

ENG-TECH CONSULTING LIMITED

GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

6 - 854 Marion Street
Winnipeg, Manitoba
R2J 0K4

Ph. (204) 233-1694
Fax: (204) 235-1579
E-mail: eng_tech@mb.sympatico.ca

November 15, 2004

File No.: 03-217-03

Manitoba Conservation
Attn: Randy Webber
123 Main Street
Suite 160
Winnipeg, Manitoba
R3C 1A4

Dear Mr. Webber,

The City of Winnipeg has requested that Manitoba Conservation receive a copy of the Phase I Environmental Site Assessment (ESA) report conducted at #2 Point Douglas Avenue (South Site) in Winnipeg, Manitoba. Attached are two copies of the report for your files regarding impacted and contaminated sites.

A Phase II ESA is in progress and upon notification from Ed Dolhun, P. Eng. with the City of Winnipeg, a copy of this report will be forwarded to you.

If there are any questions, please call me.

Sincerely,
ENG-TECH Consulting Limited



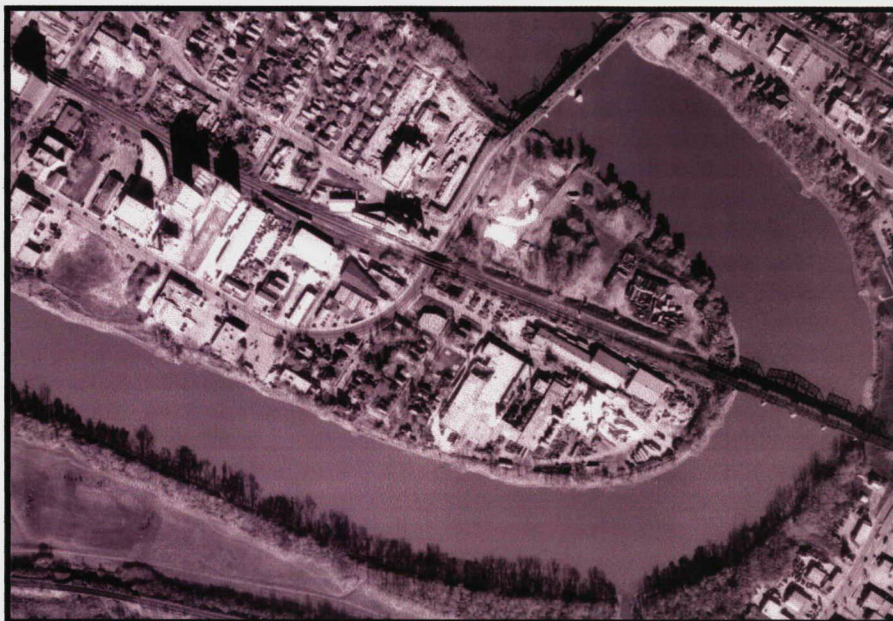
Clark Hryhoruk, M.Sc., P. Eng.
President



**PHASE II ENVIRONMENTAL SITE ASSESSMENT
FINAL REPORT**

SITE C: # 2 POINT DOUGLAS AVENUE (North)

File 04-217-03



November 2004

SUBMITTED BY:



**#6 - 854 MARION STREET
WINNIPEG, MANITOBA
R2J 0K4**

**PH: (204) 233-1694
FX: (204) 235-1579**

EXECUTIVE SUMMARY

ENG-TECH Consulting Limited (ENG-TECH) was retained by the City of Winnipeg to conduct a Phase II Environmental Site Assessment (ESA) of a property known as #2 Point Douglas Avenue (North), Winnipeg, Manitoba, owned by Gateway Industries Ltd. The purpose of the Phase II ESA was to determine whether any subsurface impact was present in areas where a potential source for environmental concern existed as identified in the Phase I ESA completed by ENG-TECH in October 2004.

The Phase II ESA consisted of a test hole drilling and soil sampling program, an analytical laboratory testing program for petroleum hydrocarbons including polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), metals, chlorides, mineral oils and grease, an evaluation of the results and preparation of this report.

The Phase II ESA was conducted using several published documents and guidelines relating to environmental site assessments.

The Phase II ESA was focussed in the following areas:

- Area 1 - along the southern access road in proximity to a former underground petroleum tank, located south of the Site;
- Area 2 - at two locations where fluorescent light ballasts were present on the ground;
- Area 3 - along the southern access road near the CPR mainline;
- Area 4 - at locations around the Site adjacent to empty metal tanks, metal frame work and other surplus metal storage; and
- Area 5 - near concrete rubble and aggregate stockpiles.

From the field and laboratory programs the following was determined:

- Eighteen (18) test holes were drilled at the Site, at the above locations. The test holes were drilled in locations where surface staining was present or in the most likely location where impact would emanate based on both the historic use of the Site and visual observations. Visual impact of petroleum hydrocarbons with depth (excluding surface staining) was not detected during the test hole drilling program at the Site. Field testing for volatile hydrocarbons only detected trace to background levels at each test hole location.
- A total of four (4) soil samples were submitted for analytical testing for various petroleum hydrocarbons. Overall, the two (2) soil samples submitted and tested for benzene, toluene, ethylbenzene, xylenes (BTEX) fractions F1 and F2 were below the method detection limits. Only trace levels of fractions F3 and F4 (all less than 36 mg/kg) were detected in the above samples. The two (2) soil samples submitted for polycyclic aromatic hydrocarbon (PAH) testing contained trace levels of PAH parameters, all well below the Canadian Council of Ministers of the Environment (CCME) criteria for residential/parkland land use.
- Two (2) soil samples were submitted for PCB testing. The two samples were at or below method detection limits and therefore also below CCME criteria.
- Three (3) soil samples were submitted for ICP metals and chloride testing. The results revealed metals concentrations typical of background values, with the exception of copper concentrations in two samples that were above CCME criteria. Chloride concentrations were

above typical background values for the area in all three (3) soil samples.

- One (1) sample was tested for Mineral Oil & Grease (MOG) revealing trace levels (200 mg/kg), well below the Manitoba Conservation Level I criterion of 1000 mg/kg.

Significant subsurface impact at the Site was not detected and considered unlikely based on the field and laboratory test results. The trace levels of both fractions F3 and F4 and MOG detected at the Site are well below the applicable criteria.

The two samples where metals concentrations, specifically copper, were above the criterion were collected in aggregate stockpile areas placed on the Site. Removal of the stockpiles could be completed followed by additional testing to ensure that the CCME criterion are met. However, it is not considered essential or immediately warranted at this time since negative impact to the Site and the risk to human health is considered unlikely, given the Site's current use.

Similarly, chloride concentrations in all three tested samples were above typical background values. These concentrations were attributed to the aggregate stockpiles placed on the Site when the Site was used as a snow dump in the 1960s and 1970s. Salts placed on city streets would have been present in the cleared snow placed on the Site, thus accumulating a higher than average chloride concentration. The chloride concentrations will eventually be returning to background concentrations as a result of dilution.

Based on the findings, further investigations, testing or remedial action is not warranted at this time. The trace concentrations of petroleum hydrocarbons, MOG, metals and chlorides are not expected to have a negative impact to the Site or users of the Site.

TABLE OF CONTENTS

PAGE

EXECUTIVE SUMMARY	i
TABLE OF CONTENTS	iii
1.0 INTRODUCTION	1
1.1 Terms of Reference	1
1.2 Background	1
1.3 Objectives	1
1.4 Scope of Work	1
1.5 Methodology	2
2.0 SITE CONDITION	2
2.1 Site Locations and Descriptions	2
2.2 Site Topography and Drainage	2
2.3 Site Geology and Groundwater	2
3.0 FIELD INVESTIGATION AND LABORATORY ANALYSES	3
3.1 Test Hole Drilling and Soil Sampling Program	3
3.2 Analytical Test Results	4
3.3 Remediation Criteria	4
3.4 Soil Stratigraphy	4
4.0 DISCUSSION and CONCLUSIONS	4
5.0 RECOMMENDATIONS	6
6.0 CLOSURE	6

BIBLIOGRAPHY/REFERENCES

LIST OF TABLES

1. Petroleum Hydrocarbons in Soil
2. Polychlorinated Biphenyls (PCBs) in Soil
3. Mineral Oil and Grease in Soil
4. Polycyclic Aromatic Hydrocarbons (PAH) in Soil
5. Metals in Soil
6. Chloride in Soil

LIST OF FIGURES

1. Site Location Plan
2. Test Hole Locations

LIST OF APPENDICES

- A Stratigraphic Test Hole Logs (18)
- B Analytical Test Results

1.0 INTRODUCTION

1.1 Terms of Reference

ENG-TECH Consulting Limited (ENG-TECH) was retained by the City of Winnipeg to conduct a Phase II Environmental Site Assessment (ESA) at a property known as #2 Point Douglas Avenue (North), Winnipeg, Manitoba, owned by Gateway Industries Ltd. The legal description of the property is Parcel C in Plan 14099 in River Lots 21 to 24, Parish of St. John, under the Certificate of Title No. 1298387 registered in the City of Winnipeg Land Titles Office. In this report the property will subsequently be referred to as the Site.

ENG-TECH received authorization to proceed with the investigation from Ed Dolhun, Land Development Co-coordinator with the City of Winnipeg on September 17, 2004.

1.2 Background

ENG-TECH completed a Phase I ESA of the Site in October 2004. Consequently, the Phase II ESA was concentrated in areas where a potential source for environmental concern existed, as identified in the Phase I ESA. Specifically, the following areas were identified:

- Area 1 - along the southern access road in proximity to a former underground petroleum tank, located south of the Site;
- Area 2 - at two locations where fluorescent light ballasts were present on the ground;
- Area 3 - along the southern access road near the CPR mainline;
- Area 4 - at locations around the Site adjacent to empty metal tanks, metal frame work and other surplus metal storage; and
- Area 5 - near concrete rubble and aggregate stockpiles.

Consequently test holes were drilled in close proximity to these areas.

1.3 Objectives

The purpose of the Phase II ESA was to determine whether any subsurface impact was present in areas where a potential source for environmental concern existed as identified in the Phase I ESA completed by ENG-TECH in October 2004.

1.4 Scope of Work

The scope of work for this project consisted of:

- A test hole drilling program within the immediate areas where a potential source for environmental concern existed. Two test holes were to be drilled to 7.6 m below existing grade in the area of potential hydrocarbon contamination, while the remainder of the test holes were to be drilled at locations near stored surplus metal, aggregate stockpiles and fluorescent light ballasts, to 3 m below existing grade or to the full depth of impacted soils, if encountered.
- Obtaining soil samples from the test holes at regular depth intervals and at stratigraphic changes, and field test these samples for volatile hydrocarbon vapours. Duplicate soils samples were to be collected at locations of potential concern, and tested for petroleum

hydrocarbons.

- A laboratory testing program. Specifically, a total of five (5) soil samples were to be tested for various petroleum hydrocarbons benzene, toluene, ethyl-benzene, xylene (BTEX) and fractions F1 to F4, polycyclic aromatic hydrocarbons (PAHs) and mineral oil & grease (MOG), three (3) soil samples were to be tested for ICP metals & chloride and two (2) samples were to be tested for PCBs.
- An evaluation of the results.
- An ESA report outlining the work conducted, evaluations, conclusions and recommendations.

1.5 Methodology

The Phase II ESA was conducted using guidelines and criteria outlined in publications from the American Society for Testing and Materials (ASTM), and the Canadian Council of Ministers of the Environment (CCME). A bibliography/reference list of the publications used are attached.

2.0 SITE CONDITION

2.1 Site Locations and Descriptions

The Site is located at the eastern end of Point Douglas Avenue, on the north side of the CPR main line in the Point Douglas area of Winnipeg Manitoba, as shown in Figure 1. The Site is irregularly shaped, occupying a thin panhandle east of Higgins Avenue along the north side of the CPR line and the eastern half of the north side of a peninsula from the beginning of an inside bend to the midpoint of the bend along the Red River. Further details on Site description are outlined in ENG-TECH's Phase I ESA report.

2.2 Site Topography and Drainage

The ground surface was predominantly level, with a slight grade towards the river. Drainage from the Site would be directed towards the river. No catch basins were located on the Site.

