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Counsel's Request

PARCEL A-2
PHASE II ENVIRONMENTAL SITE ASSESSMENT

General Motors Corporation
Clark Avenue Facility
Detroit, Michigan

MARCH 1997

REF. NO. 8889 (23)

This report is printed on recycled paper.

CONESTOGA-ROVERS & ASSOCIATES

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1.0 INTRODUCTION

Conestoga-Rovers & Associates (CRA) was retained by General Motors Corporation (GM) to conduct a Phase II Environment Site Assessment (Phase II ESA) for a portion of the GM Clark Avenue Facility located at 2860 Clark Avenue in Detroit, Michigan. The Site is defined as Parcel A-2, as identified on the survey by David C. Adams & Son (Site). The Site location is presented on Figure 1.1. A Site plan is presented on Figure 1.2.

The purpose of the Phase II ESA was to confirm or deny a release at all potential areas of environmental concern (PAOCs) identified during the Phase I ESA of the Site, which was completed from September 1996 to December 1996. The Phase I ESA identified PAOCs for the Site through the following methods:

i) review of available documentation for the Site;
ii) re-evaluation of environmental areas of interest identified during historic Site investigations; and
iii) inspection of environmental conditions during Site demolition and concrete slab removal.

This document presents a summary of the Phase II ESA activities for the Site, in the following sections:

2.0 Scope of Work
3.0 Geology and Hydrogeology
4.0 Analytical Results
5.0 Conclusions

2.0 SCOPE OF WORK

CRA conducted a Phase II ESA at the Site during the period from September 6, 1996 through December 6, 1996. The Phase II ESA was designed to confirm or deny a release at the PAOCs identified during the Phase I ESA.

2.1 SUMMARY OF PAOCS EVALUATED

Two (2) PAOCs were identified during the Phase I ESA (CRA, February 1997). PAOC locations are presented on Figure 2.1. The 2 PAOCs were identified during demolition oversight activities (PAOC A2-2) and the re-evaluation of historic environmental areas of interest (PAOC A2-1).

For the purpose of this Phase II ESA, PAOCs are named according to their location and order of discovery. For example, PAOC A2-1 was the first PAOC discovered in Parcel A-2.

Phase II ESA boreholes were only installed at PAOC A2-2. PAOC A2-1 was historically identified as the North Roadway Area. No Phase II ESA boreholes were installed in this area based on existing data. The North Roadway Area will be evaluated during the Phase III ESA.

2.2 BREAKDOWN OF BOREHOLES BY LOCATION

A total of 2 investigative boreholes were completed during the Phase II ESA on Site. Figure 2.2 presents the borehole locations.

2.3 BOREHOLE INSTALLATION

2.3.1 DRILLING METHODS

Carlo Environmental Technologies (CET), of Clinton Township, Michigan, performed all Phase II ESA drilling activities at the Site from September 1996 through December 1996.

Boreholes were advanced using a drill rig equipped with 4 1/4-inch hollow stem augers, approximately two feet into the clay layer which underlies the surficial fill material at the Site. Boreholes were advanced to approximately ten feet below ground surface (bgs), or until no adverse impact was observed, whichever was deeper.

Borehole stratigraphic logs are included in Appendix A.

2.3.2 SOIL SAMPLING METHODS

Soil samples were collected continuously using split spoon samplers. Two soil samples were collected from each boring, one from the fill material and one from the underlying clay for analysis. Soil samples were screened using a photoionization detector (PID) and visually examined for staining and/or odors. The soil sample collected from the fill material which exhibited the highest PID reading, or most significant staining/odors, was submitted for analysis. The sample collected from the last split spoon advanced into the clay layer was also submitted for analysis.

Soil samples were collected by split-spoon methods in accordance with ASTM Method 1586 using the following sampling protocols:

i) soil samples were collected using a 24-inch long, 2-inch or 3-inch outside diameter carbon-steel split-spoon sampler (precleaned as described in Section 2.3.3). The split-spoon was attached to precleaned drill rods, and driven ahead of the hollow stem augers (HSAs) into the materials to be sampled using a

140-pound hammer, free falling 30 inches. The number of hammer blows were recorded for each 6-inch increment of penetration; and

ii) all collected soil samples were described and visually classified according to the USCS System, placed in precleaned laboratory-supplied jars, and submitted to the analytical laboratory for chemical analyses.

2.3.3 DECONTAMINATION METHODS

Prior to mobilization of sampling equipment, and prior to the commencement of sampling activities, all sampling equipment was thoroughly steam-cleaned to remove oil, grease, mud and other foreign matter.

The drill rig and all downhole drilling and sampling equipment (such as augers, cutting bits, and associated equipment and tools), were cleaned using the following sequence:

i) hot potable water high-pressure, low-volume wash and hand scrubbing, as necessary, supplemented by non-phosphate detergent (Alconox); and

ii) hot potable water high-pressure, low-volume rinse.

The soil sampling equipment and tools were cleaned prior to the initial borehole, and in between each borehole installed.

Sampling equipment and tools, including split-spoons, were thoroughly cleaned using the following wash sequence:

i) cleaning with potable water and detergent (Alconox), using a brush to remove particulate matter and surface films;
ii) rinsing thoroughly with potable water;
iii) rinsing with isopropanol;
iv) rinsing thoroughly with deionized water;

v) allowing the equipment to air dry as long as possible; and

vi) wrapping with aluminum foil, if appropriate, if the equipment was to be stored or transported.

2.4 SAMPLE ANALYSIS/DATA VALIDATION

Soil samples were collected and submitted to IEA, Inc. of Cary, North Carolina, and Encotec of Ann Arbor, Michigan, and analyzed for various parameters, including volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and Michigan Metals (Metals).

