



JOHN ENGLER, Governor

DEPARTMENT OF ENVIRONMENTAL QUALITY

HOLLISTER BUILDING, PO BOX 30473, LANSING MI 48909-7973

INTERNET: <http://www.deq.state.mi.us>

RUSSELL J. HARDING, Director

8889

REPLY TO:

WASTE MANAGEMENT DIVISION
PO BOX 30241
LANSING MI 48909-7741

February 27, 1997

CERTIFIED MAIL

Ms. Bridget R. Pitlock
Environmental and Regulatory Support Remediation Team
Worldwide Facilities Group
General Motors Corporation
485 West Milwaukee Avenue, MC 482-310-004
Detroit, Michigan 48202-3220

Dear Ms. Pitlock:

SUBJECT: Acceptance of Closure Certification, Cadillac Motor Car-Clark Street Facility,
General Motors Corporation, Detroit, Wayne County: MID 005 356 704

The Michigan Department of Environmental Quality, Waste Management Division, has reviewed the closure certification and its addenda, received June 11, 1990, February 6, 1996, and December 26, 1996, respectively, for General Motors Corporation's (GM's) Cadillac Motor Car-Clark Street facility located in Detroit, Michigan (the facility). The closure certification was submitted pursuant to the requirements of Part 111 (Hazardous Waste Management) of Michigan's Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Based on our review, GM is hereby released from its closure responsibilities at the facility under Part 111. GM is, therefore, no longer required to demonstrate financial capability for closure and liability coverage at the facility.

Facility Status

With this acceptance of the certification of closure, the facility can no longer be operated as a hazardous waste treatment, storage, or disposal facility. If hazardous waste is generated at the facility, it must be managed in accordance with all applicable generator requirements in Part 3 of the Part 111 Administrative Rules.

Financial Capability

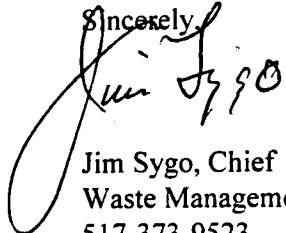
GM demonstrates financial assurance for closure of the facility by use of a Financial Test. In accordance with R 299.9703(5), this acceptance of the certification of closure constitutes a release from the requirement to maintain such financial assurance. GM is no longer required to demonstrate closure coverage for the facility with updated Financial Test information.

GM demonstrates financial responsibility for pollution liability coverage for its facility by use of a Financial Test. In accordance with R 299.9710(16), this acceptance of the certification of closure constitutes a release from the requirement to maintain such financial responsibility. GM is no longer required to demonstrate liability coverage for the facility with updated financial test information.

Corrective Action Responsibilities

This letter does not constitute a release from any facility-wide corrective action responsibilities GM may have under Part 111 or the federal Resource Conservation and Recovery Act of 1976, as amended. In addition to the responsibility to close regulated hazardous waste management units, owners and operators are responsible to conduct corrective actions for releases of hazardous wastes and hazardous constituents at waste management units.

If you have questions, please contact Mr. Dan Dailey of the Hazardous Waste Program Section, at 517-335-6610, or me.

Sincerely,

Jim Sygo, Chief
Waste Management Division
517-373-9523

cc: G. Turchan, CRA
K. West, GM
W. McFarland, GM
K. Richards, GM
Ms. Jean E. Caufield, GM
Dr. Ben Okwumabua/Mr. Larry AuBuchon, MDEQ-Southeast Michigan
Mr. Steve Buda, MDEQ
Mr. Steve Sliver, MDEQ, HWP/C&E File
Mr. Ron Stone/Mr. Clay Spencer, MDEQ
Mr. Dan Dailey, MDEQ

DRAFT

PHASE V ENVIRONMENTAL SITE ASSESSMENT – ADDENDUM NO. 1

**EXCAVATION OF IMPACTED SOIL NEAR
GM MONITORING WELL WA-1**

PARCEL A-1

**General Motors Corporation
Clark Avenue Facility
Detroit, Michigan**

APRIL 1998
REF. NO. 8889 (34)
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 coordinate additional Phase V Environmental Site Assessment (ESA) activities related to the excavation of impacted soil at the GM Clark Avenue Facility located at 2860 Clark Avenue in Detroit, Michigan. The Site is defined as Parcel A-1, 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.

This report summarizes the field activities performed by CRA and Carlo Environmental Technologies, Inc. (CET) of Clinton Township, Michigan on Wednesday, March 25, 1998 related to the excavation of impacted soil around GM monitoring well WA-1 at the Site.

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

- 2.0 Background
- 3.0 Scope of Work
- 4.0 Analytical Results
- 5.0 Conclusions

2.0 BACKGROUND

GM monitoring well WA-1 is located in an area of historical environmental interest known as the West Assembly Area. WA-1 was installed as part of a soil and groundwater investigation conducted on behalf of GM by the Chester Engineers (Chester) of Ann Arbor, Michigan in 1989-90.

The additional Phase V ESA activities were conducted as a result of the presence of free product encountered in WA-1 on Friday, March 20, 1998 by a representative for Johnson Controls, Inc., a potential future tenant of the Site.

3.0 SCOPE OF WORK

CRA and CET mobilized to the Site on Wednesday, March 25, 1998 to excavate impacted soil in the vicinity of monitoring well WA-1. Figure 3.1 presents the location of the excavation.

3.1 EXCAVATION METHODS

CET performed the excavation activities at the Site.

The excavation was advanced, using a 225 Excavator, to 7 feet below ground surface (bgs), until visually clean soil was encountered. Figure 3.2 presents the excavation area and the approximate soil verification sample locations. A thin-oil-like seam was encountered at 5 feet bgs. The soil was stockpiled on and covered with polyethylene sheeting (visqueen) adjacent to the excavation. Orange snow fencing was placed around the excavation area, pending analytical results.

Verification samples were collected from the sidewalls and floor of the excavation area in accordance with the Michigan Department of Environmental Quality (MDEQ) Verification of Soil Remediation (VSR) Guidance Document (April 1994, Revision 1).

Upon receipt of the analytical results, the excavation area was backfilled with clean fill materials provided by CET.

3.2 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 excavator bucket was cleaned using a hot potable water high-pressure, low-volume rinse and hand scrubbing, as necessary.

3.3 SAMPLE ANALYSIS/DATA VALIDATION

Twelve (12) soil verification samples were collected and submitted to Encotec of Ann Arbor, Michigan, and analyzed for benzene, toluene, ethylbenzene, xylenes (BTEX) and polynuclear aromatic hydrocarbons (PNAs).

The sample summary table, Table 3.1, presents a detailed list of which parameters were analyzed for each sample collected. Parameter selection was based on the free product encountered in WA-1 on Friday, March 20, 1998.

Samples were picked up by the analytical laboratory in sealed coolers packed with ice under chain-of-custody protocol. Analytical laboratory reports and chain-of-custody records are included in Appendix A.

Quality assessment and validation of the analytical data reported by 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 B.

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.

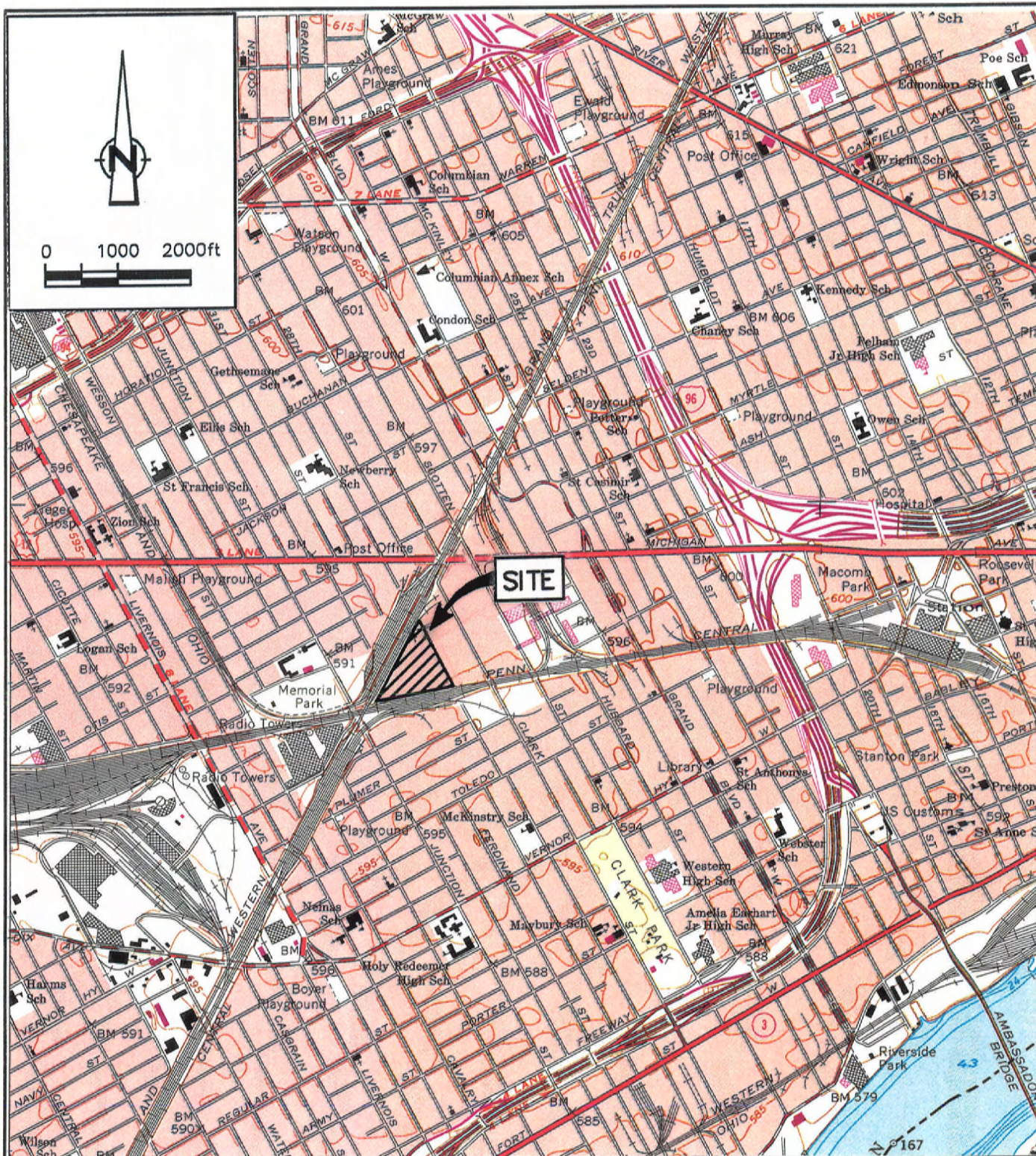
4.0 ANALYTICAL RESULTS

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

Sample S-8889-032598-SF-493 (West(S)Wall) contained benzo(a)pyrene at 1,900 µg/kg, which is above the Michigan Generic Residential Direct Contact Criteria of 1,400 µg/kg. All soil verification sample results were below the Michigan Generic Industrial Direct Contact Criteria, and the Michigan Generic Industrial Soil Inhalation Criteria.

5.0 CONCLUSIONS

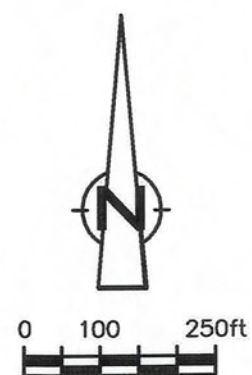
Based on the results of the additional Phase V ESA activities for the Site, no further remedial action is warranted. Remediation activities have been completed at the Site by GM which satisfy the criteria for Generic Industrial land use, as defined by the Michigan Department of Environmental Quality (MDEQ), which means that the Site can be used for industrial purposes.