2.3 Site Geology and Groundwater

Local geological maps and water well logs show that the subsurface stratigraphy in this area of Winnipeg normally consists of fill soils (such as topsoil and granular), underlain by alluvial and lacustrine silt and clay deposits, ranging in depth from 15 to 21 m. A deposit of silty till, varying in thickness from 6 to 12 m is encountered between the lacustrine deposits and the underlying bedrock. Bedrock in this area of Winnipeg typically consists of dolomitic limestone beds of various thicknesses from the Selkirk Member of the Red River Formation. Bedrock formation was from the Paleozoic Era during the Ordovician Period.

Near-surface groundwater (perched groundwater) can exist at the Site and throughout the area, and will vary on a seasonal basis and from site to site. Perched groundwater elevations are predominantly controlled by Site conditions, such as the type and thickness of fill soils. The near static groundwater elevation will typically vary with the river elevations, but mainly be located approximately 5 m below

existing grade. The groundwater elevation is controlled by the underlying bedrock aquifer. There are no aquifers above the bedrock. The potential for impact to the aquifer was considered unlikely due to the thickness of the highly plastic clay deposits and Site usage.

3.0 FIELD INVESTIGATION AND LABORATORY ANALYSES

3.1 Test Hole Drilling and Soil Sampling Program

Test Hole Drilling

On October 18 and 19, 2004 ENG-TECH supervised the drilling of eighteen (18) test holes (TH1 to TH18) at the Site. The test holes were drilled using a Bobcat drill rig owned and operated by H.D.M. Enterprises. The test holes were drilled using 125 mm diameter solid stem augers to depths between 1.5 and 6.7 m below existing grade. Upon completion of the drilling program, each test hole was examined for indication of sloughing and seepage, then backfilled using the soil cuttings. Bentonite pellets were placed in each test hole to minimize the potential of surface runoff from entering the hole. The test hole locations are shown in Figure 2, while stratigraphic logs outlining the soil and groundwater conditions at the Site are shown in Appendix A.

Soil Sampling

Soil samples were collected from each test hole and visually classified using the Unified Soil Classification System (USCS). Soils samples were collected off the auger flights at all test hole locations. Each soil sample collected was subjected to an Ambient Temperature Headspace (ATH) vapour test using a GasTech Tracetehtor calibrated using hexane. Briefly, the procedures used for ATH vapour testing were as follows:

- Collect a soil sample from the auger flight and remove the perimeter edges. Cut the sample into small pieces and place then into a plastic sealable bag.
- Seal the bag in a manner that traps air into the bag such that the bag is taut.
- Allow the vapours emanating from the soil to accumulate in the headspace of the bag at a warm ambient temperature for approximately 15 minutes.
- Measure the hydrocarbon vapour concentration in the headspace of the bag by placing the probe of the GasTech Tracetehtor into the bag.

In addition to the above, each soil sample was examined for the presence of hydrocarbon odours and staining. A duplicate soil sample was obtained for near surface soils samples, and at locations where visual signs of hydrocarbon staining were detected or at locations where elevated ATH vapour concentrations were recorded. The duplicate soil samples were placed in clean glass jars, sealed, and placed in a cooler packed with ice. Upon the completion of drilling the cooler was transported to Enviro.Test Laboratories in Winnipeg, Manitoba.

3.2 Analytical Test Results

A total of ten (10) soil samples were submitted to Enviro-Test Laboratories in Winnipeg, Manitoba for analyses. Specifically, two (2) soil samples were tested for benzene, ethyl-benzene, toluene, xylene (BTEX) and fractions F1 to F4, two (2) soil samples were tested for PAHs, two (2) soil samples were tested for PCBs, three (3) samples were tested for ICP metals and chloride, and one (1) sample was tested for mineral oil and grease. An outline of the locations, depths, soil descriptions and results are shown in Tables 1 through 6. A copy of the analytical test results from Enviro-Test Laboratories are shown in Appendix B.

3.3 Remediation Criteria

The BTEX, fractions F1 to F4, PCB, PAH and ICP metals results from the analytical testing were compared to the values outlined by the Canadian Council of the Ministers of the Environment (CCME), whereas the mineral oil and grease was compared to the Manitoba Conservation value outlined in the "Treatment and Disposal of Petroleum Contaminated Soil, Guideline 96-05", Revised April 2002. Chloride concentrations were compared with typical background values for southern Manitoba soils supplied by Enviro-Test Laboratories in Winnipeg, Manitoba.

3.4 Soil Stratigraphy

Overall, the stratigraphy at the Site typically consisted of fill or an organic surface layer ranging from 0.1 to 1.5 m in thickness, followed by a mixture of layers of silty clays and silty sands depending on the location of the test hole. The soils encountered were both alluvial and lacustrine in nature, and varied in plasticity depending on the silt and fine grained sand content. Essentially below 2 m the soils consisted of highly plastic clay with various amounts of silt and fine grained sand sizes. The near static groundwater level is expected to correspond to the grey highly plastic clay layer encountered at approximately 6.4 m below grade based on the soils encountered at TH1 and TH2.

A summary of the subsurface conditions is shown in the stratigraphic test hole logs (TH1 to TH18) in Appendix A.

4.0 DISCUSSION and CONCLUSIONS

The test hole locations are shown on Figure 2, with the test hole numbers, sample depths and analytical test results shown in Tables 1 through 6. Outlined below are discussions and conclusions based on the results of field observations and testing, and analytical testing.

Area 1 - along the southern access road in proximity to a former underground petroleum tank, located south of the Site.

Two (2) test holes (TH1 and TH2) were drilled in Area 1 in proximity to an underground fuel tank located immediately south of the CPR mainline, on the neighbouring property to the south. The underground tank was known to have caused soil contamination, however the extent of the contamination was never delineated. The results from the field vapour readings were typical of background values, with only slight variations in the vapour readings with depth. One soil sample from each test hole was submitted for BTEX and fractions F1 to F4 analysis. The sample from TH1 was chosen based on visual observations of staining, while the sample from TH2 was selected based on depth. The BTEX concentrations in the samples, including fractions F1, F2 and F4, shown in Table

1, were below the method detection limits, with the exception of the TH2 sample which contained trace amounts of fractions F4. Noted in both samples were trace amounts of fraction F3. All values were well below CCME remediation criteria. Impact to the subsurface soils was not detected at the test hole locations, and significant impact along the southern side of the Site was considered unlikely.

Area 2 - at two locations where fluorescent light ballasts were present on the ground:

Over a dozen fluorescent light ballasts were observed on the ground at two locations at the Site. The labels on the ballasts were eroded, making it difficult to research the origin and date of the ballasts to determine if they contained PCBs. No other sources of PCBs were known to have been stored on the Site. Surface soil samples from two (2) test holes (TH5 and TH16) were tested for PCBs. The PCB concentrations in the samples, shown in Table 2, were at or below the minimum detection limits and consequently below the CCME remediation criteria.

Area 3 - along the southern access road near the CPR mainline.

Three (3) test holes (TH3, TH13 and TH15) were drilled in the above area. One (1) soil sample from TH3 was tested for mineral oils and grease, where surface staining was evident. The results, shown in Table 3, revealed a concentration of 200 mg/kg well below Manitoba Conservation criterion for mineral oil and grease.

Two (2) soil samples were tested for PAHs (TH13 and TH15), because of the close proximity to the CPR mainline. Visual evidence of impact with depth was not detected at the time of drilling. The field vapour readings were basically consistent with depth, although the surface sample (0.15 m below grade) readings were slightly higher than the other readings. The TH13 soil sample PAH concentrations, shown in Table 4, were below method detection limits, while the soil sample from TH15 contained trace amounts of PAHs. The trace amounts detected were well below CCME remediation criteria.

Area 4 - at locations around the Site adjacent to empty metal tanks, metal frame work and other surplus metal storage.

Six (6) test holes (TH7, TH9, TH10, TH11, TH14 and TH18) were drilled in the above mentioned area to investigate subsurface soils and obtain soil samples for possible metals testing. One sample from TH9 was submitted for ICP metals and chloride testing. The results, shown in Tables 5 and 6, revealed metals concentrations typical of background values, all of which were below the CCME remediation criteria. The measured chloride concentration was 66 mg/L which is above expected background values. Significant visual impact to the underlain native soils was not detected.

Area 5 - near concrete rubble and aggregate stockpiles.

Five (5) test holes (TH4, TH6, TH8, TH12 and TH17) were drilled near non-native aggregate and concrete rubble stockpiles. Significant visual impact to the underlain native soils was not detected at the test hole locations. Two samples from TH6 and TH12 were submitted for ICP metals and chloride testing. All of the metals concentrations were typical of background values, with all being below the CCME remediation criteria, with the exception of the copper concentrations which were 96 and 133 mg/kg in TH6 and TH12, respectively. CCME remediation criterion is 63 mg/kg for residential/parkland land use and 91 mg/kg for commercial/industrial land use. Chloride concentrations were 89 and 64 mg/L in TH6 and TH12, respectively which are above expected background values for the area.

5.0 RECOMMENDATIONS

The two samples where the metal concentrations, specifically copper, were above the criterion were collected in aggregate stockpile areas placed on the Site. Removal of the stockpiles could be completed followed by additional testing to ensure that the CCME criterion are met. However, it is not considered essential or immediately warranted at this time since negative impact to the Site and the risk to human health is considered unlikely, given the Site's current use.

Similarly, chloride concentrations in all three samples tested were above typical background values. These concentrations were attributed to the aggregate stockpiles placed on the Site when the Site was used as a snow dump in the 1960s and 1970s. Salts placed on city streets would have been present in the cleared snow placed on the Site, thus accumulating a higher than average chloride concentration. The chloride concentrations will eventually returning to background concentrations as a result of dilution. Removal of the stockpiles could be conducted, however it is not considered necessary at this time because an adverse impact to the Site and the risk to human health is considered unlikely.

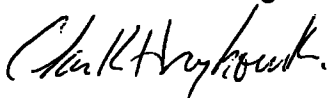
Based on the findings, further investigations, testing or remedial action is not warranted at this time. The trace concentrations of petroleum hydrocarbons, MOG, metals and chlorides are not expected to have a negative impact to the Site or users of the Site.

6.0 CLOSURE

The conclusions and recommendations presented in this report were based on the scope of work outlined for the purpose of the investigation, and were prepared in accordance with accepted professional engineering/geo-science principles and practises. However, as with any environmental site assessment the intent is to identify and address, not eliminate, potential environmental concerns.

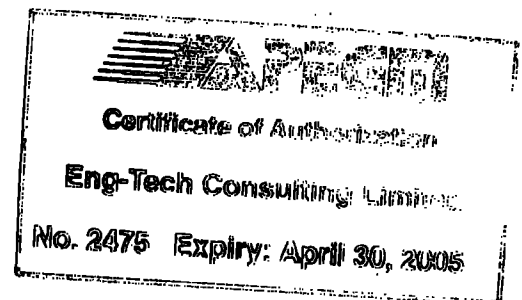
The observations made at the Site do not apply to areas which could not be observed. In addition, other materials or compounds not investigated or addressed or beyond the scope of work could be present at the Site. If this occurs, ENG-TECH Consulting Limited must be notified to determine whether modification to any part of this report should be conducted. If you have any questions or concerns regarding the findings, conclusions or recommendations presented herein, please contact the undersigned.

