Ministry of the
Environment

Ministère de
l'Environnement

Ontario

Sudbury/Sault Ste Marie District Office
747 Queen Street East
Sault Ste Marie, Ontario
P6A 2A8

Bureau de district de Sudbury/Sault Ste Marie
747 rue Queen est
Sault Ste Marie, Ontario
P6A 2A8

Phone:/téléphone: (705) 949-4640
Fax:/télécopieur: (705) 945-6868

Sault Ste Marie Area Office

July 12, 1999

Canadian National Railway
MacMillan Yard
1 Administration Road
Concord, Ontario
L4K 1B9

Attention: Mr. Nicholas Coleman
Environmental Officer

Dear Sir:

Re: Canadian National Railway, Hornepayne Yard
Industrial Sewage Inspection Report
Certificate of Approval No. 4-0052-98-006

Enclosed please find a report on the inspection of the above mentioned sewage works which was conducted on June 9, 1999, in your company and that of Mr. Jeffery Frank, KGS Group.

The report reviews the operation and maintenance of the facility and presents chemical analyses results of effluent samples collected at the time of the inspection.

Should you have any questions with the findings stated in the inspection report, please feel free to contact me.

Yours truly,

E.J. Bil
Sr. Environmental Officer

b.c.c.: File AL-HP-410

Ontario

MINISTRY OF THE ENVIRONMENT

INDUSTRIAL SEWAGE INSPECTION REPORT

COMPANY: Canadian National Railway

MAILING ADDRESS: MacMillan Yard, 1 Administration Road, Concord ON, L4K 1B9

CONTACT NAME: Nicholas Coleman **TITLE:** Environmental Officer

CONTACT TELEPHONE: 950-669-3377 **FAX:**

SITE ADDRESS: Canadian National Railway, Hornepayne Yard in Wicksteed Township

INSPECTION DATE: June 9, 1999

DATE OF LAST INSPECTION: Initial inspection of a new facility.

1.0 CERTIFICATE(S) OF APPROVAL

- Certificate of Approval # 4-0052-98-006

2.0 PROCESS DESCRIPTION

- The establishment of sewage works for the collection, transmission, treatment and disposal of groundwater that has been impacted with petroleum hydrocarbons at the west end fuelling stand. The sewage works consists of perforated pipe underdrains installed under the trackage adjacent to the west end fuelling platform and the contaminated soil stockpile, discharging to a 960 cubic metre retention lagoon. Effluent discharge is to Jackfish Creek.

3.0 EFFLUENT LIMITS

- Oil and grease limit of 15 milligrams per litre required by the Certificate of Approval.

4.0 CAPACITY ASSESSMENT

- The design capacity of the sewage works is stated in the Certificate of Approval as being 960 cubic metres. Due to the large amounts of diesel flowing into the diesel recovery lagoon, the diesel recovery system was started during the week of April 15, 1999. At the time of start up, approximately 1,200 litres of product was removed from the waste oil recovery tank. Approximately 5,783 litres of product was collected between April 15 and May 4. An additional 3,812 litres of product was collected between May 4 and June 2. The total volume of product collected in 1999 as of June 2 was 10,759 litres..

5.0 SAMPLING REQUIREMENTS

- The Certificate of Approval requires the owner to collect a grab sample of the effluent once each month at stream A, effluent from the discharge control gate. Effluent monitoring is being conduct by the owner in accordance with the Certificate of Approval.

6.0 REPORTING REQUIREMENTS

- The owner is required to immediately report all spills of polluting substances into the environment as specified in the Certificate of Approval.

7.0 FLOW MEASUREMENT

- Flow measurement is not required by the Certificate of Approval.

8.0 MINISTRY SAMPLE RESULTS

- Were Ministry samples collected during the inspection ? Yes

  Comment: A grab sample was collected for analyses of parameters specified in the Certificate of Approval. One sample container broke in transit and therefore only the oil and grease parameter was analysed for, the result of which was 5.5 milligrams per litre. This result is in compliance with the Certificate of Approval limit of 15 milligrams per litre.

9.0 REVIEW OF OUTSTANDING ISSUES

- There are no outstanding issues related to this facility.

10.0 SUMMARY OF INSPECTION FINDINGS (HEALTH/ENVIRONMENTAL IMPACT)

- Was there any indication of a known or anticipated human health impact during the inspection and/or review of relevant material, related to this Ministry's mandate ?

  Yes (No)

  Specifics:

- Was there any indication of a known or anticipated environmental impact during the inspection and/or review of relevant material ?

  Yes (No)

  Specifics:

- Was there any indication of a known or suspected violation of a legal requirement during the inspection and/or review of relevant material which could cause a human health impact or environmental impairment ?

  Yes (No)

  Specifics:

- Was there any indication of a potential for environmental impairment during the inspection and/or the review of relevant material ?

  Yes (No)

  Specifics:

10.1 ACTION(S) REQUIRED

- Collect samples of the final effluent from the discharge control gate.

11.0 OTHER INSPECTION FINDINGS

Sewage works was found to be well operated and maintained.

11.1 ACTION(S) REQUIRED:

- As stated in section **10.1**

OCCURRENCE REPORT # : NA

PREPARED BY:

ENVIRONMENTAL OFFICER: E. J. Bil
(Print)

(Signature)

(District/Area Office)

(Date)

REVIEWED BY:

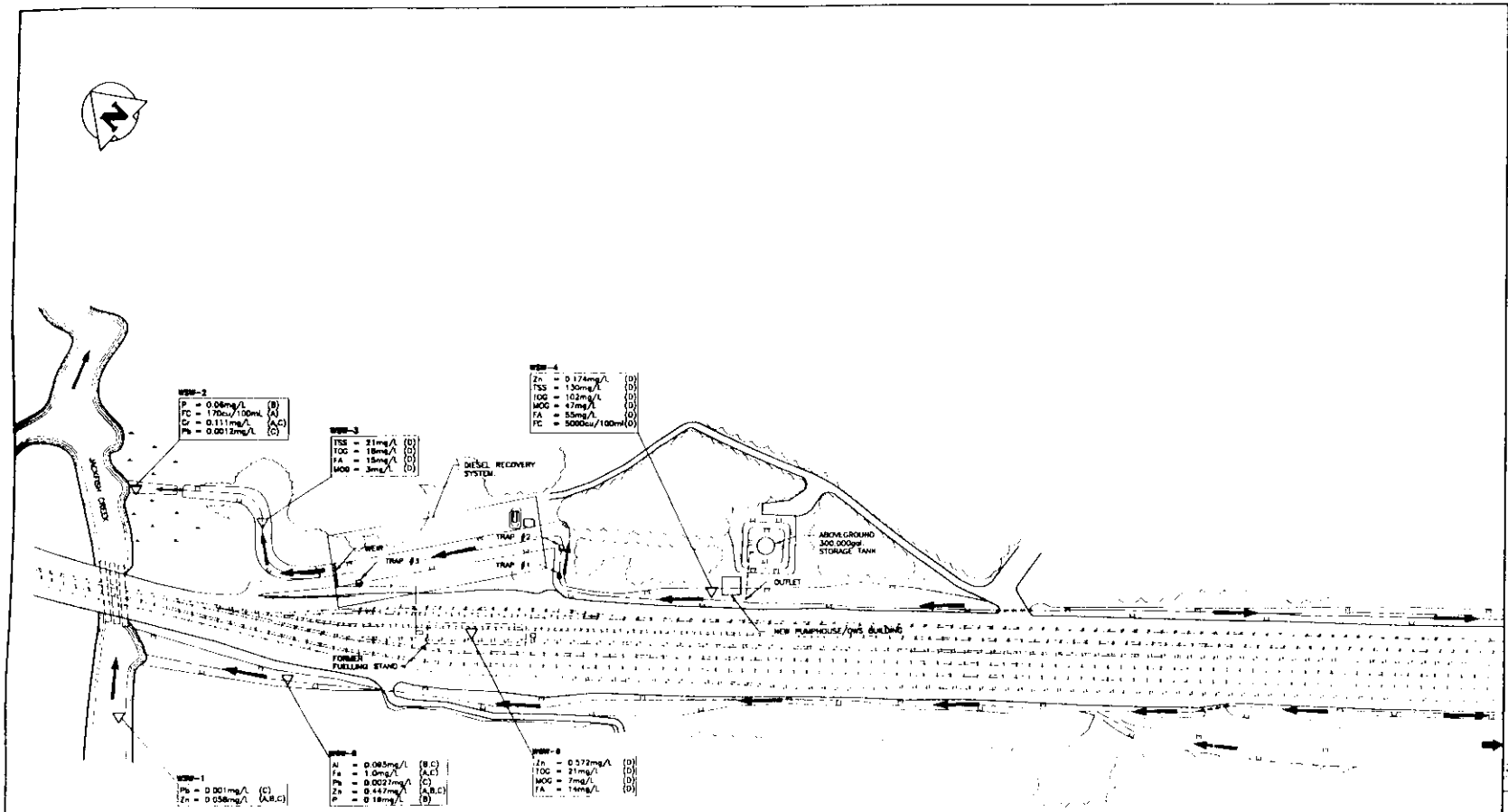
DISTRICT SUPERVISOR: _____
(Print)

_____
(Signature)

_____
(Date)

REPORT MAILED OUT ON: _____
(Date)

NOTE: **"This inspection does not in any way suggest that there is or has been compliance with applicable legislation and regulations as they apply or may apply to this facility. It is, and remains, the responsibility of the owner and/or the operating authority to ensure compliance with all applicable legislative and regulatory requirements."**



LEGEND

- CULVERT
- ▽ SURFACE WATER SAMPLING LOCATION
- FLOW DIRECTION OF SURFACE DRAINAGE
- TREES/ SHRUBS
- A - ONTARIO MINISTRY OF ENVIRONMENT AND ENERGY WATER MANAGEMENT GUIDELINES, PROVINCIAL WATER QUALITY OBJECTIVES JULY 1994 (PWQO)
- B - INTERIM PWQO
- C - CANADIAN COUNCIL OF RESOURCES AND ENVIRONMENT MINISTERS, CANADIAN WATER QUALITY GUIDELINES FOR FRESHWATER AQUATIC LIFE, APRIL 1991
- D - ONTARIO MINISTRY OF ENVIRONMENT AND ENERGY, MODEL SEWER USE BY-LAW AUGUST 1988 SECTION 3 DISCHARGES TO STORM SEWERS
- E - TYPICAL LIMITS OF CERTIFICATE OF APPROVALS FOR INDUSTRIAL SEWAGE WORKS

NOTE:

1. REFERENCE JACQUES WHITFORD ENVIRONMENTAL LIMITED PROJECT 31004, DRAWING NO. 4, 1988

0 30 60 90 120 150m

SCALE: 1:1500 METRIC 24"x36"
1:3000 METRIC 11"x17"

1	28/01/99	ISSUED FOR REPRINT
0	11/01/99	ISSUED FOR REPRINT

REVISIONS / ISSUE

A. SECTION LETTER OR DETAIL NUMBER
B. DRAWING WHERE SECTION OR DETAIL IS SHOWN
OR
DRAWING WHERE SECTION OR DETAIL WAS INDICATED
— SECTION OR DETAIL SHOWN ON SAME DRAWING

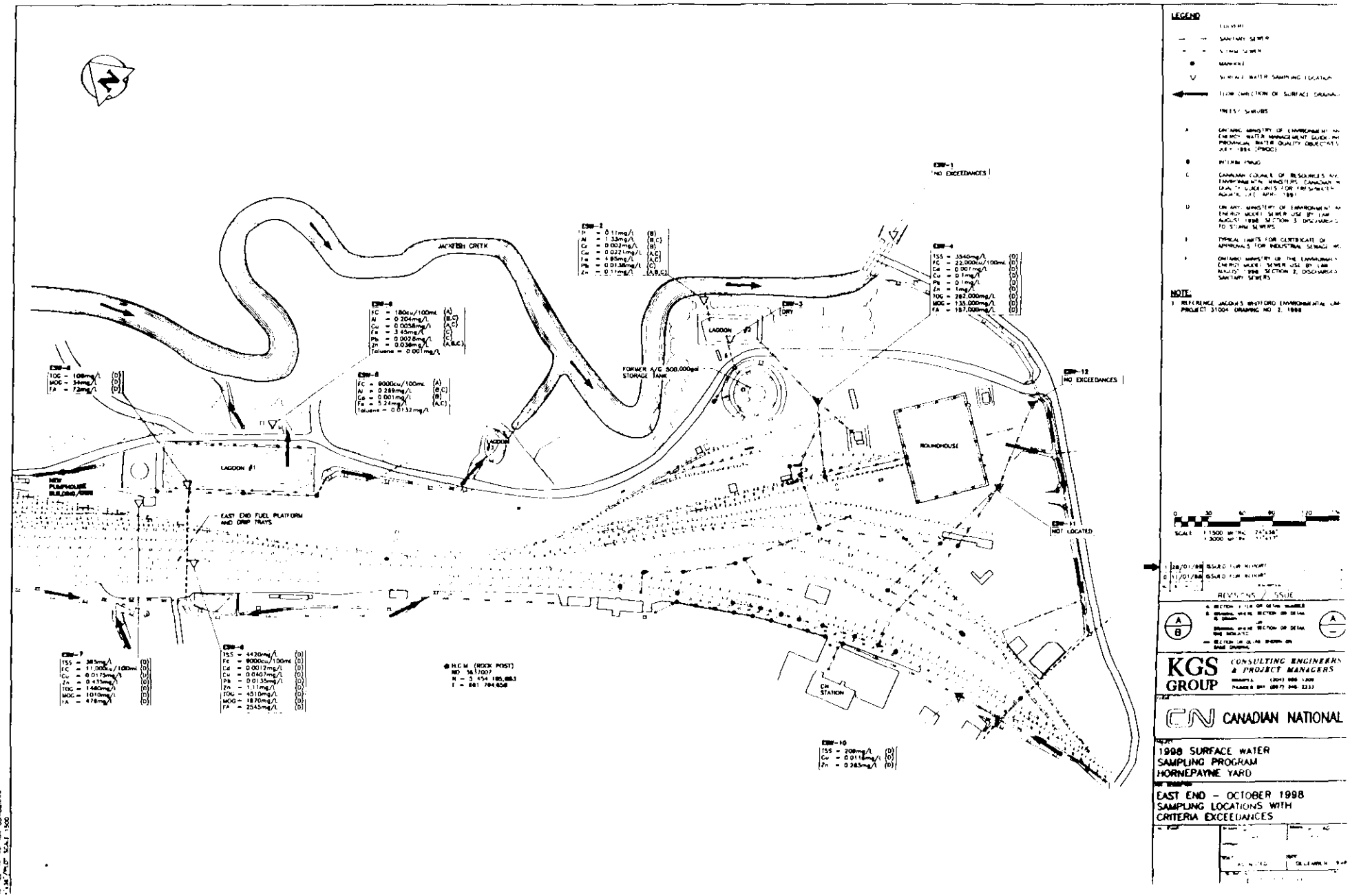
KGS GROUP CONSULTING ENGINEERS & PROJECT MANAGERS
WINNIPEG (204) 896-1209
THUNDER BAY (807) 345-5232

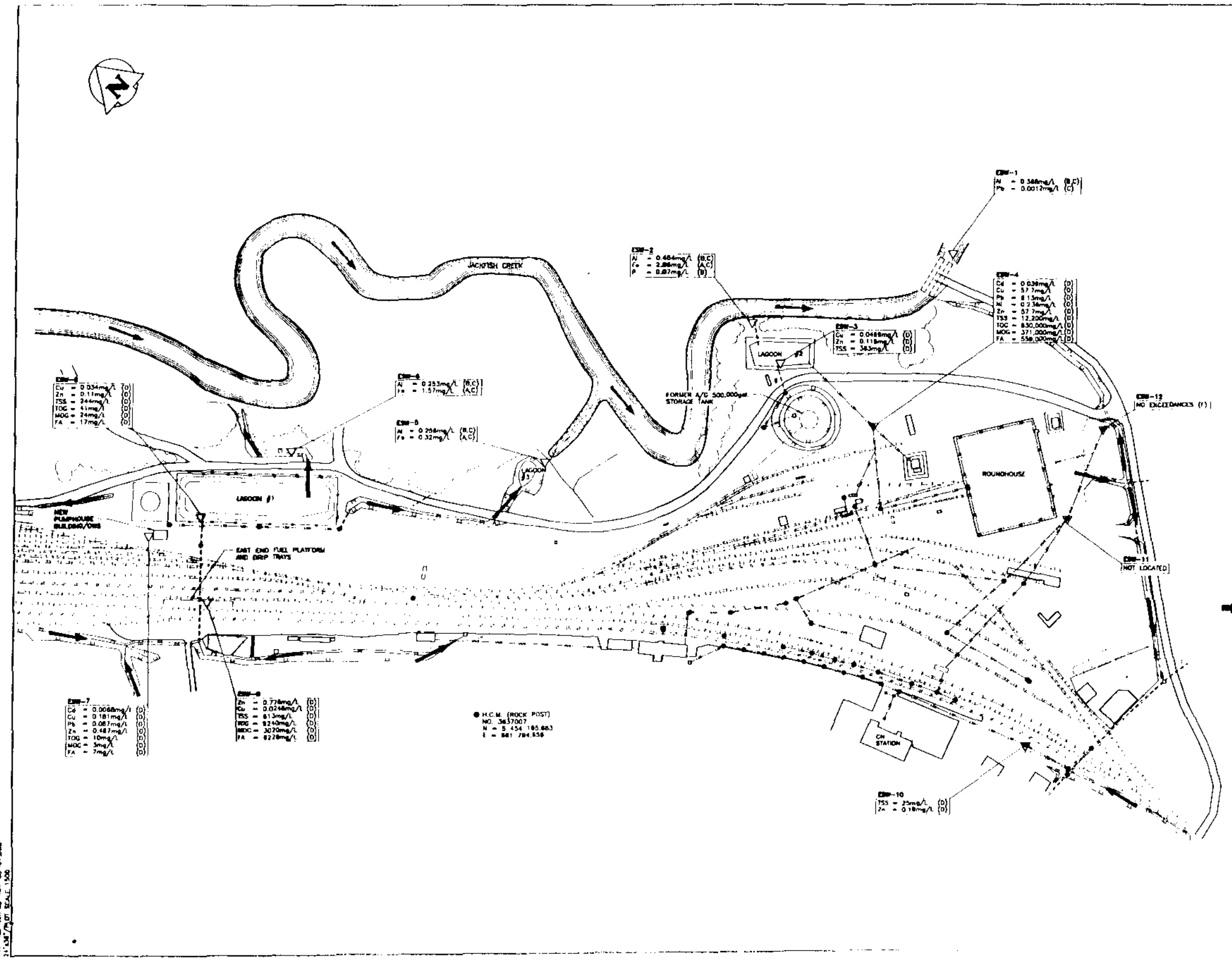
CANADIAN NATIONAL

1998 SURFACE WATER SAMPLING PROGRAM
HORNEPAYNE ONTARIO

WEST END - OCTOBER 1998 SAMPLING LOCATIONS WITH CRITERIA EXCEEDANCES

DESIGN AC
DRAWN
CHECKED
DATE AS NOTED DECEMBER 1998
FILE No. FIGURE 4 REV. 1


LEGEND
NOTE:
1 REFERENCE JACOBS SHUTFORD ENVIRONMENTAL LTD. PROJECT 31004 DRAWING NO. 2, 1998
JACKFISH CRTK
LAGOON #1
LAGOON #2
FORMER A/C 300,000gal STORAGE TANK
ROUNDHOUSE
EAST END FUEL PLATFORM AND DRIP TRAYS
NEW PUMPHOUSE BUILDING
CN STATION
NOT LOCATED
ESW-1 NO EXCEEDANCES
ESW-2
ESW-3 DRY
ESW-4
ESW-5
ESW-6
ESW-7
ESW-8
ESW-9
ESW-10
ESW-11 NOT LOCATED
ESW-12 NO EXCEEDANCES
REVISIONS / ISSUE
KGS GROUP CONSULTING ENGINEERS & PROJECT MANAGERS
CN CANADIAN NATIONAL
1998 SURFACE WATER SAMPLING PROGRAM HORNEPAYNE YARD
EAST END – OCTOBER 1998 SAMPLING LOCATIONS WITH CRITERIA EXCEEDANCES