The sample summary table, Table 2.1, presents a detailed list of which parameters were analyzed for each sample collected. Parameter selection was based on information obtained during the Phase I ESA for the Site and subsequent discussions with GM.

Samples were shipped via Federal Express or hand delivery to the analytical laboratories in sealed coolers packed with ice under chain-of-custody protocol. Chain-of-Custody records are included as Appendix B.

Quality assessment and validation of the analytical data reported by IEA and ENCOTEC was conducted by CRA's quality assurance officer. The validation of the analytical data was based on laboratory blank data, recovery data from matrix and surrogate spikes, and check samples. The analytical data was assessed for accuracy and precision based on review of the blank and spike recovery data. The analytical data was determined to be valid and suitable for quantitative use specific to this project. The data quality assessment and validation memoranda are presented in Appendix C.

The analytical results for the soil samples were compared to Michigan Act 451, Part 201 Generic Industrial Direct Contact Criteria, as defined in the Environmental Response Division Operational Memorandum #14, Revision 2, dated June 6, 1995.

3.0 GEOLOGY AND HYDROGEOLOGY

3.1 SITE GEOLOGY

The Site is located on the southeastern edge of the Michigan Basin, a regional geologic feature that includes sedimentary rocks of the Paleozoic age.

An accumulation of unconsolidated sediment deposits cover most of the Michigan area, formed during the glaciation of the Pleistocene Epoch. The lacustrine glacial till is comprised of sand, silt, and clay, and has a thickness of 101 to 200 feet (Hydrogeologic Atlas of Michigan, Western Michigan University, 1981). The glacial till at the Site was reported in previous investigations to be 111 to 125 feet thick. The underlying bedrock is reported to be limestone of the Dundee Limestone, a late Devonian formation. The Dundee Limestone is generally a highly fractured, brown, carboniferous rock.

Through years of development and industrial use, the native soils in many areas of the Site have been overlain by earth fill (i.e., sand and gravel), asphalt, concrete, or structures. This surficial layer of fill at the Site is generally less than ten feet thick.

3.2 SITE HYDROGEOLOGY

The stratigraphy at the Site contains two water bearing zones: a shallow perched water zone within the surficial fill, and an aquifer within the limestone bedrock beneath the lacustrine glacial till.

The first usable aquifer is protected from surficial contamination by impervious material. No wells in the area are reported to be located in the bedrock. The glacial drift is generally not an aquifer, but may include thin interbedded aquifers at depth (Hydrogeologic Atlas of Michigan, Western Michigan University, 1981).

It should be noted that the perched water in many areas of Detroit is considered by the Michigan Department of Environmental Quality (MDEQ) - Environmental Response Division (ERD) to be groundwater not in an aquifer.

4.0 ANALYTICAL RESULTS

4.1 VOCS

No VOC parameters were detected in any of the soil samples above method detection limits.

4.2 SVOCS

A summary of detected SVOCs in soil samples is presented in Table 4.1.

No SVOC parameters were detected above the Michigan Act 451, Part 201 Generic Industrial Direct Contact Criteria.

4.3 PCBs

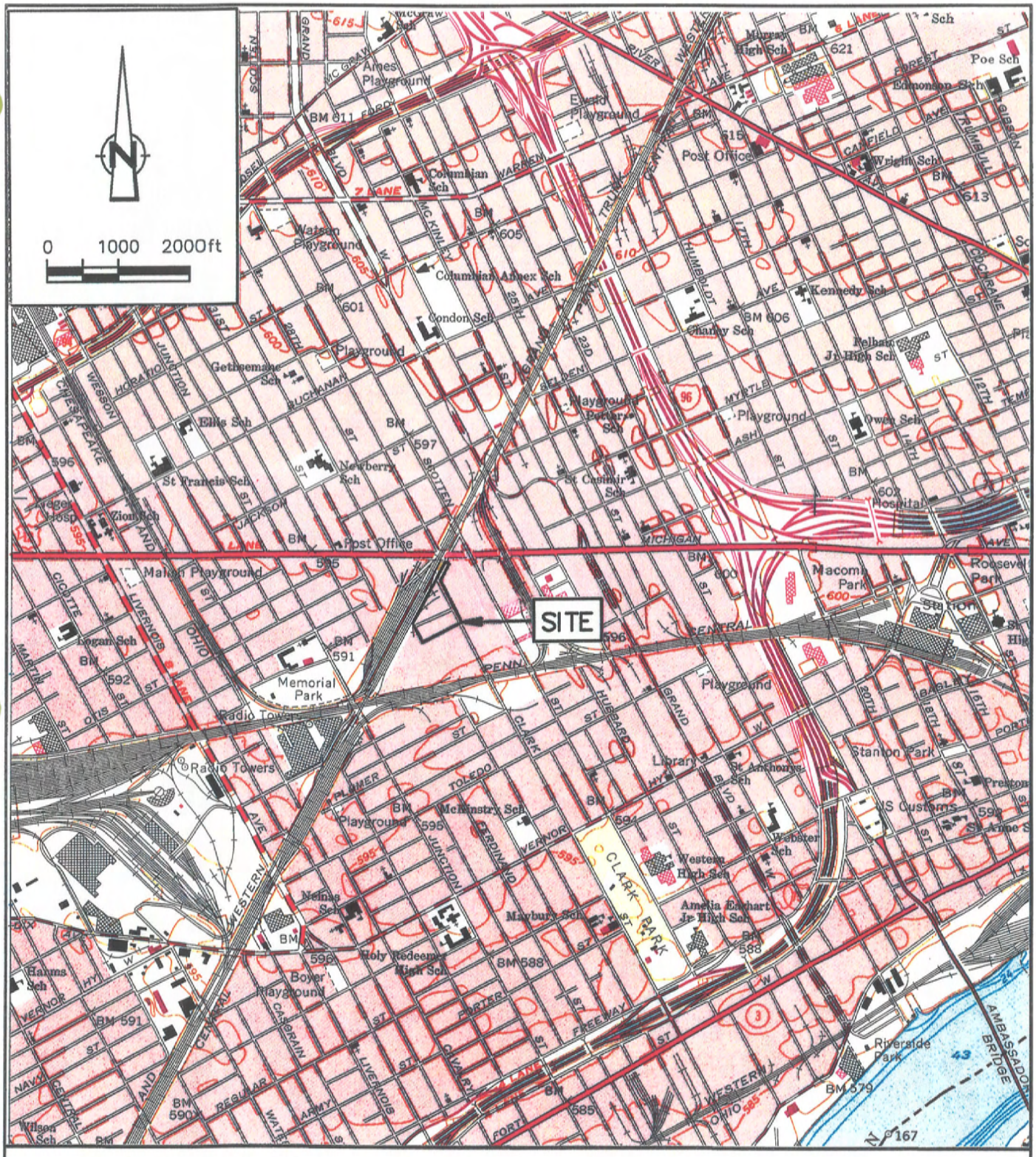
No PCB parameters were detected in any of the soil samples above method detection limits.

