSL - Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **PSA-7**

TOTAL DEPTH: **65** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Process Sump Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0006A**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/28/2012**
DATE COMPLETED:	**7/29/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**737.04 feet AMSL**
NORTHING:	**623107.7413**
EASTING:	**1485023.3387**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
36					
38	56	213.8			Note: negative result for NAPL test from 36 to 38 feet.
		141.2		SC	(38.0 - 40.0) SAND with silty clay, medium to coarse grained sand, some small rounded pebbles, poorly sorted, moist, grayish brown. Note: negative result for NAPL test from 38 to 40 feet.
40	54	5.2		SM	(40.0 - 48.0) SAND with gravel, medium to coarse sand, some silt, some small rounded pebbles, poorly sorted, loose, wet, olive brown.
42		5.5			
44		6.8			*Groundwater sample submitted for laboratory analysis from 40 to 45 feet.
46	40	30.7			
48		989.9		CL	(48.0 - 52.0) SILTY CLAY, few to some small angular pebbles, hard, low plasticity, dry, dark grayish brown.
50		2204			*Saturated soil sample submitted for laboratory analysis from 50 to 52 feet. Note: negative result for NAPL test from 48 to 50 feet. Note: negative result for NAPL test from 50 to 52 feet. Note: negative result for NAPL test from 52 to 54 feet. *Saturated soil sample submitted for laboratory analysis from 52 to 54 feet.
52	42	244.6		SM	
54		190.1			(52.0 - 64.0) SILTY SAND, medium grained sand, trace small angular pebbles, trace silt, well sorted, loose, wet, light olive brown.
56	48	73.1			
58		31.9			
60		36.1			*Groundwater sample submitted for laboratory analysis from 59 to 64 feet. Note: grades to medium grained sand, increasing silt content from 60 to 64 feet.
62	54	7.4			
64		2.2		CL	(64.0 - 65.0) SILTY CLAY, few small rounded pebbles, hard, low plasticity, dry, dark grayish brown.
66					End of boring at 65 feet.

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.
NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife AMSL - Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **PSA-8**

TOTAL DEPTH: **66.5 feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Process Sump Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0006A**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/27/2012**
DATE COMPLETED:	**7/31/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**738.73 feet AMSL**
NORTHING:	**623024.1416**
EASTING:	**1485082.2288**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0				CONCRETE	(0.0 - 0.5) CONCRETE removed by coring.
2		NM		SM	(0.5 - 10.0) SAND, medium to coarse grain, some silt, some small to large round pebbles, few small cobbles, poorly sorted, loose, dry, olive brown.
4	HK	NM			
6		NM			
8		NM			
10		NM			
12	53	2.1		SW	(10.0 - 20.0) SAND, medium grained, some small to large pebbles, poorly sorted, loose, dry, light yellowish brown.
14		2.2			
16		2.4			
18	48	2.2			Note: cobble from 17 to 20 feet.
20		1.9			
22	47	2.1		SW	(20.0 - 34.0) SAND, medium grained, some small to large rounded pebbles, trace silt, poorly sorted, loose, dry, light olive brown (2.5Y 5/3).
24		4.2			
26		6.6			Note: olive brown at 25 feet.
28	50	8.3			
30		4.4			
32	45	12.9			Note: moist at 30 feet. *Soil sample submitted for laboratory analysis from 32 to 34 feet.
34		85.0			*Groundwater sample submitted for laboratory analysis form 31 to 36 feet.
36	24	180.9		SC	(34.0 - 36.0) SAND with silty clay, medium grained sand, few rounded pebbles, poorly sorted, wet, olive brown. Note: negative result for NAPL test from 34 to 36 feet.

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.

NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System

ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife AMSL - Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **PSA-8**