LEGEND

- CULVERT
- SANITARY SEWER
- STORM SEWER
- MANHOLE
- ▽ SURFACE WATER SAMPLING LOCATION
- FLOW DIRECTION OF SURFACE DRAINAGE
- TREES/ SHRUBS

A - ONTARIO MINISTRY OF ENVIRONMENT AND ENERGY WATER MANAGEMENT GUIDELINES PROVINCIAL WATER QUALITY OBJECTIVES, JULY 1994 (PWQO)

B - INTERIM PWQO

C CANADIAN COUNCIL OF RESOURCES AND ENVIRONMENTAL MINISTERS, CANADIAN WATER QUALITY GUIDELINES FOR FRESHWATER AQUATIC LIFE, APRIL 1991

D ONTARIO MINISTRY OF ENVIRONMENT AND ENERGY MODEL SEWER USE BY-LAW AUGUST 1998 SECTION 3, DISCHARGES TO STORM SEWERS

E - TYPICAL LIMITS FOR CERTIFICATE OF APPROVALS FOR INDUSTRIAL SEWAGE WORKS

F - ONTARIO MINISTRY OF THE ENVIRONMENT AND ENERGY MODEL SEWER USE BY LAW AUGUST 1998 SECTION 2 DISCHARGES TO SANITARY SEWERS

NOTE:

1 REFERENCE JACQUES WHITFORD ENVIRONMENTAL LIMITED PROJECT 31004, DRAWING NO 3, 1998

0 30 60 90 120 150m

SCALE 1:1500 METRIC 24"x36"
1:3000 METRIC 11"x17"

1	28/01/98	ISSUED FOR REPORT
0	11/01/98	ISSUED FOR REPORT

REVISIONS / ISSUE

A SECTION LETTER OR DETAIL NUMBER
B DRAWING WHERE SECTION OR DETAIL IS DRAWN OR DRAWING WHERE SECTION OR DETAIL WAS INDICATED
— SECTION OR DETAIL SHOWN ON SAME DRAWING

KGS GROUP CONSULTING ENGINEERS & PROJECT MANAGERS

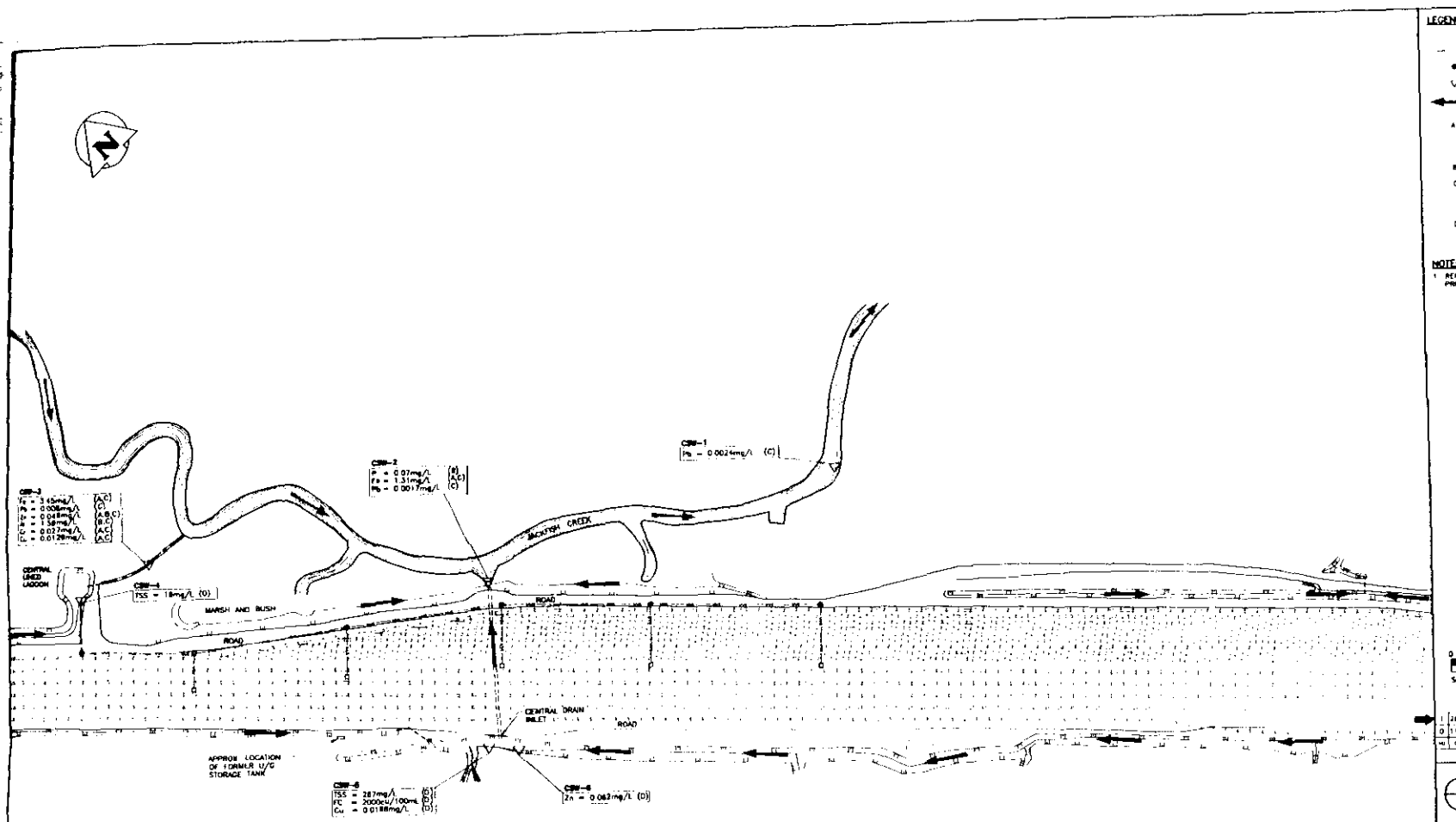
CANADIAN NATIONAL

1998 SURFACE WATER
SAMPLING PROGRAM
HORNEPAYNE YARD

EAST END – JUNE 1998
SAMPLING LOCATIONS WITH
CRITERIA EXCEEDANCES

AS NOTED
DECEMBER 1998

FIGURE 7 1



LEGEND

- CULVERT
- SANITARY SEWER
- MANHOLE
- SURFACE WATER SAMPLING LOCATION
- FLOW DIRECTION OF SURFACE DRAINAGE
- A - ONTARIO MINISTRY OF ENVIRONMENT AND ENERGY: WATER MANAGEMENT GUIDELINES PROVINCIAL WATER QUALITY OBJECTIVES, JULY 1994 (PWQO)
- B - INTERIM PWQO
- C - CANADIAN COUNCIL OF RESOURCES AND ENVIRONMENTAL MINISTERS, CANADIAN WATER QUALITY GUIDELINES FOR FRESHWATER AQUATIC LIFE, APR., 1991
- D - ONTARIO MINISTRY OF ENVIRONMENT AND ENERGY MODEL SEWER USE BY-LAW AUGUST 1990, SECTION 3, DISCHARGES TO STORM SEWERS

NOTE

1. REFERENCE JACQUES WHITFORD ENVIRONMENTAL LIMITED PROJECT 31004, DRAWING NO. 3, 1998.

SCALE: 1:1500 METRIC 24"x36" / 1:3000 METRIC 11"x17"

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REVISIONS / ISSUE

KGS GROUP — CONSULTING ENGINEERS & PROJECT MANAGERS

CANADIAN NATIONAL

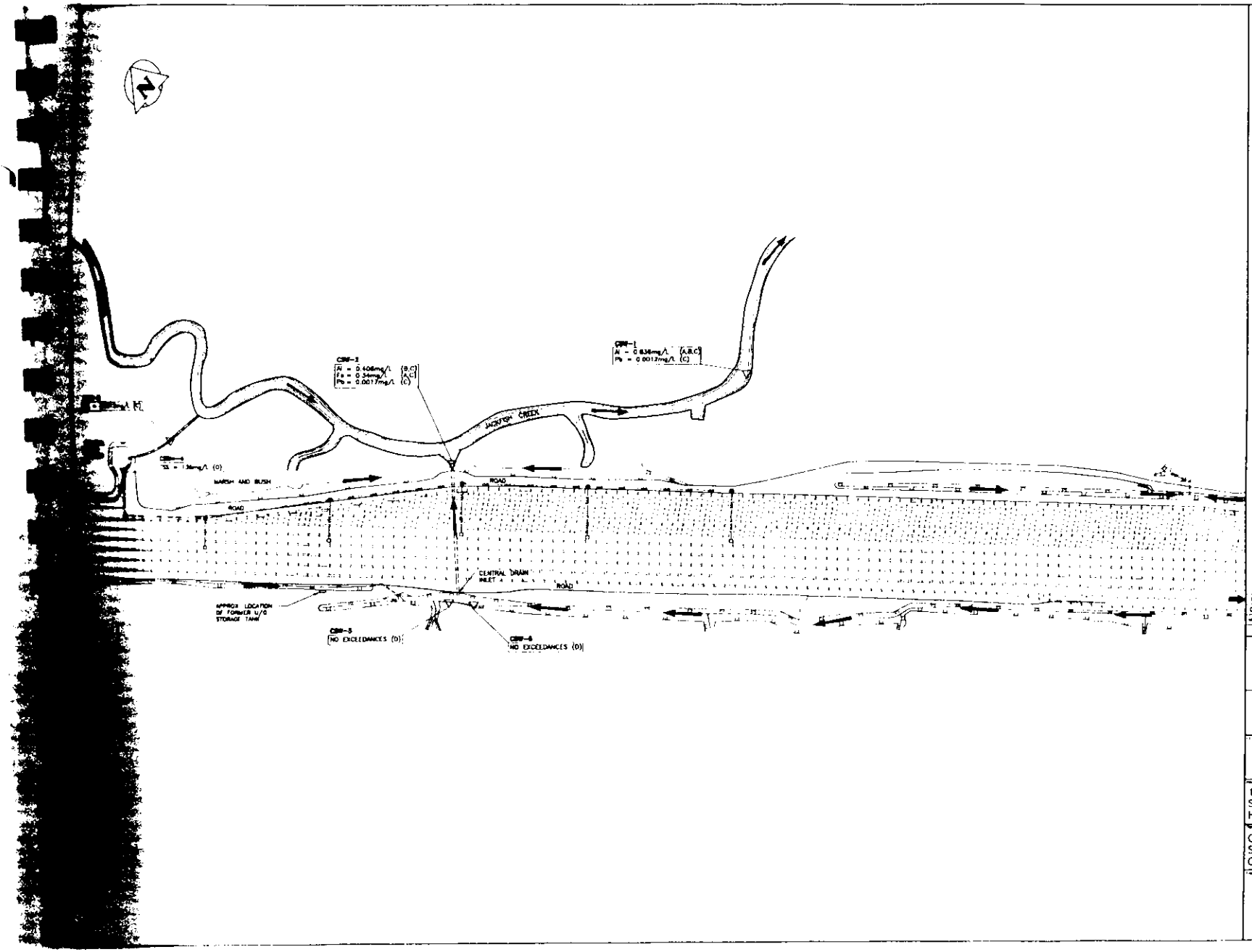
1998 SURFACE WATER SAMPLING PROGRAM HORNEPAYNE ONTARIO

CENTRAL – OCTOBER 1998 SAMPLING LOCATIONS WITH CRITERIA EXCEEDANCES

AS NOTED — DECEMBER 1998

FIGURE 6 — 1

000803



LEGEND

- CULVERT
- SANITARY SEWER
- MANHOLE
- SURFACE WATER SAMPLING LOCATION
- FLOW DIRECTION OF SURFACE DRAINAGE
- A - ONTARIO MINISTRY OF ENVIRONMENT AND ENERGY WATER MANAGEMENT GUIDELINES PROVINCIAL WATER QUALITY OBJECTIVES JULY 1984 (PWQO)
- B - INTERIM PWQO
- C - CANADIAN COUNCIL OF RESOURCES AND ENVIRONMENTAL MINISTERS, CANADIAN WATER QUALITY GUIDELINES FOR THE PROTECTION OF AQUATIC LIFE APRIL 1987
- D - ONTARIO MINISTRY OF ENVIRONMENT AND ENERGY MODEL SEWER USE BY LAW AUGUST 1984 SECTION 3 DISCHARGES TO STORM SEWERS

NOTE:

1. REFERENCE JACQUES WHITFORD ENVIRONMENTAL LIMITED PROJECT 31004 DRAWING NO 3 1998

SCALE: 1:1500 METRIC 24"=36" 1:3000 METRIC 11"x17"

1	28/01/98	ISSUED FOR REPORT
0	11/01/98	ISSUED FOR REPORT

REVISIONS / ISSUE

KGS GROUP CONSULTING ENGINEERS & PROJECT MANAGERS

CANADIAN NATIONAL

1998 SURFACE WATER SAMPLING PROGRAM HORNEPAYNE ONTARIO

CENTRAL - JUNE 1998 SAMPLING LOCATIONS WITH CRITERIA EXCEEDANCES

SCALE: AS NOTED DATE: DECEMBER 1998

FIGURE 5 1

KGS GROUP

KONTZAMANIS ▪ GRAUMANN ▪ SMITH ▪ MACMILLAN INC.
CONSULTING ENGINEERS & PROJECT MANAGERS

June 5, 1999 File No. 99-434-04

Canadian National
MacMillan Yard
1 Administration Road
Concord, Ontario
L4K 1B9

ATTENTION: Mr. Nicholas D. Coleman, B.Sc.
Environmental Officer

RE: Phase IV Remedial Action Plan
West End – Hornepayne Yard
May 1999 Environmental Status Report

Dear Mr. Coleman:

KGS Group is pleased to provide you with this status report for the above mentioned site. Please find below a summary of the environmental, operation and maintenance results for the time period between April 15 and June 2, 1999:

- Due to large amounts of diesel flowing into the diesel recovery lagoon (DRL), the diesel recovery system was started local CN Forces during the week of April 15. At the time of start up approximately 1,200 L of product was removed from the waste oil recovery tank by local CN forces.

- System inspections were conducted by KGS Group personnel on May 4 and June 2, 1999.

- The skimmer unit was cleaned by local CN Forces on May 17.

- Approximately 5,783 Litres of product was collected between April 15 and May 4. An additional 3,812 Litres of product was collected between May 4 and June 2. The total volume of product collected in 1999 as of June 2 was 10,759 Litres.

- Free product was observed in the DRL on both May 4 and June 2.

- The average elevation of groundwater (adjusted for the presence of free product) was 323.94 and 324.15 msl for May 4 and June 2 respectively. All underdrains were below the aforementioned elevations.

- An average product thickness of 1.20 m was observed in monitoring wells within the West End on May 4. Product thickness ranged from 0.12 m (MW-12) to 2.145 m (OW-60). On June 2 the average product thickness was 1.25 metres and ranged from 0.04 m (MW-12) to 2.76 metres (OW-53).

- A tanic acid sheen was observed in the DRS discharge trench discharge trench on both May 4 and June 2.

- A surfacewater sample was collected from the discharge to Jackfish Creek (WSW-2) on May 4, 1999. The sample was sent to Philip Analytical in Mississauga, Ontario for total oil and grease (TOG), mineral oil and grease(MOG), total purgeable hydrocarbon (TPH), total extractable hydrocarbon (TEH), benzene, toluene, ethylbenzene and m, o+p xylene analysis. All results were below applicable criteria except for toluene, which was above interim PWQO criteria.

Sample	Date	TOG (mg/L)	MOG (mg/L)	TEH (mg/L)	TPH (mg/L)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	m+p Xylene (mg/L)	o Xylene (mg/L)
WSW-2	4-May	8	2	1.9	<0.1	0.0022	0.0031	0.0012	0.0041	0.0063
C of A		15	-	-	-	-	-	-	-	-
Interim PWQO		-	-	-	-	0.1	0.0008	0.008	0.03	0.04

- Exceedance of Interim PWQO

We trust that the above meets your requirements. Should you have any questions or require further information, please do not hesitate to contact the undersigned or Mr. Jeff Frank.