4.4 INORGANICS

A summary of detected inorganics in soil samples is presented in Table 4.2. No inorganic parameters were detected above the Michigan Act 451, Part 201 Generic Industrial Direct Contact Criteria.

5.0 CONCLUSIONS

Based on existing data, the North Roadway Area is an AOC (A2-2). Based on the results of the Phase II ESA, no additional areas of concern (AOCs) were identified.



SOURCE: USGS QUADRANGLE MAP;
DETROIT, MICHIGAN

figure 1.1

SITE LOCATION
PARCEL A–2
GENERAL MOTORS CLARK AVENUE SITE
Detroit, Michigan

CRA

08889(023)DE

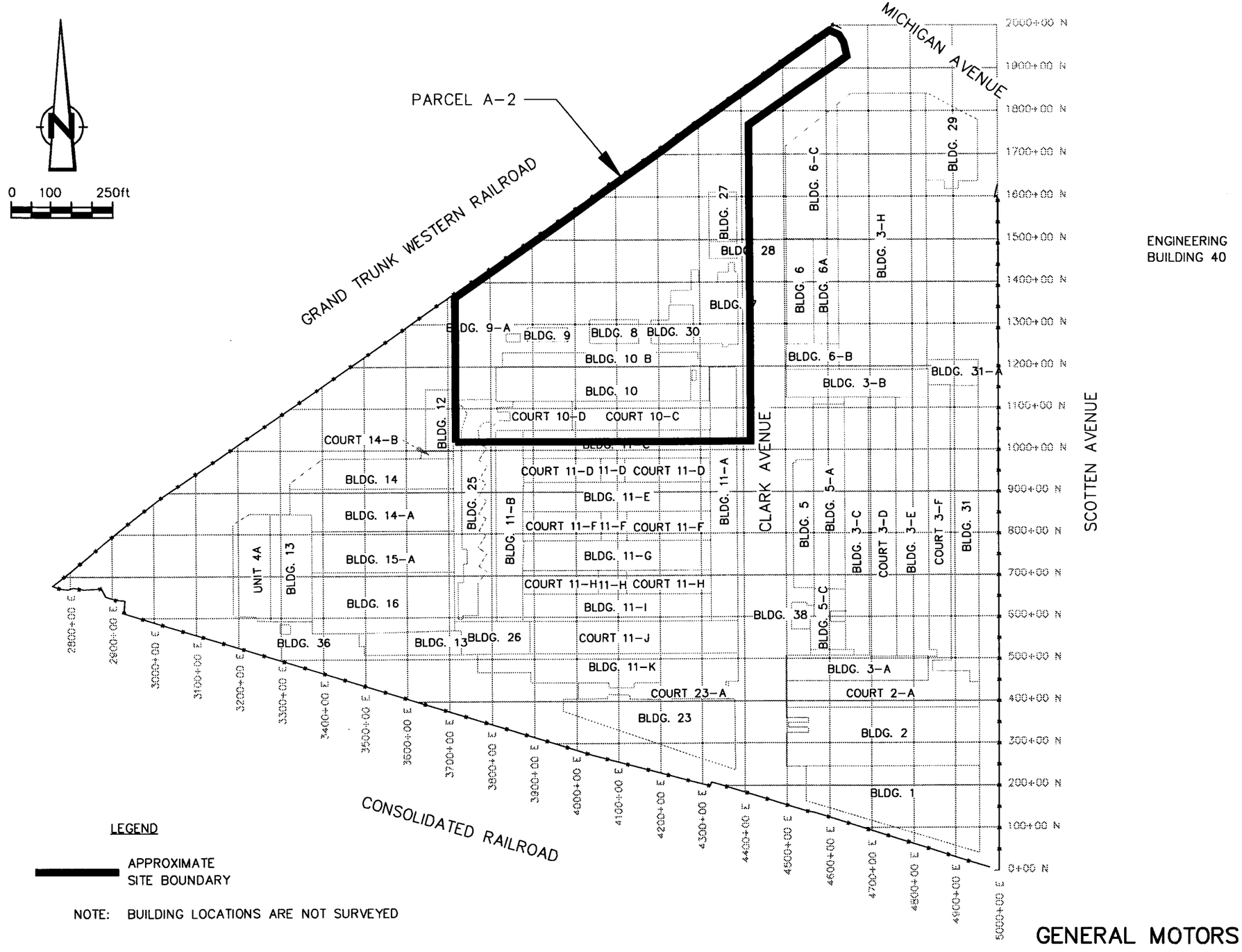
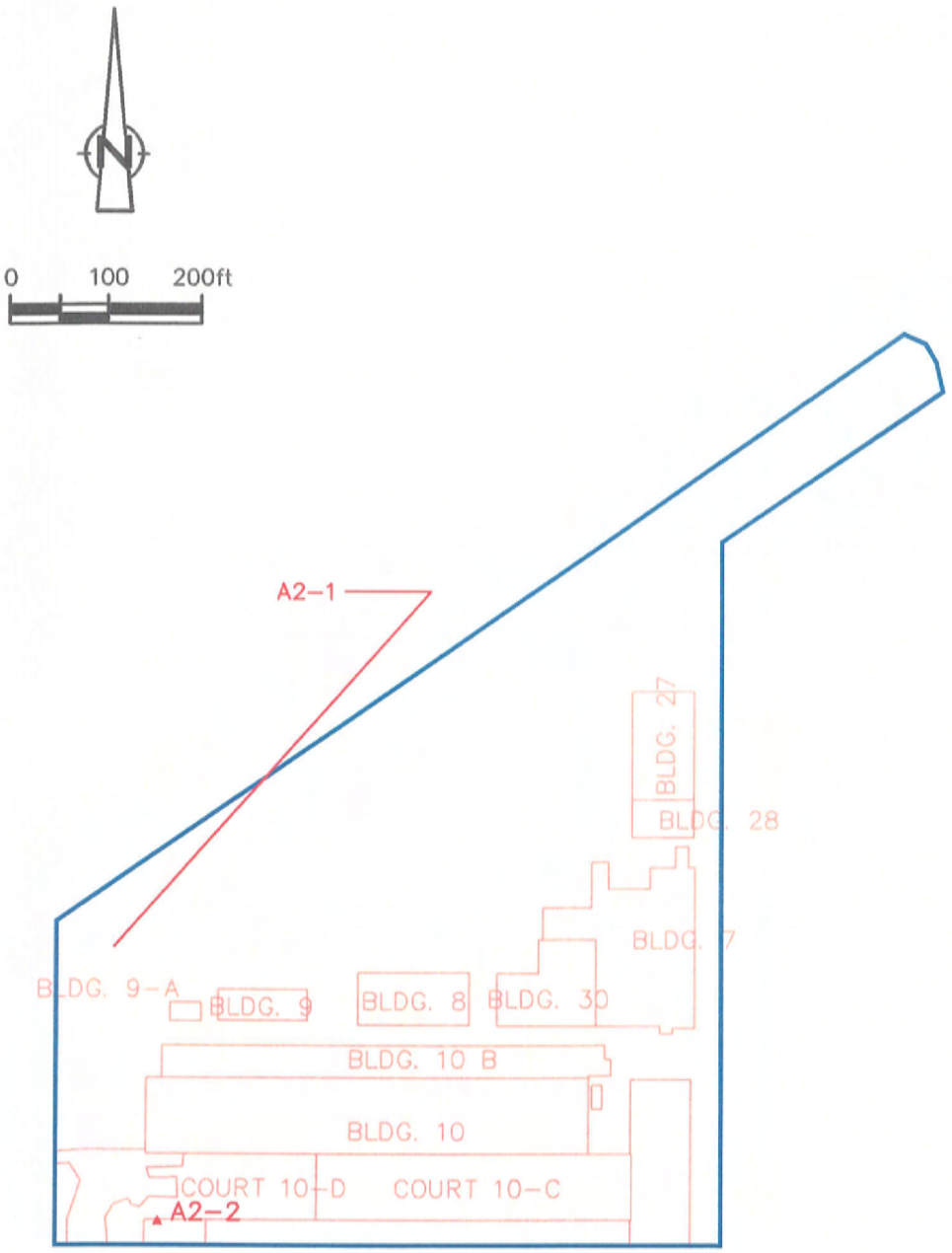