SOURCE: USGS QUADRANGLE MAP;
DETROIT, MICHIGAN

figure 1.1
SITE LOCATION
PARCEL A-1
GENERAL MOTORS CLARK AVENUE SITE
Detroit, Michigan

CRA



PARCEL A-1

LEGEND

— APPROXIMATE
SITE BOUNDARY

NOTE: BUILDING LOCATIONS ARE NOT SURVEYED

GRAND TRUNK WESTERN RAILROAD

CONSOLIDATED RAILROAD

MICHIGAN AVENUE

CLARK AVENUE

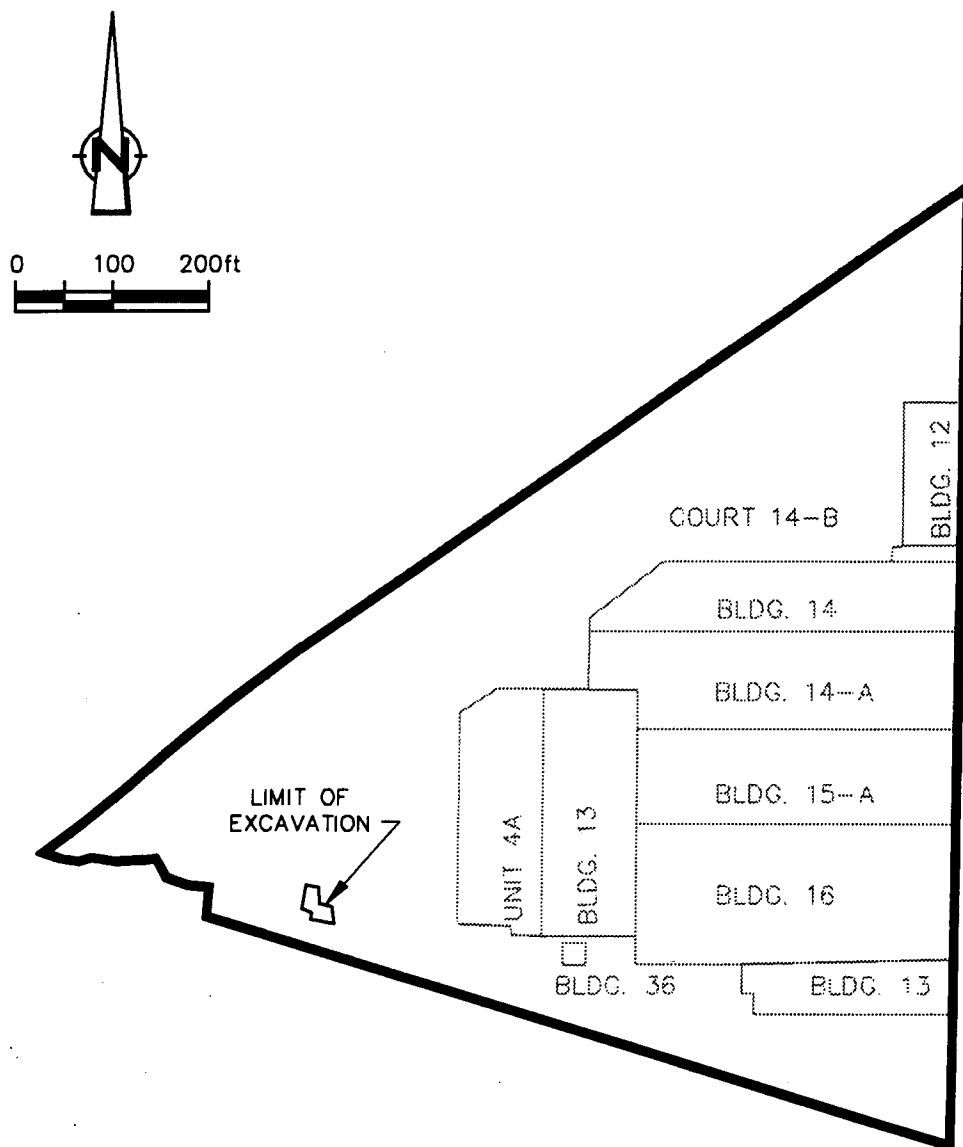
SCOTTEN AVENUE

ENGINEERING
BUILDING 40

figure 1.2
SITE PLAN
PARCEL A-1
GENERAL MOTORS CLARK AVENUE SITE
Detroit, Michigan

CRA

08889(034)DE001 APR 13/98

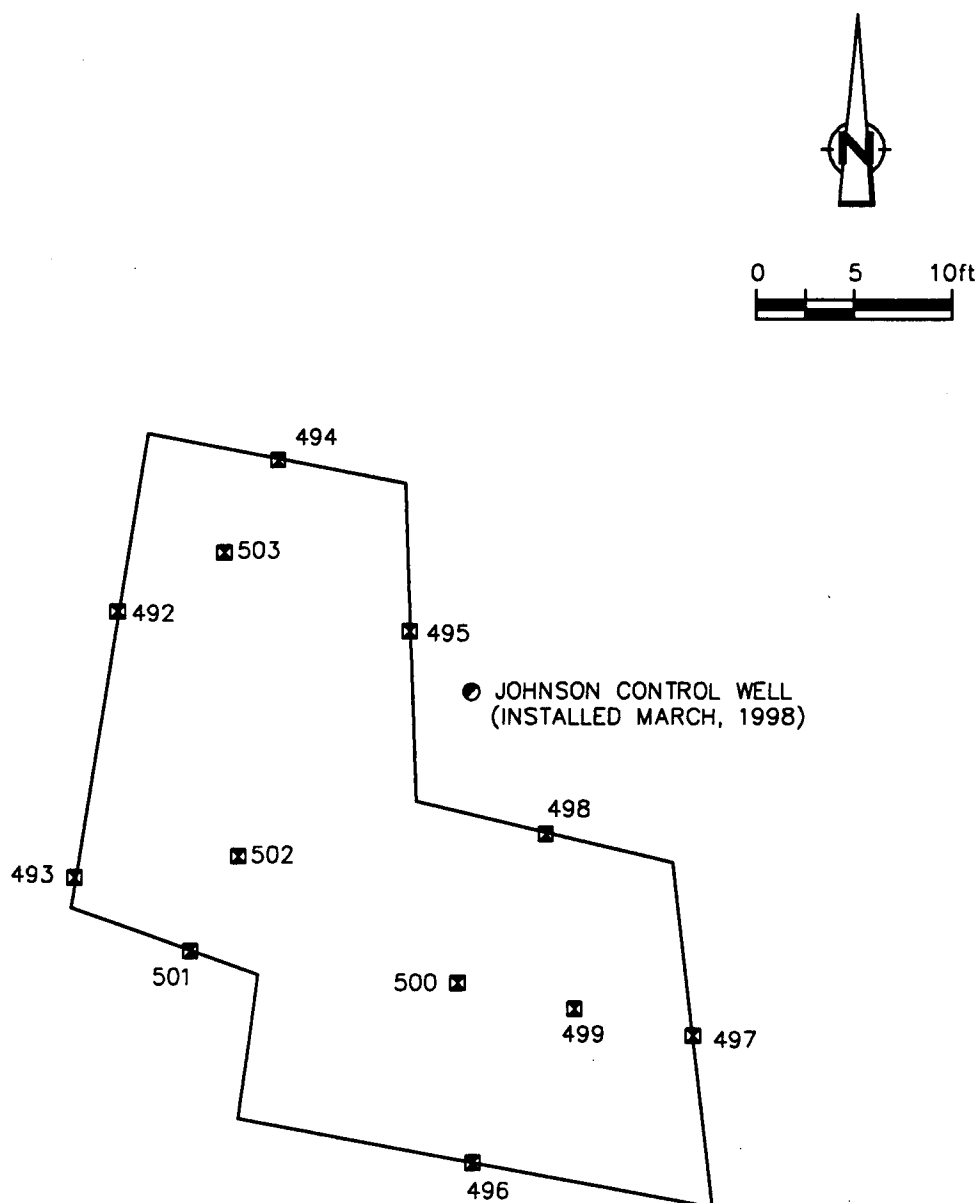


NOTE: BUILDING LOCATIONS ARE NOT SURVEYED

figure 3.1

LOCATION OF EXCAVATION AROUND MONITORING WELL WA-1
 PARCEL A-1
 GENERAL MOTORS CLARK AVENUE SITE
Detroit, Michigan

CRA



LEGEND

- MONITORING WELL LOCATION
- APPROXIMATE SOIL VERIFICATION
SAMPLE LOCATIONS

figure 3.2
EXCAVATION AREA AROUND MONITORING WELL WA-1
PARCEL A-1
GENERAL MOTORS CLARK AVENUE SITE
Detroit, Michigan

CRA

TABLE 3.1

SAMPLE SUMMARY
SOIL VERIFICATION SAMPLES FROM WA-1 EXCAVATION
GM CLARK AVENUE SITE-PARCEL A-1
DETROIT, MICHIGAN

<i>Sample ID</i>	<i>Location</i>	<i>Sample Date</i>	<i>Analysis</i>
S-8889-032598-SF-492	West (N) wall	3/25/98	BTEX, PNA
S-8889-032598-SF-493	West (S) wall	3/25/98	BTEX, PNA
S-8889-032598-SF-494	North (W) wall	3/25/98	BTEX, PNA
S-8889-032598-SF-495	East (N) wall	3/25/98	BTEX, PNA
S-8889-032598-SF-496	South (E) wall	3/25/98	BTEX, PNA
S-8889-032598-SF-497	East (S) wall	3/25/98	BTEX, PNA
S-8889-032598-SF-498	North (E) wall	3/25/98	BTEX, PNA
S-8889-032598-SF-499	East floor	3/25/98	BTEX, PNA
S-8889-032598-SF-500	Center (E) floor	3/25/98	BTEX, PNA
S-8889-032598-SF-501	South (W) wall	3/25/98	BTEX, PNA
S-8889-032598-SF-502	Center (W) floor	3/25/98	BTEX, PNA
S-8889-032598-SF-503	North floor	3/25/98	BTEX, PNA

Notes:

BTEX - Benzene, toluene, ethylbenzene, xylenes

PNA - Polynuclear aromatic hydrocarbons

**SUMMARY OF DETECTED COMPOUNDS
IN SOIL VERIFICATION SAMPLES FROM WA-1 EXCAVATION
GM CLARK AVENUE SITE-PARCEL A-1
DETROIT, MICHIGAN**

Sample ID (S-8889-032598-)	Michigan Generic Residential Direct Contact Value (1) µg/kg	Michigan Generic Industrial Direct Contact Value (2) µg/kg	Michigan Generic Industrial Soil Inhalation Criteria (SIC) Infinite Source (3) µg/kg	SF-492 West (N) Wall 3/25/98 µg/kg	SF-493 West (S) Wall 3/25/98 µg/kg	SF-494 North (W) Wall 3/25/98 µg/kg	SF-495 East (N) Wall 3/25/98 µg/kg	SF-496 South (SE) Wall 3/25/98 µg/kg	SF-497 East (S) Wall 3/25/98 µg/kg
BTEX									
Benzene	88,000	850,000	33,000	ND(10)	ND(10)	ND(10)	ND(31)	ND(570)	ND(13)
Ethylbenzene	11,000,000	72,000,000	16,000,000	ND(10)	28	ND(10)	910	3,600	450
Toluene	24,000,000	160,000,000	4,700,000	ND(10)	ND(10)	ND(10)	250	ND (570)	30
Xylenes (total)	200,000,000	1,000,000,000	77,000,000	ND(30)	76	ND(30)	3,000	9,600	890
Polynuclear Aromatics									
Acenaphthene	76,000,000	810,000,000	14,000,000	ND (330)	ND (330)	ND (330)	ND (330)	380	ND (330)
Acenaphthylene	1,500,000	16,000,000	ID	ND (330)	480	ND (330)	ND (330)	ND (330)	ND (330)
Anthracene	420,000,000	1,000,000,000	2,300,000,000	ND (330)	380	ND (330)	470	830	ND (330)
Benzo(a)anthracene	14,000	210,000	ID	380	2,500	ND (330)	2,300	430	540
Benzo(a)pyrene	1,400	21,000	1,200,000	ND (330)	1,900	ND (330)	1,400	ND (330)	370
Benzo(b)fluoranthene	14,000	210,000	ID	530	3,200	340	2,200	ND (330)	630
Benzo(g,h,i)perylene	1,500,000	16,000,000	ID	ND (330)	980	ND (330)	680	ND (330)	ND (330)
Benzo(k)fluoranthene	140,000	2,100,000	ID	ND (330)	1,100	ND (330)	970	ND (330)	ND (330)
Chrysene	1,400,000	21,000,000	ID	560	2,500	350	1,900	ND (330)	620
Dibenzo(a,h)anthracene	1,400	21,000	ID	ND (330)	560	ND (330)	ND (330)	ND (330)	ND (330)
Fluoranthene	51,000,000	540,000,000	1,300,000,000	590	3,000	420	3,500	410	940
Fluorene	51,000,000	540,000,000	210,000,000	ND (330)	ND (330)	ND (330)	350	640	ND (330)
Indeno(1,2,3-cd)pyrene	14,000	210,000	ID	ND (330)	980	ND (330)	560	ND (330)	ND (330)
Naphthalene	15,000,000	160,000,000	23,000,000	ND (330)	ND (330)	ND (330)	650	2,400	ND (330)
Phenanthrene	1,500,000	16,000,000	ID	480	860	ND (330)	1,800	2,100	890
Pyrene	32,000,000	340,000,000	1,100,000,000	640	3,400	550	3,300	460	960

Notes:

- (1) - Michigan Department of Environmental Quality, Interim Environmental Response Division Operational Memorandum #8, Revision 4: Generic Residential Cleanup Criteria, June 5, 1995, and Revisions January 26, 1996.
 - (2) - Michigan Department of Environmental Quality, Environmental Response Division Operational Memorandum #14, Revision 2, June 6, 1995 and Revisions January 25, 1996.
 - (3) - Part 201 Generic Soil Inhalation Criteria for Ambient Air (April 23, 1997): Addendum to MDEQ-ERD Memo #8.
- ID - Inadequate data to develop quantity.
ND - Not detected above the report limit stated in parenthesis.