Sincerely,
ENG-TECH Consulting Limited



Clark Hryhoruk, M.Sc., P.Eng.
President

CDH/



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LIST OF TABLES

Petroleum Hydrocarbons in Soil
Polychlorinated Biphenyls (PCBs) in Soil
Mineral Oil and Grease in Soil
Polycyclic Aromatic Hydrocarbons (PAH) in Soil
Metals in Soil
Chloride in Soil

TABLE 1
PETROLEUM HYDROCARBONS IN SOIL
PHASE II ESA - #2 POINT DOUGLAS AVENUE(NORTH)

Sample No.	Parameter ⁽¹⁾							
	Benzene	Toluene	Ethylbenzene	Xylenes	F1 (C ₆ -C ₁₀)	F2 (C ₁₀ -C ₁₆)	F3 (C ₁₆ -C ₃₄)	F4 (C ₃₄ -C ₅₀)
TH1-S5 (4.9 m)	< 0.005	< 0.01	< 0.01	< 0.03	< 5	<5	11	<5
TH2-S4 (6.1 m)	< 0.005	< 0.01	< 0.01	< 0.03	< 5	< 5	7	36
CCME ⁽²⁾ 1999 Canadian Environmental Quality Guidelines for Soil in Industrial Site								
Residential/Parkland	0.5	0.8	1:2	1	N/V	N/V	N/V	N/V
Commercial	5	0.8	20	17	N/V	N/V	N/V	N/V
Industrial	5	0.8	20	20	N/V	N/V	N/V	N/V
CCME CWS ⁽³⁾ for PHCs in Soil, 2001, Table 2, Tier 1 levels for fine grained surface soils								
Residential/Parkland	N/V	N/V	N/V	N/V	260	900	800	5600
Commercial	N/V	N/V	N/V	N/V	660	1500	2500	6600
Industrial	N/V	N/V	N/V	N/V	660	1500	2500	6600
CCME CWS for PHCs in Soil, 2001, Table 3, Tier 1 levels for coarse grained surface soils								
Residential/Parkland	N/V	N/V	N/V	N/V	30	150	400	2800
Commercial	N/V	N/V	N/V	N/V	310	760	1700	3300
Industrial	N/V	N/V	N/V	N/V	310	760	1700	3300
CCME CWS for PHCs in Soil, 2001, Table 4, Generic levels in fine grained subsoil (>1.5 m depth)								
Residential/Parkland	N/V	N/V	N/V	N/V	750	2200	3500	10000
Commercial	N/V	N/V	N/V	N/V	1000	3000	5000	10000
Industrial	N/V	N/V	N/V	N/V	1000	3000	5000	10000
CCME CWS for PHCs in Soil, 2001, Table 5, Generic levels in coarse grained subsoil (>1.5 m depth)								
Residential/Parkland	N/V	N/V	N/V	N/V	350	1500	2500	10000
Commercial	N/V	N/V	N/V	N/V	700	2000	3500	10000
Industrial	N/V	N/V	N/V	N/V	700	2000	3500	10000

Notes: ⁽¹⁾ All concentrations are in mg/kg
⁽²⁾ Canadian Council of Ministers of the Environment
⁽³⁾ Canada Wide Standards
N/V = no value

TABLE 2
POLYCHLORINATED BIPHENYLS (PCBs) IN SOIL
PHASE II ESA - #2 POINT DOUGLAS AVENUE (NORTH)

Parameters ⁽¹⁾	M.D.L	Sample Location, Depth & Soil Type				
		TH5-S1 0.15 m	TH16-S5 0.15 m	CCME Criteria ⁽²⁾ for Land Use Type		
		Granular Fill	Granular Fill	Residential/ Parkland	Commercial	Industrial
Aroclor 1016	0.1	< 0.1	< 0.1	n/v	n/v	n/v
Aroclor 1221	0.1	< 0.1	< 0.1	n/v	n/v	n/v
Aroclor 1232	0.1	< 0.1	< 0.1	n/v	n/v	n/v
Aroclor 1242	0.1	< 0.1	< 0.1	n/v	n/v	n/v
Aroclor 1248	0.1	< 0.1	< 0.1	n/v	n/v	n/v
Aroclor 1254	0.1	0.1	< 0.1	n/v	n/v	n/v
Aroclor 1260	0.1	< 0.1	< 0.1	n/v	n/v	n/v
Aroclor 1262	0.1	< 0.1	< 0.1	n/v	n/v	n/v
Aroclor 1268	0.1	< 0.1	< 0.1	n/v	n/v	n/v
Total PCBs	0.1	0.1	< 0.1	1.3	33	33

Notes: ⁽¹⁾ All concentrations are in mg/kg.

⁽²⁾ Canadian Council of Ministers of the Environment.

M.D.L. = Method Detection Limit as of November 2004.

n/v = no value.

Shaded area greater than criterion

P:\2004\Projects\217COW-General\03(Site_C-#2Point_Douglas-N)\Phase I\Tables\PCB Table.wpd

TABLE 3
MINERAL OIL AND GREASE IN SOIL
PHASE II ESA - #2 POINT DOUGLAS AVENUE (NORTH)

Parameter ⁽¹⁾	M.D.L.	Test Hole No., Sample No., and Depth	MB Conservation Criteria ⁽²⁾ for Land Use Types		
		TH 3 S-1 0.15 m	Level I (Residential)	Level II (Commercial)	Level III (Industrial)
Mineral Oil & Grease	100	200	1000	5000	5000

Notes:⁽¹⁾ All concentrations are in mg/kg.

⁽²⁾ Manitoba Conservation "Treatment and Disposal of Petroleum Contaminated Soil" Guidelines 96-05, revised April 2002

M.D.L. - Method Detection Limit

P:\2004\Projects\217COW-General\03(Site_C-#2Point_Douglas-N)\Phase II\Tables\Mineral Oil and Grease Table.wpd

TABLE 4
POLYCYCLIC AROMATIC HYDROCARBONS (PAH) IN SOIL
PHASE II ESA - #2 POINT DOUGLAS AVENUE (NORTH)

Parameters ⁽¹⁾	M.D.L.	Sample Location, Depth & Soil Type				
		TH13-S5 0.15 m	TH15-S5 0.15 m	CCME Criteria ⁽²⁾ for Land Use Type		
		Granular Fill	Granular Fill	Residential/ Parkland	Commercial	Industrial
Acenaphthene	0.05	< 0.05	< 0.05	n/v	n/v	n/v
Acenaphthylene	0.05	< 0.05	< 0.05	n/v	n/v	n/v
Anthracene	0.05	< 0.05	< 0.05	n/v	n/v	n/v
Benzo (a) Anthracene	0.05	< 0.05	0.11	1	10	10
Benzo (a) Pyrene	0.05	< 0.05	0.18	0.7	0.7	0.7
Benzo (b) Fluoranthene	0.05	< 0.05	< 0.05	1	10	10
Benzo (g h i) Perylene	0.05	< 0.05	0.16	n/v	n/v	n/v
Benzo (k) Fluoranthene	0.05	< 0.05	< 0.05	1	10	10
Chrysene	0.1	< 0.1	0.3	n/v	n/v	n/v
Dibenzo (a h) Anthracene	0.05	< 0.05	0.07	1	10	10
Fluoranthene	0.05	< 0.05	0.18	n/v	n/v	n/v
Fluorene	0.05	< 0.05	< 0.05	n/v	n/v	n/v
Indendo (1 2 3-cd) Pyrene	0.05	< 0.05	0.09	1	10	10
Napthalene	0.05	< 0.05	< 0.05	0.6	22	22
Napthalene 1-Methyl	0.05	< 0.05	< 0.05	n/v	n/v	n/v
Napthalene 2-Methyl	0.05	< 0.05	< 0.05	n/v	n/v	n/v
Phenanthrene	0.05	< 0.05	0.11	5	50	50
Pyrene	0.05	< 0.05	0.16	10	100	100
Quinoline	0.05	< 0.05	< 0.05	n/v	n/v	n/v
Acridine	0.05	< 0.05	< 0.05	n/v	n/v	n/v

Notes: ⁽¹⁾ All concentrations are in mg/kg.
⁽²⁾ Canadian Council of Ministers of the Environment.
M.D.L. = Method Detection Limit as of November 2004.
n/v = no value

TABLE 5
METALS IN SOIL
PHASE II ESA - #2 POINT DOUGLAS AVENUE (NORTH)

Type of Metal ⁽¹⁾	M.D.L.	Test Hole No., Sample No., and Depth			CCME Criteria ⁽²⁾ for Land Use Type		
		TH 6 S-1 (0.15 m)	TH 9 S-3 (1.1 m)	TH 12 S-2 (0.3 m)	Residential/ Parkland	Commercial	Industrial
Aluminum	3	7090	7510	7270	N/V	N/V	N/V
Arsenic	0.03	7	8.6	5.53	12	12	12
Barium	0.04	150	361	160	500	2000	2000
Beryllium	0.06	0.47	0.52	0.5	4	8	8
Bismuth	0.02	0.15	0.18	0.15	N/V	N/V	N/V
Boron	0.6	11.6	16.5	11.1	N/V	N/V	N/V
Cadmium	0.02	0.48	0.44	0.42	10	22	22
Calcium	7	46000	47200	69000	N/V	N/V	N/V
Chromium	0.1	19	20.4	22.2	64	87	87
Cobalt	0.01	9.23	10.9	8.71	50	300	300
Copper	0.2	96	46.1	133	63	91	91
Iron	6	16100	31800	18300	N/V	N/V	N/V
Lead	0.05	74.5	70.3	73.7	140	260	600
Magnesium	2	17700	19000	24000	N/V	N/V	N/V
Manganese	0.03	656	536	527	N/V	N/V	N/V
Molybdenum	0.02	0.89	2.69	1.17	10	40	40
Nickel	0.2	25.8	36.9	30.4	50	50	50
Potassium	7	1810	1690	1870	N/V	N/V	N/V
Selenium	0.1	0.3	0.5	0.3	3	10	10
Silver	1	< 1	< 1	< 1	20	40	40
Sodium	2	218	751	378	N/V	N/V	N/V
Strontium	0.02	54.5	239	69.1	N/V	N/V	N/V
Thallium	0.2	< 0.2	< 0.2	< 0.2	1	1	1
Tin	4	< 4	< 4	< 4	50	300	300
Titanium	0.03	333	343	278	N/V	N/V	N/V
Uranium	0.006	1.07	1.18	0.88	N/V	N/V	N/V
Vanadium	0.06	20.8	23.6	22.3	130	130	130
Zinc	2	91	130	106	200	360	360

Notes: ⁽¹⁾ All concentrations are in mg/kg, and are Total Concentrations.

⁽²⁾ Canadian Council of Ministers of the Environment

M.D.L. - Method Detection Limit

N/V - No value

Shaded area greater than criterion.

TABLE 6
CHLORIDE IN SOIL
PHASE II ESA - #2 POINT DOUGLAS AVENUE (NORTH)

Parameter ⁽¹⁾	M.D.L.	Test Hole No., Sample No., and Depth			CCME Criteria ⁽²⁾ for Land Use Type		
		TH 6 S-1 0.15 m	TH 9 S-3 1.1 m	TH 12 S-2 0.3 m	Residential/ Parkland	Commercial	Industrial
Chloride	3	89	66	64	N/V	N/V	N/V

Notes: ⁽¹⁾ All concentrations are in mg/L, and are Total Concentrations.