figure 1.2
SITE PLAN
PARCEL A-2
GENERAL MOTORS CLARK AVENUE SITE
Detroit, Michigan

CRA

08889(023)DE001



LEGEND

▲ A2-2 SURVEYED PAOC LOCATION

APPROXIMATE SITE BOUNDARY

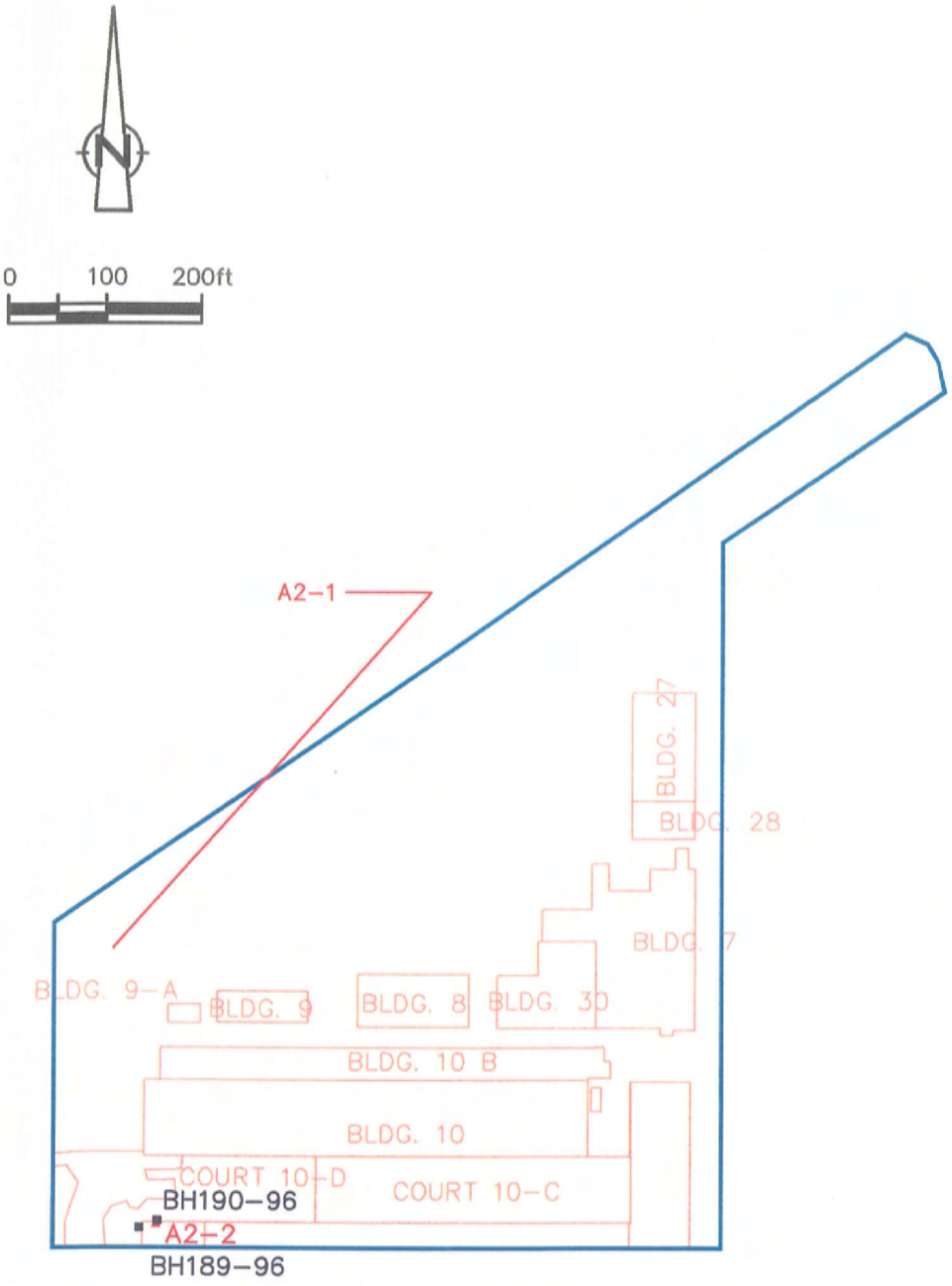
NOTE: BUILDING LOCATIONS ARE NOT SURVEYED

figure 2.1

LOCATION OF PAOCs
PARCEL A-2
GENERAL MOTORS CLARK AVENUE SITE
Detroit, Michigan

CRA

08889(023)DE002



LEGEND

▲ A2-2	SURVEYED PAOC LOCATION
■ BH190-96	BOREHOLE LOCATION
———	APPROXIMATE SITE BOUNDARY

NOTE: BUILDING LOCATIONS ARE NOT SURVEYED

figure 2.2

PHASE II ESA BOREHOLE LOCATIONS
PARCEL A-2
GENERAL MOTORS CLARK AVENUE SITE
Detroit, Michigan

CRA

08889(023)DE003

TABLE 2.1

SAMPLE SUMMARY
PHASE II ENVIRONMENTAL SITE ASSESSMENT
PARCEL A-2
GM CLARK AVENUE FACILITY
DETROIT, MICHIGAN

Sample Number	*Sample Location*	*PAOC Number*	*Analysis*	*Depth (feet bgs)*
S-8889-102296-PFR-310	BH-189-96	A2-2	VOC, SVOC, PCB, Metals	6-6.5
S-8889-102296-PFR-311	BH-189-96	A2-2	VOC, SVOC, PCB, Metals	13.5-14
S-8889-102396-PFR-312	BH-190-96	A2-2	VOC, SVOC, PCB, Metals	3.5-5
S-8889-102396-PFR-313	BH-190-96	A2-2	VOC, SVOC, PCB, Metals	13-14

Notes:

VOC = Volatile Organic Compound
SVOC = Semi-Volatile Organic Compound
PCB = Polychlorinated Biphenyls

TABLE 4.1

SUMMARY OF DETECTED SVOCs IN SOIL SAMPLES
PHASE II ESA
PARCEL A-2
GM CLARK AVENUE FACILITY
DETROIT, MICHIGAN

PAOC No.	*Michigan*	*Michigan*	*A2-2*	*A2-2*
Sample Location	*Generic Residential*	*Generic Industrial*	*BH-189-96*	*BH-190-96*