TABLE 4.1

**SUMMARY OF DETECTED COMPOUNDS
IN SOIL VERIFICATION SAMPLES FROM WA-1 EXCAVATION
GM CLARK AVENUE SITE-PARCEL A-1
DETROIT, MICHIGAN**

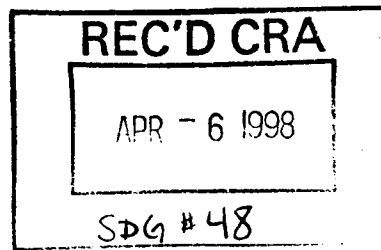
Sample ID (S-8889-032598-)	Michigan Generic Residential	Michigan Generic Industrial	Michigan Generic Industrial Soil Inhalation Criteria (SIC) Infinite Source (3)	SF-498 North (E) Wall 3/26/98	SF-499 East Floor 3/26/98	SF-500 Center (E) Floor 3/26/98	SF-501 South (W) Wall 3/26/98	SF-502 Center (W) Floor 3/26/98	SF-503 North Floor 3/26/98
Date Sampled				3/26/98	3/26/98	3/26/98	3/26/98	3/26/98	3/26/98
Date Analyzed (BTEX)				3/27/98	3/28/98	3/28/98	3/27/98	3/28/98	3/28/98
Date Analyzed (PNA)				3/27/98	3/27/98	3/27/98	3/27/98	3/27/98	3/27/98
Units	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
BTEX									
Benzene	88,000	850,000	33,000	ND(10)	ND (1,400)	ND(1,400)	ND(560)	ND(1,400)	ND(630)
Ethylbenzene	11,000,000	72,000,000	16,000,000	100	19,000	32,000	7,800	23,000	2,300
Toluene	24,000,000	160,000,000	4,700,000	ND(10)	19,000	3,000	2,000	ND (1,400)	ND (630)
Xylenes (total)	200,000,000	1,000,000,000	77,000,000	110	86,000	95,000	22,000	23,000	3,300
Polynuclear Aromatics									
Acenaphthene	76,000,000	810,000,000	14,000,000	ND (330)	730	ND (1,100)	ND (1,100)	ND (1,100)	ND (330)
Acenaphthylene	1,500,000	16,000,000	ID	ND (330)	ND (330)	ND (1,100)	ND (1,100)	ND (1,100)	ND (330)
Anthracene	420,000,000	1,000,000,000	2,300,000,000	360	680	ND (1,100)	ND (1,100)	ND (1,100)	ND (330)
Benzo(a)anthracene	14,000	210,000	ID	980	ND (330)	ND (1,100)	ND (1,100)	ND (1,100)	550
Benzo(a)pyrene	1,400	21,000	1,200,000	650	ND (330)	ND (1,100)	ND (1,100)	ND (1,100)	450
Benzo(b)fluoranthene	14,000	210,000	ID	960	ND (330)	ND (1,100)	ND (1,100)	ND (1,100)	700
Benzo(g,h,i)perylene	1,500,000	16,000,000	ID	380	ND (330)	ND (1,100)	ND (1,100)	ND (1,100)	ND (330)
Benzo(k)fluoranthene	140,000	2,100,000	ID	460	ND (330)	ND (1,100)	ND (1,100)	ND (1,100)	ND (330)
Chrysene	1,400,000	21,000,000	ID	1,100	ND (330)	ND (1,100)	ND (1,100)	ND (1,100)	720
Dibenzo(a,h)anthracene	1,400	21,000	ID	ND (330)	ND (330)	ND (1,100)	ND (1,100)	ND (1,100)	ND (330)
Fluoranthene	51,000,000	540,000,000	1,300,000,000	1,600	ND (330)	ND (1,100)	ND (1,100)	ND (1,100)	1,000
Fluorene	51,000,000	540,000,000	210,000,000	ND (330)	960	ND (1,100)	ND (1,100)	ND (1,100)	ND (330)
Indeno(1,2,3-cd)pyrene	14,000	210,000	ID	ND (330)	ND (330)	ND (1,100)	ND (1,100)	ND (1,100)	ND (330)
Naphthalene	15,000,000	160,000,000	23,000,000	360	1,600	4,400	3,000	3,000	530
Phenanthrene	1,500,000	16,000,000	ID	1,400	1,600	2,300	2,800	2,400	960
Pyrene	32,000,000	340,000,000	1,100,000,000	1,600	350	ND (1,100)	ND (1,100)	ND (1,100)	920

Notes:

- (1) - Michigan Department of Environmental Quality, Interim Environmental Response Division Operational Memorandum #8, Revision 4: Generic Residential Cleanup Criteria, June 5, 1995, and Revisions January 26, 1996.
 - (2) - Michigan Department of Environmental Quality, Environmental Response Division Operational Memorandum #14, Revision 2, June 6, 1995 and Revisions January 25, 1996.
 - (3) - Part 201 Generic Soil Inhalation Criteria for Ambient Air (April 23, 1997): Addendum to MDEQ-ERD Memo #8.
- ID - Inadequate data to develop quantity.
ND - Not detected above the report limit stated in parenthesis.

APPENDIX A

ANALYTICAL LABORATORY REPORTS AND CHAIN-OF-CUSTODY RECORDS



April 2, 1998

Mr. Paul Wiseman
Conestoga-Rovers & Associates, Inc.
11100 Metro Airport Center Drive
Suite 160
Romulus, MI 48174

RE: Analytical Results / GM Clark Street

Dear Mr. Wiseman:

Please find enclosed two hard copies of the analytical results, QC and case narrative corresponding to samples from the above referenced project, which were received by LEI/ENCOTEC on March 25, 1998.

Please note that this data was previously forwarded to you via facsimile. Transmittals occurred March 27 - 30, 1998.

Following review of this data, please feel free to contact me with any questions or concerns.

Sincerely,
Laidlaw Environmental, Inc./ENCOTEC

Jane Rusin
Project Manager

Enclosure

SDG CRA-CS-98C4
Batch# 10328
#33000

ORIGINAL ANALYTICAL REPORT

Project#: 8889-40 Lab #: CRA-CS 98C4

Name: GM Clark Street

Description

Event: Phase IV

Samples: 12 - Soil

Analysis: BTEX / PNA

TAT: Encotec 5

Lab: 48 hrs to met

Checked Against Preliminary Data:

Date: 4/6/98 Init.: MB C

Date of Validation Memo: 4/8/98

Initials: MB C

Comments:

DATA PACKAGE COVER PAGE

This report contains 43 pages, excluding the cover letter and is only for the submitted samples.

If any pages are missing please contact Laidlaw Environmental, Inc./ENCOTEC immediately.

This document is intended only for the person(s) identified in the cover letter and is to be considered **CONFIDENTIAL**.

This document cannot be reproduced, except in full, without the prior written consent of Laidlaw Environmental, Inc./ENCOTEC.

This analytical report does not comply with State of Utah batch QC requirements for organic extractables unless otherwise noted in the laboratory narrative.

Flags and Definitions

U =	The analyte was not detected at or above the quantitation limit.	J =	The analyte was detected at a concentration below the quantitation limit but above the method detection limit.
E =	The analyte was detected at a concentration greater than the calibration range; therefore the result is estimated.	B =	The analyte was detected in the associated method blank.
DL =	The sample was diluted due to sample matrix, therefore QC was not recoverable.	M =	Matrix interference has resulted in an elevated quantitation limit or distorted QC result.
* =	The value is outside quality control limits.	NC =	Not Calculable.
K =	Reported concentration is proportional to dilution factor and may be exaggerated.	NA =	Not Applicable.
P =	When one or both sample results are <5 times the quantitation limit, the RPD cannot be properly evaluated. It is not included in the total QC count.	A =	If the sample result is >4 times the amount spiked, the MS recovery cannot be properly evaluated. It is not included in the total QC count.
G =	Result is greater than the numerical value presented.	CA =	Combustion aid was necessary to achieve results.

SDG	A Sample Delivery Group is a grouping of samples arriving under separate Chains of Custody that are reported together.
QC Set ID	An alphanumeric identification associating appropriate QC data with sample data.
Calculation Basis	Indicates whether the results have been adjusted for moisture content.
Quant Limit	The limit at which the analyte can be reliably reported within the method- specified limits of precision and accuracy under routine operating conditions.
Dil	Dilution Factor.
Conc	The concentration, expressed in appropriate units.
LCS	Laboratory Control Sample.
LCD	Laboratory Control Sample Duplicate.
MS	Matrix Spike.
MSD	Matrix Spike Duplicate.
%Rec	The percent recovery of a fortified analyte (surrogate, matrix spike, lab control sample).
RPD	The relative percent difference for duplicate analyses.
Second Analysis Date	The date on which a sample was analyzed a second time, at a dilution different than that on the (initial) Analysis Date.

If a numerical value is very large, it will be expressed in scientific notation. For example, a concentration of 10,000,000 ug Kg will be reported as 1E7.

LABORATORY NARRATIVE

Client Name: CONESTOGA-ROVERS & ASSOCIATES
Project Name: 8889-40
Project Number: 33000
Sample Delivery Group: CRA-CS-98C4
Batch Number(s): 100010328
Narrative Date: April 1, 1998

Samples were received and analyzed without incident, within holding times, with chain-of-custody maintained, and according to the referenced methods, except as noted below:

Surrogate Spike Recovery Outliers

QC Set ID	Analysis	Corrective Action/Result
BNAC2509S	Semivolatiles	EPA guidelines allow either one acid and/or base neutral surrogate to recover outside QC windows.

LCS Recovery Outliers

QC Set ID	Analysis	Corrective Action/Result
BNAC2509S	Semivolatiles	Since $\geq 80\%$ of the LCS recoveries were within QC windows, corrective action was deemed unnecessary.

MS/MSD Recovery Outliers

QC Set ID	Analysis	Corrective Action/Result
BNAC2509S	Semivolatiles	Since $\geq 80\%$ of the fortified analytes in the LCS recovered within QC windows, matrix interference is assumed. Corrective action was deemed unnecessary.

I certify that the data presented in this report is accurate, complete and meets the minimum quality assurance standards as specified in 40-CFR 136, 40-CFR-141, and/or SW-846. An assessment of the quality of the data, noting any exceptions, outliers, and/or problems encountered have been narrated herein.