TOTAL DEPTH: **66.5 feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Process Sump Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0006A**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/27/2012**
DATE COMPLETED:	**7/31/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**738.73 feet AMSL**
NORTHING:	**623024.1416**
EASTING:	**1485082.2288**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
36		183.3		CL	Note: negative result for NAPL test from 36 to 38 feet.
38		181.1			(36.0 - 43.0) SILTY CLAY, few small round pebbles, poorly sorted, hard, dry, very dark grayish brown. Note: negative result for NAPL test from 38 to 40 feet.
40	81	575.4			Note: very hard material is fractured from 40 to 43 feet. Note: negative result for NAPL test from 40 to 42 feet.
42		180.4			*Groundwater sample submitted for laboratory analysis from 43 to 48 feet.
44		165.8		SM	(43.0 - 50.0) SAND, coarse grain with silt, some medium to large pebbles, poorly sorted, loose, wet, olive brown.
46	71	115.8			Note: negative result for NAPL test from 44 to 46 feet. Note: negative result for NAPL test from 46 to 48 feet.
48		83.2			
50	24	392		CL	(50.0 - 52.0) SILTY CLAY, some small pebbles, poorly sorted, hard, dry, very dark grayish brown. Note: negative result for NAPL test from 50 to 52 feet.
52		233.4		ML	(52.0 - 56.0) SANDY SILT with clay, medium to coarse grain sand, few small to medium pebbles, poorly sorted, loose, moist to wet, odor, olive brown.
54		10,887			
56	NM	11,901		SM	(56.0 - 58.0) SILTY SAND, medium to coarse grain with some small to medium pebbles, poorly sorted, loose, moist to wet, odor, olive brown. *Saturated soil sample submitted for laboratory analysis from 56 to 58 feet.
58		9,029		ML	(58.0 - 60.0) SILT, few small pebbles, fractured/crumbled, hard, odor, olive brown (2.5Y 3/2).
60	24	298.2		SW	(60.0 - 62.0) SAND, medium to coarse grain, few small pebbles, trace silt, poorly sorted, loose, wet. Note: negative result for NAPL test from 60 to 62 feet.
62	36	268.1		ML	*Groundwater sample submitted for laboratory analysis from 61 to 66 feet. Note: more silt at 61.5 feet.
64		255.4			(62.0 - 66.0) SILT with very fine sand, stiff, wet, odor, olive brown. Note: negative result for NAPL test from 62 to 64 feet.
66	48	38.1		CL	Note: negative result for NAPL test from 64 to 66 feet.
68					(66.0 - 66.5) SILTY CLAY, trace small round pebbles, hard. Note: negative result for NAPL test from 66 to 66.5 feet.
					End of boring at 66.5 feet.

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.
NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife AMSL - Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **PSA-9**

TOTAL DEPTH: **65** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Process Sump Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0006A**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/27/2012**
DATE COMPLETED:	**8/7/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**738.81 feet AMSL**
NORTHING:	**622912.6158**
EASTING:	**1485207.1184**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0		NM		CONCRETE	(0.0 - 0.5) CONCRETE removed by coring.
2		NM		SM	(0.5 - 10.0) SAND, medium to coarse grain, some silt, some small to medium round pebbles, few small cobbles, poorly sorted, loose, dry.
4	HK	NM			
6		NM			
8		NM			
10		3.2		SM	(10.0 - 20.0) SAND, fine to medium grain, silt, some small to medium pebbles, poorly sorted, loose, dry, olive brown.
12	35	3.6			
14		3.4			
16	34	1.1			Note: higher silt content, olive brown from 15 to 20 feet.
18		3.9			
20		2.1		GW	(20.0 - 21.0) PEBBLES, small to medium, trace coarse sand, poorly sorted, loose, dry, olive brown.
22	45	3.3		ML	(21.0 - 30.0) SILT with fine to medium sand, few medium round pebbles, poorly sorted, loose, dry, olive brown (2.5Y 4/3).
24		2.2			
26	38	6.3			Note: more medium round pebbles with depth from 26 to 30 feet. *Soil sample submitted for laboratory analysis from 26 to 28 feet.
28		6.1			
30	NR	NM			(30.0 - 32.0) NO RECOVERY.
32		2.1		SW	(32.0 - 40.0) SAND with small pebbles, medium to coarse sand, few medium pebbles, little silt, poorly sorted, loose, wet, olive brown. *Groundwater sample submitted for laboratory analysis from 32 to 37 feet.
34		2.6			
36					

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.

NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System

ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife AMSL - Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **PSA-9**

TOTAL DEPTH: **65** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Process Sump Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0006A**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/27/2012**
DATE COMPLETED:	**8/7/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**738.81 feet AMSL**
NORTHING:	**622912.6158**
EASTING:	**1485207.1184**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
36	48	5.2			Note: higher silt content, some clay, wet from 36 to 40 feet.
38		2.2			
40		2.4		ML	(40.0 - 42.0) SILT, little fine grain sand, loose, wet, olive brown.
42	33	4.2		SM	(42.0 - 50.0) SAND, fine to coarse grain with silt, few small to medium round pebbles, poorly sorted, loose, wet, olive brown.
44		8.4			Note: higher silt content, wet from 45 to 50 feet.
46	34	9.3			*Groundwater sample submitted for laboratory analysis from 47 to 52 feet.
48		8.2			
50	18	11.3		SM	(50.0 - 54.0) SILTY SAND, medium to coarse grain, few medium pebbles to small cobbles, trace clay, poorly sorted, loose to moderately stiff, wet, olive brown.
52	34	5.7			Note: more consolidated with depth from 52 to 54 feet.
54		17.8		CL	(54.0 - 59.0) SILTY CLAY, few medium round pebbles, poorly sorted, hard, dry, dark gray brown.
56	33	13.8			Note: dry, slight odor from 55 to 59 feet.
58		73.9			(59.0 - 60.0) SILTY SAND, fine to medium grain, few small to medium pebbles, moderately stiff, wet, very dark gray. *Groundwater sample submitted for laboratory analysis from 59 to 64 feet.
60				SM	
62	41	46.9		SM	(60.0 - 64.0) SAND, medium to coarse grain with silt, few small round pebbles, poorly sorted, loose, wet, dark gray brown.
64		108.7			Note: increased silt content with depth.
66		73.8		ML	(64.0 - 64.5) SILT, few small round pebbles, trace sand, poorly sorted, moderately stiff, slight odor, moist.
				CL	(64.5 - 65.0) SILTY CLAY, few small round pebbles, poorly sorted, hard, slight odor, dry.