Sample ID (S-8889-)	*Direct Contact*	*Direct Contact*	*102296-PFR-310*	*102396-PFR-312*
Sample Depth (feet bgs)	*Criteria (1)*	*Criteria (2)*	*6-6.5*	*3.5-5*
Date Sampled			*10/22/96*	*10/23/96*
Parameter				
Semi-Volatile Organic Compounds (ug/kg)				
Acenaphthene	76,000,000	810,000,000	ND(400)	ND(380)
Anthracene	420,000,000	1,000,000,000	ND(400)	ND(380)
Benzo(a)anthracene	14,000	210,000	ND(400)	ND(380)
Benzo(a)pyrene	1,400	21,000	ND(400)	ND(380)
Benzo(b)fluoranthene	14,000	210,000	ND(400)	ND(380)
Benzo(g,h,i)perylene	1,500,000	16,000,000	ND(400)	ND(380)
Benzo(k)fluoranthene	140,000	210,000	ND(400)	ND(380)
Benzyl butyl phthalate	68,000,000	720,000,000	ND(400)	ND(380)
Bis(2-Ethylhexyl)phthalate	700,000	11,000,000	ND(400)	ND(380)
Carbazole	--	--	ND(400)	ND(380)
Chrysene	1,400,000	21,000,000	ND(400)	ND(380)
Di-n-butylphthalate	51,000,000	540,000,000	1,100	ND(380)
Dibenzo(a,h)anthracene	1,400	21,000	ND(400)	ND(380)
Dibenzofuran	ID	ID	ND(400)	ND(380)
3,3'-Dichlorobenzidine	5,700	55,000	ND(800)	ND(2,300)
Fluoranthene	51,000,000	540,000,000	600	ND(380)
Fluorene	51,000,000	540,000,000	ND(400)	ND(380)
Indeno(1,2,3-c,d)pyrene	14,000	210,000	ND(400)	ND(380)
2-Methylnaphthalene	15,000,000	160,000,000	ND(400)	460
Napthalene	15,000,000	160,000,000	ND(400)	ND(380)
Pentachlorophenol	8,100	63,000	ND(2,000)	ND(3,900)
Phenanthrene	1,500,000	16,000,000	860	ND(380)
Pyrene	32,000,000	340,000,000	500	ND(380)