Walt Roudebush (or designee)
Technical Director

4/2/98
Date

SAMPLE CROSS REFERENCE REPORT

CLIENT: CONESTOGA-ROVERS & ASSOCIATES

Project/Site: 8889-40

SDG: CRA-CS-98C4

Submission ID(s): 100010328

<u>Client Sample ID</u>	<u>ENCOTEC Sample ID</u>	<u>Sample Matrix</u>	<u>Date Sampled</u>	<u>Date Received</u>
S-8889-032598-SF-492	200069885	SOIL	03/25/98	03/25/98
S-8889-032598-SF-493	200069886	SOIL	03/25/98	03/25/98
S-8889-032598-SF-494	200069887	SOIL	03/25/98	03/25/98
S-8889-032598-SF-495	200069888	SOIL	03/25/98	03/25/98
S-8889-032598-SF-496	200069889	SOIL	03/25/98	03/25/98
S-8889-032598-SF-497	200069890	SOIL	03/25/98	03/25/98
S-8889-032598-SF-498	200069891	SOIL	03/25/98	03/25/98
S-8889-032598-SF-499	200069892	SOIL	03/25/98	03/25/98
S-8889-032598-SF-500	200069893	SOIL	03/25/98	03/25/98
S-8889-032598-SF-501	200069894	SOIL	03/25/98	03/25/98
S-8889-032598-SF-502	200069895	SOIL	03/25/98	03/25/98
S-8889-032598-SF-503	200069896	SOIL	03/25/98	03/25/98

aidlaw Environmental, Inc. / ENCOTEC

185 Research Park Drive - Ann Arbor, MI 48108
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METHOD DESCRIPTION REPORT

CLIENT: CONESTOGA-ROVERS & ASSOCIATES

Project/Site: 8889-40

SDG: CRA-CS-98C4

Submission ID(s): 100010328

<u>Method Reference</u>	<u>Description</u>
160.3	Residue, Total, Gravimetric, Dried at 103-105o C
8260	Volatile Organic Compounds by GC/MS: Capillary Column
8270	Semivolatile Organic Compounds by GC/MS: Capillary Column

ANALYTICAL REPORT

CLIENT: CONESTOGA-ROVERS & ASSOCIATES

Project/Site: 8889-40

Sample ID: S-8889-032598-SF-492

Date Sampled:	03/25/98	ENCOTEC Project ID:	33000
Date Received:	03/25/98	ENCOTEC SDG ID:	CRA-CS-98C4
Date Extracted:	N/A	ENCOTEC QC Set ID:	VORC2601S
Analysis Date:	03/26/98	ENCOTEC Submission ID:	100010328
Second Analysis Date:	N/A	ENCOTEC Sample ID:	200069885
Method Reference:	8260	Percent Total Solids:	79.7
Matrix:	SOIL	Calculation Basis:	Dry Weight

VOLATILE ORGANICS MDEQ Part 201 Aromatic VOCs List		CAS #	Quant Limit (ug/Kg)	Dil	Conc (ug/Kg)	Flag
1	Benzene	71-43-2	10	1.0	U	
2	Ethylbenzene	100-41-4	10	1.0	U	
3	Toluene	108-88-3	10	1.0	U	
4	total Xylenes	1330-20-7	30	1.0	U	

ANALYTICAL REPORT

CLIENT: CONESTOGA-ROVERS & ASSOCIATES

Project/Site: 8889-40

Sample ID: S-8889-032598-SF-493

Date Sampled:	03/25/98	ENCOTEC Project ID:	33000
Date Received:	03/25/98	ENCOTEC SDG ID:	CRA-CS-98C4
Date Extracted:	N/A	ENCOTEC QC Set ID:	VORC2601S
Analysis Date:	03/26/98	ENCOTEC Submission ID:	100010328
Second Analysis Date:	N/A	ENCOTEC Sample ID:	200069886
Method Reference:	8260	Percent Total Solids:	79.1
Matrix:	SOIL	Calculation Basis:	Dry Weight

	VOLATILE ORGANICS MDEQ Part 201 Aromatic VOCs List	CAS #	Quant Limit (ug/Kg)	Dil	Conc (ug/Kg)	Flag
1	Benzene	71-43-2	10	1.0	U	
2	Ethylbenzene	100-41-4	10	1.0	28	
3	Toluene	108-88-3	10	1.0	U	
4	total Xylenes	1330-20-7	30	1.0	76	

ANALYTICAL REPORT

CLIENT: CONESTOGA-ROVERS & ASSOCIATES

Project/Site: 8889-40

Sample ID: S-8889-032598-SF-494

Date Sampled:	03/25/98	ENCOTEC Project ID:	33000
Date Received:	03/25/98	ENCOTEC SDG ID:	CRA-CS-98C4
Date Extracted:	N/A	ENCOTEC QC Set ID:	VORC2601S
Analysis Date:	03/27/98	ENCOTEC Submission ID:	100010328
Second Analysis Date:	N/A	ENCOTEC Sample ID:	200069887
Method Reference:	8260	Percent Total Solids:	78.2
Matrix:	SOIL	Calculation Basis:	Dry Weight

VOLATILE ORGANICS MDEQ Part 201 Aromatic VOCs List		CAS #	Quant Limit (ug/Kg)	Dil	Conc (ug/Kg)	Flag
1	Benzene	71-43-2	10	1.0	U	
2	Ethylbenzene	100-41-4	10	1.0	U	
3	Toluene	108-88-3	10	1.0	U	
4	total Xylenes	1330-20-7	30	1.0	U	

ANALYTICAL REPORT

CLIENT: CONESTOGA-ROVERS & ASSOCIATES

Project/Site: 8889-40

Sample ID: S-8889-032598-SF-495

Date Sampled: 03/25/98
Date Received: 03/25/98
Date Extracted: N/A
Analysis Date: 03/27/98
Second Analysis Date: N/A
Method Reference: 8260
Matrix: SOIL

ENCOTEC Project ID: 33000
ENCOTEC SDG ID: CRA-CS-98C4
ENCOTEC QC Set ID: VORC2601S
ENCOTEC Submission ID: 100010328
ENCOTEC Sample ID: 200069888
Percent Total Solids: 81.6
Calculation Basis: Dry Weight

VOLATILE ORGANICS MDEQ Part 201 Aromatic VOCs List		CAS #	Quant Limit (ug/Kg)	Dil	Conc (ug/Kg)	Flag
1	Benzene	71-43-2	31	5.0	U	
2	Ethylbenzene	100-41-4	31	5.0	910	
3	Toluene	108-88-3	31	5.0	250	
4	total Xylenes	1330-20-7	92	5.0	3000	

ANALYTICAL REPORT

CLIENT: CONESTOGA-ROVERS & ASSOCIATES

Project/Site: 8889-40

Sample ID: S-8889-032598-SF-496

Date Sampled:	03/25/98	ENCOTEC Project ID:	33000
Date Received:	03/25/98	ENCOTEC SDG ID:	CRA-CS-98C4
Date Extracted:	N/A	ENCOTEC QC Set ID:	VOTC2701M
Analysis Date:	03/27/98	ENCOTEC Submission ID:	100010328
Second Analysis Date:	N/A	ENCOTEC Sample ID:	200069889
Method Reference:	8260	Percent Total Solids:	88.4
Matrix:	SOIL	Calculation Basis:	Dry Weight

VOLATILE ORGANICS MDEQ Part 201 Aromatic VOCs List		CAS #	Quant Limit (ug/Kg)	Dil	Conc (ug/Kg)	Flag
1	Benzene	71-43-2	570	100	U	
2	Ethylbenzene	100-41-4	570	100	3600	
3	Toluene	108-88-3	570	100	U	
4	total Xylenes	1330-20-7	1700	100	9600	

ANALYTICAL REPORT

CLIENT: CONESTOGA-ROVERS & ASSOCIATES

Project/Site: 8889-40

Sample ID: S-8889-032598-SF-497

Date Sampled:	03/25/98	ENCOTEC Project ID:	33000
Date Received:	03/25/98	ENCOTEC SDG ID:	CRA-CS-98C4
Date Extracted:	N/A	ENCOTEC QC Set ID:	VORC2601S
Analysis Date:	03/27/98	ENCOTEC Submission ID:	100010328
Second Analysis Date:	N/A	ENCOTEC Sample ID:	200069890
Method Reference:	8260	Percent Total Solids:	78.6
Matrix:	SOIL	Calculation Basis:	Dry Weight

VOLATILE ORGANICS MDEQ Part 201 Aromatic VOCs List		CAS #	Quant Limit (ug/Kg)	Dil	Conc (ug/Kg)	Fla
1	Benzene	71-43-2	13	2.0	U	
2	Ethylbenzene	100-41-4	13	2.0	450	
3	Toluene	108-88-3	13	2.0	30	
4	total Xylenes	1330-20-7	38	2.0	890	

ANALYTICAL REPORT

CLIENT: CONESTOGA-ROVERS & ASSOCIATES

Project/Site: 8889-40

Sample ID: S-8889-032598-SF-498

Date Sampled: 03/25/98
Date Received: 03/25/98
Date Extracted: N/A
Analysis Date: 03/26/98
Second Analysis Date: N/A
Method Reference: 8260
Matrix: SOIL

ENCOTEC Project ID: 33000
ENCOTEC SDG ID: CRA-CS-98C4
ENCOTEC QC Set ID: VORC2601S
ENCOTEC Submission ID: 100010328
ENCOTEC Sample ID: 200069891
Percent Total Solids: 79.3
Calculation Basis: Dry Weight

VOLATILE ORGANICS MDEQ Part 201 Aromatic VOCs List		CAS #	Quant Limit (ug/Kg)	Dil	Conc (ug/Kg)	Flag
1	Benzene	71-43-2	10	1.0	U	
2	Ethylbenzene	100-41-4	10	1.0	100	
3	Toluene	108-88-3	10	1.0	U	
4	total Xylenes	1330-20-7	30	1.0	110	

ANALYTICAL REPORT

CLIENT: CONESTOGA-ROVERS & ASSOCIATES

Project/Site: 8889-40

Sample ID: S-8889-032598-SF-499

Date Sampled: 03/25/98
Date Received: 03/25/98
Date Extracted: N/A
Analysis Date: 03/27/98
Second Analysis Date: N/A
Method Reference: 8260
Matrix: SOIL

ENCOTEC Project ID: 33000
ENCOTEC SDG ID: CRA-CS-98C4
ENCOTEC QC Set ID: VOTC2701M
ENCOTEC Submission ID: 100010328
ENCOTEC Sample ID: 200069892
Percent Total Solids: 91.6
Calculation Basis: Dry Weight

VOLATILE ORGANICS MDEQ Part 201 Aromatic VOCs List		CAS #	Quant Limit (ug/Kg)	Dil	Conc (ug/Kg)	Flag
1	Benzene	71-43-2	1400	250	U	
2	Ethylbenzene	100-41-4	1400	250	19000	
3	Toluene	108-88-3	1400	250	19000	
4	total Xylenes	1330-20-7	4100	250	86000	

ANALYTICAL REPORT

CLIENT: CONESTOGA-ROVERS & ASSOCIATES

Project/Site: 8889-40

Sample ID: S-8889-032598-SF-500

Date Sampled: 03/25/98
Date Received: 03/25/98
Date Extracted: N/A
Analysis Date: 03/27/98
Second Analysis Date: N/A
Method Reference: 8260
Matrix: SOIL

ENCOTEC Project ID: 33000
ENCOTEC SDG ID: CRA-CS-98C4
ENCOTEC QC Set ID: VOTC2701M
ENCOTEC Submission ID: 100010328
ENCOTEC Sample ID: 200069893
Percent Total Solids: 90.4
Calculation Basis: Dry Weight

VOLATILE ORGANICS MDEQ Part 201 Aromatic VOCs List		CAS #	Quant Limit (ug/Kg)	Dil	Conc (ug/Kg)	Flag
1	Benzene	71-43-2	1400	250	U	
2	Ethylbenzene	100-41-4	1400	250	32000	
3	Toluene	108-88-3	1400	250	3000	
4	total Xylenes	1330-20-7	4100	250	95000	

ANALYTICAL REPORT

CLIENT: CONESTOGA-ROVERS & ASSOCIATES

Project/Site: 8889-40

Sample ID: S-8889-032598-SF-501

Date Sampled:	03/25/98	ENCOTEC Project ID:	33000
Date Received:	03/25/98	ENCOTEC SDG ID:	CRA-CS-98C4
Date Extracted:	N/A	ENCOTEC QC Set ID:	VOTC2701M
Analysis Date:	03/27/98	ENCOTEC Submission ID:	100010328
Second Analysis Date:	N/A	ENCOTEC Sample ID:	200069894
Method Reference:	8260	Percent Total Solids:	88.7
Matrix:	SOIL	Calculation Basis:	Dry Weight

VOLATILE ORGANICS MDEQ Part 201 Aromatic VOCs List		CAS #	Quant Limit (ug/Kg)	Dil	Conc (ug/Kg)	Flag
1	Benzene	71-43-2	560	100	U	
2	Ethylbenzene	100-41-4	560	100	7800	
3	Toluene	108-88-3	560	100	2000	
4	total Xylenes	1330-20-7	1700	100	22000	

ANALYTICAL REPORT

CLIENT: CONESTOGA-ROVERS & ASSOCIATES

Project/Site: 8889-40

Sample ID: S-8889-032598-SF-502

Date Sampled:	03/25/98	ENCOTEC Project ID:	33000
Date Received:	03/25/98	ENCOTEC SDG ID:	CRA-CS-98C4
Date Extracted:	N/A	ENCOTEC QC Set ID:	VOTC2701M
Analysis Date:	03/27/98	ENCOTEC Submission ID:	100010328
Second Analysis Date:	N/A	ENCOTEC Sample ID:	200069895
Method Reference:	8260	Percent Total Solids:	91.5
Matrix:	SOIL	Calculation Basis:	Dry Weight

VOLATILE ORGANICS MDEQ Part 201 Aromatic VOCs List		CAS #	Quant Limit (ug/Kg)	Dil	Conc (ug/Kg)	Flag
1	Benzene	71-43-2	1400	250	U	
2	Ethylbenzene	100-41-4	1400	250	23000	
3	Toluene	108-88-3	1400	250	U	
4	total Xylenes	1330-20-7	4100	250	23000	