End of boring at 65 feet.

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.

NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System

ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife AMSL - Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **PSA-10**

TOTAL DEPTH: **65** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Process Sump Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0006A**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/27/2012**
DATE COMPLETED:	**8/28/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**738.77 feet AMSL**
NORTHING:	**622869.8232**
EASTING:	**1485368.4397**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
0	HK	NM		CONCRETE	(0.0 - 0.8) CONCRETE removed by coring.
2		NM		SM	(0.8 - 10.0) SAND, medium to coarse grain, silt, some small to medium round pebbles, few small cobbles, poorly sorted, loose, dry, olive brown.
4		NM			
6		NM			
8		NM			
10	36	1.4		SM	(10.0 - 15.0) SAND, medium grain, some silt, some small to large round pebbles, poorly sorted, loose, dry, olive brown.
12		1.2			
14		0.5			(15.0 - 16.0) SAND, medium grain, few small round pebbles, trace silt, poorly sorted, loose, dry, olive brown.
16	34	1.9		SW	(16.0 - 32.0) SAND, medium grain, some small to large round pebbles, poorly sorted, loose, dry, light olive brown.
18		2.0		SW	
20	42	1.4			
22		1.4			
24		2.4			Note: cobbles at 23 feet.
26	40	2.1			Note: higher silt content, more medium round pebbles from 25 to 30 feet.
28		2.8			
30	29	3.0			*Soil sample submitted for laboratory analysis from 30 to 32 feet.
32		2.9		CL	(32.0 - 45.0) SILTY CLAY, some small round pebbles, poorly sorted, loose, dry, gray.
34	30	2.6			
36	48	0.8			
38					

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.

NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System

ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife AMSL - Above Mean Sea Level

SOIL BORING LOG

BORING NO.: **PSA-10**

TOTAL DEPTH: **65** **feet bls**

PROJECT INFORMATION

CLIENT:	**RACER Trust**
PROJECT:	**Process Sump Area Investigation**
SITE LOCATION:	**Moraine, Ohio**
PROJECT NUMBER:	**OH000294.2012.0006A**
LOGGED BY:	**Lauren Baumgartner**
DATE STARTED:	**6/27/2012**
DATE COMPLETED:	**8/28/2012**

DRILLING INFORMATION AMSL

DRILLING CO.:	**Boart Longyear**
DRILLER:	**Jason Greer**
DRILLING METHOD:	**Rotosonic**
GROUND ELEVATION:	**738.77 feet AMSL**
NORTHING:	**622869.8232**
EASTING:	**1485368.4397**

DEPTH (feet)	Recovery (inches)	PID (ppm)	Soil Symbols	USCS Classification	SOIL DESCRIPTION
38					
40		1.4			
	52	2.1			Note: more small round pebbles, higher silt content from 40 to 45 feet.
42		2.0			
44		1.8			(45.0 - 45.5) SILTY CLAY, some small to medium round pebbles, little medium sand, poorly sorted, soft, moist to wet, olive brown.
46		2.0		CL	(45.5 - 46.5) SAND, coarse grain with silt, some small to medium round pebbles, little clay, loose to moderate stiff, wet, olive brown.
48		4.5		SM CL	(46.5 - 65.0) SILTY CLAY, some small to medium round pebbles, trace sand, poorly sorted, hard, dry, gray.
50		7.0			*Groundwater sample submitted for laboratory analysis from 45 to 50 feet.
52		8.3			
54	120	8.5			
56		9.3			Note: seams of medium sand, well sorted from 55 to 56 feet.
58		12.2			Note: more medium round pebbles from 58 to 60 feet.
60		7.2			
62	78	5.3			
64		3.4			
66					Note: higher silt content from 64.5 to 65 feet. End of boring at 65 feet.

Notes:
bls: below land surface
NR: No Recovery
*Indicates sample submitted for laboratory analysis.
NR: No Recovery
NM: Not Measured
USCS: Unified Soil Classification System
ppm: parts per million
PID: Photo-ionization Detector
ft: feet
HK: Hydroknife AMSL - Above Mean Sea Level