⁽²⁾ Canadian Council of Ministers of the Environment

M.D.L. - Method Detection Limit

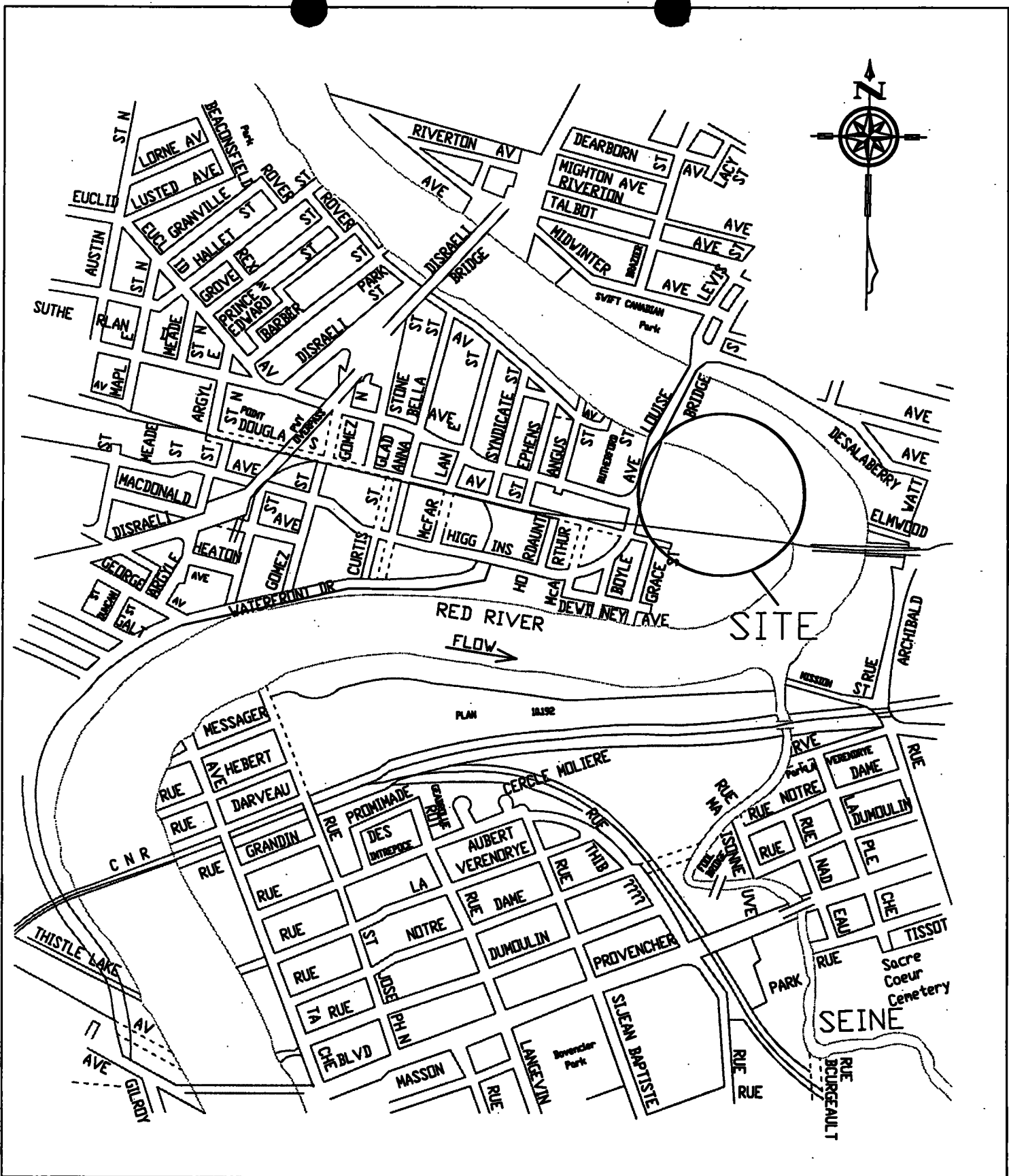
N/V - No value

Shaded area greater than criterion.

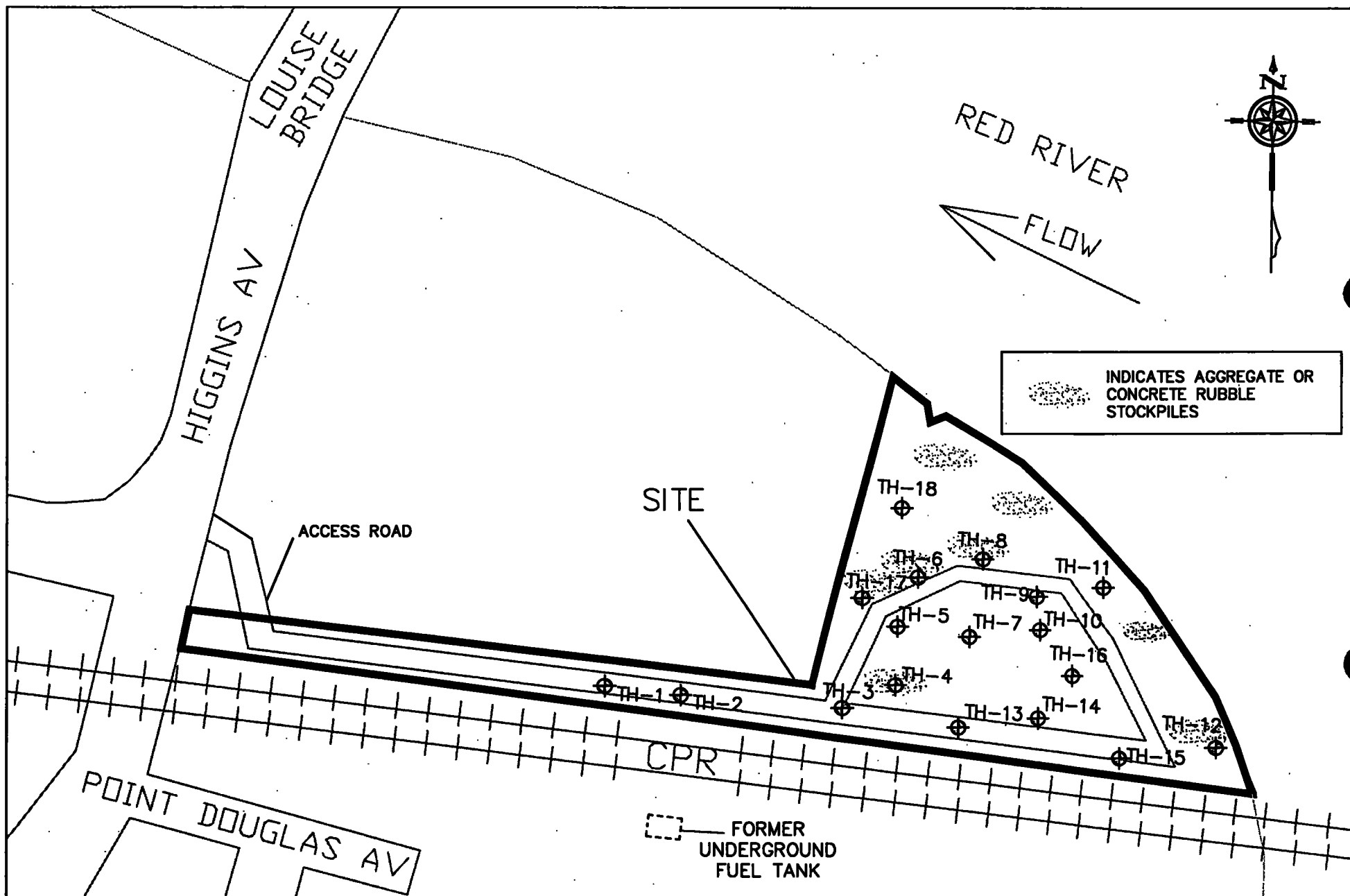
P:\2004\Projects\217COW-General\03(Site_C-#2Point_Douglas-N)\Phase II\Tables\Chlorides Table.wpd

LIST OF FIGURES

Site Location Plan
Test Hole Locations



ENG-TECH CONSULTING LIMITED GEOTECHNICAL - ENVIRONMENTAL - MATERIALS TESTING			CLIENT: CITY OF WINNIPEG		SITE LOCATION PHASE II ESA #2 POINT DOUGLAS AVE NORTH SITE WINNIPEG, MB
DRAWN BY: N/A	SCALE: NTS	DATE: NOV 2004	FILE No: 04-217-03	FIGURE No: 1	



ENG-TECH CONSULTING LIMITED

GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

DRAWN BY:
JRD

SCALE:
NTS

DATE:
NOVEMBER 2004

CLIENT: CITY OF WINNIPEG

FILE NO: 04-217-03

FIGURE NO.: 2

PHASE II ESA
#2 POINT DOUGLAS AVE
(NORTH)
TEST HOLE LOCATIONS

ENG-TECH CONSULTING LIMITED

GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

Client: City of Winnipeg

Project: Phase II Environmental Site Assessment

Site: 2 Point Douglas Avenue (North), Winnipeg, Manitoba

Location: See Figure 2

Test Hole #: TH1

Project No: 04-217-03

Date Drilled: October 18, 2004

Grade Elevation: 100 m (local)

Water Elevation: --

SUBSURFACE PROFILE				SAMPLE DATA					Well Data	Comments			
Depth (m)	Soil Symbol	Description	Elevation (m)	Number	Sample Type	Recovery (%)	ATH Vapour Concentration (ppm)						
							10	30			50	70	90
0		Ground Surface	100										
1		Organic Fill (OH) - dark brown, dry, low plastic, some silt & sand sizes, trace gravel sizes, trace organics.	99	S1	Split Barrel	100							
2		Clay (CH) - dark brown, damp to moist, high plastic.	98	S2	Split Barrel	100							
3		Silty Clay (CH) - brown, moist, high plastic, with silt, occasional silt pockets.	97	S3	Split Barrel	100							
4		- below 4.9 m, staining observed.	96	S4	Split Barrel	100							
5			95	S5	Split Barrel	100							
			95	S6	Split Barrel	100							
6			94	S7	Split Barrel	100							
7		Clay (CH) - grey, wet, high plastic, some silt, some fine to medium grained sand sizes.	93										
			92	S8	Split Barrel	100							
8		End of Test Hole - ended test hole at 7.6 m below existing grade. - test hole backfilled with auger cuttings, followed by bentonite from 0.0 to 0.2 m below grade.	91										
9		- sloughing encountered at 4.6 m below grade.	90										
10													

ENG-TECH Consulting Limited

Logged by: JSD & KWJ

Reviewed by: *CA*

Drilled By: H.D.M. Enterprises

Drill Rig: Bobcat drill rig

Auger Size: 125 mm

Completion Depth: 7.6 m

Completion Elevation: 92.4 m

Sheet: 1 of 1

Sample Type



Split Barrel



Shelby Tube



Auger Cuttings



Split Spoon

ENG-TECH CONSULTING LIMITED

GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

Client: City of Winnipeg

Project: Phase II Environmental Site Assessment

Site: 2 Point Douglas Avenue (North), Winnipeg, Manitoba

Location: See Figure 2

Test Hole #: TH2

Project No: 04-217-03

Date Drilled: October 18, 2004

Grade Elevation: 100 m (local)

Water Elevation: --

SUBSURFACE PROFILE				SAMPLE DATA				Well Data	Comments
Depth (m)	Soil Symbol	Description	Elevation (m)	Number	Sample Type	Recovery (%)	ATH Vapour Concentration (ppm)		
							10 30 50 70 90		
0		Ground Surface	100						
0		Organic Fill (OH) - black, dry, low plastic, some silt & sand sizes, trace gravel sizes, trace organics.							
1		Sand (SM) - brown, damp, fine to medium grained, some silt. - below 0.6 m, dry: - below 1.5 m, moist. - below 3.0 m, trace clay.		S1	SM	100			
2									
3				S2	SM	100			
4									
5		Clayey Sand (SC) - dark brown, wet, fine to medium grained, with clay. - below 4.9 m, trace oxides.		S3	SM	100			
6				S4	SM	100			
6				S5	SM	100			
7		Clay (CH) - grey, wet, high plastic, some silt, some fine to medium grained sand sizes. - below 7.2 m, blue, occasional sand pockets.							
7				S6	SM	100			
8		End of Test Hole - ended test hole at 7.6 m below existing grade. - test hole backfilled with auger cuttings, followed by bentonite from 0.0 to 0.2 m below grade. - sloughing encountered at 5.9 m below grade.							
9									
10									

ENG-TECH Consulting Limited

Logged by: JSD & KWJ

Reviewed by: 

Drilled By: H.D.M. Enterprises

Drill Rig: Bobcat drill rig

Auger Size: 125 mm

Completion Depth: 7.6 m

Completion Elevation: 92.4 m

Sheet: 1 of 1

Sample Type



Split Barrel



Shelby Tube



Auger Cuttings



Split Spoon

ENG-TECH CONSULTING LIMITED

GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

Client: City of Winnipeg

Project: Phase II Environmental Site Assessment

Site: 2 Point Douglas Avenue (North), Winnipeg, Manitoba

Location: See Figure 2

Test Hole #: TH3

Project No: 04-217-03

Date Drilled: October 18, 2004

Grade Elevation: 100 m (local)

Water Elevation: --

SUBSURFACE PROFILE				SAMPLE DATA					Well Data	Comments	
Depth (m)	Soil Symbol	Description	Elevation (m)	Number	Sample Type	Recovery (%)	ATH Vapour Concentration (ppm)				
							10	30	50	70	90
0		Ground Surface	100								
		15 mm of Asphalt Overlay		S1		100					
1		Granular Fill - dark brown, damp, with clay.	99								
		Clayey Sand (SC) - brown, damp to moist, fine to medium grained, with clay, some silt.	98								
2		End of Test Hole - ended test hole at 1.5 m below existing grade. - test hole backfilled with auger cuttings followed by bentonite from 0.0 to 0.2 m below grade. - no sloughing encountered during drilling.	97								
3			96								
4			95								
5			94								
6			93								
7			92								
8			91								
9			90								
10			90								