ANALYTICAL REPORT

CLIENT: CONESTOGA-ROVERS & ASSOCIATES

Project/Site: 8889-40

Sample ID: S-8889-032598-SF-503

Date Sampled:	03/25/98	ENCOTEC Project ID:	33000
Date Received:	03/25/98	ENCOTEC SDG ID:	CRA-CS-98C4
Date Extracted:	N/A	ENCOTEC QC Set ID:	VOTC2701M
Analysis Date:	03/27/98	ENCOTEC Submission ID:	100010328
Second Analysis Date:	N/A	ENCOTEC Sample ID:	200069896
Method Reference:	8260	Percent Total Solids:	79.0
Matrix:	SOIL	Calculation Basis:	Dry Weight

	VOLATILE ORGANICS MDEQ Part 201 Aromatic VOCs List	CAS #	Quant Limit (ug/Kg)	Dil	Conc (ug/Kg)	Flag
1	Benzene	71-43-2	630	100	U	
2	Ethylbenzene	100-41-4	630	100	2300	
3	Toluene	108-88-3	630	100	U	
4	total Xylenes	1330-20-7	1900	100	3300	

ANALYTICAL REPORT

CLIENT: CONESTOGA-ROVERS & ASSOCIATES

Project/Site: 8889-40

Sample ID: S-8889-032598-SF-492

Date Sampled:	03/25/98	ENCOTEC Project ID:	33000
Date Received:	03/25/98	ENCOTEC SDG ID:	CRA-CS-98C4
Date Extracted:	03/25/98	ENCOTEC QC Set ID:	BNAC2509S
Analysis Date:	03/26/98	ENCOTEC Submission ID:	100010328
Second Analysis Date:	N/A	ENCOTEC Sample ID:	200069885
Method Reference:	8270	Percent Total Solids:	79.7
Matrix:	SOIL	Calculation Basis:	Dry Weight

	SEMIVOLATILE ORGANICS MDEQ Part 201, PAHs List	CAS #	Quant Limit (ug/Kg)	Dil	Conc (ug/Kg)	Flag
1	Acenaphthene	83-32-9	330	1.0	U	
2	Acenaphthylene	208-96-8	330	1.0	U	
3	Anthracene	120-12-7	330	1.0	U	
4	Benzo (a) anthracene	56-55-3	330	1.0	380	
5	Benzo (a) pyrene	50-32-8	330	1.0	U	
6	Benzo (b) fluoranthene	205-99-2	330	1.0	530	
7	Benzo (g, h, i) perylene	191-24-2	330	1.0	U	
8	Benzo (k) fluoranthene	207-08-9	330	1.0	U	
9	Chrysene	218-01-9	330	1.0	560	
10	Dibenz (a, h) anthracene	53-70-3	330	1.0	U	
11	Fluoranthene	206-44-0	330	1.0	590	
12	Fluorene	86-73-7	330	1.0	U	
13	Indeno (1, 2, 3-c, d) pyrene	193-39-5	330	1.0	U	
14	Naphthalene	91-20-3	330	1.0	U	
15	Phenanthrene	85-01-8	330	1.0	480	
16	Pyrene	129-00-0	330	1.0	640	

ANALYTICAL REPORT

CLIENT: CONESTOGA-ROVERS & ASSOCIATES

Project/Site: 8889-40

Sample ID: S-8889-032598-SF-493

Date Sampled:	03/25/98	ENCOTEC Project ID:	33000
Date Received:	03/25/98	ENCOTEC SDG ID:	CRA-CS-98C4
Date Extracted:	03/25/98	ENCOTEC QC Set ID:	BNAC2509S
Analysis Date:	03/26/98	ENCOTEC Submission ID:	100010328
Second Analysis Date:	N/A	ENCOTEC Sample ID:	200069886
Method Reference:	8270	Percent Total Solids:	79.1
Matrix:	SOIL	Calculation Basis:	Dry Weight

	SEMIVOLATILE ORGANICS MDEQ Part 201, PAHs List	CAS #	Quant Limit (ug/Kg)	Dil	Conc (ug/Kg)	Flag
1	Acenaphthene	83-32-9	330	1.0	U	
2	Acenaphthylene	208-96-8	330	1.0	480	
3	Anthracene	120-12-7	330	1.0	380	
4	Benzo (a) anthracene	56-55-3	330	1.0	2500	
5	Benzo (a) pyrene	50-32-8	330	1.0	1900	
6	Benzo (b) fluoranthene	205-99-2	330	1.0	3200	
7	Benzo (g, h, i) perylene	191-24-2	330	1.0	980	
8	Benzo (k) fluoranthene	207-08-9	330	1.0	1100	
9	Chrysene	218-01-9	330	1.0	2500	
10	Dibenz (a, h) anthracene	53-70-3	330	1.0	560	
11	Fluoranthene	206-44-0	330	1.0	3000	
12	Fluorene	86-73-7	330	1.0	U	
13	Indeno (1, 2, 3-c, d) pyrene	193-39-5	330	1.0	980	
14	Naphthalene	91-20-3	330	1.0	U	
15	Phenanthrene	85-01-8	330	1.0	860	
16	Pyrene	129-00-0	330	1.0	3400	

ANALYTICAL REPORT

CLIENT: CONESTOGA-ROVERS & ASSOCIATES

Project/Site: 8889-40

Sample ID: S-8889-032598-SF-494

Date Sampled:	03/25/98	ENCOTEC Project ID:	33000
Date Received:	03/25/98	ENCOTEC SDG ID:	CRA-CS-98C4
Date Extracted:	03/25/98	ENCOTEC QC Set ID:	BNAC2509S
Analysis Date:	03/26/98	ENCOTEC Submission ID:	100010328
Second Analysis Date:	N/A	ENCOTEC Sample ID:	200069887
Method Reference:	8270	Percent Total Solids:	78.2
Matrix:	SOIL	Calculation Basis:	Dry Weight

	SEMIVOLATILE ORGANICS MDEQ Part 201, PAHs List	CAS #	Quant Limit (ug/Kg)	Dil	Conc (ug/Kg)	Flag
1	Acenaphthene	83-32-9	330	1.0	U	
2	Acenaphthylene	208-96-8	330	1.0	U	
3	Anthracene	120-12-7	330	1.0	U	
4	Benzo (a) anthracene	56-55-3	330	1.0	U	
5	Benzo (a) pyrene	50-32-8	330	1.0	U	
6	Benzo (b) fluoranthene	205-99-2	330	1.0	340	
7	Benzo (g, h, i) perylene	191-24-2	330	1.0	U	
8	Benzo (k) fluoranthene	207-08-9	330	1.0	U	
9	Chrysene	218-01-9	330	1.0	350	
10	Dibenz (a, h) anthracene	53-70-3	330	1.0	U	
11	Fluoranthene	206-44-0	330	1.0	420	
12	Fluorene	86-73-7	330	1.0	U	
13	Indeno (1,2,3-c, d) pyrene	193-39-5	330	1.0	U	
14	Naphthalene	91-20-3	330	1.0	U	
15	Phenanthrene	85-01-8	330	1.0	U	
16	Pyrene	129-00-0	330	1.0	550	

ANALYTICAL REPORT

CLIENT: CONESTOGA-ROVERS & ASSOCIATES

Project/Site: 8889-40

Sample ID: S-8889-032598-SF-495

Date Sampled:	03/25/98	ENCOTEC Project ID:	33000
Date Received:	03/25/98	ENCOTEC SDG ID:	CRA-CS-98C4
Date Extracted:	03/25/98	ENCOTEC QC Set ID:	BNAC2509S
Analysis Date:	03/26/98	ENCOTEC Submission ID:	100010328
Second Analysis Date:	N/A	ENCOTEC Sample ID:	200069888
Method Reference:	8270	Percent Total Solids:	81.6
Matrix:	SOIL	Calculation Basis:	Dry Weight

	SEMIVOLATILE ORGANICS MDEQ Part 201, PAHs List	CAS #	Quant Limit (ug/Kg)	Dil	Conc (ug/Kg)	Flag
1	Acenaphthene	83-32-9	330	1.0	U	
2	Acenaphthylene	208-96-8	330	1.0	U	
3	Anthracene	120-12-7	330	1.0	470	
4	Benzo(a)anthracene	56-55-3	330	1.0	2300	
5	Benzo(a)pyrene	50-32-8	330	1.0	1400	
6	Benzo(b)fluoranthene	205-99-2	330	1.0	2200	
7	Benzo(g,h,i)perylene	191-24-2	330	1.0	680	
8	Benzo(k)fluoranthene	207-08-9	330	1.0	970	
9	Chrysene	218-01-9	330	1.0	1900	
10	Dibenz(a,h)anthracene	53-70-3	330	1.0	U	
11	Fluoranthene	206-44-0	330	1.0	3500	
12	Fluorene	86-73-7	330	1.0	350	
13	Indeno(1,2,3-c,d)pyrene	193-39-5	330	1.0	560	
14	Naphthalene	91-20-3	330	1.0	650	
15	Phenanthrene	85-01-8	330	1.0	1800	
16	Pyrene	129-00-0	330	1.0	3300	

ANALYTICAL REPORT

CLIENT: CONESTOGA-ROVERS & ASSOCIATES

Project/Site: 8889-40

Sample ID: S-8889-032598-SF-496

Date Sampled:	03/25/98	ENCOTEC Project ID:	33000
Date Received:	03/25/98	ENCOTEC SDG ID:	CRA-CS-98C4
Date Extracted:	03/25/98	ENCOTEC QC Set ID:	BNAC2509S
Analysis Date:	03/26/98	ENCOTEC Submission ID:	100010328
Second Analysis Date:	N/A	ENCOTEC Sample ID:	200069889
Method Reference:	8270	Percent Total Solids:	88.4
Matrix:	SOIL	Calculation Basis:	Dry Weight

SEMIVOLATILE ORGANICS MDEQ Part 201, PAHs List		CAS #	Quant Limit (ug/Kg)	Dil	Conc (ug/Kg)	Flag
1	Acenaphthene	83-32-9	330	1.0	380	
2	Acenaphthylene	208-96-8	330	1.0	U	
3	Anthracene	120-12-7	330	1.0	830	
4	Benzo (a) anthracene	56-55-3	330	1.0	430	
5	Benzo (a) pyrene	50-32-8	330	1.0	U	
6	Benzo (b) fluoranthene	205-99-2	330	1.0	U	
7	Benzo (g, h, i) perylene	191-24-2	330	1.0	U	
8	Benzo (k) fluoranthene	207-08-9	330	1.0	U	
9	Chrysene	218-01-9	330	1.0	U	
10	Dibenz (a, h) anthracene	53-70-3	330	1.0	U	
11	Fluoranthene	206-44-0	330	1.0	410	
12	Fluorene	86-73-7	330	1.0	640	
13	Indeno (1, 2, 3-c, d) pyrene	193-39-5	330	1.0	U	
14	Naphthalene	91-20-3	330	1.0	2400	
15	Phenanthrene	85-01-8	330	1.0	2100	
16	Pyrene	129-00-0	330	1.0	460	

ANALYTICAL REPORT

CLIENT: CONESTOGA-ROVERS & ASSOCIATES

Project/Site: 8889-40

Sample ID: S-8889-032598-SF-497

Date Sampled:	03/25/98	ENCOTEC Project ID:	33000
Date Received:	03/25/98	ENCOTEC SDG ID:	CRA-CS-98C4
Date Extracted:	03/25/98	ENCOTEC QC Set ID:	BNAC2509S
Analysis Date:	03/26/98	ENCOTEC Submission ID:	100010328
Second Analysis Date:	N/A	ENCOTEC Sample ID:	200069890
Method Reference:	8270	Percent Total Solids:	78.6
Matrix:	SOIL	Calculation Basis:	Dry Weight

	SEMIVOLATILE ORGANICS MDEQ Part 201, PAHs List	CAS #	Quant Limit (ug/Kg)	Dil	Conc (ug/Kg)	Flag
1	Acenaphthene	83-32-9	330	1.0	U	
2	Acenaphthylene	208-96-8	330	1.0	U	
3	Anthracene	120-12-7	330	1.0	U	
4	Benzo (a) anthracene	56-55-3	330	1.0	540	
5	Benzo (a) pyrene	50-32-8	330	1.0	370	
6	Benzo (b) fluoranthene	205-99-2	330	1.0	630	
7	Benzo (g, h, i) perylene	191-24-2	330	1.0	U	
8	Benzo (k) fluoranthene	207-08-9	330	1.0	U	
9	Chrysene	218-01-9	330	1.0	620	
10	Dibenz (a, h) anthracene	53-70-3	330	1.0	U	
11	Fluoranthene	206-44-0	330	1.0	940	
12	Fluorene	86-73-7	330	1.0	U	
13	Indeno (1, 2, 3-c, d) pyrene	193-39-5	330	1.0	U	
14	Naphthalene	91-20-3	330	1.0	U	
15	Phenanthrene	85-01-8	330	1.0	890	
16	Pyrene	129-00-0	330	1.0	960	