Notes:

ND( ) - Parameter was not detected above level in parenthesis.
PAOC - Potential Area of Concern.
bgs - below ground surface
-- - Criterion not available.
ID - Inadequate data to develop criterion.
(1) Values taken from MDEQ Operational Memorandum #8, Revision 4, dated June 5, 1995.
(2) Values taken from MDEQ Operational Memorandum #14, Revision 2, dated June 6, 1995.

TABLE 4.2

SUMMARY OF DETECTED INORGANICS IN SOIL SAMPLES
PHASE II ESA
PARCEL A-2
GM CLARK AVENUE FACILITY
DETROIT, MICHIGAN

PAOC No. *Sample Location* *Sample ID (S-8889-)* *Sample Depth (feet bgs* *Date Sampled*	*Michigan Generic Residential Direct Contact Criteria (1)*	*Michigan Generic Industrial Direct Contact Criteria (2)*	*A2-2* *BH-189-96* *102296-PFR-310* *6-6.5* *10/22/96*	*A2-2* *BH-189-96* *102296-PFR-311* *13.5-14* *10/22/96*	*A2-2* *BH-190-96* *102396-PFR-312* *3.5-5* *10/23/96*	*A2-2* *BH-190-96* *102396-PFR-313* *13-14* *10/23/96*
Inorganics (mg/kg)						
Arsenic	6.6	100	11.6	5.29	4.54	7.30
Barium	30,000	320,000	114	62.2	62.8	89.2
Cadmium	210	2,300	0.381 J	0.198 J	0.207 J	0.116 J
Chromium	2,000	22,000	19.9	18.4	16.8	28.2
Copper	16,000	170,000	18.6	17.1	17.2	16.2
Lead	400	400	13.2 J	8.38 J	33.5 J	9.69 J
Mercury	130	1,400	ND(0.100)	ND(0.100)	0.159	ND(0.128)
Selenium	2,100	23,000	ND(1.26)	ND(1.30)	ND(1.24)	ND(1.28)
Silver	2,000	21,000	ND(0.628)	ND(0.649)	ND(0.619) UJ	ND(0.638) UJ
Zinc	140,000	1,000,000	58.4	77.3	58.2 J	56.4 J

Notes:

J - The associated numerical value is an estimated quantity.
UJ - the compound was analyzed for, but not detected. The sample quantitation limit is an estimated value.
ND( ) - Parameter was not detected above level in parentheses.
PAOC - Potential Area of Concern
bgs - below ground surface.
Shaded number indicates exceedance of Generic Residential Direct Contact Criteria.
(1) Values taken from MDEQ Operational Memorandum #8, Revision 4, dated June 5, 1995.
(2) Values taken from MDEQ Operational Memorandum #14, Revision 2, dated June 6, 1995.

APPENDIX A

BOREHOLE STRATIGRAPHIC LOGS

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(DL201)
Page 1 of 1

PROJECT NAME: GM CLARK STREET
PROJECT NUMBER: 8889
CLIENT: GM
LOCATION: DETROIT, MI

HOLE DESIGNATION: BH189-96
DATE COMPLETED: OCTOBER 22, 1996
DRILLING METHOD: 4 ¼" ID HSA
CRA SUPERVISOR: P. RUMMEL

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	0.00					
	No samples						
		-2.0					
2.5	SW/GW-SAND and GRAVEL (FILL), medium dense, fine to coarse sand, fine to medium gravel, well graded, gray, dry		CUTTINGS	1SS		10	0
		-4.5					
5.0	CONCRETE			2SS		-	0
		-6.0					
	ML-SILT, trace sand, trace clay, very loose, very fine sand, green-gray, moist	-6.3		3SS		-	-
7.5	CL-CLAY, trace silt, firm, high plasticity, olive-green, moist		8" Ø BOREHOLE	4SS		2	16.9
10.0				5SS		4	1.9
	- stiff, brown						
12.5				(8SS)		8	1.3
		-14.0					
	END OF HOLE @ 14.0ft BGS						
15.0							
17.5							
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
ANALYSIS ⬭

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(DL180)
Page 1 of 1

PROJECT NAME: GM CLARK STREET
PROJECT NUMBER: 8889
CLIENT: GM
LOCATION: DETROIT, MI

HOLE DESIGNATION: BH190-96
DATE COMPLETED: OCTOBER 23, 1996
DRILLING METHOD: 4 ¼" ID HSA
CRA SUPERVISOR: P. RUMMEL

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUND SURFACE	0.00					
	No sample						
-2.5	SM/ML-SAND and SILT, trace gravel, little clay, loose, very fine to medium sand, fine to medium gravel, olive-green, moist	-2.0	CUTTINGS	1SS		5	10.3
-5.0				2SS		8	19.3
-7.5	ML/CL-SILT and CLAY, trace sand, trace gravel, soft, fine to medium sand, fine gravel, well graded, olive-green, moist	-7.3	8" Ø BOREHOLE	3SS		5	3.3
-10.0	CL-CLAY, trace silt, soft, high plasticity, gray, dry	-10.0		4SS		10	30.4
-12.5				5SS		2	6.8
	END OF HOLE @ 14.0ft BGS	-14.0		6SS		10	1.4
-15.0							
-17.5							
-20.0							
-22.5							
-25.0							
-27.5							
-30.0							
-32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
ANALYSIS ⬭

APPENDIX B

CHAIN-OF-CUSTODY FORMS

1808 - 13 to R

CRA

CONESTOGA-ROVERS & ASSOCIATES, INC.
11100 Metro Airport Center Drive - Suite 160
Romulus, MI 48174 (313) 942-0909

CHAIN OF CUSTODY RECORD

SHIPPED TO (Laboratory Name): IEA

REFERENCE NUMBER: 8999-20

PROJECT NAME: GM - Clark St.