ENG-TECH Consulting Limited

Logged by: JSD & KWJ

Reviewed by: *CH*

Sample Type



Split Barrel



Shelby Tube



Auger Cuttings



Split Spoon

Drilled By: H.D.M. Enterprises

Drill Rig: Bobcat drill rig

Auger Size: 125 mm

Completion Depth: 1.5 m

Completion Elevation: 98.5 m

Sheet: 1 of 1

ENG-TECH CONSULTING LIMITED

GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

Client: City of Winnipeg

Project: Phase II Environmental Site Assessment

Site: 2 Point Douglas Avenue (North), Winnipeg, Manitoba

Location: See Figure 2

Test Hole #: TH4

Project No: 04-217-03

Date Drilled: October 18, 2004

Grade Elevation: 100 m (local)

Water Elevation: --

SUBSURFACE PROFILE				SAMPLE DATA					Well Data	Comments			
Depth (m)	Soil Symbol	Description	Elevation (m)	Number	Sample Type	Recovery (%)	ATH Vapour Concentration (ppm)						
							10	30			50	70	90
0		Ground Surface	100										
		Clay (CH) - dark brown, moist, high plastic, some silt.		S1		100							
1		Silty Clay (CH) - light brown, moist, high plastic, with silt.	99										
2		Clayey Sand (SC) - brown, damp, fine to medium grained, with clay, some silt.	98										
3		End of Test Hole - ended test hole at 1.5 m below existing grade. - test hole backfilled with auger cuttings, followed by bentonite from 0.0 to 0.2 m below grade. - no sloughing encountered during drilling.	97										
4			96										
5			95										
6			94										
7			93										
8			92										
9			91										
10			90										

ENG-TECH Consulting Limited

Logged by: JSD & KWJ

Reviewed by: 

Sample Type



Split Barrel



Shelby Tube



Auger Cuttings



Split Spoon

Drilled By: H.D.M. Enterprises

Drill Rig: Bobcat drill rig

Auger Size: 125 mm

Completion Depth: 1.5 m

Completion Elevation: 98.5 m

Sheet: 1 of 1

ENG-TECH CONSULTING LIMITED

GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

Client: City of Winnipeg

Project: Phase II Environmental Site Assessment

Site: 2 Point Douglas Avenue (North), Winnipeg, Manitoba

Location: See Figure 2

Test Hole #: TH5

Project No: 04-217-03

Date Drilled: October 18, 2004

Grade Elevation: 100 m (local)

Water Elevation: --

SUBSURFACE PROFILE				SAMPLE DATA					Well Data	Comments			
Depth (m)	Soil Symbol	Description	Elevation (m)	Number	Sample Type	Recovery (%)	ATH Vapour Concentration (ppm)						
							100	300			500	700	900
0		Ground Surface	100										
0.2		Granular Fill - dark brown, damp, some clay fill.		S1	1	100							
1		Silty Clay (CH) - dark brown, moist, high plastic, with silt, trace sand sizes.	99										
2			98										
3		Sand (SM) - brown, damp, fine to medium grained, some silt.	97										
4		End of Test Hole - ended test hole at 3.0 m below existing grade. - test hole backfilled with auger cuttings, followed by bentonite from 0.0 to 0.2 m below grade. - no sloughing encountered during drilling.	96										
5			95										
6			94										
7			93										
8			92										
9			91										
10			90										

ENG-TECH Consulting Limited

Logged by: JSD & KWJ

Reviewed by: *CH*

Sample Type



Split Barrel



Shelby Tube



Auger Cuttings



Split Spoon

Drilled By: H.D.M. Enterprises

Drill Rig: Bobcat drill rig

Auger Size: 125 mm

Completion Depth: 3.0 m

Completion Elevation: 97.0 m

Sheet: 1 of 1

ENG-TECH CONSULTING LIMITED

GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

Client: City of Winnipeg

Project: Phase II Environmental Site Assessment

Site: 2 Point Douglas Avenue (North), Winnipeg, Manitoba

Location: See Figure 2

Test Hole #: TH6

Project No: 04-217-03

Date Drilled: October 18, 2004

Grade Elevation: 100 m (local)

Water Elevation: --

SUBSURFACE PROFILE				SAMPLE DATA					Well Data	Comments			
Depth (m)	Soil Symbol	Description	Elevation (m)	Number	Sample Type	Recovery (%)	ATH Vapour Concentration (ppm)						
							10	30			50	70	90
0		Ground Surface	100										
		Granular Fill - dark brown, damp, with clay fill, slight staining observed.		S1		100							
1		Clayey Sand (SC) - dark brown, moist, fine to medium grained, with clay.	99										
2		End of Test Hole - ended test hole at 1.5 m below existing grade. - test hole backfilled with auger cuttings, followed by bentonite from 0.0 to 0.2 m below grade. - no sloughing encountered during drilling.	98										
3			97										
4			96										
5			95										
6			94										
7			93										
8			92										
9			91										
10			90										

ENG-TECH Consulting Limited

Logged by: JSD & KWJ

Reviewed by: 

Sample Type



Split Barrel



Shelby Tube



Auger Cuttings



Split Spoon

Drilled By: H.D.M. Enterprises

Drill Rig: Bobcat drill rig

Auger Size: 125 mm

Completion Depth: 1.5 m

Completion Elevation: 98.5 m

Sheet: 1 of 1

ENG-TECH CONSULTING LIMITED

GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

Client: City of Winnipeg

Project: Phase II Environmental Site Assessment

Site: 2 Point Douglas Avenue (North), Winnipeg, Manitoba

Location: See Figure 2

Test Hole #: TH7

Project No: 04-217-03

Date Drilled: October 18, 2004

Grade Elevation: 100 m (local)

Water Elevation: --

SUBSURFACE PROFILE				SAMPLE DATA					Well Data	Comments			
Depth (m)	Soil Symbol	Description	Elevation (m)	Number	Sample Type	Recovery (%)	ATH Vapour Concentration (ppm)						
							100	300			500	700	900
0		Ground Surface Granular Fill - dark brown, damp, with clay.	100										
1		Clay Fill (CH) - dark brown, moist, high plastic, some silt. - below 2.4 m, 50 mm brown sand lense.	99										
2		Sandy Clay (CH) - dark brown, moist, high plastic, with fine to medium grained sand sizes.	98										
3		End of Test Hole - ended test hole at 3.0 m below existing grade. - test hole backfilled with auger cuttings, followed by bentonite from 0.0 to 0.2 m below existing grade. - no sloughing encountered during drilling.	97										
4			96										
5			95										
6			94										
7			93										
8			92										
9			91										
10			90										

ENG-TECH Consulting Limited

Logged by: JSD & KWJ

Reviewed by: 

Sample Type



Split Barrel



Shelby Tube



Auger Cuttings



Split Spoon

Drilled By: H.D.M. Enterprises

Drill Rig: Bobcat drill rig

Auger Size: 125 mm

Completion Depth: 3.0 m

Completion Elevation: 97.0 m

Sheet: 1 of 1

ENG-TECH CONSULTING LIMITED

GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

Client: City of Winnipeg

Project: Phase II Environmental Site Assessment

Site: 2 Point Douglas Avenue (North), Winnipeg, Manitoba

Location: See Figure 2

Test Hole #: TH8

Project No: 04-217-03

Date Drilled: October 18, 2004

Grade Elevation: 100 m (local)

Water Elevation: --

SUBSURFACE PROFILE				SAMPLE DATA					Well Data	Comments			
Depth (m)	Soil Symbol	Description	Elevation (m)	Number	Sample Type	Recovery (%)	ATH Vapour Concentration (ppm)						
							100	300			500	700	900
0		Ground Surface	100										
		200 mm Topsoil w/ Grass Cover											
1		Granular Fill - dark brown, damp, some clay.	99										
2		Sandy Clay (CH) - dark brown, moist, high plastic, with fine to medium grained sand sizes, trace oxides.	98	S1	1	100	20						
3		End of Test Hole - ended test hole at 3.0 m below existing grade. - test hole backfilled with auger cuttings, followed by bentonite from 0.0 to 0.2 m below grade. - no sloughing encountered during drilling.	97										
4			96										
5			95										
6			94										
7			93										
8			92										
9			91										
10			90										

ENG-TECH Consulting Limited

Logged by: JSD & KWJ

Reviewed by: *CH*

Sample Type



Split Barrel



Shelby Tube



Auger Cuttings



Split Spoon

Drilled By: H.D.M. Enterprises

Drill Rig: Bobcat drill rig

Auger Size: 125 mm

Completion Depth: 3.0 m

Completion Elevation: 97.0 m

Sheet: 1 of 1

ENG-TECH CONSULTING LIMITED

GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

Client: City of Winnipeg

Project: Phase II Environmental Site Assessment

Site: 2 Point Douglas Avenue (North), Winnipeg, Manitoba

Location: See Figure 2

Test Hole #: TH9

Project No: 04-217-03

Date Drilled: October 18, 2004

Grade Elevation: 100 m (local)

Water Elevation: --

SUBSURFACE PROFILE				SAMPLE DATA					Well Data	Comments			
Depth (m)	Soil Symbol	Description	Elevation (m)	Number	Sample Type	Recovery (%)	ATH Vapour Concentration (ppm)						
							10	30			50	70	90
0		Ground Surface	100										
0		Granular Fill - dark brown, damp, some clay. - below 0.3 m, brown.		S1		100							
0				S2		100							
1		Clay Fill (CH) - black, moist, high plastic. - between 1.1 to 1.2 m oxide pocket.	99	S3		100							
2		Sandy Clay (CH) - brown, moist, high plastic, with fine to coarse grained sand sizes, some silt.	98	S4		100							
3		End of Test Hole - ended test hole at 2.1 m below existing grade. - test hole backfilled with auger cuttings, followed by bentonite from 0.0 to 0.2 m below grade. - no sloughing encountered during drilling.	97										
4			96										
5			95										
6			94										
7			93										
8			92										
9			91										
10			90										

ENG-TECH Consulting Limited

Logged by: JSD & KWJ

Reviewed by: *CA*

Drilled By: H.D.M. Enterprises

Drill Rig: Bobcat drill rig

Auger Size: 125 mm

Completion Depth: 2.1 m

Completion Elevation: 97.9 m

Sheet: 1 of 1

Sample Type



Split Barrel



Shelby Tube



Auger Cuttings



Split Spoon

ENG-TECH CONSULTING LIMITED

GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

Client: City of Winnipeg

Project: Phase II Environmental Site Assessment

Site: 2 Point Douglas Avenue (North), Winnipeg, Manitoba

Location: See Figure 2

Test Hole #: TH10

Project No: 04-217-03

Date Drilled: October 18, 2004

Grade Elevation: 100 m (local)

Water Elevation: --

SUBSURFACE PROFILE				SAMPLE DATA					Well Data	Comments			
Depth (m)	Soil Symbol	Description	Elevation (m)	Number	Sample Type	Recovery (%)	ATH Vapour Concentration (ppm)						
							100	300			500	700	900
0		Ground Surface	100										
		Granular Fill - dark brown, damp, some clay.		S1		100	10						
1		Clay Fill (CH) - black, moist, high plastic.	99										
		Clay (CH) - brown, moist, high plastic. - below 2.1 m, 150 mm brown sand lense, damp, fine to medium grained.		S2		100	40						
2			98										
3		End of Test Hole - ended test hole at 3.0 m below existing grade. - test hole backfilled with auger cuttings, followed by bentonite from 0.0 to 0.2 m below grade. - no sloughing encountered during drilling.	97										
4			96										
5			95										
6			94										
7			93										
8			92										
9			91										
10			90										