ANALYTICAL REPORT

CLIENT: CONESTOGA-ROVERS & ASSOCIATES

Project/Site: 8889-40

Sample ID: S-8889-032598-SF-498

Date Sampled: 03/25/98
 Date Received: 03/25/98
 Date Extracted: 03/25/98
 Analysis Date: 03/26/98
 Second Analysis Date: N/A
 Method Reference: 8270
 Matrix: SOIL

ENCOTEC Project ID: 33000
 ENCOTEC SDG ID: CRA-CS-98C4
 ENCOTEC QC Set ID: BNAC2509S
 ENCOTEC Submission ID: 100010328
 ENCOTEC Sample ID: 200069891
 Percent Total Solids: 79.3
 Calculation Basis: Dry Weight

	SEMIVOLATILE ORGANICS MDEQ Part 201, PAHs List	CAS #	Quant Limit (ug/Kg)	Dil	Conc (ug/Kg)	Flag
1	Acenaphthene	83-32-9	330	1.0	U	
2	Acenaphthylene	208-96-8	330	1.0	U	
3	Anthracene	120-12-7	330	1.0	360	
4	Benzo (a) anthracene	56-55-3	330	1.0	980	
5	Benzo (a) pyrene	50-32-8	330	1.0	650	
6	Benzo (b) fluoranthene	205-99-2	330	1.0	960	
7	Benzo (g, h, i) perylene	191-24-2	330	1.0	380	
8	Benzo (k) fluoranthene	207-08-9	330	1.0	460	
9	Chrysene	218-01-9	330	1.0	1100	
10	Dibenz (a, h) anthracene	53-70-3	330	1.0	U	
11	Fluoranthene	206-44-0	330	1.0	1600	
12	Fluorene	86-73-7	330	1.0	U	
13	Indeno (1, 2, 3-c, d) pyrene	193-39-5	330	1.0	U	
14	Naphthalene	91-20-3	330	1.0	360	
15	Phenanthrene	85-01-8	330	1.0	1400	
16	Pyrene	129-00-0	330	1.0	1600	

ANALYTICAL REPORT

CLIENT: CONESTOGA-ROVERS & ASSOCIATES

Project/Site: 8889-40

Sample ID: S-8889-032598-SF-499

Date Sampled:	03/25/98	ENCOTEC Project ID:	33000
Date Received:	03/25/98	ENCOTEC SDG ID:	CRA-CS-98C4
Date Extracted:	03/25/98	ENCOTEC QC Set ID:	BNAC2509S
Analysis Date:	03/26/98	ENCOTEC Submission ID:	100010328
Second Analysis Date:	N/A	ENCOTEC Sample ID:	200069892
Method Reference:	8270	Percent Total Solids:	91.6
Matrix:	SOIL	Calculation Basis:	Dry Weight

	SEMIVOLATILE ORGANICS MDEQ Part 201, PAHs List	CAS #	Quant Limit (ug/Kg)	Dil	Conc (ug/Kg)	Flag
1	Acenaphthene	83-32-9	330	1.0	730	
2	Acenaphthylene	208-96-8	330	1.0	U	
3	Anthracene	120-12-7	330	1.0	680	
4	Benzo (a) anthracene	56-55-3	330	1.0	U	
5	Benzo (a) pyrene	50-32-8	330	1.0	U	
6	Benzo (b) fluoranthene	205-99-2	330	1.0	U	
7	Benzo (g,h,i) perylene	191-24-2	330	1.0	U	
8	Benzo (k) fluoranthene	207-08-9	330	1.0	U	
9	Chrysene	218-01-9	330	1.0	U	
10	Dibenz (a,h) anthracene	53-70-3	330	1.0	U	
11	Fluoranthene	206-44-0	330	1.0	U	
12	Fluorene	86-73-7	330	1.0	960	
13	Indeno (1,2,3-c,d) pyrene	193-39-5	330	1.0	U	
14	Naphthalene	91-20-3	330	1.0	1600	
15	Phenanthrene	85-01-8	330	1.0	1600	
16	Pyrene	129-00-0	330	1.0	350	

ANALYTICAL REPORT

CLIENT: CONESTOGA-ROVERS & ASSOCIATES

Project/Site: 8889-40

Sample ID: S-8889-032598-SF-500

Date Sampled:	03/25/98	ENCOTEC Project ID:	33000
Date Received:	03/25/98	ENCOTEC SDG ID:	CRA-CS-98C4
Date Extracted:	03/25/98	ENCOTEC QC Set ID:	BNAC2509S
Analysis Date:	03/26/98	ENCOTEC Submission ID:	100010328
Second Analysis Date:	N/A	ENCOTEC Sample ID:	200069893
Method Reference:	8270	Percent Total Solids:	90.4
Matrix:	SOIL	Calculation Basis:	Dry Weight

	SEMIVOLATILE ORGANICS MDEQ Part 201, PAHs List	CAS #	Quant Limit (ug/Kg)	Dil	Conc (ug/Kg)	Flag
1	Acenaphthene	83-32-9	1100	10	U	
2	Acenaphthylene	208-96-8	1100	10	U	
3	Anthracene	120-12-7	1100	10	U	
4	Benzo (a) anthracene	56-55-3	1100	10	U	
5	Benzo (a) pyrene	50-32-8	1100	10	U	
6	Benzo (b) fluoranthene	205-99-2	1100	10	U	
7	Benzo (g, h, i) perylene	191-24-2	1100	10	U	
8	Benzo (k) fluoranthene	207-08-9	1100	10	U	
9	Chrysene	218-01-9	1100	10	U	
10	Dibenz (a, h) anthracene	53-70-3	1100	10	U	
11	Fluoranthene	206-44-0	1100	10	U	
12	Fluorene	86-73-7	1100	10	U	
13	Indeno (1, 2, 3-c, d) pyrene	193-39-5	1100	10	U	
14	Naphthalene	91-20-3	1100	10	4400	
15	Phenanthrene	85-01-8	1100	10	2300	
16	Pyrene	129-00-0	1100	10	U	

ANALYTICAL REPORT

CLIENT: CONESTOGA-ROVERS & ASSOCIATES

Project/Site: 8889-40

Sample ID: S-8889-032598-SF-501

Date Sampled:	03/25/98	ENCOTEC Project ID:	33000
Date Received:	03/25/98	ENCOTEC SDG ID:	CRA-CS-98C4
Date Extracted:	03/25/98	ENCOTEC QC Set ID:	BNAC2509S
Analysis Date:	03/26/98	ENCOTEC Submission ID:	100010328
Second Analysis Date:	N/A	ENCOTEC Sample ID:	200069894
Method Reference:	8270	Percent Total Solids:	88.7
Matrix:	SOIL	Calculation Basis:	Dry Weight

	SEMIVOLATILE ORGANICS MDEQ Part 201, PAHs List	CAS #	Quant Limit (ug/Kg)	Dil	Conc (ug/Kg)	Flag
1	Acenaphthene	83-32-9	1100	10	U	
2	Acenaphthylene	208-96-8	1100	10	U	
3	Anthracene	120-12-7	1100	10	U	
4	Benzo (a) anthracene	56-55-3	1100	10	U	
5	Benzo (a) pyrene	50-32-8	1100	10	U	
6	Benzo (b) fluoranthene	205-99-2	1100	10	U	
7	Benzo (g, h, i) perylene	191-24-2	1100	10	U	
8	Benzo (k) fluoranthene	207-08-9	1100	10	U	
9	Chrysene	218-01-9	1100	10	U	
10	Dibenz (a, h) anthracene	53-70-3	1100	10	U	
11	Fluoranthene	206-44-0	1100	10	U	
12	Fluorene	86-73-7	1100	10	U	
13	Indeno (1, 2, 3-c, d) pyrene	193-39-5	1100	10	U	
14	Naphthalene	91-20-3	1100	10	3000	
15	Phenanthrene	85-01-8	1100	10	2800	
16	Pyrene	129-00-0	1100	10	U	

ANALYTICAL REPORT

CLIENT: CONESTOGA-ROVERS & ASSOCIATES

Project/Site: 8889-40

Sample ID: S-8889-032598-SF-502

Date Sampled:	03/25/98	ENCOTEC Project ID:	33000
Date Received:	03/25/98	ENCOTEC SDG ID:	CRA-CS-98C4
Date Extracted:	03/25/98	ENCOTEC QC Set ID:	BNAC2509S
Analysis Date:	03/26/98	ENCOTEC Submission ID:	100010328
Second Analysis Date:	N/A	ENCOTEC Sample ID:	200069895
Method Reference:	8270	Percent Total Solids:	91.5
Matrix:	SOIL	Calculation Basis:	Dry Weight

	SEMIVOLATILE ORGANICS MDEQ Part 201, PAHs List	CAS #	Quant Limit (ug/Kg)	Dil	Conc (ug/Kg)	Flag
1	Acenaphthene	83-32-9	1100	10	U	
2	Acenaphthylene	208-96-8	1100	10	U	
3	Anthracene	120-12-7	1100	10	U	
4	Benzo (a) anthracene	56-55-3	1100	10	U	
5	Benzo (a) pyrene	50-32-8	1100	10	U	
6	Benzo (b) fluoranthene	205-99-2	1100	10	U	
7	Benzo (g, h, i) perylene	191-24-2	1100	10	U	
8	Benzo (k) fluoranthene	207-08-9	1100	10	U	
9	Chrysene	218-01-9	1100	10	U	
10	Dibenz (a, h) anthracene	53-70-3	1100	10	U	
11	Fluoranthene	206-44-0	1100	10	U	
12	Fluorene	86-73-7	1100	10	U	
13	Indeno (1, 2, 3-c, d) pyrene	193-39-5	1100	10	U	
14	Naphthalene	91-20-3	1100	10	3000	
15	Phenanthrene	85-01-8	1100	10	2400	
16	Pyrene	129-00-0	1100	10	U	

ANALYTICAL REPORT

CLIENT: CONESTOGA-ROVERS & ASSOCIATES

Project/Site: 8889-40

Sample ID: S-8889-032598-SF-503

Date Sampled:	03/25/98	ENCOTEC Project ID:	33000
Date Received:	03/25/98	ENCOTEC SDG ID:	CRA-CS-98C4
Date Extracted:	03/25/98	ENCOTEC QC Set ID:	BNAC2509S
Analysis Date:	03/26/98	ENCOTEC Submission ID:	100010328
Second Analysis Date:	N/A	ENCOTEC Sample ID:	200069896
Method Reference:	8270	Percent Total Solids:	79.0
Matrix:	SOIL	Calculation Basis:	Dry Weight

	SEMIVOLATILE ORGANICS MDEQ Part 201, PAHs List	CAS #	Quant Limit (ug/Kg)	Dil	Conc (ug/Kg)	Flag
1	Acenaphthene	83-32-9	330	1.0	U	
2	Acenaphthylene	208-96-8	330	1.0	U	
3	Anthracene	120-12-7	330	1.0	U	
4	Benzo(a)anthracene	56-55-3	330	1.0	550	
5	Benzo(a)pyrene	50-32-8	330	1.0	450	
6	Benzo(b)fluoranthene	205-99-2	330	1.0	700	
7	Benzo(g,h,i)perylene	191-24-2	330	1.0	U	
8	Benzo(k)fluoranthene	207-08-9	330	1.0	U	
9	Chrysene	218-01-9	330	1.0	720	
10	Dibenz(a,h)anthracene	53-70-3	330	1.0	U	
11	Fluoranthene	206-44-0	330	1.0	1000	
12	Fluorene	86-73-7	330	1.0	U	
13	Indeno(1,2,3-c,d)pyrene	193-39-5	330	1.0	U	
14	Naphthalene	91-20-3	330	1.0	530	
15	Phenanthrene	85-01-8	330	1.0	960	
16	Pyrene	129-00-0	330	1.0	920	

QUALITY ASSESSMENT REPORT - METHOD BLANK Analysis

Extraction Date:	N/A
Analysis Date:	03/26/98
Second Analysis Date:	N/A
Method Reference:	8260
Matrix:	SOIL

ENCOTEC Project ID:	33000
ENCOTEC SDG ID:	CRA-CS-98C4
ENCOTEC QC Set ID:	VORC2601S
ENCOTEC Submission ID:	100010328
ENCOTEC Method Blank ID:	200066829

	VOLATILE ORGANICS MDEQ Part 201 Aromatic VOCs List	CAS #	Quant Limit (ug/Kg)	Dil	Conc (ug/Kg)	Flag
1	Benzene	71-43-2	10	1.0	U	
2	Ethylbenzene	100-41-4	10	1.0	U	
3	Toluene	108-88-3	10	1.0	U	
4	total Xylenes	1330-20-7	30	1.0	U	