SAMPLER'S SIGNATURE: Patrick Rummel PRINTED NAME:

SEQ: No.	DATE	TIME		SAMPLE TYPE	No. OF CONTAINERS	PARAMETERS: BTEX	TCL SVOC	TAL Inorg. Metals	PCB's	REMARKS
	Oct 22/96	900	S. 8999-102296-PFR-291	Soil	1	✓				
		900	S- 292		1	✓				MS/MSD
		900	S- 293		1	✓				
		900	S- 294		1	✓				72 hrs TAT.
		1000	S- 295		1	✓				
		1000	S- 296		1	✓				
		1100	S- 297		1	✓				
		1100	S- 298		1	✓				
		1200	S- 299		1	✓				
		1200	S- 300		1	✓				
		1300	S- 309		1	✓				
		1300	S- 310		2	✓	✓	✓	✓	
		1400	S- 311		2	✓	✓	✓	✓	
		1400								
TOTAL NUMBER OF CONTAINERS					15					

RELINQUISHED BY: 1. Patrick Rummel	DATE: Oct. 22/96 TIME: 1800	RECEIVED BY: 1.	DATE: TIME:
RELINQUISHED BY: 2.	DATE: TIME:	RECEIVED BY: 2.	DATE: TIME:
RELINQUISHED BY: 3.	DATE: TIME:	RECEIVED BY: 1.	DATE: TIME:

METHOD OF SHIPMENT: Fedex. AIR BILL No.

White -Fully Executed Copy
Yellow -Receiving Laboratory Copy
Pink -Shipper Copy
Goldenrod -Sampler Copy

3678

SAMPLE TEAM:

RECEIVED FOR LABORATORY BY:
DATE: 10/23/96 TIME:

1001 (FO...S)-APRIL 29 93-REV 0-(C)/E-01

CRA

CONESTOGA-ROVERS & ASSOCIATES, INC.
11100 Metro Airport Center Drive - Suite 160
Romulus, MI 48174 (313) 942-0909

CHAIN OF CUSTODY RECORD

SHIPPED TO (Laboratory Name): TEA

REFERENCE NUMBER: 8889-20

PROJECT NAME: GM - Clark St.

SAMPLER'S SIGNATURE: Patrick Rummel PRINTED NAME: Patrick Rummel

SEQ: No.	DATE	TIME		SAMPLE TYPE	No. OF CONTAINERS	PARAMETERS: VOC's / TCL SVOC's / Michigan Metals / PCB's	REMARKS
1	Oct. 23/96	800	S-8889-102396-PIER-312	Soil	2	✓ ✓ ✓ ✓	72 hour TAT
2		800	S- 313		2	✓ ✓ ✓ ✓	
3		900	S- 314		2	✓ ✓ ✓ ✓	
4		900	S- 315		2	✓ ✓ ✓ ✓	
5		1000	S- 316		2	✓ ✓ ✓ ✓	
6		1001	S- 317		2	✓ ✓ ✓ ✓	
7		1335	S-8889-102396-SF-318	Soil	2	✓ ✓ ✓ ✓	
8		1355	-319		2	✓ ✓ ✓ ✓	
9		1515	-320 MS/MSD		2	✓ ✓ ✓ ✓	
10	↓	1525	-321	↓	2	✓ ✓ ✓ ✓	
			SF 10/23/96				
TOTAL NUMBER OF CONTAINERS					20		

RELINQUISHED BY: 1. Susan Felek	DATE: 10/23/96 TIME: 1715	RECEIVED BY: 1.	DATE: TIME:
RELINQUISHED BY: 2.	DATE: TIME:	RECEIVED BY: 2.	DATE: TIME:
RELINQUISHED BY: 3.	DATE: TIME:	RECEIVED BY: 1.	DATE: TIME:

METHOD OF SHIPMENT: Fed Ex AIR BILL No.

White -Fully Executed Copy Pink -Shipper Copy
Yellow -Receiving Laboratory Copy Goldenrod -Sampler Copy

No. 3686

SAMPLE TEAM: P. Rummel, S. Felek

RECEIVED FOR LABORATORY BY: D. McCormick 10/24/96 TIME: 0930

ICE-137 PDS 6 °C

1001 (FORMS)-APRIL 29, 93-REV 0-(C)(E-01)

APPENDIX C

DATA VALIDATION MEMORANDA

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MEMO

TO: Sara Anderson REFERENCE NO: 8889

FROM: Mary Cameron/mbc/51/Det. DATE: December 30, 1996

RE: Data Quality Assessment and Validation for Soil Samples Collected from the General Motors Clark Street Site in Detroit, Michigan

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The following details a quality assessment and validation of the analytical data resulting from the October 22 and 23, 1996, collection of four (4) soil samples from the General Motors Clark Street Site in Detroit, Michigan. The samples identified in Table 1 were analyzed for target compound list (TCL) volatile organic compounds (VOC); TCL semi-volatile organic compounds (SVOC); polychlorinated biphenyl (PCB); and Michigan metals. Sample analysis was completed at IEA Inc's Cary, North Carolina facility (IEA) in accordance with the methodologies presented in Table 2. The quality control criteria used to assess the data were established by the methods and the quality assurance project plan (QAPP).[1]

Holding Time Period and Sample Analysis

The holding time periods are presented in Table 3. The samples, as indicated by the sample collection, extraction and analysis dates on the chain-of-custody forms and analytical reports provided by IEA, were prepared and analyzed within the required holding time periods.