ENG-TECH Consulting Limited

Logged by: JSD & KWJ

Reviewed by: *CH*

Drilled By: H.D.M. Enterprises

Drill Rig: Bobcat drill rig

Auger Size: 125 mm

Completion Depth: 3.0 m

Completion Elevation: 97.0 m

Sheet: 1 of 1

Sample Type



Split Barrel



Shelby Tube



Auger Cuttings



Split Spoon

ENG-TECH CONSULTING LIMITED

GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

Client: City of Winnipeg

Project: Phase II Environmental Site Assessment

Site: 2 Point Douglas Avenue (North), Winnipeg, Manitoba

Location: See Figure 2

Test Hole #: TH11

Project No: 04-217-03

Date Drilled: October 18, 2004

Grade Elevation: 100 m (local)

Water Elevation: --

SUBSURFACE PROFILE				SAMPLE DATA					Well Data	Comments			
Depth (m)	Soil Symbol	Description	Elevation (m)	Number	Sample Type	Recovery (%)	ATH Vapour Concentration (ppm)						
							100	300			500	700	900
0		Ground Surface	100										
0.2		Silty Clay (CH) - brown, moist, high plastic, with silt.		S1		100							
0.4				S2		100	10						
1		Granular Fill - dark brown, damp, some clay. - below 0.8 m, black.	99										
2		Sand (SM) - dark brown, damp to moist, fine to medium grained.	98										
3		Clay (CH) - brown, moist, high plastic, some fine to medium grained sand sizes. - below 2.4 m, dark grey.	97										
4		End of Test Hole - ended test hole at 3.0 m below existing grade. - test hole backfilled with auger cuttings, followed by bentonite from 0.0 to 0.2 m below grade. - no sloughing encountered during drilling.	96										
5			95										
6			94										
7			93										
8			92										
9			91										
10			90										

ENG-TECH Consulting Limited

Logged by: JSD & KWJ

Reviewed by: *CH*

Drilled By: H.D.M. Enterprises

Drill Rig: Bobcat drill rig

Auger Size: 125 mm

Completion Depth: 3.0 m

Completion Elevation: 97.0 m

Sheet: 1 of 1

Sample Type



Split Barrel



Shelby Tube



Auger Cuttings



Split Spoon

ENG-TECH CONSULTING LIMITED

GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

Client: City of Winnipeg

Project: Phase II Environmental Site Assessment

Site: 2 Point Douglas Avenue (North), Winnipeg, Manitoba

Location: See Figure 2

Test Hole #: TH12

Project No: 04-217-03

Date Drilled: October 18, 2004

Grade Elevation: 100 m (local)

Water Elevation: --

SUBSURFACE PROFILE				SAMPLE DATA					Well Data	Comments			
Depth (m)	Soil Symbol	Description	Elevation (m)	Number	Sample Type	Recovery (%)	ATH Vapour Concentration (ppm)						
							100	300			500	700	900
0		Ground Surface	100										
		Clay Fill (CH) - dark brown, moist, high plastic, some sand & gravel sizes. - between 0.5 to 0.8 m, black.		S2		100							
1		Sand (SM) - dark brown, damp to moist, fine to medium grained, trace silt.	99										
		Sandy Clay (CH) - dark brown, moist, high plastic, with fine to medium grained sand sizes.		S1		100	100						
2			98										
		Clay (CH) - blue, moist, high plastic.											
3			97										
		End of Test Hole - ended test hole at 3.0 m below existing grade. - test hole backfilled with auger cuttings, followed by 0.0 to 0.2 m of bentonite below grade. - no sloughing encountered during drilling.											
4			96										
5			95										
6			94										
7			93										
8			92										
9			91										
10			90										

ENG-TECH Consulting Limited

Logged by: JSD & KWJ

Reviewed by: *CH*

Sample Type



Split Barrel



Shelby Tube



Auger Cuttings



Split Spoon

Drilled By: H.D.M. Enterprises

Drill Rig: Bobcat drill rig

Auger Size: 125 mm

Completion Depth: 3.0 m

Completion Elevation: 97.0 m

Sheet: 1 of 1

ENG-TECH CONSULTING LIMITED

GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

Client: City of Winnipeg

Project: Phase II Environmental Site Assessment

Site: 2 Point Douglas Avenue (North), Winnipeg, Manitoba

Location: See Figure 2

Test Hole #: TH13

Project No: 04-217-03

Date Drilled: October 19, 2004

Grade Elevation: 100 m (local)

Water Elevation: --

SUBSURFACE PROFILE				SAMPLE DATA					Well Data	Comments			
Depth (m)	Soil Symbol	Description	Elevation (m)	Number	Sample Type	Recovery (%)	ATH Vapour Concentration (ppm)						
							10	30			50	70	90
0		Ground Surface Granular Fill - black, damp, with clay.	100										
				S5		100							
				S2		100		25					
				S3		100		25					
1		Silty Clay (CH) - dark brown, damp, high plastic, with silt, some fine to medium grained sand sizes.	99										
				S4		100		25					
2		Clay (CH) - brown, damp, high plastic.	98										
3		End of Test Hole - ended test hole at 1.5 m below existing grade. - test hole backfilled with auger cuttings, followed by bentonite from 0.0 to 0.2 m below grade. - no sloughing encountered during drilling.	97										
4			96										
5			95										
6			94										
7			93										
8			92										
9			91										
10			90										

ENG-TECH Consulting Limited

Logged by: JSD

Reviewed by: 

Sample Type



Split Barrel



Shelby Tube



Auger Cuttings



Split Spoon

Drilled By: H.D.M. Enterprises

Drill Rig: Bobcat drill rig

Auger Size: 125 mm

Completion Depth: 1.5 m

Completion Elevation: 98.5 m

Sheet: 1 of 1

ENG-TECH CONSULTING LIMITED

GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

Client: City of Winnipeg

Project: Phase II Environmental Site Assessment

Site: 2 Point Douglas Avenue (North), Winnipeg, Manitoba

Location: See Figure 2

Test Hole #: TH14

Project No: 04-217-03

Date Drilled: October 19, 2004

Grade Elevation: 100 m (local)

Water Elevation: --

SUBSURFACE PROFILE				SAMPLE DATA					Well Data	Comments			
Depth (m)	Soil Symbol	Description	Elevation (m)	Number	Sample Type	Recovery (%)	ATH Vapour Concentration (ppm)						
							10	30			50	70	90
0		Ground Surface	100										
		75 mm Topsoil w/ Grass Cover		S1	CH	100							
		Clay Fill (CH)		S2	CH	100							
1		- brown, damp, high plastic, some silt.	99	S5	CH	100							
		Sandy Clay (CH)		S4	CH	100							
		- brown, moist, high plastic, with fine to medium grained sand sizes.											
2		End of Test Hole	98										
		- ended test hole at 1.5 m below existing grade.											
		- test hole backfilled with auger cuttings, followed by bentonite from 0.0 to 0.2 m below grade.											
		- no sloughing encountered during drilling.											
3			97										
4			96										
5			95										
6			94										
7			93										
8			92										
9			91										
10			90										

ENG-TECH Consulting Limited

Logged by: JSD

Reviewed by: 

Sample Type



Split Barrel



Shelby Tube



Auger Cuttings



Split Spoon

Drilled By: H.D.M. Enterprises

Drill Rig: Bobcat drill rig

Auger Size: 125 mm

Completion Depth: 1.5 m

Completion Elevation: 98.5 m

Sheet: 1 of 1

ENG-TECH CONSULTING LIMITED

GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

Client: City of Winnipeg

Project: Phase II Environmental Site Assessment

Site: 2 Point Douglas Avenue (North), Winnipeg, Manitoba

Location: See Figure 2

Test Hole #: TH15

Project No: 04-217-03

Date Drilled: October 19, 2004

Grade Elevation: 100 m (local)

Water Elevation: --

SUBSURFACE PROFILE				SAMPLE DATA					Well Data	Comments			
Depth (m)	Soil Symbol	Description	Elevation (m)	Number	Sample Type	Recovery (%)	ATH Vapour Concentration (ppm)						
							100	300			500	700	900
0		Ground Surface	100										
0.1		Granular Fill - dark brown, damp, some clay.		S5	SB	100	75						
0.2				S2	SB	100	30						
0.3				S3	SB	100	35						
0.4				S4	SB	100	30						
1		Sandy Clay (CH) - brown, damp, high plastic, with fine to medium grained sand sizes.	99										
2		Sand (SM) - light brown, damp to moist, fine to medium grained, some silt.	98										
3		Sandy Clay (CH) - brown, moist, high plastic, with fine to medium grained sand sizes.	97										
4		Sand (SM) - light brown, damp to moist, fine to medium grained, some silt.	96										
5		End of Test Hole - ended test hole at 1.5 m below existing grade. - test hole backfilled with auger cuttings, followed by bentonite from 0.0 to 0.2 m below grade. - no sloughing encountered during drilling.	95										
6			94										
7			93										
8			92										
9			91										
10			90										

ENG-TECH Consulting Limited

Logged by: JSD

Reviewed by: *CTA*

Drilled By: H.D.M. Enterprises

Drill Rig: Bobcat drill rig

Auger Size: 125 mm

Completion Depth: 1.5 m

Completion Elevation: 98.5 m

Sheet: 1 of 1

Sample Type



Split Barrel



Shelby Tube



Auger Cuttings



Split Spoon

ENG-TECH CONSULTING LIMITED

GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

Client: City of Winnipeg

Project: Phase II Environmental Site Assessment

Site: 2 Point Douglas Avenue (North), Winnipeg, Manitoba

Location: See Figure 2

Test Hole #: TH16

Project No: 04-217-03

Date Drilled: October 19, 2004

Grade Elevation: 100 m (local)

Water Elevation: --

SUBSURFACE PROFILE				SAMPLE DATA					Well Data	Comments			
Depth (m)	Soil Symbol	Description	Elevation (m)	Number	Sample Type	Recovery (%)	ATH Vapour Concentration (ppm)						
							10	30			50	70	90
0		Ground Surface	100										
0.2		Granular Fill - brown, damp, some clay.		S5	SB	100							
0.4				S2	SB	100							
0.6				S3	SB	100							
1		Sand (SM) - light brown, damp to moist, fine to medium grained, some silt.	99										
1.2				S4	SB	100							
2		Sandy Clay (CH) - dark brown, damp, high plastic, with fine to medium grained sand sizes.	98										
3		End of Test Hole - ended test hole at 1.5 m below existing grade. - test hole backfilled with auger cuttings, followed by bentonite from 0.0 to 0.2 m below grade. - no sloughing encountered during drilling.	97										
4			96										
5			95										
6			94										
7			93										
8			92										
9			91										
10			90										

ENG-TECH Consulting Limited

Logged by: JSD

Reviewed by: 

Sample Type



Split Barrel



Shelby Tube



Auger Cuttings



Split Spoon

Drilled By: H.D.M. Enterprises

Drill Rig: Bobcat drill rig

Auger Size: 125 mm

Completion Depth: 1.5 m

Completion Elevation: 98.5 m

Sheet: 1 of 1

ENG-TECH CONSULTING LIMITED

GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

Client: City of Winnipeg

Project: Phase II Environmental Site Assessment

Site: 2 Point Douglas Avenue (North), Winnipeg, Manitoba

Location: See Figure 2

Test Hole #: TH17

Project No: 04-217-03

Date Drilled: October 19, 2004

Grade Elevation: 100 m (local)

Water Elevation: --

SUBSURFACE PROFILE				SAMPLE DATA					Well Data	Comments			
Depth (m)	Soil Symbol	Description	Elevation (m)	Number	Sample Type	Recovery (%)	ATH Vapour Concentration (ppm)						
							10	30			50	70	90
0		Ground Surface Granular Fill - brown, damp, some clay. - below 0.3 m, black, some silt.	100										
				S1		100							
				S2		100							
1		Sandy Clay (CH) - brown, damp, high plastic, with fine to medium grained sand sizes, trace gravel sizes. - below 1.2 m, moist, occasional oxide inclusions.	99	S3		100							
				S4		100							
2			98										
3		End of Test Hole - ended test hole at 1.5 m below existing grade. - test hole backfilled with auger cuttings, followed by bentonite from 0.0 to 0.2 m below existing grade. - no sloughing encountered during drilling.	97										
4			96										
5			95										
6			94										
7			93										
8			92										
9			91										
10			90										