QUALITY ASSESSMENT REPORT - METHOD BLANK Analysis

Extraction Date:	N/A	ENCOTEC Project ID:	33000
Analysis Date:	03/27/98	ENCOTEC SDG ID:	CRA-CS-98C4
Second Analysis Date:	N/A	ENCOTEC QC Set ID:	VORC2601S
Method Reference:	8260	ENCOTEC Submission ID:	100010328
Matrix:	SOIL	ENCOTEC Method Blank ID:	200066837

VOLATILE ORGANICS MDEQ Part 201 Aromatic VOCs List		CAS #	Quant Limit (ug/Kg)	Dil	Conc (ug/Kg)	Flag
1	Benzene	71-43-2	10	1.0	U	
2	Ethylbenzene	100-41-4	10	1.0	U	
3	Toluene	108-88-3	10	1.0	U	
4	total Xylenes	1330-20-7	30	1.0	U	

QUALITY ASSESSMENT REPORT - METHOD BLANK Analysis

Extraction Date:	N/A
Analysis Date:	03/27/98
Second Analysis Date:	N/A
Method Reference:	8260
Matrix:	SOIL

ENCOTEC Project ID: 33000
ENCOTEC SDG ID: CRA-CS-98C4
ENCOTEC QC Set ID: VOTC2701M
ENCOTEC Submission ID: 100010328
ENCOTEC Method Blank ID: 200066839

	VOLATILE ORGANICS MDEQ Part 201 Aromatic VOCs List	CAS #	Quant Limit (ug/Kg)	Dil	Conc (ug/Kg)	Flag
1	Benzene	71-43-2	500	100	U	
2	Ethylbenzene	100-41-4	500	100	U	
3	Toluene	108-88-3	500	100	U	
4	total Xylenes	1330-20-7	1500	100	U	

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**SOIL MATRIX SURROGATE RECOVERY
VOLATILE ORGANICS**

Project Name: CONESTOGA - ROVERS & ASSOCIATES
Project Number: 33000
Method: 8240 ____ 8260 X 8260A ____
Report Date: March 31, 1998
QC Set I.D.: VORC2601S

ENCOTEC Sample I.D.	% Recovery Dibromofluoromethane (80-120)	% Recovery D4-1,2-Dichloroethane (70-121)	% Recovery D8-Toluene (81-117)	% Recovery BFB (74-121)
200069885	98	102	110	115
200069886	99	105	111	113
200069887	97	98	108	102
200069888	95	96	109	120
200069890	97	99	108	114
200069891	104	108	116	108
200066829 MB	95	95	98	96
200066837 MB	97	96	99	97
200066961 LCS	101	98	101	97
200069885 MS	102	105	109 M	121 M
200069885 MSD	103	107	122 M	131 M

* Value outside of established quality control windows.
DL = Sample matrix diluted, therefore surrogate recoveries are not applicable.
M = Matrix interferences caused distortion to recovery value.

RECOVERY: 0 out of 40 outside QC Windows.

Note:

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**SOIL MATRIX SURROGATE RECOVERY
VOLATILE ORGANICS**

Project Name: CONESTOGA - ROVERS & ASSOCIATES
Project Number: 33000
Method: 8240 ____ 8260 X 8260A ____
Report Date: March 31, 1998
QC Set I.D.: VOTC2701M

ENCOTEC Sample I.D.	% Recovery Dibromofluoromethane (80-120)	% Recovery D4-1,2-Dichloroethane (70-121)	% Recovery D8-Toluene (81-117)	% Recovery BFB (74-121)
200069889	93	78	94	86
200069892	94	77	95	89
200069893	95	79	95	88
200069894	96	81	94	87
200069895	95	82	94	87
200069896	93	77	93	90
200066839 MB	95	78	93	91
200066969 LCS	94	82	93	91
200069894 MS	95	80	95	89
200069894 MSD	96	80	94	89

* Value outside of established quality control windows.
DL = Sample matrix diluted, therefore surrogate recoveries are not applicable.
M = Matrix interferences caused distortion to recovery value.

RECOVERY: 0 out of 40 outside QC Windows.

Note:

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LABORATORY CONTROL SAMPLE (LCS)
VOLATILE ORGANICS - SOIL MATRIX

Project Name: ENCOTEC
Project Number: 10000
QC Set ID: VORC2601S

ENCOTEC ID: 200066961

<u>Compound</u>	<u>Conc.</u> <u>Spiked</u> <u>(mg/Kg)</u>	<u>Conc.</u> <u>LCS</u> <u>(mg/Kg)</u>	<u>Percent</u> <u>Recovery</u> <u>(%)</u>	Quality Control
				<u>Windows</u> <u>Recovery</u> <u>(%)</u>
Benzene	0.0500	0.0547	109	76-136
Bromodichloromethane	0.0500	0.0475	95	78-131
Bromoform	0.0500	0.0386	77	68-124
Carbon tetrachloride	0.0500	0.0501	100	70-136
Chlorobenzene	0.0500	0.0512	102	73-127
Chloroform	0.0500	0.0501	100	78-126
Dibromochloromethane	0.0500	0.0439	88	67-133
1,1-Dichloroethane	0.0500	0.0520	104	66-140
1,2-Dichloroethane	0.0500	0.0482	96	63-140
1,1-Dichloroethene	0.0500	0.0520	104	47-187
trans-1,2-Dichloroethene	0.0500	0.0500	100	69-143
1,2-Dichloropropane	0.0500	0.0536	107	70-122
Ethylbenzene	0.0500	0.0521	104	73-129
Methylene chloride	0.0500	0.0496	99	61-163
1,1,2,2-Tetrachloroethane	0.0500	0.0402	80	68-120
Tetrachloroethene	0.0500	0.0524	105	61-135
Toluene	0.0500	0.0500	100	71-133
1,1,1-Trichloroethane	0.0500	0.0506	101	67-129
1,1,2-Trichloroethane	0.0500	0.0456	91	73-125
Trichloroethene	0.0500	0.0533	107	64-152

Recovery: 0 out of 20 outside QC windows

Note:

SAVED AS: C:\HPCHEM\1\DATA\QC\VLC26S1R.XLS

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LABORATORY CONTROL SAMPLE (LCS)
VOLATILE ORGANICS - SOIL MATRIX

Project Name: ENCOTEC
Project Number: 10000
QC Set ID: VOTC2701M

ENCOTEC ID: 200066969

<u>Compound</u>	<u>Conc.</u> <u>Spiked</u> <u>(mg/Kg)</u>	<u>Conc.</u> <u>LCS</u> <u>(mg/Kg)</u>	<u>Percent</u> <u>Recovery</u> <u>(%)</u>	<u>Quality Control</u> <u>Windows</u>
				<u>Recovery</u> <u>(%)</u>
Benzene	0.0500	0.0473	95	76-136
Bromodichloromethane	0.0500	0.0394	79	78-131
Bromoform	0.0500	0.0494	99	68-124
Carbon tetrachloride	0.0500	0.0414	83	70-136
Chlorobenzene	0.0500	0.0486	97	73-127
Chloroform	0.0500	0.0419	84	78-126
Dibromochloromethane	0.0500	0.0466	93	67-133
1,1-Dichloroethane	0.0500	0.0423	85	66-140
1,2-Dichloroethane	0.0500	0.0413	83	63-140
1,1-Dichloroethene	0.0500	0.0411	82	47-187
trans-1,2-Dichloroethene	0.0500	0.0423	85	69-143
1,2-Dichloropropane	0.0500	0.0432	86	70-122
Ethylbenzene	0.0500	0.0482	96	73-129
Methylene chloride	0.0500	0.0430	86	61-163
1,1,2,2-Tetrachloroethane	0.0500	0.0453	91	68-120
Tetrachloroethene	0.0500	0.0505	101	61-135
Toluene	0.0500	0.0462	92	71-133
1,1,1-Trichloroethane	0.0500	0.0415	83	67-129
1,1,2-Trichloroethane	0.0500	0.0467	93	73-125
Trichloroethene	0.0500	0.0500	100	64-152

Recovery: 0 out of 20 outside QC windows

Note:

SAVED AS: C:\HPCHEM\1\DATA\QC\VLC27M1T.XLS

Rev. 02/24/97

MATRIX SPIKE (MS) AND MATRIX SPIKE DUPLICATE (MSD)
VOLATILE ORGANICS - SOIL MATRIX

Project Name: ENCOTEC
Project Number: 10000
QC Set ID: VORC2601S

ENCOTEC ID: 200069885

Compound	Conc. Spiked (mg/Kg)	Sample Result (mg/Kg)	Conc.		Percent Recovery		Conc.		Percent Recovery		RPD		Limits	
			MS	(mg/Kg)	(%)	(%)	MSD	(mg/Kg)	(%)	(%)	(%)	(%)	RPD	(%)
1,1-Dichloroethene	0.0500	U	0.0391		78		0.0486		97		21.73		22	59-172
Trichloroethene	0.0500	U	0.0381		76		0.0407		81		6.45		24	62-137
Chlorobenzene	0.0500	U	0.0457		91		0.0519		104		12.77		21	60-133
Toluene	0.0500	U	0.0469		94		0.0559		112		17.58		21	59-139
Benzene	0.0500	U	0.0514		103		0.0562		112		9.01		21	66-142

RPD: 0 out of 5 outside of quality control limits.
Recovery: 0 out of 10 outside of quality control limits.

Note:

SAVED AS: C:\HPCHEM\1\DATA\QC\VMC26S1R.XLS

MATRIX SPIKE (MS) AND MATRIX SPIKE DUPLICATE (MSD)
VOLATILE ORGANICS - SOIL MATRIX

Project Name: ENCOTEC
Project Number: 10000
QC Set ID: VOTC2701M

ENCOTEC ID: 200069894

Compound	Conc. Spiked (mg/Kg)	Sample Result (mg/Kg)	Conc. MS (mg/Kg)	Percent		Conc.		Percent		Recovery		Quality Control Limits	
				Recovery (%)	MSD (mg/Kg)	Recovery (%)	MSD (mg/Kg)	Recovery (%)	MSD (mg/Kg)	RPD (%)	Recovery (%)	RPD (%)	Recovery (%)
1,1-Dichloroethene	5.00	U	4.29	86	4.29	86	4.29	86	4.29	0.02	22	22	59-172
Trichloroethene	5.00	U	4.83	97	4.84	97	4.84	97	4.84	0.29	24	24	62-137
Chlorobenzene	5.00	U	4.81	96	4.76	95	4.76	95	4.76	0.96	21	21	60-133
Toluene	5.00	1.7	6.25	90	6.30	91	6.30	91	6.30	0.78	21	21	59-139
Benzene	5.00	U	4.65	93	4.57	91	4.57	91	4.57	1.82	21	21	66-142

RPD: 0 out of 5 outside of quality control limits.
Recovery: 0 out of 10 outside of quality control limits.