Yours very truly,

Antonio A. Gallo M.Sc., P.Biol.
Environmental Scientist

TABLE 3
HYDROCARBONS IN SYSTEM EFFLUENT
1998 OPERATING YEAR
WEST END DIESEL RECOVERY SYSTEM
CN HORNEPAYNE YARD

Sample Location	Sampling Date	Parameter (1)										Field Observations
		Benzene	Toluene	Ethyl-benzene	Xylenes (-m,-o,-p)	Total Purgeable Hydrocarbons	Total Extractable Hydrocarbons	Total Petroleum Hydrocarbons	Oil & Grease			
									Total (Gravimetric)	Mineral	Fatty Acids	
Effluent Ditch (WSW-3)	06/12/98	-	-	-	-	<0.1	-	<0.1	31	3	28	Sheen
	10/08/98	<0.0002	<0.0002	<0.0002	<0.0004	<0.1	5.13	5.13	18	3	15	Sheen
	11/04/98	0.00231	0.00022	0.00086	0.0061	<0.1	1.36	1.36				Sheen
Effluent Discharge (WSW-2)	06/12/98	-	-	-	-	<0.1	-	<0.1	1	<1	1	No sheen
	10/08/98	<0.0002	<0.0002	<0.0002	<0.0004	<0.1	0.183	0.183	2	1	1	No sheen
	11/04/98	0.0005	<0.0002	<0.0002	0.00127	<0.1	0.622	0.622				No sheen
Interim PWQO (2)		0.1	0.0008	0.008	0.07	(3)						-
Certificate of Approval		-	-	-	-	-	-	-	15	-	-	-

Notes:
1. All concentrations in mg/L.
2. PWQO - Provincial Water Quality Objectives of Ministry of Environment and Energy, July 1994.
3. Oil or petrochemicals should not be present in concentrations that:
- can be detected as a visible film, Sheen, or discolouration on the surface
- can be detected as by odour
- can form deposits on shorelines and bottom sediments that are detectable by sight or odour, or are deleterious to resident aquatic organisms

KGS GROUP CONSULTING ENGINEERS
Suite 301A - 1001 William Street
Thunder Bay ON P7B 6M1
Phone: (807) 623-2195
Fax: (807) 473-5671

AL HP FR 410

TRANSMITTAL

CNR

TRANSMITTAL No. **12-0434-004-00016**

PROJECT : 12-0434-004 CN Hornepayne Yard, 2012 Environmental Services Program

TO : Mr. Kirk Crosson
Ministry of the Environment
289 Bay Street
3rd Floor
Sault Ste. Marie ON P6A 1W7

FROM : Nick Tropea
KGS Group

SAULT STE. MARIE
MINISTRY OF ENVIRONMENT
FEB 0 4 2013
RECEIVED

DATE : January 31, 2013

SUBJECT : CN Hornepayne Final Report

SUBMITTED FOR : ☐ Approval ☑ Your Use ☐ As Requested ☐ Review and Comment

SENT VIA :

ITEM	DESCRIPTION	STATUS
RPT_MOE	Title: CN Hornepayne Yard 2012 Environmental Program Report (RPT_MOE), Revision: (0, Jan 31, 2013)	Issued for Use

REMARKS : As per the request of Nick Tropea, 1 hard copy of the Final Report regarding CN Hornepayne Yard will be sent to you via Purolator.

Regards,

Stacy Allison
Document Control

COPIES TO :

KGS Group
Tony Gallo

KGS GROUP
CONSULTING ENGINEERS

Suite 301A
1001 William Street
Thunder Bay,
Ontario
P7B 6M1
807.623.2195
fax: 807.473.5671
www.kgsgroup.com

January 31, 2013

File No. 12-0434-004

Canadian National
MacMillan Yard
4 Welding Way
Concord, Ontario
L4K 1B9

ATTENTION: Mr. Alexandre Borges
Environmental Officer

RE: CN Hornepayne Yard – 2012 Final Report for the Ministry of Environment
2012 Environmental Program – Hornepayne, Ontario

Dear Mr. Borges:

Please find enclosed one (1) hard copy and one (1) electronic copy of the Final Report for the above noted site. For your convenience, an electronic copy of the final report has been forwarded to both Ms. Seble Afework and Mr. Marc Grenier-Savard. Also, one (1) hard copy of the final report has been forwarded to Mr. Kirk Crosson of the Ministry of Environment.

KGS Group sincerely appreciates the opportunity to have been of service on this project. If you have any further questions regarding this report, please contact Mr. Nick Tropea or the undersigned.

Yours truly,

Tony Gallo, M.Sc.
Project Manger

TG/sla
/Enclosure

cc: Ms. Seble Afework, P.Eng. Environmental Engineer, CN Environment
Mr. Marc Grenier-Savard, Environmental Coordinator, CN Environment
Mr. Kirk Crosson, Sr. Environmental Officer, Ministry of the Environment

Canadian National
Hornepayne Yard
Hornepayne, Ontario
2012 Environmental Program
Ministry of the Environment

January 2013

Privileged and Confidential

Prepared By

Nick Tropea, B.Sc.
Environmental Technologist

Reviewed By

Tony Gallo, M.Sc.
Project Manager

Approved By

Rob Sinclair, P.Eng.
Manager, Environmental Services

KGS Group
Thunder Bay, Ontario

EXECUTIVE SUMMARY

Kontzamanis Graumann Smith MacMillan Inc. (KGS Group) was retained by Canadian National (CN) to provide environmental and engineering services for the 2012 Environmental Program at the CN Hornepayne Yard, located in Hornepayne, Ontario. This report details the operation and maintenance activities associated with remedial activities at the Yard. The Hornepayne Yard operates under the Amended Certificate of Approval (C of A) No. 3528–83LQWT.

West End Diesel Recovery System

The West End Diesel Recovery System (DRS) continues to function as per design, passively collecting Light Non-Aqueous Phase Liquids (LNAPL) from the fuelling stand area and preventing the off-site migration of LNAPL. Approximately 2,842 L of LNAPL was collected during the 2012 operating year. Since commissioning in the fall of 1998, the system has recovered approximately 176,553 L.

In 2012, the DRS was inspected weekly from May to November, and monthly DRS effluent samples met all criteria outlined in the C of A.

East End Environmental Protection System

Lagoon No.2 Containment System

The Lagoon No.2 Containment System continued to prevent the off-site migration of LNAPL from the Lagoon No.2 and Former Pump House areas to the Little Jackfish River.

The horizontal extent of the LNAPL plume has not changed from previous years, although the measured LNAPL thickness in monitoring wells fluctuates between years. The Lagoon No.2 Containment System recovered approximately 2,680 L of LNAPL in 2012. Since 1998, approximately 24,234 L of LNAPL has been collected from this area.

Effluent sampled from the Lagoon No.2 outlet met all criteria outlined in the C of A. Lagoon No.2 continues to adequately attenuate impacted effluent from various Yard operations.

Former Shop Track Fuelling Area Diesel Recovery System

The Former Shop Track Fuelling (FSTF) area DRS did not operate in 2012, as CN could not place a tanker car at the Waste Oil Transfer Facility (WOTF). However, the skimmer unit was activated for a portion of the 2012 operating year (June to August), dictated by fluid levels within the collection sump. In total, 1,712 L of LNAPL was collected from this area between the operation of the skimmer unit and the collection of LNAPL from Yard operations by both KGS Group and local CN personnel. Since 2004, approximately 12,288 L of LNAPL / waste oil has been collected from this area.

Waste Oil Transfer Facility

The WOTF did not operate in 2012, as a tanker car could not be placed at the site. A total of 11,690 L of total fluids, collected by KGS Group led operations, were taken directly off-site for processing.

Surface Water

The surface water program continues to show that Yard effluent/surface water discharge is not having a measurable or visible effect on off-site surface water, namely the Little Jackfish River.

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1.0 INTRODUCTION

Kontzamanis Graumann Smith MacMillan Inc. (KGS Group) was retained by Canadian National (CN) to provide environmental and engineering services for the 2012 Environmental Program at the CN Hornepayne Yard, located in Hornepayne, Ontario (Figure 1). This report details the operation and maintenance activities associated with both the West End Fuelling Stand System and East End Environmental Protection Systems (PIN # 1000/ONPR/100586, PIN # 1000/ONPR/100587, and PIN # 1000/ONPR/100591), and also details the results of the groundwater and surface water monitoring and sampling program conducted during the 2012 operating year. The East and West End systems operate under the Amended Certificate of Approval (C of A) No. 3528–83LQWT, which was issued on April 29, 2010 (Appendix A).

1.1 SYSTEM DESCRIPTIONS

1.1.1 West End Fuelling Stand System

The location of the West End Diesel Recovery System (DRS) (PIN # 1000/ONPR/100587) within the Hornepayne Yard is shown on Figure 2, while the DRS components are shown on Figure 3. The DRS was originally constructed in 1998 and was composed of eleven (11) underdrains, each at various elevations within the subsurface. Only ten (10) underdrains remain. Underdrain No.7 was destroyed in 1998 during construction of the diesel recovery lagoon (DRL). The underdrains discharge total fluids into the DRL. A skimmer unit, located within the Skimmer Building at the west end of the DRL, collects LNAPL floating on the surface of the water within the DRL. Collected LNAPL is transferred by gravity to a 25,000 L waste oil recovery tank. Effluent from the DRL is discharged to a discharge trench. At the downstream end of the discharge trench is a concrete control structure, through which effluent is discharged to the Little Jackfish River. Flow through the structure is controlled using a manual butterfly valve.

1.1.2 East End Environmental Protection System

Lagoon No.2 Containment System

Figure 4 shows the location of the Lagoon No. 2 containment system relative to the Yard. The general components of the containment system are shown on Figure 5. The containment system consists of a bentonite cut-off wall, ten (10) recovery wells and an interception trench. Six (6) of the recovery wells were installed in 2006 as part of the containment system upgrade (PW-5 to PW-10). Pumping well PW-1 was damaged during the system upgrade. This pumping well is no longer used as a recovery well, but accumulated LNAPL (when present) is bailed from the well during each system inspection. Five (5), top loading, AP4 pneumatic pumps are utilized to collect total fluids from selected pumping wells. The pneumatic pumps are configured to pump total fluids to a 45 L per minute oil / water separator (OWS). The pneumatic pumps can be transferred between the pumping wells as dictated by both fluctuating water table and LNAPL levels, respectively. LNAPL collected in the OWS is gravity drained to a 4,560 L double walled waste oil tank. Effluent from the OWS gravity drains to Lagoon No.2, which ultimately, discharges to the Little Jackfish River.

An interception trench was installed in the former pump house area of the Yard, located west of Lagoon No.2. The interception trench is equipped with a Myers ½ horsepower sump pump, which transfers total fluids collected within the interception trench to the OWS, located at the Lagoon No.2 Containment System. LNAPL collected in the OWS is gravity drained to a 4,560 L double walled waste oil tank. Effluent from the OWS gravity drains to Lagoon No.2, which ultimately, discharges to the Little Jackfish River.

Former Shop Track Fuelling Area Diesel Recovery System

The location of the Former Shop Track Fuelling area (FSTF) (PIN # 1000/ONPR/100591) is shown on Figure 6, while the general FSTF components are shown on Figure 7. The FSTF DRS consists of a rock filled recovery trench, collection sump and a skimmer unit, located within the Skimmer Building. A Myers ½ horsepower sump pump is used to depress the water table within the sump. Groundwater is pumped directly to the 227 L per minute OWS, located at the Waste Oil Transfer Facility. Effluent from the OWS, gravity discharges to a manhole within the area of the system. Effluent from the manhole gravity discharges to Lagoon No.2 and ultimately, to the Little Jackfish River. The skimmer belt collects LNAPL floating on the surface

of the water within the sump. Collected LNAPL is then transferred by gravity to a 5,000 L waste oil recovery tank.

Waste Oil Transfer Facility

The location of the Waste Oil Transfer Facility (WOTF) (PIN # 1000/ONPR/100591) is shown on Figure 8. The WOTF system components are shown on Figure 9. To the south of the WOTF are drip trays, which drain to a sump equipped with a Myers ½ horsepower sump pump. Any potential spills within the drip trays are pumped from the sump to the 227 L per minute OWS separator situated within the WOTF. A 45,400 L holding tank is located to the west of the WOTF. All collected LNAPL is placed in the waste oil tank and processed through the OWS. Clean water is discharged to Lagoon No.2. Remaining LNAPL is transferred via a Loading Arm to a nearby Tanker car, stationed at the drip trays.

2.0 OPERATION AND MAINTENANCE

2.1 WEST END FUELLING STAND SYSTEM

2.1.1 Operations and Inspections

KGS Group personnel started the skimmer unit on May 15, 2012. Local personnel adjusted the skimmer belt and increased / decreased the blade tension on the skimmer belt on an as required basis during 2012. The skimmer unit was shutdown and winterized on November 14, 2012 by KGS Group personnel.

In 2012, KGS Group personnel conducted monthly inspections from May to November, while local personnel conducted weekly inspections during the same time period. Inspections were conducted to assess the operation of the DRS, to measure the collection of LNAPL, and to visually inspect the final discharge location. KGS Group personnel also collected an effluent sample, when effluent flow was present, from the final discharge location on a monthly basis. Weekly inspection forms for the 2012 operating year can be provided upon request.

2.1.2 Operation and Maintenance Issues

In 2012, the skimmer unit operated from May to November without any operational interruptions.

2.1.3 Collected LNAPL

The West End DRS recovered a total of approximately 2,842 L of LNAPL during the 2012 operating year (Figure 10). Since the commissioning of the system in the spring of 1998, the West End DRS has collected approximately 176,553 L of LNAPL (Figure 11).

2.2 EAST END ENVIRONMENTAL PROTECTION SYSTEM

2.2.1 Lagoon No.2 Containment System Operations and Inspections

KGS Group personnel installed the pneumatic pumps and the associated system components on May 14, 2012 and started system operation. In 2012, KGS Group personnel conducted monthly inspections from May to November, while local personnel conducted weekly

inspections during the same time period. Inspections were conducted to assess the operation of the Lagoon No.2 Containment System, to measure the collection of LNAPL, and to visually inspect the final discharge location. KGS Group personnel also collected an effluent sample, when effluent flow was present, from the final discharge location on a monthly basis. Weekly inspection forms for the 2012 operating year can be provided upon request.

The recovery trench submersible pump operated within normal parameters throughout the 2012 operating year. The pneumatic pumps were rotated between five (5) of the recovery wells in 2012 (PW-2, PW-3, PW-7, PW-8, and PW-9). Pumping Wells PW-4, PW-5, PW-6, and PW-10 were not utilized due to insignificant thickness of LNAPL present and low water table levels. LNAPL from within these four (4) pumping wells was manually bailed during each inspection, when present.

2.2.2 Lagoon No.2 Containment System Operation and Maintenance Issues

Operation of the Lagoon No.2 Containment System began on May 14, 2012, with five (5) pumps operated in pumping wells PW-2, PW-3, PW-7, PW-8 and PW-9, as well as the interception trench submersible pump. On July 19, 2012, the system experienced an automatic shut down due to a full waste oil recovery tank, which activated the automatic shut down of the system operation. Hearst Septic Tank Ltd. of Hearst, Ontario removed the contents of the waste oil tank on July 24, 2012. KGS Group personnel activated the system on July 24, 2012.

The system operated until August 10, 2012 when local personnel observed the compressor was not in operation. Further inspection conducted by KGS Group personnel on August 13, 2012 confirmed that the compressor motor was damaged due to prolonged use, and would no longer be able to operate. The system was manually shut down on August 13, 2012, and remained down for the remainder of the 2012-operating year. Arrangements were made to purchase and replace the existing compressor as soon as possible in 2012, in order to operate the system for the latter part of 2012; however, the new compressor was delivered to the site in late October 2012.

2.2.3 Lagoon No.2 Collected LNAPL

The Lagoon No.2 Containment System recovered a total of approximately 2,680 L of LNAPL during the 2012 operating year (Figure 12). Since LNAPL recovery began in the spring of 1998,

the Lagoon No.2 Containment System, in it various forms, has collected approximately 24,234 L of LNAPL (Figure 13).

2.2.4 Former Shop Track Fuelling Area Diesel Recovery System Operations and Inspections

As there was no tanker car placed at the WOTF in 2012, which is a requirement for operating both the Former Shop Track Fuelling area DRS and the WOTF, the remedial system, with the exception of the skimmer unit, was not operated in 2012.

KGS Group personnel installed the skimmer belt and started the skimmer unit on May 15, 2012. Local personnel adjusted the skimmer belt and increased / decreased the blade tension on the skimmer belt on an as required basis during 2012. The skimmer unit was manually shut down on August 14, 2012 due to the low water table level within the collection sump (water table below the end of the skimmer belt). The skimmer unit was winterized on November 14, 2012 by KGS Group personnel.

Although the remedial system did not operate in 2012 as per its original design, system components, namely the waste oil tank and skimmer unit, were inspected on a monthly basis, as KGS Group and local CN personnel still use the tank to store waste oil from Yard activities, and the skimmer unit was functioning for the majority of the operating year.

In 2012, KGS Group personnel conducted monthly inspections from May to November, while local personnel conducted weekly inspections during the same time period. Inspections were conducted to measure the collection of LNAPL placed in the waste oil tank, and inspect the skimmer unit. Weekly inspection forms for the 2012 operating year can be provided upon request.

2.2.5 Former Shop Track Fuelling Area Diesel Recovery System Operation and Maintenance Issues

There were no operation or maintenance issues to report for the FSTF area DRS in 2012.

2.2.6 Former Shop Track Fuelling Area Diesel Recovery System Collected LNAPL

In total, 1,712 L of LNAPL was recovered / collected from this area in 2012. The FSTF area skimmer unit operated from June until August 2012, while both KGS Group and local CN personnel placed waste oil, from various Yard operations, in the waste oil tank. A summary of LNAPL collection for 2012 can be found on Figure 14. Since its commissioning in the spring of 2004, system and manual collection of waste oil has recovered approximately 12,288 L of LNAPL / waste oil. A summary of historical collection can be found on Figure 15.