ENG-TECH Consulting Limited

Logged by: JSD

Reviewed by: 1.5 m

Sample Type



Split Barrel



Shelby Tube



Auger Cuttings



Split Spoon

Drilled By: H.D.M. Enterprises

Drill Rig: Bobcat drill rig

Auger Size: 125 mm

Completion Depth: 98.5 m

Completion Elevation:

Sheet: 1 of 1

ENG-TECH CONSULTING LIMITED

GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

Client: City of Winnipeg

Project: Phase II Environmental Site Assessment

Site: 2 Point Douglas Avenue (North), Winnipeg, Manitoba

Location: See Figure 2

Test Hole #: TH18

Project No: 04-217-03

Date Drilled: October 19, 2004

Grade Elevation: 100 m (local)

Water Elevation: --

SUBSURFACE PROFILE				SAMPLE DATA					Well Data	Comments			
Depth (m)	Soil Symbol	Description	Elevation (m)	Number	Sample Type	Recovery (%)	ATH Vapour Concentration (ppm)						
							10	30			50	70	90
0		Ground Surface	100										
0.2		Granular Fill - dark brown, damp, some clay. - below 0.2 m, some fine to medium grained sand sizes.		S1		100							
				S2		100							
				S3		100							
1		Sand (SM) - brown, damp to moist, fine to medium grained, some silt.	99	S4		100							
2		Sandy Clay (CH) - light brown, damp, high plastic, with fine to medium grained sand sizes.	98										
3		End of Test Hole - ended test hole at 1.5 m below existing grade. - test hole backfilled with auger cuttings, followed by bentonite from 0.0 to 0.2 m below existing grade. - no sloughing encountered during drilling.	97										
4			96										
5			95										
6			94										
7			93										
8			92										
9			91										
10			90										

ENG-TECH Consulting Limited

Logged by: JSD

Reviewed by: 

Sample Type



Split Barrel



Shelby Tube



Auger Cuttings



Split Spoon

Drilled By: H.D.M. Enterprises

Drill Rig: Bobcat drill rig

Auger Size: 125 mm

Completion Depth: 1.5 m

Completion Elevation: 98.5 m

Sheet: 1 of 1

APPENDIX B

Analytical Test Results



Enviro-Test
LABORATORIES
Manitoba Technology Centre Ltd.



745 Logan Avenue
Winnipeg, Manitoba R3E 3L5
Tel: (204) 945-3705 Fax: (204) 945-0763
G.S.T. Reg.#895929230RT

ANALYTICAL REPORT

ENG-TECH CONSULTING
ATTN: JODI DOUCET
#8-854 MARION STREET
WINNIPEG MB R2J 0K4

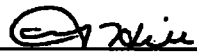
DATE: 10-NOV-04

Lab Work Order #: L218098
Project P.O. #: 04-217-03
Project Reference: 04-217-03

Sampled By:

Date Received: 20-OCT-04

Comments:

APPROVED BY: 

GAIL HILL

Project Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU
REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

LABORATORY ACCREDITATIONS:

- STANDARDS COUNCIL OF CANADA IN COOPERATION WITH THE CANADIAN ASSOCIATION FOR ENVIRONMENTAL ANALYTICAL LABORATORIES (CAEAL)
FOR SPECIFIC TESTS AS REGISTERED BY THE COUNCIL (EDMONTON, CALGARY, GRANDE PRAIRIE, SASKATOON, WINNIPEG, THUNDER BAY, WATERLOO)
- AMERICAN INDUSTRIAL HYGIENE ASSOCIATION (AIHA) IN THE INDUSTRIAL HYGIENE PROGRAM (EDMONTON, WINNIPEG)
- STANDARDS COUNCIL OF CANADA IN COOPERATION WITH THE CANADIAN FOOD INSPECTION AGENCY (CFIA) FOR FERTILIZER AND FEED TESTING (SASKATOON) AND FOR MICROBIOLOGICAL TESTING IN FOOD (WINNIPEG)

ENVIRO-TEST ANALYTICAL REPORT

Sample ID / Location	Report	Craft	D.L.	Units	Extraction	Analysis	By	Batch
L218098-1 TH1-S5 Sample Date: 18-OCT-04 Matrix: Soil CCME BTEX + F1-F4 CCME Total Hydrocarbons F1 (C6-C10) <5 F1-BTEX <5 F2 (C10-C16) 5 F3 (C16-C34) 11 F4 (C34-C50) <5 Total Hydrocarbons (C6-C50) 16 Chromatogram to baseline at nC50 YES CCME Total Extractable Hydrocarbons Prep/Analysis Dates CCME BTEX Benzene <0.005 Toluene <0.01 Ethylbenzene <0.01 o-Xylene <0.01 Xylenes, m+p <0.02 Xylenes <0.03 % Moisture 23								
			5	mg/kg		27-OCT-04		
			5	mg/kg		27-OCT-04		
			5	mg/kg		27-OCT-04		
			5	mg/kg		27-OCT-04		
			5	mg/kg		27-OCT-04		
			5	mg/kg		27-OCT-04		
			5	mg/kg		27-OCT-04		
					26-OCT-04	27-OCT-04	HDT	R231758
			0.005	mg/kg	21-OCT-04	21-OCT-04	DVH	R230749
			0.01	mg/kg	21-OCT-04	21-OCT-04	DVH	R230749
			0.01	mg/kg	21-OCT-04	21-OCT-04	DVH	R230749
			0.01	mg/kg	21-OCT-04	21-OCT-04	DVH	R230749
			0.02	mg/kg	21-OCT-04	21-OCT-04	DVH	R230749
			0.03	mg/kg	21-OCT-04	21-OCT-04	DVH	R230749
			0.1	%	21-OCT-04	22-OCT-04	JKH	R230617
L218098-2 TH2-S4 Sample Date: 18-OCT-04 Matrix: Soil CCME BTEX + F1-F4 CCME Total Hydrocarbons F1 (C6-C10) <5 F1-BTEX <5 F2 (C10-C16) 7 F3 (C16-C34) 36 F4 (C34-C50) 7 Total Hydrocarbons (C6-C50) 50 Chromatogram to baseline at nC50 YES CCME Total Extractable Hydrocarbons Prep/Analysis Dates CCME BTEX Benzene <0.005 Toluene <0.01 Ethylbenzene <0.01 o-Xylene <0.01 Xylenes, m+p <0.02 Xylenes <0.03 % Moisture 24								
			5	mg/kg		27-OCT-04		
			5	mg/kg		27-OCT-04		
			5	mg/kg		27-OCT-04		
			5	mg/kg		27-OCT-04		
			5	mg/kg		27-OCT-04		
			5	mg/kg		27-OCT-04		
					26-OCT-04	27-OCT-04	HDT	R231758
			0.005	mg/kg	21-OCT-04	21-OCT-04	DVH	R230749
			0.01	mg/kg	21-OCT-04	21-OCT-04	DVH	R230749
			0.01	mg/kg	21-OCT-04	21-OCT-04	DVH	R230749
			0.01	mg/kg	21-OCT-04	21-OCT-04	DVH	R230749
			0.02	mg/kg	21-OCT-04	21-OCT-04	DVH	R230749
			0.03	mg/kg	21-OCT-04	21-OCT-04	DVH	R230749
			0.1	%	21-OCT-04	22-OCT-04	JKH	R230617
L218098-3 TH3-S1 Sample Date: 18-OCT-04 Matrix: Soil Mineral Oil and Grease 200								
			100	mg/kg		27-OCT-04	HDT	R232424
L218098-5 TH5-S1 Sample Date: 18-OCT-04 Matrix: Soil								

ENVIRO-TEST ANALYTICAL REPORT

Sample ID / Parameters	Result	Qualifier	D.L.	Units	Extracted	Analyzed	By	Batch
L218098-5 TH5-S1 Sample Date: 18-OCT-04 Matrix: Soil								
PCB								
% Moisture	11		0.1	%	26-OCT-04	26-OCT-04	THT	R231636
Aroclor 1016	<0.1		0.1	mg/kg	25-OCT-04	26-OCT-04	THT	R231699
Aroclor 1221	<0.1		0.1	mg/kg	25-OCT-04	26-OCT-04	THT	R231699
Aroclor 1232	<0.1		0.1	mg/kg	25-OCT-04	26-OCT-04	THT	R231699
Aroclor 1242	<0.1		0.1	mg/kg	25-OCT-04	26-OCT-04	THT	R231699
Aroclor 1248	<0.1		0.1	mg/kg	25-OCT-04	26-OCT-04	THT	R231699
Aroclor 1254	0.1		0.1	mg/kg	25-OCT-04	26-OCT-04	THT	R231699
Aroclor 1260	<0.1		0.1	mg/kg	25-OCT-04	26-OCT-04	THT	R231699
Aroclor 1262	<0.1		0.1	mg/kg	25-OCT-04	26-OCT-04	THT	R231699
Aroclor 1268	<0.1		0.1	mg/kg	25-OCT-04	26-OCT-04	THT	R231699
Total PCBs	0.1		0.1	mg/kg	25-OCT-04	26-OCT-04	THT	R231699
L218098-6 TH6-S1 Sample Date: 18-OCT-04 Matrix: Soil								
Metals								
Chloride (Cl)	89		3	mg/L	25-OCT-04	25-OCT-04	AES	R231401
Silver (Ag)-Total	<1		1	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Aluminum (Al)-Total	7090	RAMB	3	mg/kg	26-OCT-04	30-OCT-04	MEB	R234234
Arsenic (As)-Total	7.00		0.03	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Boron (B)-Total	11.6		0.6	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Barium (Ba)-Total	150	RAMB	0.04	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Beryllium (Be)-Total	0.47		0.06	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Bismuth (Bi)-Total	0.15		0.02	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Calcium (Ca)-Total	46000	RAMB	7	mg/kg	26-OCT-04	30-OCT-04	MEB	R234234
Cadmium (Cd)-Total	0.48		0.02	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Cobalt (Co)-Total	9.23		0.01	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Chromium (Cr)-Total	19.0		0.1	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Copper (Cu)-Total	96.0		0.2	mg/kg	26-OCT-04	30-OCT-04	MEB	R234234
Iron (Fe)-Total	16100		6	mg/kg	26-OCT-04	30-OCT-04	MEB	R234234
Potassium (K)-Total	1810		7	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Magnesium (Mg)-Total	17700	RAMB	2	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Manganese (Mn)-Total	656	RAMB	0.03	mg/kg	26-OCT-04	30-OCT-04	MEB	R234234
Molybdenum (Mo)-Total	0.89	RAMB	0.02	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Sodium (Na)-Total	218	RAMB	2	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Nickel (Ni)-Total	25.8		0.2	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Lead (Pb)-Total	74.5	RAMB	0.05	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Selenium (Se)-Total	0.3		0.1	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Tin (Sn)-Total	<4	RAMB	4	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Strontium (Sr)-Total	54.5	RAMB	0.02	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Titanium (Ti)-Total	333	RAMB	0.03	mg/kg	26-OCT-04	30-OCT-04	MEB	R234234
Thallium (Tl)-Total	<0.2		0.2	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Uranium (U)-Total	1.07		0.006	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Vanadium (V)-Total	20.8		0.06	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Zinc (Zn)-Total	91		2	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
L218098-7 TH9-S3 Sample Date: 18-OCT-04 Matrix: Soil								