Note:

SAVED AS: C:\HPCHEM\1\DATA\QC\VMC27M1T.XLS

QUALITY ASSESSMENT REPORT - METHOD BLANK Analysis

Extraction Date:	03/25/98	ENCOTEC Project ID:	33000
Analysis Date:	03/26/98	ENCOTEC SDG ID:	CRA-CS-98C4
Second Analysis Date:	N/A	ENCOTEC QC Set ID:	BNAC2509S
Method Reference:	8270	ENCOTEC Submission ID:	100010328
Matrix:	SOIL	ENCOTEC Method Blank ID:	200066779

	SEMIVOLATILE ORGANICS MDEQ Part 201, PAHs List	CAS #	Quant Limit (ug/Kg)	Dil	Conc (ug/Kg)	Flag
1	Acenaphthene	83-32-9	330	1.0	U	
2	Acenaphthylene	208-96-8	330	1.0	U	
3	Anthracene	120-12-7	330	1.0	U	
4	Benzo (a) anthracene	56-55-3	330	1.0	U	
5	Benzo (a) pyrene	50-32-8	330	1.0	U	
6	Benzo (b) fluoranthene	205-99-2	330	1.0	U	
7	Benzo (g, h, i) perylene	191-24-2	330	1.0	U	
8	Benzo (k) fluoranthene	207-08-9	330	1.0	U	
9	Chrysene	218-01-9	330	1.0	U	
10	Dibenz (a, h) anthracene	53-70-3	330	1.0	U	
11	Fluoranthene	206-44-0	330	1.0	U	
12	Fluorene	86-73-7	330	1.0	U	
13	Indeno (1, 2, 3-c, d) pyrene	193-39-5	330	1.0	U	
14	Naphthalene	91-20-3	330	1.0	U	
15	Phenanthrene	85-01-8	330	1.0	U	
16	Pyrene	129-00-0	330	1.0	U	

Laidlaw Environmental, Inc. / ENCOTEC
 3985 Research Park Drive * Ann Arbor, MI 48108
 734 / 761-1389

**SOIL MATRIX SURROGATE RECOVERY
 SEMIVOLATILE ORGANICS**

Project Name: CONESTOGA - ROVERS & ASSOCIATES
 Project Number: 33000
 Method: 8270 X 8270B
 Report Date: March 27, 1998
 QC Set I.D.: BNAC2509S

ENCOTEC Sample I. D.	BASE-NEUTRAL EXTRACTABLE ANALYTES			ACID EXTRACTABLE ANALYTES		
	% Recovery Nitrobenzene -d5 (23-120)	% Recovery 2-Fluorobi- phenyl (30-115)	% Recovery Terphenyl -dl4 (18-137)	% Recovery Phenol-d5 (24-113)	% Recovery 2-Fluoro- phenol (25-121)	% Recovery 2,4,6-Tribromo- phenol (19-122)
200069885	87	92	91	86	83	98
200069886	87	86	75	82	63	88
200069887	90	84	96	83	64	94
200069888	102	97	77	93	83	116
200069889	112	87	76	83	93	127*
200069890	58	50	47	49	47	51
200069891	90	84	67	79	85	89
200069892	103	70	73	76	126*	92
200069893	DL	DL	DL	DL	DL	DL
200069894	DL	DL	DL	DL	DL	DL
200069895	DL	DL	DL	DL	DL	DL
200069896	87	95	84	82	88	91
200066779 MB	86	96	90	87	94	98
200066875 LCS	94	101	85	87	83	104
200069896 MS	103	93	93	95	92	133*
200069896 MSD	113	103	86	89	89	139*

* Value outside of quality control windows.
 DL = Sample extract diluted, therefore surrogate recoveries not applicable.
 M = Matrix interferences caused distortion to recovery value.

RECOVERY: 4 out of 78 outside QC Windows

Note:

Form 090SSL2G.GEN

Rev. 09/27/97

LABORATORY CONTROL SAMPLE (LCS)
SEMIVOLATILE ORGANICS - SOIL MATRIX

Project Name: ENCOTEC
Project Number: 10000
QC Set ID: BNAC2509S

ENCOTEC ID: 20006875

Compound	Conc. pike (mg/kg)	Conc. LCS (mg/kg)	Quality Control	
			Percent Recovery (%)	Windows Recovery (%)
2-Chlorophenol	2.00	1.68	84	57-112
bis(2-Chloroethyl) ether	2.00	1.83	92	61-123
Phenol	2.00	1.44	72	58-120
1,3-Dichlorobenzene	2.00	1.76	88	68-114
1,4-Dichlorobenzene	2.00	1.94	97	67-119
1,2-Dichlorobenzene	2.00	1.70	85	71-116
bis(2-Chloroisopropyl) ether	2.00	1.83	92	52-151
Hexachloroethane	2.00	1.91	96	69-126
n-Nitroso-di-n-propylamine	2.00	1.84	92	79-114
Nitrobenzene	2.00	1.94	97	46-137
Isophorone	2.00	1.99	100	61-126
2-Nitrophenol	2.00	1.85	93	62-113
2,4-Dimethylphenol	2.00	1.72	86	54-121
bis(2-Chloroethoxy) methane	2.00	2.02	101	74-127
2,4-Dichlorophenol	2.00	1.84	92	61-116
1,2,4-Trichlorobenzene	2.00	1.82	91	74-120
Naphthalene	2.00	1.84	92	75-119
Hexachlorobutadiene	2.00	2.11	106	58-162
4-Chloro-3-methylphenol	2.00	2.05	103	80-117
2,4,6-Trichlorophenol	2.00	2.17	109	62-116
2-Chloronaphthalene	2.00	2.09	105	70-124
Acenaphthylene	2.00	1.85	93	69-118
2,6-Dinitrotoluene	2.00	2.27	114	30-167
Acenaphthene	2.00	2.00	100	68-131
2,4-Dinitrophenol	2.00	1.01	51	D-113
2,4-Dinitrotoluene	2.00	2.24	112	78-121
4-Nitrophenol	2.00	1.73	87	56-109
Fluorene	2.00	1.87	94	74-132
4-Chlorophenyl phenyl ether	2.00	2.07	104	74-128
Diethylphthalate	2.00	1.85	93	72-128
4,6-Dinitro-2-methylphenol	2.00	1.48	74	2-175
n-Nitrosodiphenylamine	2.00	2.18	109	30-171
4-Bromophenyl phenyl ether	2.00	2.02	101	68-131
Hexachlorobenzene	2.00	1.89	95	68-128
Pentachlorophenol	2.00	2.13	107	18-100
Phenanthrene	2.00	1.96	98	74-126
Anthracene	2.00	2.32	116	75-132
Di-n-butyl phthalate	2.00	2.02	101	77-126
Fluoranthene	2.00	2.01	101	69-141
Pyrene	2.00	2.14	107	65-145
Butyl benzyl phthalate	2.00	2.19	110	71-143
Benzo(a)anthracene	2.00	2.16	108	69-139
Chrysene	2.00	3.01	151	48-182
3-3'-Dichlorobenzidine	2.00	1.40	70	D-292
bis(2-Ethylhexyl) phthalate	2.00	2.18	109	38-188
Di-n-octyl phthalate	2.00	2.12	106	21-173
Benzo(b)fluoranthene	2.00	1.97	99	50-135
Benzo(k)fluoranthene	2.00	1.98	99	62-141
Benzo(a)pyrene	2.00	1.96	98	70-134
Indeno(1,2,3-cd)pyrene	2.00	1.75	88	35-169
Dibenz(a,h)anthracene	2.00	2.37	119	41-171
Benzo(ghi)perylene	2.00	2.26	113	2-192

Recovery: 1 out of 52 outside QC windows

Note:

SAVED AS: D:\DATA\QC\BLC5252A.XLS

Form 090SSM4G.XL2

Rev.10/01/96

MATRIX SPIKE (MS) AND MATRIX SPIKE DUPLICATE (MSD)
SEMIVOLATILE ORGANICS - SOIL MATRIX

Project Name: ENCOTEC

Project Number: 10000

QC Set ID: BNAC2509S

SAMPLE SPIKED - ENCOTEC ID: 200069896

Compound	Conc. Spiked (mg/Kg)	Sample Result (mg/Kg)	Conc. MS (mg/Kg)	Percent Recovery (%)	Conc. MSD (mg/Kg)	Percent Recovery (%)	Quality Control Limits	
							RPD (%)	Recovery (%)
1,2,4-Trichlorobenzene	2.00	U	1.82	91	1.65	83	23	43-113
Acenaphthene	2.00	U	1.97	99	2.39	119	19	45-124
2,4-Dinitrotoluene	2.00	U	2.24	112 *	2.29	115 *	47	44-109
Pyrene	2.00	0.49	2.75	113	2.23	87	36	24-142
N-Nitroso-di-n-propylamine	2.00	U	2.12	106	2.29	114	38	44-115
1,4-Dichlorobenzene	2.00	U	1.81	90	1.72	86	27	40-108
Pentachlorophenol	3.00	U	3.29	110	2.89	96	47	33-129
Phenol	3.00	U	2.51	84	2.52	84	35	60-97
2-Chlorophenol	3.00	U	2.67	89	2.56	85	50	49-111
4-Chloro-3-methylphenol	3.00	U	2.74	91	2.45	82	33	49-120
4-Nitrophenol	3.00	U	2.27	76	1.96	65	50	41-133

4

RPD: 0 out of 11 outside of QC Limits.
Recovery: 2 out of 22 outside of QC Limits.

Note:

SAVED AS: D:\DATA\QC\BMCS252A.XLS

CRA

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

CHAIN OF CUSTODY RECORD

SAMPLER'S SIGNATURE: Susan Fielek PRINTED NAME: Susan Fielek

SEQ. No. DATE TIME

1	032598	S-8889-032598-SF-442	Soil	2	✓	24 hours TAT
2		-443		2	✓	
3		-494		2	✓	
4		-495		2	✓	
5		-496		2	✓	
6		-497		2	✓	
7		-498		2	✓	
8		-499		2	✓	
9		-500		2	✓	
10		-501		2	✓	
11		-502		2	✓	
12		-503		2	✓	

TOTAL NUMBER OF CONTAINERS 74

RELINQUISHED BY: <u>Susan Fielek</u>	DATE: <u>032598</u>	RECEIVED BY: <u>Joseph Hemenway</u>	DATE: <u>3/25/98</u>
RELINQUISHED BY: <u>Joseph Hemenway</u>	TIME: <u>1430</u>	RECEIVED BY: <u>Joseph Hemenway</u>	TIME: <u>3:20</u>
RELINQUISHED BY: <u>Joseph Hemenway</u>	DATE: <u>3/25/98</u>	RECEIVED BY: <u>Joseph Hemenway</u>	DATE: <u>3/25/98</u>
RELINQUISHED BY: <u>Joseph Hemenway</u>	TIME: <u>3:43</u>	RECEIVED BY: <u>Joseph Hemenway</u>	TIME: <u>3:43</u>
RELINQUISHED BY: <u>Joseph Hemenway</u>	DATE: <u>3/25/98</u>	RECEIVED BY: <u>Joseph Hemenway</u>	DATE: <u>3/25/98</u>
RELINQUISHED BY: <u>Joseph Hemenway</u>	TIME: <u>3:43</u>	RECEIVED BY: <u>Joseph Hemenway</u>	TIME: <u>3:43</u>

METHOD OF SHIPMENT: Pick up by Encote AIR BILL No. 5524

White	Fully Executed Copy	Pink	Shipper Copy
Yellow	Receiving Laboratory Copy	Goldendrod	Sampler Copy
SAMPLE TEAM: <u>S. Fielek</u>		RECEIVED FOR LABORATORY BY: <u>S. Fielek</u>	
DATE: <u>3-25-98</u>		TIME: <u>3:50pm</u>	

APPENDIX B

DATA VALIDATION MEMORANDA

CRA

11100 Metro Airport Center Drive
Suite 160
Romulus, MI 48174
(313) 942-0909

MEMO

TO: Sara Anderson

REFERENCE NO: 8889-40

FROM: Mary Cameron/mc/58/Det. 

DATE: April 8, 1998

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

The following details a quality assessment and validation of the analytical data resulting from the March 25, 1998, collection of 12 soil samples from the General Motors Clark Street Site in Detroit, Michigan. The samples identified in Table 1 were analyzed for benzene, ethylbenzene, toluene, and xylenes (total) (BTEX) and polynuclear aromatics (PNA). Sample analysis was completed at Laidlaw Environmental, Inc. /Encotec in Ann Arbor, Michigan (Encotec) 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 Encotec, 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)

Individual sample performance for the organic analyses was monitored by assessing the results of surrogate compound percent recoveries. The PNA surrogate recoveries could not be measured for in several samples due to dilutions required to successfully analyze the samples. No further qualification was required. The surrogate recovery acceptance criteria was met for the remaining samples.

¹ Application of quality assurance criteria was consistent with "Draft National Functional Guideline for Organic Data Review", December 1990, revised June 1991.

Matrix Spike/Matrix Spike Duplicate Percent Recoveries

To assess the long term accuracy and precision of the analytical methods on various matrices, matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and the relative percent difference (RPD) of the recoveries were determined. The MS/MSD 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.

TABLE 1

**SAMPLE IDENTIFICATION NUMBERS
GENERAL MOTORS CLARK STREET SITE
DETROIT, MICHIGAN**

S-8889-032598-SF-492

S-8889-032598-SF-493

S-8889-032598-SF-494

S-8889-032598-SF-495

S-8889-032598-SF-496

S-8889-032598-SF-497

S-8889-032598-SF-498

S-8889-032598-SF-499

S-8889-032598-SF-500

S-8889-032598-SF-501

S-8889-032598-SF-502

S-8889-032598-SF-503

TABLE 2
SUMMARY OF ANALYTICAL METHODS
GENERAL MOTORS CLARK STREET SITE
DETROIT, MICHIGAN

<i>Parameter</i>	<i>Method</i>
BTEX	SW-846 8260 ¹
PNA	SW-846 8270

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

TABLE 3
HOLDING TIME PERIODS
GENERAL MOTORS CLARK STREET SITE
DETROIT, MICHIGAN

<i>Analysis</i>	<i>Holding Time Period</i>
BTEX	- 14 days from sample collection to completion of analysis
PNA	- 14 days from sample collection to extraction - 40 days from extraction to completion of analysis