2.2.7 Waste Oil Transfer Facility Operations and Inspections

As there was no tanker car placed at the WOTF in 2012, which is a requirement for operating both the FSTF area DRS and the WOTF, the transfer system was not operated in 2012.

Although the WOTF system did not operate in 2012, the system components, namely the waste oil holding tank, were inspected on a monthly basis as part of the monthly tank and outfall inspections. Level measurements were also recorded as KGS Group and local CN personnel used the holding tank to store waste oil generated from Yard activities.

KGS Group personnel conducted monthly inspections from May to November, while local personnel conducted weekly inspections during the same time period. Inspections were conducted to measure the collection of LNAPL placed in the waste oil holding tank. Weekly inspection forms for the 2012 operating year can be provided upon request.

2.2.8 Waste Oil Transfer Facility Operation and Maintenance Issues

There were no operation or maintenance issues to report for the WOTF in 2012.

2.2.9 Waste Oil Transfer Facility Collected LNAPL

The WOTF did not operate in 2012; therefore, 0 L of total fluids was processed through the WOTF. Green for Life of Thunder Bay and Hearst Septic Tank Ltd. of Hearst, Ontario removed approximately 11,690 L of total fluids (collected from various LNAPL collection systems in the Yard) for off-site processing / disposal. Waste Manifest Forms are provided in Appendix B.

3.0 EFFLUENT SAMPLING

3.1 WEST END FUELLING STAND SYSTEM

As per the requirements of the C of A, effluent samples were collected from the outlet to the Little Jackfish River (Hor-013-05) from May through November 2012, with the exception of August, September, and October 2012, when the final effluent location was found to be dry. The effluent sampling location is shown on Figure 16. KGS Group personnel collected effluent samples during each monthly inspection visit or as part of the surface water-sampling program. Effluent samples were submitted to Maxxam Analytics Inc. in Mississauga, Ontario for the laboratory analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), total purgeable hydrocarbons (TPH), total extractable hydrocarbons (TEH), petroleum hydrocarbon fractions (PHC) F1 to F4, methyl-t-butyl-Ether (MTBE), pH, alkalinity, hardness, and lead. The effluent samples were submitted to the laboratory accompanied with pre-filled chain of custody (COC) forms supplied by CN via the SAP program.

Laboratory results show that BTEX, MTBE, lead and pH in the effluent samples were below the applicable C of A criterion. PHC fractions, where analysed, were below applicable C of A criteria. Surface water quality analysis results are presented in Table 1. Laboratory certificates of analysis can be provided upon request.

3.2 EAST END ENVIRONMENTAL PROTECTION SYSTEM

Effluent samples from the Lagoon No.2 discharge to the Little Jackfish River (Hor-002-05) were taken on a monthly basis from May to November 2012, with the exception of September 2012, when the final effluent location was found to be dry. The effluent sampling location is presented on Figure 16. KGS Group personnel collected effluent samples during each monthly inspection visit or as part of the surface water-sampling program. Effluent samples were submitted to Maxxam Analytics Inc. in Mississauga, Ontario for the laboratory analysis of BTEX, TPH, TEH, PHC fractions F1 to F4, MTBE, pH, alkalinity, hardness, and lead. The effluent samples were submitted to the laboratory accompanied with pre-filled chain of custody (COC) forms supplied by CN via the SAP program.

Laboratory results show that BTEX, MTBE, lead and pH were below the applicable C of A criterion. Where PHC fractions F1 to F4 were analysed, the concentrations were below applicable C of A criteria. Surface water quality analysis results for parameters sampled during the 2012 operating year are presented in Table 1. Laboratory certificates of analysis can be provided upon request.

4.0 GEOLOGY AND HYDROGEOLOGY

4.1 GEOLOGY

4.1.1 West End

Native soils within the West End are generally silty sands with traces of clay. The shallow soils are typically brown turning to grey-blue at the saturation zone, which is typical of a stable water table. Localized peat layers are also found within this area. Layers of surficial imported fill, where present, range in thickness from 0 to 4 m. Historical drill logs are provided in Appendix C, while stratigraphic cross sections for the West End are presented in Appendix D (Figure D1 and D2, respectively).

4.1.2 East End

The geology of the East End typically consists of fill overtop layers of peat and silty sands. Parallel to the Little Jackfish River, the geology shifts to more coarse granular materials, sands, gravel, cobbles and boulders. Historical drill logs are provided in Appendix C, while stratigraphic cross sections for the East End are presented in Appendix D (Figures D3 and D4, respectively).

4.2 HYDROGEOLOGY

4.2.1 West End

Representative contours for the spring and fall monitoring events are shown on Figures 17 and 18, respectively.

Groundwater elevations ranged from an elevation of 323.58 m (IMW-4) to 326.37 (MW-120) in the spring, and from 323.06 (IMW-4) to 325.27 m (MW-120) in the fall.

Interpreted groundwater flow direction was to the north/northeast, with local flow varying in the area of the DRS due to the influence of the underground drains and the recovery lagoon.

The average hydraulic gradient in the spring was 0.02 m/m, with local variations ranging from 0.01 to 0.04 m/m in the spring, while the average hydraulic gradient in the fall was 0.03 m/m, with local variations ranging from 0.01 to 0.05 m/m. Based on an estimated hydraulic conductivity of 10^{-8} m/s for silty clay and an effective porosity of 0.25, the estimated groundwater velocity local to the DRS in 2012 ranged from 0.01 to 0.06 m/year.

4.2.2 East End

Groundwater monitoring data for the Yard is presented in Table 2. Representative contours for the spring and fall monitoring events are shown on Figures 19 and 20, respectively.

Former Pump House Area

Groundwater elevations in the Former Pump House area ranged from an elevation of 322.22 m (MW-43) to 324.16 m (MW-108) in the spring and from 321.15 m (MW-43) to 322.47 m (MW-108) in the fall.

Interpreted groundwater flow direction was to the north / northeast, generally towards the Little Jackfish River. Hydraulic gradients were variable and the estimated groundwater velocities through the silty sands ranged between 1 m/year to 3 m/year.

LNAPL was measured in two (2) monitoring wells in the Former Pump House area in 2012. Monitoring well MW-106 showed an LNAPL thickness of 0.56 m, while monitoring well MW-107 showed an LNAPL thickness of 0.01 m. Detailed results are presented in Table 2.

Lagoon No.2 Area

Groundwater elevations in the Lagoon No.2 area ranged from an elevation of 321.06 m (MW-21) to 322.32 (MW-40) in the spring, and from 319.69 (OW 5-3) to 320.94 m (OW 5-2) in the fall.

Interpreted groundwater flow direction was to the north / northeast, with local flow varying in the area of Lagoon No.2 due to the influence of underground infrastructure. The average hydraulic gradient in the spring was 0.015 m/m, with local variations ranging from 0.011 to 0.017 m/m in the spring, while the average hydraulic gradient in the fall was 0.022 m/m, with local variations ranging from 0.017 to 0.034 m/m. Based on an estimated hydraulic conductivity of 10^{-6} m/s for silt / silty sands and an effective porosity of 0.30, the estimated groundwater velocity local to

Lagoon No.2 in 2012 ranged from 1.26 to 1.79 m/year in the spring and from 1.89 to 3.78 m/year in the fall.

In 2012, LNAPL was measured in seven (7) monitoring wells (MW-21 – 0.81 m, MW-51 – 0.09 m, MW-52 – 0.06 m, MW-101 – 0.33 m, MW-102 – 0.01 m, MW-104 – 0.47 m, and OW 5-2 – 0.10) m. Detailed results are presented in Table 2.

Former Shop Track Fuelling Area

Groundwater elevations ranged from an elevation of 322.54 m (MW-114) to 324.65 m (MW-126) in the spring and from 322.27 m (OW 3-2) to 322.57 m (MW-49) in the fall.

Interpreted groundwater flow direction was to the north/northeast towards Lagoon No.2 and the Little Jackfish River. Groundwater flow is locally influenced by the underground sewer networks. The average hydraulic gradients in the spring and fall were variable, with local variations ranging from 0.01 m/m to 0.025 m/m. Based on an estimated hydraulic conductivity of 10^{-6} m/s for silty sands and an effective porosity of 0.30, the estimated groundwater velocity local to the FSTF area in 2012 ranged from 1 to 3 m/year in the spring and fall.

In 2012, LNAPL was measured in three (3) monitoring wells in 2012 (MW-109 – 0.21 m, MW-126 – 0.07 m, and OW 3-2 – 0.07 m). Detailed results are presented in Table 2.

Roundhouse Area

Representative contours for the spring and fall monitoring events are shown on Figures 19 and 20, respectively. Groundwater flow was to the north/northwest. Groundwater gradients were variable, with an estimated groundwater velocity of 1 to 3 m/year through the sandy silts/silts.

LNAPL was not measured within the Roundhouse area in 2012. Detailed results are presented in Table 2.

5.0 GROUNDWATER SAMPLING

5.1 METHODOLOGY

5.1.1 Groundwater Sampling

Groundwater sampling events were conducted on June 5 (spring) and October 2 (fall), 2012. Groundwater samples were obtained using dedicated polyethylene tubing and foot valves. Each monitoring well was purged dry to ensure a representative sample was obtained from the aquifer. Groundwater samples were collected when 40% to 50% of the initial volume had recharged. Each sample was then placed into the appropriate sample bottle and shipped in cooler chests with ice to Maxxam Analytics Inc., an accredited analytical testing facility, in Mississauga, Ontario.

Groundwater samples from monitoring wells located within 30 m of the Little Jackfish River were submitted for the laboratory analysis of BTEX, and PHC fractions F1 to F4 as part of the spring sampling event. Groundwaters sampled from these wells were submitted for the laboratory analysis of PHC fractions F2 to F4 as part of the fall sampling event. All other groundwater samples were submitted for the laboratory analysis of PHC fractions F2 to F4 in October.

5.1.2 Assessment Criteria

Groundwater sampling results were compared to the Ontario Ministry of Environment (MOE) "Soil, Groundwater and Sediment Standards for us under XV.1 of the Environmental Protection Act, dated April 15, 2011. Groundwater results for monitoring wells located within 30 m of the Little Jackfish River were assessed using Table 9 Site Conditions Standards, while results from monitoring wells outside of the 30 m from the Little Jackfish River were assessed using the Table 3 Site Condition Standards.

5.2 GROUNDWATER SAMPLING RESULTS

Figure 21 highlights the monitoring wells which were sampled during the 2012 groundwater monitoring and sampling program, as per C of A requirements. Laboratory results for samples collected during the groundwater monitoring and sampling program are presented on Table 3,

while general groundwater field chemistry results are presented on Table 4. Laboratory certificates of analysis can be provided upon request.

5.2.1 Former Pump House Area

Within 30 m of Little Jackfish River – Groundwater was sampled from three (3) monitoring wells (MW-20, MW-43, and MW-46) within 30 m of the Little Jackfish River in 2012. BTEX and PHC fraction F1 to F4 concentrations were non-detectable, or at concentrations below MOE Table 9 Site Condition Standards. BTEX results were generally similar to both 2010 and 2011 results, with concentrations being non-detectable or at levels below MOE Table 9 Site Condition Standards. PHC fraction concentrations which exceeded MOE Table 9 Site Condition Standards are as follows:

- **MW-20** – PHC fractions F2 and F3 exceeded in both June and October, with concentrations being slightly elevated when compared to both 2010 and 2011 results.
- **MW-43** – PHC fraction F2 exceeded in both June and October, with concentrations being lower than 2010 and 2011 results.
- **MW-46** – PHC fractions F2 to F4 exceeded in October. Each PHC fraction concentration at this monitoring well was non-detectable in June. These results show higher concentrations in 2012 when compared to results in 2010 and 2011.

Outside 30 m from Little Jackfish River – Three (3) monitoring wells (MW-106, MW-107, and MW-108) were sampled from outside the 30 m limit from the Little Jackfish River in 2012. PHC fraction F4 concentrations were non-detectable, or where detectable, below MOE Table 3 Site Condition Standards, with the exception of monitoring well MW-106. PHC fraction concentrations which exceeded MOE Table 3 Site Condition Standards are as follows:

- **MW-106, MW-107, and MW-108** – PHC fractions F2 and F3 exceeded in 2012, with concentrations being elevated at MW-107, compared to both 2010 and 2011 results. PHC fraction F4 concentration exceeded MOE Table 3 Site Condition Standards at MW-106 in October 2012.

Field Chemistry – Groundwater sampled from all wells within the FPH area was impacted to some degree, making comparisons for trends in field chemistry difficult. However, the data continues to generally show that DO concentrations are slightly lower, and more reduced conditions exist in wells at this location, compared to other locations in the Yard where

groundwater is not impacted. These results indicate increased biological activity is occurring within the FPH area.

5.2.2 Lagoon No.2 Area

Within 30 m of Little Jackfish River – Groundwater was sampled from five (5) monitoring wells (MW-40, MW-52, OW5-1, OW5-2, and OW5-3) that are located within 30 m of the Little Jackfish River in June and October 2012. BTEX concentrations were below method detection limits or below Table 9 Site Condition Standards in all groundwater samples. PHC fractions F1 to F4 were non-detectable or below MOE Table 9 Site Condition Standards with the exception of the following:

- **MW-40** – The concentration of PHC fraction F2 in October exceeded MOE Table 9 Site Condition Standards. Previous results for this location showed these parameters to be non-detectable, with the exception of the results from October 2011.
- **MW-52** – PHC fractions F2 and F3 concentrations in 2012 exceeded MOE Table 9 Site Condition Standards and were elevated compared to both 2010 and 2011 results.
- **OW5-1** – PHC fractions F2 and F3 concentrations exceeded MOE Table 9 Site Condition Standards in October 2012, while only F2 exceeded in June. Concentrations of PHC fractions F2 and F3 concentrations in October were elevated compared to both 2010 and 2011.
- **OW5-2** – PHC fraction F2 to F4 concentrations in groundwater exceeded MOE Table 9 Site Condition Standards in 2012, with results generally being within the range of results from this location.
- **OW5-3** – PHC fractions F2 and F3 exceeded MOE Table 9 Site Condition Standards in both June and October 2012, and were slightly elevated compared to 2010 and 2011 results. PHC fraction F4 exceeded MOE Table 9 Site Condition Standards in October 2012, and was elevated compared to previous results.

Outside 30 m from Little Jackfish River – Groundwater samples were collected from six (6) monitoring wells (MW-21, MW-51, MW-101, MW-102, MW-103, and MW-104) from outside of the 30 m limit from the Little Jackfish River, in October 2012. PHC Fraction F2 to F4 concentrations in groundwater generally exceeded MOE Table 3 Site Condition Standards at all sampling locations as follows:

- **MW-21** – PHC fractions F2 to F4 exceeded Table 3 Site Condition Standards, and were slightly lower than both 2010 and 2011 results.

- **MW-51** – PHC fractions F2 to F4 exceeded Table 3 Site Condition Standards, and were within the range of results from 2010 and 2011.

- **MW-101** – PHC fractions F2 to F4 exceeded Table 3 Site Condition Standards, and were slightly lower than the results from 2010 and 2011.

- **MW-102 and MW-103** – PHC fractions F2 and F3 exceeded Table 3 Site Condition Standards, and were similar to both 2010 and 2011 results. PHC fraction F4 was non-detectable, similar to 2010.

- **MW-104** – PHC fractions F2 to F4 exceeded Table 3 Site Condition Standards, and were slightly elevated in the F2 and F3 concentration range when compared to results from both 2010 and 2011.

Field Chemistry – Field chemistry results show a definite trend of low dissolved oxygen and increased reducing conditions in groundwater from impacted wells as compared to non-impacted wells. The data suggests that there is increased biological activity within impacted areas

5.2.3 Former Shop Track Fuelling Area

Groundwater from five (5) monitoring wells was sampled in the FSTF area in October 2012 (MW-49, MW-109, MW-115, MW-126, and OW 3-2). Groundwater could not be obtained from monitoring well MW-114, as this location was dry at the time of sampling. PHC Fraction F2 to F4 concentrations in groundwater exceeded MOE Table 3 Site Condition Standards as follows:

- **MW-49, MW-114, MW-126, and OW3-2** – PHC fractions F2 to F4 exceeded MOE Table 3 Site Condition Standards, and were either elevated or within the range of previous results when compared to both 2010 and 2011 results.

- **MW-115** – PHC fractions F2 and F3 exceeded Table 3 Site Condition Standards and were similar to both 2010 and 2011 results.

Field Chemistry – Field chemistry results show lower dissolved oxygen concentrations and more reduced conditions in groundwater sampled form impacted areas versus non-impacted areas. The data suggest increased biological activity in impacted areas.

5.2.4 Roundhouse Area

Groundwater was sampled from one (1) monitoring well, MW-24, in October 2012. PHC fraction F2 exceeded MOE Table 3 Site Condition Standards and was elevated when compared to both 2010 and 2011 results. PHC fraction F3 was elevated compared to previous results.

6.0 CONCLUSIONS

The following conclusions are made based on the 2012-operating year:

6.1 WEST END

- The West End DRS continues to function as per design, passively collecting LNAPL from the fuelling stand area and preventing the off-site migration of LNAPL.
- The skimmer unit operated for one hundred and eighty-three (183) out of a possible one hundred and eighty-three (183) days throughout the 2012-operating year. LNAPL was removed as required from the DRL.
- Approximately 2,842 L of LNAPL was collected during the 2012-operating year. Since commissioning in the fall of 1998, the system has recovered approximately 176,553 L.
- Target parameter concentrations in monthly effluent samples were below their applicable C of A criterion.
- Weekly inspections were conducted throughout the operating year, which lasted from May 15, 2012 to November 14, 2012.