Method Blank Samples

Contamination of samples contributed by laboratory conditions or procedures was monitored by concurrent preparation and analysis of method blank samples. The method blank samples were reported to be free from detectable concentrations of target analytes, indicating no laboratory-attributable contamination occurred.

Laboratory Control Sample Analysis

The laboratory control sample (LCS) analyses serve as a monitor of the overall performance in all steps of the sample analysis. The LCS percent recoveries were within the laboratory control limits, indicating that an acceptable level of overall performance was achieved.

Surrogate Compound Percent Recoveries (Surrogate Recoveries) – Organic Analyses

Individual sample performance for the organic analyses was monitored by assessing the results of surrogate compound percent recoveries. The reported PCB quantitation limit for sample S-8889-102396-PFR-312 should be qualified as estimated values due to outlying surrogate percent recovery.

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[1] Application of quality assurance criteria was consistent with "Draft National Functional Guidelines for Organic Data Review", December 1990, revised June 1991 and "Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analysis", Draft October 1989.

Surrogate Compound Percent Recoveries (Surrogate Recoveries) – Organic Analyses (Cont'd)

The surrogate recovery acceptance criteria was met for the remaining samples.

Matrix Spike/Matrix Spike Duplicate Analysis - Metal Analyses

Matrix spike matrix spike duplicate (MS/MSD) percent recoveries and the relative percent difference (RPD) of the recoveries were monitored to determine the effects of sample matrix on the laboratories digestion and measurement methods. The samples that should be qualified due to violation of MS/MSD recovery criteria are outlined in Table 4. The remainder of the data were within the acceptance criteria.

Duplicate Sample Analyses – Metal Analyses

The laboratory precision of matrix-specific metals methods was monitored by the analyses for duplicate samples. The duplicate RPD data for the samples outlined in Table 5 violated the duplicate RPD acceptance criteria. The remaining samples were within the acceptance criteria.

Matrix Spike/Matrix Spike Duplicate Percent Recoveries - Organic Analyses

To assess the long term accuracy and precision of the analytical methods on various matrices, MS/MSD percent recoveries and the RPD of the recoveries were determined. The percent recoveries and RPDs acceptance criteria were met for all analyses.

Overall Assessment

The data were found to exhibit acceptable levels of accuracy and precision, based on the provided information, and may be used with the qualifications noted.

TABLE 1

SAMPLE IDENTIFICATION NUMBERS
GM CLARK STREET SITE
DETROIT, MICHIGAN

S-8889-102296-PFR-310

S-8889-102296-PFR-311

S-8889-102396-PFR-312

S-8889-102396-PFR-313

TABLE 2

SUMMARY OF ANALYTICAL METHODS
GM CLARK STREET SITE
DETROIT, MICHIGAN

Parameter	*Method*
TCL VOC	SW-846 8260[1]
TCL SVOC	SW-846 8270
PCB	SW-846 8080
Michigan Metals	
Arsenic	SW-846 6020
Barium	SW-846 6020
Cadmium	SW-846 6020
Chromium	SW-846 6020
Copper	SW-846 6020
Lead	SW-846 6020
Mercury	CLPM 245.5 [2]
Selenium	SW-846 6020
Silver	SW-846 6010
Zinc	SW-846 6010

[1] "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, 3rd Edition, and promulgated updates, November 1986.

[2] CLPM – "USEPA Contract Laboratory Program Statement of Work for Inorganic Analysis, Multi-Media Multi-Concentration", Document Number ILM 2.0 (Modified Method) September 1991, and revisions ILM 02.1.

TABLE 3

HOLDING TIME PERIODS
GM CLARK STREET SITE
DETROIT, MICHIGAN

Analysis	*Holding Time Period*
TCL VOC	- 14 days from sample collection to completion of analysis
TCL SVOC, PCB	- 14 days from sample collection to extraction - 40 days from extraction to completion of analysis
Michigan Metals -	
Metals (except Mercury)	- 180 days from sample collection to completion of analysis
Mercury	- 28 days from sample collection to completion of analysis

TABLE 4

SUMMARY OF QUALIFIED SAMPLE DATA DUE TO OUTLYING MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY DATA-METALS GM CLARK STREET SITE DETROIT, MICHIGAN

Parameters	*Associated Samples*	*Qualifier*[1]
Lead	S-8889-102296-PFR-310, S-8889-102296-PFR-311, S-8889-102396-PFR-312, S-8889-102396-PFR-313	J
Silver	S-8889-102396-PFR-312,	UJ
Zinc	S-8889-102396-PFR-313	J

[1] The parameter results should be qualified for the listed samples as:

J - The analyte was analyzed for and was positively identified, but the associated numerical value may not be consistent with the amount actually present in the environmental sample (for detected parameters).

UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is estimated and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample (for non-detected parameters).

TABLE 5

SUMMARY OF QUALIFIED SAMPLE DATA DUE TO OUTLYING DUPLICATE RPDS-METALS GM CALRK STREET SITE DETROIT, MICHIGAN

Parameter	*Associated Samples*	*Qualifier*[1]
Cadmium	S-8889-102296-PFR-310, S-8889-102296-PFR-311, S-8889-102396-PFR-312, S-8889-102396-PFR-313	J

[1] The parameter results should be qualified for the listed samples as:

J - The analyte was analyzed for and was positively identified, but the associated numerical value may not be consistent with the amount actually present in the environmental sample (for detected parameters).