ENVIRO-TEST ANALYTICAL REPORT

Sample ID/Parameter	Result	Qualifier	DL	Units	Extracted	Analyzed	By	Batch
L218098-7 TH9-S3 Sample Date: 18-OCT-04 Matrix: Soil								
Chloride (Cl)	66		3	mg/L	25-OCT-04	25-OCT-04	AES	R231401
Metals								
Silver (Ag)-Total	<1		1	mg/kg	28-OCT-04	30-OCT-04	MEB	R234234
Aluminum (Al)-Total	7510		3	mg/kg	28-OCT-04	30-OCT-04	MEB	R234234
Arsenic (As)-Total	8.60		0.03	mg/kg	28-OCT-04	30-OCT-04	MEB	R234234
Boron (B)-Total	16.5		0.6	mg/kg	28-OCT-04	30-OCT-04	MEB	R234234
Barium (Ba)-Total	361	RAMB	0.04	mg/kg	28-OCT-04	30-OCT-04	MEB	R234234
Beryllium (Be)-Total	0.52		0.06	mg/kg	28-OCT-04	30-OCT-04	MEB	R234234
Bismuth (Bi)-Total	0.18		0.02	mg/kg	28-OCT-04	30-OCT-04	MEB	R234234
Calcium (Ca)-Total	47200	RAMB	7	mg/kg	28-OCT-04	30-OCT-04	MEB	R234234
Cadmium (Cd)-Total	0.44		0.02	mg/kg	28-OCT-04	30-OCT-04	MEB	R234234
Cobalt (Co)-Total	10.9		0.01	mg/kg	28-OCT-04	30-OCT-04	MEB	R234234
Chromium (Cr)-Total	20.4		0.1	mg/kg	28-OCT-04	30-OCT-04	MEB	R234234
Copper (Cu)-Total	46.1	RAMB	0.2	mg/kg	28-OCT-04	30-OCT-04	MEB	R234234
Iron (Fe)-Total	31800		6	mg/kg	28-OCT-04	30-OCT-04	MEB	R234234
Potassium (K)-Total	1690		7	mg/kg	28-OCT-04	30-OCT-04	MEB	R234234
Magnesium (Mg)-Total	19000	RAMB	2	mg/kg	28-OCT-04	30-OCT-04	MEB	R234234
Manganese (Mn)-Total	536	RAMB	0.03	mg/kg	28-OCT-04	30-OCT-04	MEB	R234234
Molybdenum (Mo)-Total	2.69	RAMB	0.02	mg/kg	28-OCT-04	30-OCT-04	MEB	R234234
Sodium (Na)-Total	751	RAMB	2	mg/kg	28-OCT-04	30-OCT-04	MEB	R234234
Nickel (Ni)-Total	36.9		0.2	mg/kg	28-OCT-04	30-OCT-04	MEB	R234234
Lead (Pb)-Total	70.3	RAMB	0.05	mg/kg	28-OCT-04	30-OCT-04	MEB	R234234
Selenium (Se)-Total	0.5		0.1	mg/kg	28-OCT-04	30-OCT-04	MEB	R234234
Tin (Sn)-Total	<4	RAMB	4	mg/kg	28-OCT-04	30-OCT-04	MEB	R234234
Strontium (Sr)-Total	239	RAMB	0.02	mg/kg	28-OCT-04	30-OCT-04	MEB	R234234
Titanium (Ti)-Total	343	RAMB	0.03	mg/kg	28-OCT-04	30-OCT-04	MEB	R234234
Thallium (Tl)-Total	<0.2		0.2	mg/kg	28-OCT-04	30-OCT-04	MEB	R234234
Uranium (U)-Total	1.18		0.006	mg/kg	28-OCT-04	30-OCT-04	MEB	R234234
Vanadium (V)-Total	23.6		0.06	mg/kg	28-OCT-04	30-OCT-04	MEB	R234234
Zinc (Zn)-Total	130		2	mg/kg	28-OCT-04	30-OCT-04	MEB	R234234
L218098-10 TH12-S2 Sample Date: 18-OCT-04 Matrix: Soil								
Chloride (Cl)	64		3	mg/L	25-OCT-04	25-OCT-04	AES	R231401
Metals								
Silver (Ag)-Total	<1		1	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Aluminum (Al)-Total	7270	RAMB	3	mg/kg	26-OCT-04	30-OCT-04	MEB	R234234
Arsenic (As)-Total	5.53		0.03	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Boron (B)-Total	11.1		0.6	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Barium (Ba)-Total	160	RAMB	0.04	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Beryllium (Be)-Total	0.50		0.06	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Bismuth (Bi)-Total	0.15		0.02	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Calcium (Ca)-Total	69000	RAMB	7	mg/kg	26-OCT-04	30-OCT-04	MEB	R234234
Cadmium (Cd)-Total	0.42		0.02	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Cobalt (Co)-Total	8.71		0.01	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Chromium (Cr)-Total	22.2		0.1	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Copper (Cu)-Total	133		0.2	mg/kg	26-OCT-04	30-OCT-04	MEB	R234234
Iron (Fe)-Total	18300		6	mg/kg	26-OCT-04	30-OCT-04	MEB	R234234
Potassium (K)-Total	1870		7	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071

ENVIRO-TEST ANALYTICAL REPORT

Sample Description	Result	Qualifier	D.L.	Unit	Extracted	Analyzed	By	Batch
L218098-10 TH12-S2								
Sample Date: 18-OCT-04								
Matrix: Soil								
Metals								
Magnesium (Mg)-Total	24000	RAMB	2	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Manganese (Mn)-Total	527	RAMB	0.03	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Molybdenum (Mo)-Total	1.17	RAMB	0.02	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Sodium (Na)-Total	378	RAMB	2	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Nickel (Ni)-Total	30.4		0.2	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Lead (Pb)-Total	73.7	RAMB	0.05	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Selenium (Se)-Total	0.3		0.1	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Tin (Sn)-Total	<4	RAMB	4	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Strontium (Sr)-Total	69.1	RAMB	0.02	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Titanium (Ti)-Total	278	RAMB	0.03	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Thallium (Tl)-Total	<0.2		0.2	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Uranium (U)-Total	0.880		0.006	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Vanadium (V)-Total	22.3		0.06	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
Zinc (Zn)-Total	106		2	mg/kg	26-OCT-04	27-OCT-04	MEB	R233071
L218098-11 TH13-S5								
Sample Date: 18-OCT-04								
Matrix: Soil								
% Moisture	17		0.1	%	26-OCT-04	27-OCT-04	JAP	R232170
PAH								
Acenaphthene	<0.05		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Acenaphthylene	<0.05		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Anthracene	<0.05		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Benzo(a)anthracene	<0.05		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Benzo(a)pyrene	<0.05		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Benzo(b)fluoranthene	<0.05		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Benzo(ghi)perylene	<0.05		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Benzo(k)fluoranthene	<0.05		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Chrysene	<0.1		0.1	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Dibenzo(ah)anthracene	<0.05		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Fluoranthene	<0.05		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Fluorene	<0.05		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Indeno(1,2,3 cd)pyrene	<0.05		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Naphthalene	<0.05		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
1-Methyl Naphthalene	<0.05		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
2-Methyl Naphthalene	<0.05		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Phenanthrene	<0.05		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Pyrene	<0.05		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Quinoline	<0.05		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Acridine	<0.05		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Surr: 2-Fluorobiphenyl Surr	83		50-150	%	25-OCT-04	27-OCT-04	JAP	R232422
Surr: Terphenyl Surr	98		50-150	%	25-OCT-04	27-OCT-04	JAP	R232422
L218098-14 TH15-S5								
Sample Date: 18-OCT-04								
Matrix: Soil								
% Moisture	12		0.1	%	26-OCT-04	27-OCT-04	JAP	R232170
PAH								
Acenaphthene	<0.05		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422

ENVIRO-TEST ANALYTICAL REPORT

Sample Data / Parameters	Result	Qualifier	D.L.	Unit	Extracted	Analyzed	By	Batch
L218098-14 TH15-S5 Sample Date: 18-OCT-04 Matrix: Soil								
PAH								
Acenaphthylene	<0.05		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Anthracene	<0.05		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Benzo(a)anthracene	0.11		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Benzo(a)pyrene	0.18		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Benzo(b)fluoranthene	<0.05		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Benzo(ghi)perylene	0.16		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Benzo(k)fluoranthene	<0.05		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Chrysene	0.3		0.1	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Dibenzo(ah)anthracene	0.07		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Fluoranthene	0.18		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Fluorene	<0.05		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Indeno(1,2,3 cd)pyrene	0.09		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Naphthalene	<0.05		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
1-Methyl Naphthalene	<0.05		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
2-Methyl Naphthalene	<0.05		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Phenanthrene	0.11		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Pyrene	0.16		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Quinoline	<0.05		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Acridine	<0.05		0.05	mg/kg	25-OCT-04	27-OCT-04	JAP	R232422
Surr: 2-Fluorobiphenyl Surr	79		50-150	%	25-OCT-04	27-OCT-04	JAP	R232422
Surr: Terphenyl Surr	94		50-150	%	25-OCT-04	27-OCT-04	JAP	R232422
L218098-16 TH16-S5 Sample Date: 18-OCT-04 Matrix: Soil								
% Moisture	14		0.1	%	26-OCT-04	26-OCT-04	THT	R231636
PCB								
Aroclor 1016	<0.1		0.1	mg/kg	25-OCT-04	26-OCT-04	THT	R231699
Aroclor 1221	<0.1		0.1	mg/kg	25-OCT-04	26-OCT-04	THT	R231699
Aroclor 1232	<0.1		0.1	mg/kg	25-OCT-04	26-OCT-04	THT	R231699
Aroclor 1242	<0.1		0.1	mg/kg	25-OCT-04	26-OCT-04	THT	R231699
Aroclor 1248	<0.1		0.1	mg/kg	25-OCT-04	26-OCT-04	THT	R231699
Aroclor 1254	<0.1		0.1	mg/kg	25-OCT-04	26-OCT-04	THT	R231699
Aroclor 1260	<0.1		0.1	mg/kg	25-OCT-04	26-OCT-04	THT	R231699
Aroclor 1262	<0.1		0.1	mg/kg	25-OCT-04	26-OCT-04	THT	R231699
Aroclor 1268	<0.1		0.1	mg/kg	25-OCT-04	26-OCT-04	THT	R231699
Total PCBs	<0.1		0.1	mg/kg	25-OCT-04	26-OCT-04	THT	R231699
Refer to Referenced Information for Qualifiers (if any) and Methodology.								

Reference Information

Sample Parameter Qualifier key listed:

Qualifier	Description
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RAMB	Result Adjusted For Method Blank
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Methods Listed (If applicable):

ETL Test Code	Matrix	Test Description	Preparation Method Reference(Based On)	Analytical Method Reference(Based On)
CL-SAR-SK	Soil	Chloride (Cl) (Saturated Paste)	CSSS (1993) 18.2.2	APHA 4500 Cl E-Colorimetry
ETL-BTX,TVH-CCME-WP	Soil	CCME BTEX		CCME CWS-PHC Dec-2000 - Pub# 1310
ETL-TEH-CCME-WP	Soil	CCME Total Extractable Hydrocarbons		CCME CWS-PHC Dec-2000 - Pub# 1310
ETL-TVH,TEH-CCME-WP	Soil	CCME Total Hydrocarbons		CCME CWS-PHC Dec-2000 - Pub# 1310

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC

Hydrocarbon results are expressed on a dry weight basis.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

HOG-WP	Soil	Mineral Oil and Grease	CCME Tier 1 Dec 2000
METAL-LOW-EXD-WP	Soil	Metals	EPA SW846 3050B Rev 2 1996
PAH,PANH-WP	Soil	PAH	EPA SW846 8270B Sep 1994,3550A Sep 1994
PCB-WP	Soil	PCB	EPA SW-846, 3550A, Sep 1994

Samples are ground into sodium sulfate and extracted with acetone/dichloromethane using a combination of high frequency sonication and shake using a wrist-action shaker. After extract concentration, samples are analyzed by GC/MS.

A 10 gram aliquot of soil sample is extracted with 25 mLs of 50% acetone/hexane using a shaker followed by sonication. An aliquot of the extract is solvent exchanged into hexane, cleaned with sulphuric acid and analyzed by gas chromatography/electron capture detection. The sample is quantitated against commercial Arochlor standards.

** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies.

Chain of Custody numbers:

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
SK	Enviro-Test Laboratories - Saskatoon, Saskatchewan, Canada	WP	Enviro-Test Laboratories - Winnipeg, Manitoba, Canada

Reference Information

GLOSSARY OF REPORT TERMS

Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in environmental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds.

The reported surrogate recovery value provides a measure of method efficiency. The Laboratory warning units are determined under column heading D.L.

mg/kg (units) - unit of concentration based on mass, parts per million

mg/L (units) - unit of concentration based on volume, parts per million

< - Less than

D.L. - Detection Limit

N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

UNLESS OTHERWISE STATED, SAMPLES ARE NOT CORRECTED FOR CLIENT FIELD BLANKS.

Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

Enviro-Test Laboratories has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, Enviro-Test Laboratories assumes no liability for the use or interpretation of the results.