6.2 EAST END

6.2.1 Lagoon No.2 Containment System Operation and Maintenance

- The Lagoon No.2 containment system continues to prevent the off-site migration of LNAPL from the Lagoon No.2 area to the Little Jackfish River.
- A total of 2,680 L of LNAPL was collected in 2012. Since 1998, approximately 24,234 L of LNAPL has been collected. The Lagoon No.2 containment system operated from May 14, 2012 to August 13, 2012 due to an inoperative compressor.
- LNAPL was measured in seven (7) monitoring wells in 2012 (MW-21 – 0.81 m, MW-51 – 0.09 m, MW-52 – 0.06 m, MW-101 – 0.33 m, MW-102 – 0.01 m, MW-104 – 0.47 m, and OW 5-2 – 0.10 m.
- Groundwater from this area was sampled in 2012 and analyzed based on the C of A Criterion. Laboratory analysis showed the continued presence of target parameters in exceedance of applicable MOE Criteria.
- Field chemistry results show a trend of low dissolved oxygen and increased reducing conditions in groundwater from impacted wells as compared to non-impacted wells. The

data continues to suggest that there is increased biological activity within impacted areas.

- Target parameter concentrations in monthly effluent samples were below their applicable C of A criterion.
- Weekly inspections were conducted throughout the operating year, which lasted from May 14, 2012 to November 14, 2012.

6.2.2 Former Shop Track Fuelling Area

- The FSTF DRS, with the exception of the skimmer unit, did not operate in 2012.
- The skimmer unit operated from June 4, 2012 to August 14, 2012, when it was manually shut down due to low water table levels within the collection sump.
- Approximately 1,712 L of LNAPL was collected by the skimmer unit and from Yard operations and maintenance by both CN forces and KGS Group personnel in 2012. Since 2004, approximately 12,288 L of LNAPL has been collected.

6.2.3 Waste Oil Transfer Facility

- Enviro-West of Thunder Bay processed 11,690 L of total fluids, collected from various Yard LNAPL recovery systems, off-site due to the non-operation of the WOTF.

6.2.4 Surface Water

- No hydrocarbon sheen was observed on any of the surface water samples taken in 2012. The 2012 data showed that the Yard activities are not having any measurable or visible effects on the surface water quality of the Little Jackfish River.

7.0 THIRD PARTY USE AND STATEMENT OF LIMITATIONS

7.1 THIRD PARTY USE OF REPORT

This report has been prepared for Canadian National Railway and any use by a third party of this report, or any reliance on or decisions made based on it, are the responsibility of such third parties. KGS Group accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions undertaken based on this report.

7.2 STATEMENT OF LIMITATIONS

KGS Group prepared the environmental conclusions and recommendations for this report in a professional manner using the degree of skill and care exercised for similar projects under similar conditions by reputable and competent environmental consultants. As the report is based on the available information, some of its conclusions could be different if the information upon which it is based is determined to be false, inaccurate or contradicted by additional information. KGS Group makes no representation concerning the legal significance of its findings or the value of the property investigated.

TABLES

TABLE 1
SURFACE WATER QUALITY ANALYSIS
CN HORNEPAYNE YARD, HORNEPAYNE, ONTARIO

Sample [1]	Date	Parameter (mg/L)																		Comments
		Benzene	Toluene	Ethyl-benzene	Xylene (-o)	Xylenes (-m,-p)	MTBE	F1 ($C6-C_{10}$)	F2 ($C_{10}-C_{16}$)	F3 ($C_{16}-C_{34}$)	F4 ($C_{34}-C_{50}$)	T.P.H. ($<C_{10}$)	T.E.H. ($C_{10}-C_{24}$)	Oil & Grease	Mineral Oil & Grease	pH	Alkalinity	Hardness	Lead	
HOR 002 05 (Lagoon No.2)	Nov-12	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	1.2	<0.5	7.5	280	340	<0.05	[4]
	Oct-12	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.1	-	0.20	<0.1	<0.1	<0.1	0.29	<0.5	<0.5	8.2	260	290	<0.05	[4]
	Oct-12	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	Lab Dup.
	Sep-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Dry
	Aug-12	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0005	-	0.33	0.18	<0.1	<0.1	0.46	3.2	0.7	7.9	430	460	<0.05	
	Jul-12	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.002	-	1.20	0.38	<0.1	<0.1	1.50	<0.5	<0.5	7.7	420	410	<0.05	
	Jun-12	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.002	-	-	-	-	<0.1	0.52	1.7	<0.5	7.8	320	380	<0.05	[4]
	May-12	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.002	-	1.00	0.50	<0.1	<0.1	2.50	<0.5	<0.5	7.7	300	350	<0.05	[4]
	Nov-11	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.002	-	1.60	0.78	<0.1	<0.1	2.50	<0.5	<0.5	7.8	433	410	<0.05	[4]
	Oct-11	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.001	-	-	-	-	<0.1	1.00	0.9	<0.5	7.9	327	330	<0.05	[3]
	Sep-11	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.002	-	1.50	0.42	<0.1	<0.1	1.90	<0.5	<0.5	7.9	432	430	<0.05	[4]
	Aug-11	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0005	-	1.60	0.82	<0.1	<0.1	2.40	<0.5	<0.5	8.0	441	430	<0.05	[4]
	Jul-11	0.0008	<0.0002	0.0004	0.0004	<0.0004	<0.001	-	-	-	-	0.32	8.50	<0.5	<0.5	7.6	400	410	<0.05	[3]
	Jun-11	0.0006	<0.0002	0.0004	<0.0002	0.0015	<0.002	-	-	-	-	<0.1	3.70	<0.5	<0.5	7.8	288	300	<0.05	[3]
	May-11	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0005	-	0.12	0.12	<0.1	<0.1	0.24	<0.5	<0.5	8.0	-	250	<0.05	[4]
	Nov-10	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	-	-	-	<0.1	0.54	<0.5	<0.5	7.9	-	380	<0.05	[4]
	Oct-10	0.0003	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	-	-	-	<0.1	0.45	<0.5	<0.5	8.1	362	400	<0.05	[4]
	Sep-10	0.0003	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	-	-	-	<0.1	0.37	<0.5	<0.5	8.0	366	390	<0.05	[4]
	Aug-10	<0.0002	0.0002	<0.0002	<0.0002	<0.0004	<0.0001	-	-	-	-	<0.1	0.39	1.2	<0.5	7.9	272	250	<0.05	[4]
	Jul-10	<0.0002	0.0002	<0.0002	<0.0002	<0.0004	<0.0001	-	-	-	-	<0.1	1.50	1.9	<0.5	7.8	363	330	<0.05	[3]
	Jun-10	0.0006	<0.0002	0.0002	<0.0002	<0.0004	<0.0004	-	-	-	-	0.15	4.80	4.3	<0.5	7.6	382	360	<0.05	[3]
	May-10	<0.0005	<0.01	<0.0005	<0.0005	<0.0005	<0.01	-	-	-	-	<0.1	1.80	<0.5	<0.5	7.8	393	410	<0.05	[3]
HOR 004 05 (Jackfish River, Down Stream)	Nov-12	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	<0.1	<0.1	<0.1	<0.1	<0.1	1.1	<0.5	6.8	100	110	<0.05	
	Oct-12	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	8.4	180	190	<0.05	
	Oct-12	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	8.4	179	190	<0.05	Field Dup.
	Sep-12	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	7.8	170	180	<0.05	
	Sep-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.8	170	-	<0.05	Lab Dup.
	Aug-12	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	<0.1	<0.1	<0.1	<0.1	<0.1	2.6	<0.5	7.9	140	150	<0.05	
	Aug-12	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	<0.1	<0.1	<0.1	<0.1	<0.1	1.2	<0.5	7.7	140	160	<0.05	Field Dup.
	Jul-12	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0005	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	8.0	100	100	<0.05	[4]
	Jul-12	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	Lab Dup.
	Jun-12	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	-	-	-	<0.1	<0.1	1.2	<0.5	8.0	88	96	<0.05	
	Jun-12	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0005	-	<0.1	<0.1	<0.1	-	-	<0.5	<0.5	7.9	87	96	<0.05	Field Dup.
	May-12	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	7.7	89	94	<0.05	
	Nov-11	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	-	-	-	<0.1	<0.1	<0.5	<0.5	8.1	129	130	<0.05	
	Oct-11	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	-	-	-	<0.1	<0.1	<0.5	<0.5	8.1	127	130	<0.05	
	Oct-11	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	Lab Dup.
	Oct-11	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	<0.1	<0.1	<0.1	-	-	<0.5	<0.5	8.0	127	130	<0.05	Field Dup.
	Sep-11	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	8.2	160	160	<0.05	
	Aug-11	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	8.0	127	130	<0.05	
	Aug-11	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	8.0	127	130	<0.05	Field Dup.
	Aug-11	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	Lab Dup.
	Jul-11	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	-	-	-	<0.1	<0.1	<0.5	<0.5	8.1	101	100	<0.05	
	Jun-11	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	8.0	91	100	<0.05	
	Jun-11	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	-	-	-	<0.1	<0.1	-	-	-	-	-	-	Lab Dup.
	Jun-11	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0002	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	8.1	291	300	<0.05	Field Dup.
	May-11	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	7.9	-	63	<0.05	

TABLE 1
SURFACE WATER QUALITY ANALYSIS
CN HORNEPAYNE YARD, HORNEPAYNE, ONTARIO

Sample [1]	Date	Parameter (mg/L)																		Comments
		Benzene	Toluene	Ethyl-benzene	Xylene (-o)	Xylenes (-m,-p)	MTBE	F1 ($C6-C_{10}$)	F2 ($C_{10}-C_{16}$)	F3 ($C_{16}-C_{34}$)	F4 ($C_{34}-C_{50}$)	T.P.H. ($<C_{10}$)	T.E.H. ($C_{10}-C_{24}$)	Oil & Grease	Mineral Oil & Grease	pH	Alkalinity	Hardness	Lead	
HOR 004 05 (Jackfish River, Down Stream) (cont'd)	Nov-10	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	-	-	-	<0.1	<0.1	<0.5	<0.5	8.0	-	100	<0.005	
	Oct-10	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	-	-	-	<0.1	<0.1	0.90	<0.5	8.0	98	110	<0.005	
	Oct-10	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	-	-	-	<0.1	<0.1	<0.5	<0.5	8.1	102	110	<0.005	Field Dup.
	Sep-10	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	-	-	-	<0.1	<0.1	<0.5	<0.5	7.7	98	100	<0.005	
	Aug-10	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0002	-	-	-	-	<0.1	<0.1	<0.5	<0.5	8.0	121	120	<0.005	Field Dup.
	Aug-10	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0002	-	-	-	-	<0.1	<0.1	<0.5	<0.5	8.0	122	120	<0.005	
	Jul-10	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	-	-	-	<0.1	<0.1	0.80	<0.5	7.9	123	130	<0.005	
	Jun-10	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	-	-	-	<0.1	<0.1	<0.5	<0.5	7.9	109	110	<0.005	Field Dup.
	Jun-10	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	-	-	-	<0.1	<0.1	0.80	<0.5	7.9	107	110	<0.005	
	May-10	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0002	-	-	-	-	<0.1	<0.1	<0.5	<0.5	8.1	98	100	<0.005	
HOR 005 05 (Jackfish River, Mid-Stream)	Nov-12	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	<0.1	<0.1	<0.1	<0.1	<0.1	1.1	<0.5	6.8	100	110	<0.05	
	Oct-12	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0005	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	8.4	160	160	<0.05	[4]
	Sep-12	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	<0.1	<0.1	<0.1	<0.1	<0.1	1.2	<0.5	7.8	150	170	<0.05	
	Aug-12	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	<0.1	<0.1	<0.1	<0.1	<0.1	1.3	<0.5	7.3	130	150	<0.05	
	Aug-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	Lab Dup.
	Jul-12	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0005	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	7.9	99	100	<0.05	[4]
	Jul-12	-	-	-	-	-	<0.0005	-	-	-	-	-	-	-	-	-	-	-	-	Lab Dup.
	Jun-12	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	-	-	-	<0.1	0.24	<0.5	<0.5	7.9	86	95	<0.05	
	May-12	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	7.7	89	93	<0.05	
	Nov-11	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	-	-	-	<0.1	<0.1	<0.5	<0.5	8.1	126	120	<0.05	
	Oct-11	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	-	-	-	<0.1	<0.1	<0.5	<0.5	8.1	125	130	<0.05	
	Sep-11	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	-	-	-	<0.1	<0.1	<0.5	<0.5	7.8	156	150	<0.05	
	Aug-11	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	-	-	-	<0.1	<0.1	<0.5	<0.5	8.1	128	130	<0.05	
	Aug-11	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	Lab Dup.
	Jul-11	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	-	-	-	<0.1	<0.1	<0.5	<0.5	8.0	99	100	<0.05	
	Jul-11	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	Lab Dup.
	Jun-11	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	8.0	91	96	<0.05	
	Jun-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.0	91	-	-	Lab Dup.
	May-11	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	7.9	-	66	<0.05	
	Nov-10	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	-	-	-	<0.1	<0.1	<0.5	<0.5	7.8	-	110	<0.005	
	Oct-10	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	-	-	-	<0.1	<0.1	0.70	<0.5	7.9	102	110	<0.005	
	Sep-10	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	-	-	-	<0.1	<0.1	<0.5	<0.5	7.8	98	100	<0.005	
	Aug-10	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	-	-	-	<0.1	<0.1	<0.5	<0.5	8.0	122	120	<0.005	
	Jul-10	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	-	-	-	<0.1	<0.1	1.10	<0.5	7.9	123	120	<0.005	
	Jun-10	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	-	-	-	<0.1	<0.1	0.70	<0.5	7.8	107	110	<0.005	
	May-10	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0002	-	-	-	-	<0.1	<0.1	<0.5	<0.5	8.1	102	110	<0.005	
HOR 013 05 (West End)	Nov-12	0.0004	<0.0002	0.0005	<0.0002	0.0005	<0.002	-	0.19	0.32	<0.1	<0.1	0.48	1.3	<0.5	7.2	250	270	<0.05	[4]
	Oct-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Dry
	Sep-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Dry
	Aug-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Dry
	Jul-12	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0005	-	0.13	0.17	<0.1	<0.1	0.27	<0.5	<0.5	8.1	270	280	<0.05	[4]
	Jun-12	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.002	-	-	-	-	<0.1	0.73	1.1	<0.5	8.0	330	360	<0.05	[4]
	May-12	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.002	-	0.28	0.30	<0.1	<0.1	0.58	3.30	<0.5	7.9	330	380	<0.05	
	Nov-11	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	-	<0.1	0.11	<0.1	<0.1	0.24	<0.5	<0.5	8.2	239	240	<0.05	
	Oct-11	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0004	-	-	-	-	<0.1	0.24	<0.5	<0.5	8.2	184	200	<0.05	
	Aug-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Dry
	Jul-11	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.002	-	-	-	-	<0.1	0.22	<0.5	<0.5	8.0	267	290	<0.05	[4]

TABLE 1
SURFACE WATER QUALITY ANALYSIS
CN HORNEPAYNE YARD, HORNEPAYNE, ONTARIO

Sample [1]	Date	Parameter (mg/L)																		Comments
		Benzene	Toluene	Ethyl-benzene	Xylene (-o)	Xylenes (-m,-p)	MTBE	F1 (C_6-C_{10})	F2 (C_{10}-C_{16})	F3 (C_{16}-C_{34})	F4 (C_{34}-C_{50})	T.P.H. (<C_{10})	T.E.H. (C_{10}-C_{24})	Oil & Grease	Mineral Oil & Grease	pH	Alkalinity	Hardness	Lead	
HOR 013 05 (West End) (cont'd)	Jun-11	0.0005	<0.0002	0.0004	<0.0002	0.0005	<0.001	-	-	-	-	<0.1	0.58	<0.5	<0.5	8.0	312	330	<0.05	[4]
	May-11	0.0003	<0.0002	0.0005	<0.0002	0.0006	<0.0005	-	0.18	0.20	<0.1	<0.1	0.36	<0.5	<0.5	7.8	-	130	<0.05	
	Nov-10	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.004	-	-	-	-	<0.1	0.34	<0.5	<0.5	7.9	-	350	<0.005	
	Oct-10	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.001	-	-	-	-	<0.1	0.28	2.60	<0.5	8.0	278	310	<0.005	
	Sep-10	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.005	-	-	-	-	<0.1	0.23	3.40	<0.5	8.1	229	250	<0.005	
	Aug-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Dry
	Jul-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Dry
	Jun-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Dry
	May-10	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0002	-	-	-	-	<0.1	0.50	<0.5	<0.5	8.1	238	260	<0.005	[4]
Certificate of Approval [1]																				
C of A Criteria		5	0.8	2	40	32	200	1,000		1,000		-	-	-	-	6.5-8.5	-	-	[2]	-

Notes:
"-" = No Data
T.P.H. = Total Purgeable Hydrocarbons
T.E.H. = Total Extractable Hydrocarbons
MTBE = Methyl-t-butyl-Ether

1. Certificate of Approval No. 3528-83LQWT issued for the sets the effluent criteria as listed above.
2. The limit for Lead shall be determined based on the hardness of water. If the hardness is less than 30 mg/L, then the limit is 1 ug/L. If the hardness is between 30 mg/L and 80 mg/L, then the limit is 3 ug/L. When hardness is greater than 80 mg/L, then the limit is 5 ug/L.
3. Due to the level of petroleum hydrocarbon compounds beyond the appropriate range, the sample required dilution. Detection limits were adjusted accordingly.
4. Due to foaming, the sample required dilution. Detection limits were adjusted accordingly.

BOLD - Exceedance of C of A Criteria

TABLE 1
SURFACE WATER QUALITY ANALYSIS
CN HORNEPAYNE YARD, HORNEPAYNE, ONTARIO

TABLE 2
GROUNDWATER MONITORING DATA
CN HORNEPAYNE, HORNEPAYNE, ONTARIO

Well No.	Date	Top of Pipe Elev. (m)	Depth to Water (m)	Depth to LNAPL (m)	LNAPL Thickness (m)	GW Elev. (m)	Corrected GW Elev. [1] (m)	Comments
WEST END								
IMW-3	2-Oct-12	326.504	1.934	-	-	324.570	-	
	5-Jun-12	326.504	1.486	-	-	325.018	-	
	4-Oct-11	326.504	1.793	-	-	324.711	-	
	27-Jun-11	326.504	1.799	-	-	324.705	-	
	4-Oct-10	326.504	1.674	-	-	324.830	-	
	22-Jun-10	326.504	1.863	-	-	324.641	-	
IMW-4	2-Oct-12	324.406	1.350	-	-	323.056	-	
	5-Jun-12	324.406	0.824	-	-	323.582	-	
	4-Oct-11	324.406	1.196	-	-	323.210	-	
	27-Jun-11	324.406	1.129	-	-	323.277	-	
	4-Oct-10	324.406	1.014	-	-	323.392	-	
	22-Jun-10	324.406	1.290	-	-	323.116	-	
IMW-8	2-Oct-12	325.553	-	-	-	-	-	Dry, DTB - 2.163 m
	5-Jun-12	325.553	1.641	-	-	323.912	-	
	4-Oct-11	325.553	2.170	-	-	323.383	-	
	27-Jun-11	325.553	1.842	-	-	323.711	-	
	4-Oct-10	325.553	1.992	-	-	323.561	-	
	22-Jun-10	325.553	2.138	-	-	323.415	-	
MW-10	2-Oct-12	327.075	3.454	-	-	323.621	-	
	5-Jun-12	327.075	2.888	-	-	324.187	-	
	4-Oct-11	327.075	3.165	-	-	323.910	-	
	27-Jun-11	327.283	3.055	-	-	324.228	-	
	4-Oct-10	327.283	3.086	-	-	324.197	-	
	22-Jun-10	327.283	3.335	-	-	323.948	-	
MW-11	2-Oct-12	327.035	4.376	3.440	0.936	322.659	323.595	
	5-Jun-12	327.035	4.324	2.810	1.514	322.711	324.225	
	4-Oct-11	327.035	4.282	3.212	1.070	322.753	323.823	
	27-Jun-11	327.035	4.227	3.017	1.210	322.808	324.018	
	4-Oct-10	327.035	4.320	2.986	1.334	322.715	324.049	
	22-Jun-10	327.035	4.407	3.196	1.211	322.628	323.839	
MW-12	2-Oct-12	326.875	3.000	-	-	323.875	-	
	5-Jun-12	326.875	2.238	-	-	324.637	-	
	4-Oct-11	326.875	2.605	-	-	324.270	-	
	27-Jun-11	326.875	2.478	-	-	324.397	-	
	4-Oct-10	326.875	2.428	-	-	324.447	-	
	22-Jun-10	326.875	2.652	-	-	324.223	-	
MW-16	2-Oct-12	-	2.697	-	-	-	-	
	5-Jun-12	-	1.543	-	-	-	-	
	4-Oct-11	-	2.619	-	-	-	-	
	27-Jun-11	-	0.865	-	-	-	-	
	4-Oct-10	-	2.367	-	-	-	-	
	22-Jun-10	-	2.443	-	-	-	-	
MW-17	2-Oct-12	-	-	-	-	-	-	Dry, DTB - 2.180 m
	5-Jun-12	-	0.150	-	-	-	-	
	4-Oct-11	-	1.782	-	-	-	-	
	27-Jun-11	-	1.784	-	-	-	-	
	4-Oct-10	-	1.283	-	-	-	-	
	22-Jun-10	-	1.605	-	-	-	-	

TABLE 2
GROUNDWATER MONITORING DATA
CN HORNEPAYNE, HORNEPAYNE, ONTARIO

Well No.	Date	Top of Pipe Elev. (m)	Depth to Water (m)	Depth to LNAPL (m)	LNAPL Thickness (m)	GW Elev. (m)	Corrected GW Elev. [1] (m)	Comments
WEST END								
MW-119	2-Oct-12	327.641	3.735	-	-	323.906	-	
	5-Jun-12	327.641	3.230	-	-	324.411	-	
	4-Oct-11	327.641	3.520	-	-	324.121	-	
	27-Jun-11	327.641	3.400	-	-	324.241	-	
	4-Oct-10	327.641	3.381	-	-	324.260	-	
	22-Jun-10	327.641	3.519	-	-	324.122	-	
MW-120	2-Oct-12	327.331	2.060	-	-	325.271	-	
	5-Jun-12	327.331	0.960	-	-	326.371	-	
	4-Oct-11	327.331	1.595	-	-	325.736	-	
	27-Jun-11	327.331	1.119	-	-	326.212	-	
	4-Oct-10	327.331	1.144	-	-	326.187	-	
	22-Jun-10	327.331	1.213	-	-	326.118	-	
MW-122	2-Oct-12	327.344	3.174	3.167	0.007	324.170	324.177	
	5-Jun-12	327.344	2.455	2.436	0.019	324.889	324.908	
	4-Oct-11	327.344	2.940	2.897	0.043	324.404	324.447	
	27-Jun-11	327.344	2.734	2.695	0.039	324.610	324.649	
	4-Oct-10	327.344	2.760	2.702	0.058	324.584	324.642	
	22-Jun-10	327.344	2.938	2.896	0.042	324.406	324.448	
OW 8-1	2-Oct-12	327.506	3.766	-	-	323.740	-	
	5-Jun-12	327.506	2.830	-	-	324.676	-	
	4-Oct-11	327.506	3.313	-	-	324.193	-	
	27-Jun-11	327.506	3.335	-	-	324.171	-	
	4-Oct-10	327.506	3.221	-	-	324.285	-	
	22-Jun-10	327.506	3.438	-	-	324.068	-	
OW 8-2	2-Oct-12	327.474	3.632	-	-	323.842	-	
	5-Jun-12	327.474	2.811	-	-	324.663	-	
	4-Oct-11	327.474	3.374	-	-	324.100	-	
	27-Jun-11	327.474	3.193	-	-	324.281	-	
	4-Oct-10	327.474	3.145	-	-	324.329	-	
	22-Jun-10	327.474	3.384	-	-	324.090	-	
OW 8-3	2-Oct-12	327.669	3.997	3.960	0.037	323.672	323.709	
	5-Jun-12	327.669	3.380	3.378	0.002	324.289	324.291	
	4-Oct-11	327.669	3.775	-	-	323.894	-	
	27-Jun-11	327.669	3.552	3.548	0.004	324.117	324.121	
	4-Oct-10	327.669	3.564	-	-	324.105	-	
	22-Jun-10	327.669	3.727	3.722	0.005	323.942	323.947	
OW 9-3	2-Oct-12	325.520	1.475	-	-	324.045	-	
	5-Jun-12	325.520	0.570	-	-	324.950	-	
	4-Oct-11	325.520	1.198	-	-	324.322	-	
	27-Jun-11	325.520	0.964	-	-	324.556	-	
	4-Oct-10	325.520	0.985	-	-	324.535	-	
	22-Jun-10	325.520	1.219	-	-	324.301	-	
EAST END								
MW-20	2-Oct-12	324.575	2.410	-	-	322.165	-	
	5-Jun-12	324.575	1.435	-	-	323.140	-	
	4-Oct-11	324.575	2.147	-	-	322.428	-	
	28-Jun-11	324.575	1.690	-	-	322.885	-	
	5-Oct-10	324.575	1.752	-	-	322.823	-	
	22-Jun-10	324.575	2.179	-	-	322.396	-	

TABLE 2
GROUNDWATER MONITORING DATA
CN HORNEPAYNE, HORNEPAYNE, ONTARIO

Well No.	Date	Top of Pipe Elev. (m)	Depth to Water (m)	Depth to LNAPL (m)	LNAPL Thickness (m)	GW Elev. (m)	Corrected GW Elev. [1] (m)	Comments
EAST END								
MW-21	2-Oct-12	325.243	4.816	4.504	0.312	320.427	320.739	
	5-Jun-12	324.475	4.226	3.412	0.814	320.249	321.063	
	4-Oct-11	325.243	4.625	4.335	0.290	320.618	320.908	
	28-Jun-11	324.475	3.701	3.316	0.385	320.774	321.159	
	5-Oct-10	324.475	3.705	3.193	0.512	320.770	321.282	
	22-Jun-10	324.475	3.822	3.435	0.387	320.653	321.040	
MW-24	2-Oct-12	325.870	4.321	-	-	321.549	-	
	5-Jun-12	325.870	1.644	-	-	324.226	-	
	4-Oct-11	325.870	2.770	-	-	323.100	-	
	28-Jun-11	325.870	2.049	-	-	323.821	-	
	5-Oct-10	325.870	1.838	-	-	324.032	-	
	22-Jun-10	325.870	2.295	-	-	323.575	-	
MW-40	2-Oct-12	324.140	3.287	-	-	320.853	-	
	5-Jun-12	324.140	1.823	-	-	322.317	-	
	4-Oct-11	324.140	2.965	-	-	321.175	-	
	28-Jun-11	324.140	2.756	-	-	321.384	-	
	5-Oct-10	324.140	2.336	-	-	321.804	-	
	22-Jun-10	324.140	2.961	-	-	321.179	-	
MW-43	2-Oct-12	323.695	2.550	-	-	321.145	-	
	5-Jun-12	323.695	1.474	-	-	322.221	-	
	4-Oct-11	323.695	2.239	-	-	321.456	-	
	28-Jun-11	323.695	1.937	-	-	321.758	-	
	5-Oct-10	323.695	1.929	-	-	321.766	-	
	22-Jun-10	323.695	2.225	-	-	321.470	-	
MW-46	2-Oct-12	324.385	2.571	-	-	321.814	-	
	5-Jun-12	324.385	1.795	-	-	322.590	-	
	4-Oct-11	324.385	2.316	-	-	322.069	-	
	28-Jun-11	324.385	2.028	-	-	322.357	-	
	5-Oct-10	324.385	2.022	-	-	322.363	-	
	22-Jun-10	324.385	2.366	-	-	322.019	-	
MW-49	2-Oct-12	325.260	2.695	-	-	322.565	-	
	5-Jun-12	325.260	0.980	-	-	324.280	-	
	4-Oct-11	325.260	2.338	-	-	322.922	-	
	28-Jun-11	325.260	1.161	-	-	324.099	-	
	5-Oct-10	325.260	1.664	-	-	323.596	-	
	22-Jun-10	325.260	2.370	-	-	322.890	-	
MW-51	2-Oct-12	324.235	3.567	3.476	0.091	320.668	320.759	
	5-Jun-12	324.235	2.374	-	-	321.861	-	
	4-Oct-11	324.235	3.310	3.290	0.020	320.925	320.945	
	28-Jun-11	324.235	3.016	-	-	321.219	-	
	5-Oct-10	324.235	2.903	2.865	0.038	321.332	321.370	
	22-Jun-10	324.235	3.171	3.165	0.006	321.064	321.070	
MW-52	2-Oct-12	323.575	2.720	2.661	0.059	320.855	320.914	
	5-Jun-12	323.575	1.615	-	-	321.960	-	
	4-Oct-11	323.575	2.514	-	-	321.061	-	
	28-Jun-11	323.575	2.022	-	-	321.553	-	
	5-Oct-10	323.575	2.050	-	-	321.525	-	
	22-Jun-10	323.575	2.345	-	-	321.230	-	

TABLE 2
GROUNDWATER MONITORING DATA
CN HORNEPAYNE, HORNEPAYNE, ONTARIO

Well No.	Date	Top of Pipe Elev. (m)	Depth to Water (m)	Depth to LNAPL (m)	LNAPL Thickness (m)	GW Elev. (m)	Corrected GW Elev. [1] (m)	Comments
EAST END								
MW-101	2-Oct-12	324.120	3.590	3.256	0.334	320.530	320.864	
	5-Jun-12	324.120	2.209	-	-	321.911	-	
	4-Oct-11	324.120	3.367	3.072	0.295	320.753	321.048	
	28-Jun-11	324.120	3.098	2.835	0.263	321.022	321.285	
	5-Oct-10	324.120	2.879	2.697	0.182	321.241	321.423	
	22-Jun-10	324.120	3.242	2.957	0.285	320.878	321.163	
MW-102	2-Oct-12	324.160	3.364	3.350	0.014	320.796	320.810	
	5-Jun-12	324.160	2.270	-	-	321.890	-	
	4-Oct-11	324.160	3.160	-	-	321.000	-	
	28-Jun-11	324.160	2.892	-	-	321.268	-	
	5-Oct-10	324.160	2.730	-	-	321.430	-	
	22-Jun-10	324.160	3.024	-	-	321.136	-	
MW-103	2-Oct-12	323.570	2.975	-	-	320.595	-	
	5-Jun-12	323.570	1.717	-	-	321.853	-	
	4-Oct-11	323.570	2.607	-	-	320.963	-	
	28-Jun-11	323.570	2.397	-	-	321.173	-	
	5-Oct-10	323.570	2.150	-	-	321.420	-	
	22-Jun-10	323.570	2.645	-	-	320.925	-	
MW-104	2-Oct-12	323.910	3.490	3.020	0.470	320.420	320.890	
	5-Jun-12	323.910	2.042	-	-	321.868	-	
	4-Oct-11	323.910	3.026	2.898	0.128	320.884	321.012	
	28-Jun-11	323.910	2.508	-	-	321.402	-	
	5-Oct-10	323.910	2.490	-	-	321.420	-	
	22-Jun-10	323.910	2.761	-	-	321.149	-	
MW-106	2-Oct-12	323.900	3.292	2.728	0.564	320.608	321.172	
	5-Jun-12	323.900	1.610	1.582	0.028	322.290	322.318	
	4-Oct-11	323.900	2.703	2.581	0.122	321.197	321.319	
	28-Jun-11	323.900	1.874	-	-	322.026	-	
	5-Oct-10	323.900	2.035	-	-	321.865	-	
	22-Jun-10	323.900	2.426	-	-	321.474	-	
MW-107	2-Oct-12	324.010	2.727	2.720	0.007	321.283	321.290	
	5-Jun-12	324.010	1.329	-	-	322.681	-	
	4-Oct-11	324.010	2.482	-	-	321.528	-	
	28-Jun-11	324.010	1.572	-	-	322.438	-	
	5-Oct-10	324.010	1.863	-	-	322.147	-	
	22-Jun-10	324.010	2.322	-	-	321.688	-	
MW-108	2-Oct-12	324.870	2.403	-	-	322.467	-	
	5-Jun-12	324.870	0.711	-	-	324.159	-	
	4-Oct-11	324.870	2.042	-	-	322.828	-	
	28-Jun-11	324.870	0.995	-	-	323.875	-	
	5-Oct-10	324.870	1.088	-	-	323.782	-	
	22-Jun-10	324.870	2.374	-	-	322.496	-	
MW-109	2-Oct-12	325.480	3.170	3.137	0.033	322.310	322.343	
	5-Jun-12	325.480	2.006	1.798	0.208	323.474	323.682	
	4-Oct-11	325.480	2.932	2.890	0.042	322.548	322.590	
	28-Jun-11	325.480	2.210	1.889	0.321	323.270	323.591	
	5-Oct-10	325.480	2.498	-	-	322.982	-	
	22-Jun-10	325.480	2.935	-	-	322.545	-	

TABLE 2
GROUNDWATER MONITORING DATA
CN HORNEPAYNE, HORNEPAYNE, ONTARIO

Well No.	Date	Top of Pipe Elev. (m)	Depth to Water (m)	Depth to LNAPL (m)	LNAPL Thickness (m)	GW Elev. (m)	Corrected GW Elev. [1] (m)	Comments
EAST END								
MW-114	2-Oct-12	325.410	-	-	-	-	-	Dry
	5-Jun-12	325.410	2.867	-	-	322.543	-	
	4-Oct-11	325.410	3.619	-	-	321.791	-	
	28-Jun-11	325.410	3.341	-	-	322.069	-	
	5-Oct-10	325.410	3.171	-	-	322.239	-	
	22-Jun-10	325.410	3.577	-	-	321.833	-	
MW-115	2-Oct-12	325.910	3.375	-	-	322.535	-	
	5-Jun-12	325.910	2.210	-	-	323.700	-	
	4-Oct-11	325.910	3.037	-	-	322.873	-	
	28-Jun-11	325.910	2.769	-	-	323.141	-	
	5-Oct-10	325.910	2.530	-	-	323.380	-	
	22-Jun-10	325.910	3.037	-	-	322.873	-	
MW-126	2-Oct-12	325.815	3.377	3.320	0.057	322.438	322.495	
	5-Jun-12	325.815	1.244	1.170	0.074	324.571	324.645	
	4-Oct-11	325.815	3.631	2.833	0.798	322.184	322.982	
	28-Jun-11	325.815	1.919	1.629	0.290	323.896	324.186	
	5-Oct-10	325.815	2.840	1.997	0.843	322.975	323.818	
	22-Jun-10	325.815	4.188	2.850	1.338	321.627	322.965	
OW 3-2	2-Oct-12	325.340	3.142	3.071	0.071	322.198	322.269	
	5-Jun-12	325.340	0.954	-	-	324.386	-	
	4-Oct-11	325.340	2.874	2.802	0.072	322.466	322.538	
	28-Jun-11	325.340	1.457	-	-	323.883	-	
	5-Oct-10	325.340	2.255	2.108	0.147	323.085	323.232	
	22-Jun-10	325.340	2.938	2.835	0.103	322.402	322.505	
OW 5-1	2-Oct-12	324.365	4.280	-	-	320.085	-	
	5-Jun-12	324.365	3.085	-	-	321.280	-	
	4-Oct-11	324.365	4.096	-	-	320.269	-	
	28-Jun-11	324.365	2.919	-	-	321.446	-	
	5-Oct-10	324.365	2.766	-	-	321.599	-	
	22-Jun-10	324.365	3.258	-	-	321.107	-	
OW 5-2	2-Oct-12	323.600	2.758	2.663	0.095	320.842	320.937	
	5-Jun-12	323.600	1.634	1.603	0.031	321.966	321.997	
	4-Oct-11	323.600	2.548	2.470	0.078	321.052	321.130	
	28-Jun-11	323.600	2.607	2.215	0.392	320.993	321.385	
	5-Oct-10	323.600	2.138	-	-	321.462	-	
	22-Jun-10	323.600	2.405	2.374	0.031	321.195	321.226	
OW 5-3	2-Oct-12	323.675	3.983	-	-	319.692	-	
	5-Jun-12	323.675	1.964	-	-	321.711	-	
	4-Oct-11	323.675	2.817	-	-	320.858	-	
	28-Jun-11	323.675	2.580	-	-	321.095	-	
	5-Oct-10	323.675	2.477	-	-	321.198	-	
	22-Jun-10	323.675	2.708	-	-	320.967	-	

Notes:
"-" = No Data
1. Density correction applied to groundwater elevation for wells where free product exists.

TABLE 3
EAST END GROUNDWATER LABORATORY RESULTS
CN HORNEPAYNE YARD, HORNEPAYNE, ONTARIO

Well No.	Date	Parameter [1]								Comments
		Benzene	Toluene	Ethyl-benzene	Xylenes (o,-m,-p)	F1 (C_6-C_{10})	F2 (C_{10}-C_{16})	F3 (C_{16}-C_{34})	F4 (C_{34}-C_{50})	
EAST END - TABLE 9 (Within 30 m of the Little Jackfish River)										
MW-20	3-Oct-12	-	-	-	-	-	**13,000**	**7,500**	<100	
	6-Jun-12	0.60	<0.2	0.46	0.9	39	**5,800**	**3,300**	180	
	5-Oct-11	-	-	-	-	-	**2,900**	**1,500**	<100	
	29-Jun-11	<0.2	<0.2	<0.2	<0.4	<100	**2,200**	**920**	<100	
	7-Oct-10	-	-	-	-	-	**3,600**	**1,700**	<100	
	22-Jun-10	0.50	<0.2	0.9	2.7	110	**2,600**	**1,100**	<100	
MW-40	3-Oct-12	-	-	-	-	-	**410**	280	<100	
	6-Jun-12	<0.2	<0.2	<0.2	<0.4	<25	<100	<100	<100	
	5-Oct-11	-	-	-	-	-	**930**	**630**	<100	
	29-Jun-11	<0.2	<0.2	<0.2	<0.4	<100	<100	<100	<100	
	7-Oct-10	-	-	-	-	-	<100	<100	<100	
	22-Jun-10	<0.2	<0.2	<0.2	<0.4	<100	<100	<100	<100	
MW-43	3-Oct-12	-	-	-	-	-	**270**	<100	<100	[5]
	6-Jun-12	<0.2	<0.2	<0.2	0.4	<25	**230**	<100	<100	[5]
	5-Oct-11	-	-	-	-	-	**300**	110	<100	
	29-Jun-11	<0.2	<0.2	<0.2	<0.4	<100	**830**	300	<100	
	7-Oct-10	-	-	-	-	-	**660**	170	<100	
	22-Jun-10	<0.2	<0.2	<0.2	<0.4	<100	**740**	400	<100	
MW-46	3-Oct-12	-	-	-	-	-	**1,400**	**2,000**	**550**	[5]
	6-Jun-12	<0.2	<0.2	<0.2	<0.4	<100	<100	<100	<100	
	5-Oct-11	-	-	-	-	-	**620**	350	<100	
	29-Jun-11	<0.2	<0.2	<0.2	<0.4	<100	<100	<100	<100	
	7-Oct-10	-	-	-	-	-	<100	<100	<100	
	7-Oct-10	-	-	-	-	-	<100	<100	<100	Field Dup.
	22-Jun-10	<0.2	<0.2	<0.2	<0.4	<100	<100	<100	<100	
MW-52	3-Oct-12	-	-	-	-	-	**190,000**	**50,000**	170	[5]
	6-Jun-12	<0.2	<0.2	6.1	6.8	390	**54,000**	**16,000**	120	
	6-Jun-12	<0.2	<0.2	3.1	2.4	560	**38,000**	**11,000**	120	Field Dup.
	5-Oct-11	-	-	-	-	-	**33,000**	**10,000**	<100	
	5-Oct-11	-	-	-	-	-	**9,700**	**2,800**	<100	Lab Dup.
	5-Oct-11	-	-	-	-	-	**17,000**	**4,800**	<100	Field Dup.
	29-Jun-11	6.40	<0.2	52	2.8	280	**5,500**	**1,400**	<100	
	29-Jun-11	6.10	<0.2	51	2.3	300	**8,900**	**2,700**	<100	Field Dup.
	7-Oct-10	-	-	-	-	-	**600**	150	<100	
	22-Jun-10	2.90	0.40	24	2.0	<100	**670**	<100	<100	Field Dup.
	22-Jun-10	2.60	0.30	22	2.1	<100	**560**	<100	<100	

TABLE 3
EAST END GROUNDWATER LABORATORY RESULTS
CN HORNEPAYNE YARD, HORNEPAYNE, ONTARIO

Well No.	Date	Parameter [1]								Comments
		Benzene	Toluene	Ethyl-benzene	Xylenes (o,-m,-p)	F1 (C_6-C_{10})	F2 (C_{10}-C_{16})	F3 (C_{16}-C_{34})	F4 (C_{34}-C_{50})	
EAST END - TABLE 2 (Within 30 m of the Little Jackfish River)										
OW 5-1	3-Oct-12	-	-	-	-	-	**6,000**	**3,300**	<100	
	3-Oct-12	-	-	-	-	-	**8,400**	**4,400**	<100	[5], Field Dup.
	6-Jun-12	<0.2	<0.2	<0.2	<0.4	<25	**330**	160	<100	
	5-Oct-11	-	-	-	-	-	**3,100**	**1,800**	120	
	29-Jun-11	<0.2	<0.2	<0.2	<0.4	<100	**210**	120	<100	
	7-Oct-10	-	-	-	-	-	**860**	**590**	<100	
	22-Jun-10	-	-	-	-	-	**1,800**	**1,000**	<100	Lab Dup.
	22-Jun-10	<0.2	<0.2	<0.2	<0.4	<100	**1,800**	**870**	<100	
OW 5-2	3-Oct-12	-	-	-	-	-	**470,000**	**210,000**	**7,700**	
	6-Jun-12	-	-	-	-	-	-	-	-	Dry
	5-Oct-11	-	-	-	-	-	**700,000**	**340,000**	**13,000**	
	29-Jun-11	4.40	0.50	4.6	73.0	**3,100**	**390,000**	**160,000**	**6,700**	
	7-Oct-10	-	-	-	-	-	**720,000**	**290,000**	**<10,000**	[4]
	22-Jun-10	<0.2	<0.2	<0.2	<0.4	**18,000**	**3,000,000**	**1,300,000**	**33,000**	[4]
OW 5-3	3-Oct-12	-	-	-	-	-	**15,000**	**9,500**	**690**	
	6-Jun-12	<0.2	0.78	<0.2	<0.4	<25	**15,000**	**8,100**	440	
	5-Oct-11	-	-	-	-	-	**11,000**	**7,000**	**540**	
	29-Jun-11	4.00	<0.2	<0.2	<0.4	**480**	**5,900**	**3,100**	190	
	7-Oct-10	-	-	-	-	-	**3,300**	**1,900**	<100	
	22-Jun-10	0.60	<0.2	<0.2	<0.4	<100	**10,000**	**4,400**	<100	
EAST END - TABLE 3 (Outside 30 m of the Little Jackfish River)										
MW-21	3-Oct-12	-	-	-	-	-	**560,000**	**240,000**	**8,800**	[5]
	5-Oct-11	-	-	-	-	-	**1,600,000**	**680,000**	**26,000**	
	7-Oct-10	-	-	-	-	-	**1,600,000**	**610,000**	**11,000**	[4]
MW-24	3-Oct-12	-	-	-	-	-	**1,100**	480	<100	[5]
	5-Oct-11	-	-	-	-	-	**290**	120	<100	
	5-Oct-11	-	-	-	-	-	**270**	110	<100	Lab Dup.
	7-Oct-10	-	-	-	-	-	<100	<100	<100	
MW-49	3-Oct-12	-	-	-	-	-	**3,300**	**4,500**	**510**	
	5-Oct-11	-	-	-	-	-	**120,000**	**130,000**	**14,000**	
	7-Oct-10	-	-	-	-	-	**1,500**	**1,200**	<100	
MW-51	3-Oct-12	-	-	-	-	-	**600,000**	**310,000**	**21,000**	
	5-Oct-11	-	-	-	-	-	**3,000,000**	**1,600,000**	**100,000**	
	7-Oct-10	-	-	-	-	-	**230,000**	**96,000**	**5,500**	[4]

TABLE 3
EAST END GROUNDWATER LABORATORY RESULTS
CN HORNEPAYNE YARD, HORNEPAYNE, ONTARIO

Well No.	Date	Parameter [1]								Comments
		Benzene	Toluene	Ethyl-benzene	Xylenes (o,-m,-p)	F1 (C_6-C_{10})	F2 (C_{10}-C_{16})	F3 (C_{16}-C_{34})	F4 (C_{34}-C_{50})	
EAST END - TABLE 3 (Outside 30 m of the Little Jackfish River)										
MW-101	3-Oct-12	-	-	-	-	-	**380,000**	**160,000**	**6,500**	[5]
	5-Oct-11	-	-	-	-	-	**2,300,000**	**1,000,000**	**44,000**	
	7-Oct-10	-	-	-	-	-	**1,800,000**	**620,000**	**13,000**	[4]
MW-102	3-Oct-12	-	-	-	-	-	**1,500**	**690**	<100	[5]
	5-Oct-11	-	-	-	-	-	**1,800**	**840**	<100	
	7-Oct-10	-	-	-	-	-	**1,700**	**760**	<100	
MW-103	3-Oct-12	-	-	-	-	-	**570**	470	<100	[5]
	5-Oct-11	-	-	-	-	-	**2,100**	**1,200**	<100	
	5-Oct-11	-	-	-	-	-	**1,200**	**580**	<100	
	7-Oct-10	-	-	-	-	-	100	190	<100	
MW-104	3-Oct-12	-	-	-	-	-	**1,400,000**	**420,000**	**1,700**	[5]
	5-Oct-11	-	-	-	-	-	**1,100,000**	**340,000**	**3,200**	
	7-Oct-10	-	-	-	-	-	**17,000**	**4,600**	<100	
MW-106	6-Oct-12	-	-	-	-	-	**280,000**	**90,000**	**630**	
	5-Oct-11	-	-	-	-	-	**4,900,000**	**1,700,000**	<100	
	7-Oct-10	-	-	-	-	-	**220,000**	**79,000**	210	
MW-107	6-Oct-12	-	-	-	-	-	**170,000**	**69,000**	340	
	5-Oct-11	-	-	-	-	-	**65,000**	**31,000**	170	
	7-Oct-10	-	-	-	-	-	**43,000**	**19,000**	<100	
MW-108	6-Oct-12	-	-	-	-	-	**1,400**	**690**	<100	
	5-Oct-11	-	-	-	-	-	**4,500**	**2,200**	140	
	7-Oct-10	-	-	-	-	-	**1,600**	400	<100	
MW-109	3-Oct-12	-	-	-	-	-	**560,000**	**210,000**	**6,400**	
	5-Oct-11	-	-	-	-	-	**150,000**	**58,000**	**1,300**	
	7-Oct-10	-	-	-	-	-	**42,000**	**14,000**	<100	
MW-114	3-Oct-12	-	-	-	-	-	-	-	-	Dry
	5-Oct-11	-	-	-	-	-	**77,000**	**44,000**	**1,100**	
	7-Oct-10	-	-	-	-	-	**87,000**	**37,000**	**1,100**	
MW-115	3-Oct-12	-	-	-	-	-	**3,900**	**1,500**	<100	
	3-Oct-12	-	-	-	-	-	**3,300**	**1,300**	<100	Lab Dup.
	5-Oct-11	-	-	-	-	-	**410**	130	<100	
	7-Oct-10	-	-	-	-	-	<100	<100	<100	
MW-126	3-Oct-12	-	-	-	-	-	**1,000,000**	**440,000**	**32,000**	
	5-Oct-11	-	-	-	-	-	**1,300,000**	**520,000**	**45,000**	
	7-Oct-10	-	-	-	-	-	**690,000**	**260,000**	**21,000**	

TABLE 3
EAST END GROUNDWATER LABORATORY RESULTS
CN HORNEPAYNE YARD, HORNEPAYNE, ONTARIO

Well No.	Date	Parameter [1]								Comments
		Benzene	Toluene	Ethyl-benzene	Xylenes (o,-m,-p)	F1 (C_6-C_{10})	F2 (C_{10}-C_{16})	F3 (C_{16}-C_{34})	F4 (C_{34}-C_{50})	
EAST END - TABLE 3 (Outside 30 m of the Little Jackfish River)										
OW 3-2	3-Oct-12	-	-	-	-	-	**190,000**	**81,000**	**1,900**	
	5-Oct-11	-	-	-	-	-	**3,000,000**	**1,200,000**	**30,000**	
	7-Oct-10	-	-	-	-	-	**1,000,000**	**390,000**	**11,000**	
QA / QC										
Method Blank	3-Oct-12	-	-	-	-	-	<100	<100	<100	
Method Blank	6-Jun-12	<0.2	<0.2	<0.2	<0.4	<25	-	-	-	
Method Blank	5-Oct-11	-	-	-	-	-	<100	<100	<100	
Method Blank	29-Jun-11	<0.2	<0.2	<0.2	<0.4	-	-	-	-	
Travel Blank	3-Oct-12	-	-	-	-	-	<100	<100	<100	
Travel Blank	6-Jun-12	<0.2	<0.2	<0.2	<0.4	<25	<100	<100	<100	
Travel Blank	5-Oct-11	-	-	-	-	-	<100	<100	<100	
Travel Blank	29-Jun-11	<0.2	<0.2	<0.2	<0.4	<100	<100	<100	<100	
Travel Blank	7-Oct-10	<0.2	<0.2	<0.2	<0.4	<100	<100	<100	<100	
Travel Blank	22-Jun-10	<0.2	<0.2	<0.2	<0.4	<100	<100	<100	<100	
MOE										
Table 3 [2]		(430) 44	(18,000) 18,000	(2,300) 2,300	(4,200) 4,200	(750) 750	(150) 150	(500) 500	(500) 500	-
Table 9 [3]		44	14,000	1,800	3,300	420	150	500	500	-

Notes:
"-" = No Data

1. All concentrations in micrograms per litre (µg/L).
2. MOE 2011 - Ontario Ministry of Environment. Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act (All Types of Property) Table 3 - Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition ( ) - Criterion value in brackets applies to medium and fine textured soils.
3. MOE 2011 - Ontario Ministry of Environment. Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act (All Types of Property) Table 9 - Non-Potable Groundwater
4. Due to the high concentration of target analytes, the sample required dilution. The reporting limits were adjusted accordingly.
5. The sample bottle contained visible sediment, which was included in the analysis as per the Protocol for Analytical Methods Use in the Assessment of Properties, under part XV.1 of the Environmental Protection Act.

BOLD = Parameter exceeds MOE Table 9 Criteria
BOLD = Parameter exceeds MOE Table 3 Criteria

TABLE 4
EAST END GENERAL GROUNDWATER FIELD CHEMISTRY
CN HORNEPAYNE YARD, HORNEPAYNE, ONTARIO

Well No.	Date	pH (units)	E.C. (µS/cm)	D.O. (mg/L)	Temp. (°C)	O.R.P. (mV)	Colour	Turbidity	Sheen	Odour	Comments
EAST END											
MW-20	3-Oct-12	7.10	883.0	2.08	13.3	-123	dark grey	turbid	none	none	
	6-Jun-12	7.03	811.0	3.19	17.3	-59	beige	turbid	none	h/c odour	
	5-Oct-11	7.01	665.0	2.30	11.7	-123	beige	turbid	none	h/c odour	
	29-Jun-11	6.55	851.0	3.24	13.4	-98	beige	slightly turbid	none	h/c odour	
	7-Oct-10	6.88	827.0	2.93	15.8	-84	yellow	turbid	none	h/c odour	
	22-Jun-10	6.86	569.0	4.91	9.4	-76	black	turbid	none	h/c odour	
MW-21	3-Oct-12	7.40	592.0	2.05	13.0	-121	light grey	turbid	h/c sheen	h/c odour	
	5-Oct-11	6.95	352.0	4.35	11.1	-48	clear	clear	h/c sheen	h/c odour	
	7-Oct-10	7.29	590.0	1.51	16.7	under range	clear	clear	h/c sheen	h/c odour	
MW-24	3-Oct-12	7.20	733.0	3.85	10.2	-50	light grey	turbid	h/c sheen	h/c odour	
	5-Oct-11	7.39	411.0	4.71	9.2	60	beige	turbid	none	none	
	7-Oct-10	7.45	690.0	4.63	15.7	-20	clear	clear	none	none	
MW-40	3-Oct-12	7.30	763.0	2.94	11.6	-36	light grey	turbid	none	none	
	6-Jun-12	7.71	716.0	3.82	14.0	33	beige	turbid	none	none	
	5-Oct-11	7.13	496.0	3.42	11.3	-13	light yellow	turbid	h/c sheen	h/c odour	
	29-Jun-11	6.78	754.0	7.95	13.3	-54	beige	turbid	none	none	
	7-Oct-10	7.09	914.0	2.58	15.1	-45	white	turbid	none	none	
	22-Jun-10	7.07	504.0	7.49	10.6	115	beige	slightly turbid	none	h/c odour	

TABLE 4
EAST END GENERAL GROUNDWATER FIELD CHEMISTRY
CN HORNEPAYNE YARD, HORNEPAYNE, ONTARIO

Well No.	Date	pH (units)	E.C. (µS/cm)	D.O. (mg/L)	Temp. (°C)	O.R.P. (mV)	Colour	Turbidity	Sheen	Odour	Comments
EAST END											
MW-43	3-Oct-12	7.00	854.0	1.19	11.4	-137	light grey	turbid	none	none	
	6-Jun-12	7.50	690.0	2.67	13.4	-65	beige	turbid	none	none	
	5-Oct-11	7.25	360.0	1.06	11.2	-123	beige	turbid	h/c sheen	h/c odour	
	29-Jun-11	6.59	568.0	6.89	12.1	-74	beige	turbid	none	none	
	7-Oct-10	7.21	807.0	2.15	14.0	-76	beige	turbid	h/c sheen	h/c odour	
	22-Jun-10	7.08	430.0	3.22	8.6	-51	beige	turbid	none	none	
MW-46	3-Oct-12	6.90	830.0	2.96	12.3	-83	light grey	turbid	none	none	
	6-Jun-12	7.08	892.0	3.06	15.7	-52	beige	turbid	none	none	
	5-Oct-11	7.09	589.0	2.98	10.6	-62	beige	turbid	none	none	
	29-Jun-11	6.41	945.0	3.62	10.6	-78	beige	turbid	none	none	
	7-Oct-10	7.23	901.0	3.39	14.9	-77	beige	turbid	none	none	
	22-Jun-10	6.92	561.0	7.48	12.5	-25	grey	turbid	none	none	
MW-49	3-Oct-12	-	-	-	-	-	-	-	-	-	Insufficient Sample
	5-Oct-11	-	-	-	-	-	-	-	-	-	Insufficient Sample
	7-Oct-10	6.87	984.0	2.36	15.7	14	yellow	clear	h/c sheen	h/c odour	
MW-51	3-Oct-12	7.40	534.0	2.27	11.5	-116	dark grey	turbid	h/c sheen	h/c odour	
	5-Oct-11	6.97	579.0	1.48	10.3	-69	beige	turbid	h/c sheen	h/c odour	
	7-Oct-10	6.94	1,113.0	1.40	15.6	-28	light grey	turbid	h/c sheen	h/c odour	

TABLE 4
EAST END GENERAL GROUNDWATER FIELD CHEMISTRY
CN HORNEPAYNE YARD, HORNEPAYNE, ONTARIO

Well No.	Date	pH (units)	E.C. (µS/cm)	D.O. (mg/L)	Temp. (°C)	O.R.P. (mV)	Colour	Turbidity	Sheen	Odour	Comments
EAST END											
MW-52	3-Oct-12	6.90	975.0	2.03	10.9	-140	light grey	turbid	h/c sheen	h/c odour	
	6-Jun-12	7.46	479.0	2.68	14.4	-61	beige	turbid	h/c sheen	h/c odour	
	5-Oct-11	6.94	810.0	2.41	9.4	-91	clear	turbid	none	none	
	29-Jun-11	6.81	904.0	3.30	11.6	-72	clear	turbid	none	h/c odour	
	7-Oct-10	6.95	929.0	1.72	14.6	-74	beigr	turbid	none	h/c odour	
	22-Jun-10	6.96	258.0	6.22	9.9	-93	clear	slightly turbid	none	h/c odour	
MW-101	3-Oct-12	7.30	984.0	1.91	10.9	-114	clear	turbid	h/c sheen	h/c odour	
	5-Oct-11	7.41	491.0	3.06	10.2	-88	clear	turbid	h/c sheen	h/c odour	
	7-Oct-10	7.02	1,203.0	0.93	15.8	-88	clear	clear	h/c sheen	h/c odour	
MW-102	3-Oct-12	7.30	717.0	1.80	12.6	-111	dark grey	turbid	h/c sheen	h/c odour	
	5-Oct-11	7.22	800.0	1.30	9.6	-100	dark grey	turbid	h/c sheen	h/c odour	
	7-Oct-10	7.15	1,085.0	1.65	13.7	-45	dark grey	turbid	h/c sheen	h/c odour	
MW-103	3-Oct-12	7.20	1,020.0	1.31	11.0	-33	clear	clear	none	none	
	5-Oct-11	7.07	548.0	6.27	10.7	71	clear	turbid	none	none	
	7-Oct-10	6.91	1,046.0	1.65	15.6	-42	clear	slightly turbid	none	none	
MW-104	3-Oct-12	7.10	112.0	1.99	11.8	-144	orange/brown	turbid	h/c sheen	h/c odour	
	5-Oct-11	6.69	384.0	9.26	12.0	-53	yellow	turbid	h/c sheen	h/c odour	
	7-Oct-10	6.81	994.0	2.71	16.2	-32	yellow	turbid	h/c sheen	h/c odour	

TABLE 4
EAST END GENERAL GROUNDWATER FIELD CHEMISTRY
CN HORNEPAYNE YARD, HORNEPAYNE, ONTARIO

Well No.	Date	pH (units)	E.C. (µS/cm)	D.O. (mg/L)	Temp. (°C)	O.R.P. (mV)	Colour	Turbidity	Sheen	Odour	Comments
EAST END											
MW-106	3-Oct-12	6.80	852.0	3.16	11.8	-137	yellow	turbid	h/c sheen	h/c odour	
	5-Oct-11	6.98	840.0	2.04	10.8	-80	beige	turbid	h/c sheen	h/c odour	
	7-Oct-10	6.84	945.0	1.39	14.7	-64	clear	turbid	h/c sheen	h/c odour	
MW-107	3-Oct-12	7.00	1,198.0	1.96	12.8	-141	light grey	turbid	h/c sheen	h/c odour	
	5-Oct-11	6.94	704.0	2.43	10.7	-73	beige	turbid	h/c sheen	h/c odour	
	7-Oct-10	6.91	900.0	2.74	14.9	-49	light grey	turbid	h/c sheen	h/c odour	
MW-108	3-Oct-12	6.80	1,070.0	1.39	12.6	-124	dark grey	turbid	none	none	
	5-Oct-11	6.82	850.0	1.91	11.4	-106	beige	turbid	none	none	
	7-Oct-10	6.53	1,575.0	1.98	15.1	-31	grey	turbid	h/c sheen	h/c odour	
MW-109	3-Oct-12	6.80	1,049.0	2.15	11.2	-96	light grey	turbid	h/c sheen	h/c odour	
	5-Oct-11	6.79	774.0	1.29	9.9	-75	light grey	turbid	h/c sheen	h/c odour	
	7-Oct-10	6.88	1,073.0	1.86	13.9	-65	clear	clear	h/c sheen	h/c odour	
MW-114	3-Oct-12	-	-	-	-	-	-	-	-	-	Insufficient Sample
	5-Oct-11	7.62	562.0	3.90	10.8	-44	dark grey	turbid	h/c sheen	h/c odour	
	7-Oct-10	7.22	990.0	2.60	15.4	-81	dark grey	turbid	h/c sheen	h/c odour	
MW-115	3-Oct-12	6.80	2,360.0	4.45	11.6	-21	beige	turbid	none	none	
	5-Oct-11	6.79	652.0	3.21	11.2	144	clear	slight turbidity	none	none	
	7-Oct-10	6.74	1,926.0	3.48	17.2	40	yellow	turbid	h/c sheen	h/c odour	

TABLE 4
EAST END GENERAL GROUNDWATER FIELD CHEMISTRY
CN HORNEPAYNE YARD, HORNEPAYNE, ONTARIO

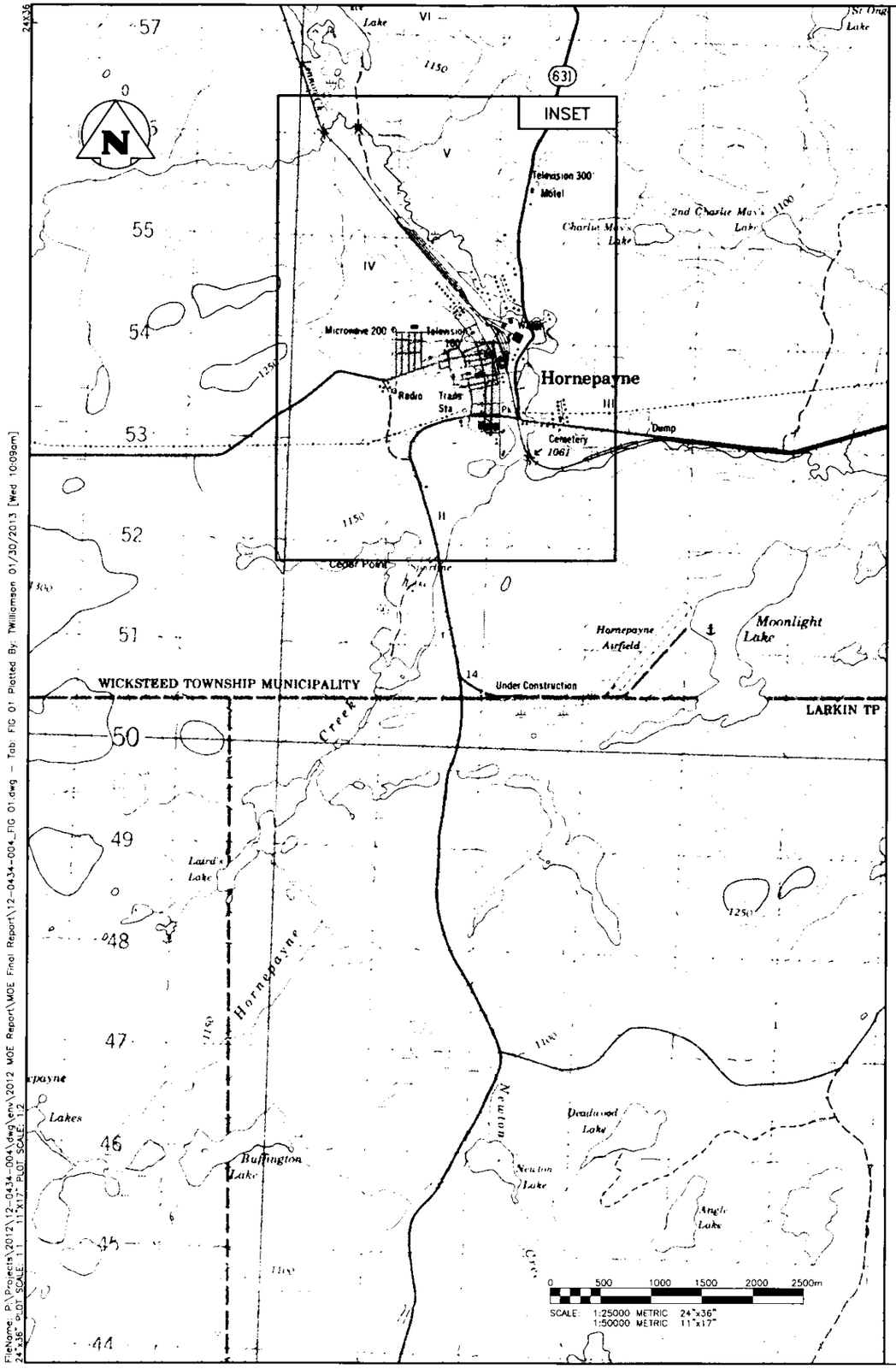
Well No.	Date	pH (units)	E.C. (µS/cm)	D.O. (mg/L)	Temp. (°C)	O.R.P. (mV)	Colour	Turbidity	Sheen	Odour	Comments
EAST END											
MW-126	3-Oct-12	7.10	712.0	1.46	12.6	-70	clear	turbid	h/c sheen	h/c odour	
	5-Oct-11	-	-	-	-	-	-	-	-	-	Insufficient Sample
	7-Oct-10	6.86	874.0	2.33	16.6	-54	clear	clear	h/c sheen	h/c odour	
OW 3-2	3-Oct-12	7.00	814.0	2.03	12.3	-97	light grey	turbid	h/c sheen	h/c odour	
	5-Oct-11	7.90	465.0	2.40	10.5	-108	clear	turbid	h/c sheen	h/c odour	
	7-Oct-10	6.83	993.0	2.26	16.9	-53	clear	clear	h/c sheen	h/c odour	
OW 5-1	3-Oct-12	7.40	662.0	1.40	11.2	-64	yellow/orange	turbid	none	none	
	6-Jun-12	7.71	756.0	1.80	12.3	17	orange/brown	turbid	none	none	
	5-Oct-11	7.19	418.0	3.08	9.1	5	beige	turbid	none	h/c odour	
	29-Jun-11	6.46	924.0	2.24	12.5	-14	light brown	turbid	none	none	
	7-Oct-10	7.21	837.0	2.11	13.4	-82	yellow	turbid	none	none	
	22-Jun-10	7.26	459.0	3.66	9.9	-46	beige	slightly turbid	h/c sheen	h/c odour	
OW 5-2	3-Oct-12	7.20	625.0	1.65	11.9	-104	clear	clear	none	none	
	5-Oct-11	7.23	537.0	3.44	10.2	-80	beige	turbid	h/c sheen	h/c odour	
	29-Jun-11	6.77	805.0	1.88	14.4	-79	clear	slightly turbid	h/c sheen	h/c odour	
	7-Oct-10	6.82	1,030.0	1.57	15.5	61	clear	clear	none	none	
	22-Jun-10	7.52	617.0	3.09	11.1	-118	beige	slightly turbid	h/c sheen	h/c odour	

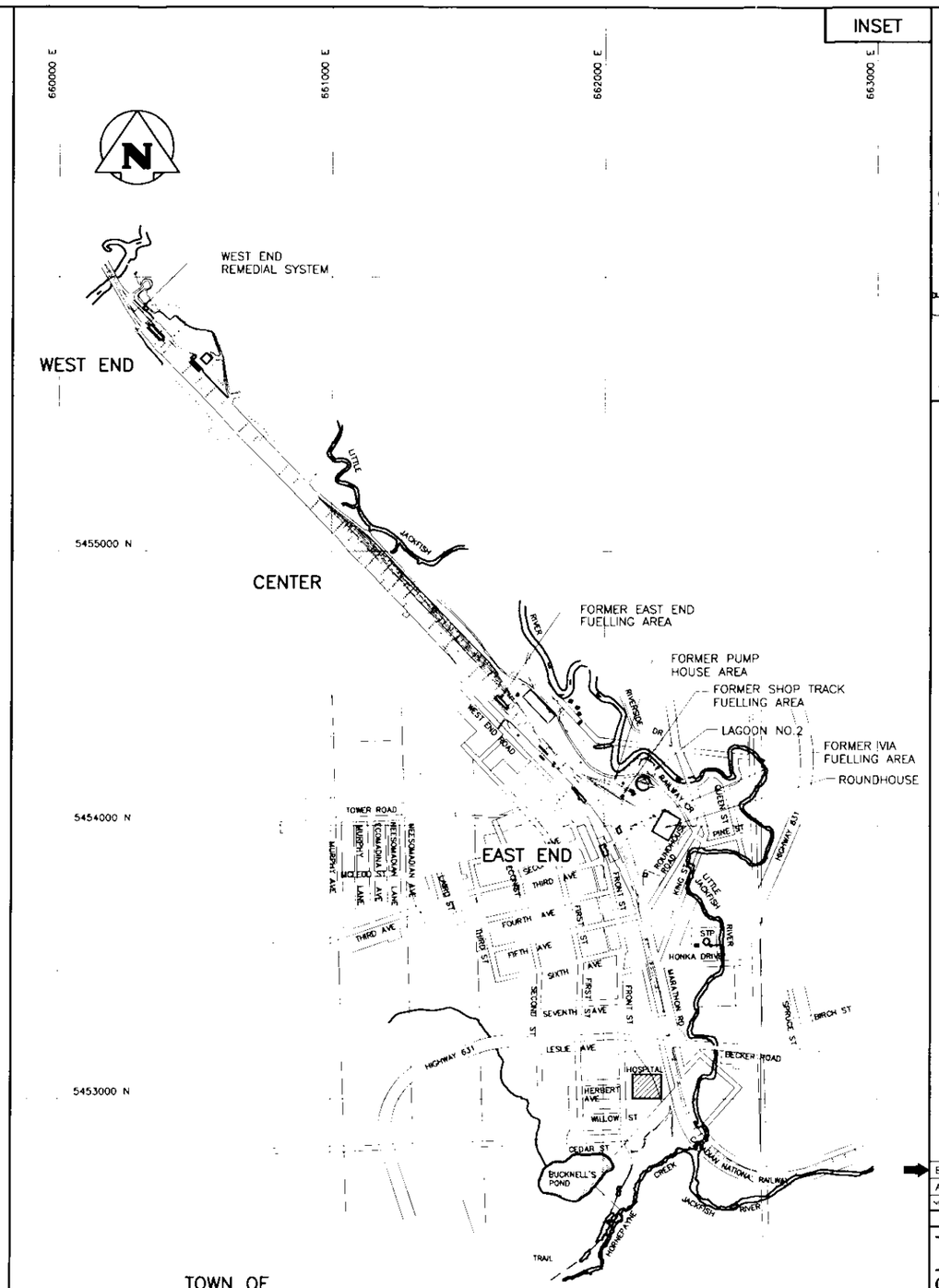
TABLE 4
EAST END GENERAL GROUNDWATER FIELD CHEMISTRY
CN HORNEPAYNE YARD, HORNEPAYNE, ONTARIO

Well No.	Date	pH (units)	E.C. (µS/cm)	D.O. (mg/L)	Temp. (°C)	O.R.P. (mV)	Colour	Turbidity	Sheen	Odour	Comments
EAST END											
OW 5-3	3-Oct-12	7.30	1,108.0	1.64	11.4	-137	dark grey	turbid	h/c sheen	h/c odour	
	6-Jun-12	7.66	583.0	1.89	14.4	-63	yellow/brown	turbid	h/c sheen	h/c odour	
	5-Oct-11	7.07	643.0	2.89	9.9	-102	grey	turbid	h/c sheen	h/c odour	
	29-Jun-11	6.40	954.0	0.46	12.2	-66	beige	turbid	none	h/c odour	
	7-Oct-10	7.14	836.0	1.51	14.4	-52	dark grey	turbid	h/c sheen	h/c odour	
	22-Jun-10	6.97	629.0	5.52	9.8	-73	beige	turbid	none	none	

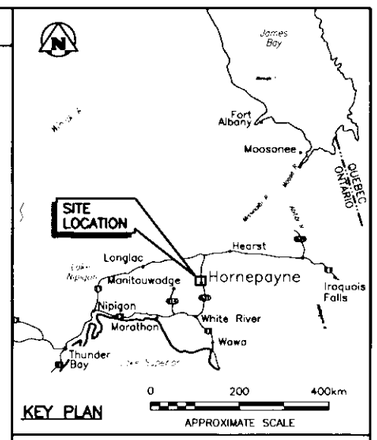
Notes:
"-" = No Data
D.O. = Dissolved Oxygen
E.C. = Electrical Conductivity
O.R.P. = Oxidation Reduction Potential

FIGURES





TOWN OF HORNEPAYNE



KEY PLAN

NOTES:

1. LOCATION OF INSET-PLAN IN RELATION TO COORDIATES IS APPROXIMATE

REFERENCE:

BASE MAP: 1:50,000 NTS MAP 42 F/2 (HORNEPAYNE), NAD 1927, EDITION 2, PUBLISHED 1979

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CN CANADIAN NATIONAL

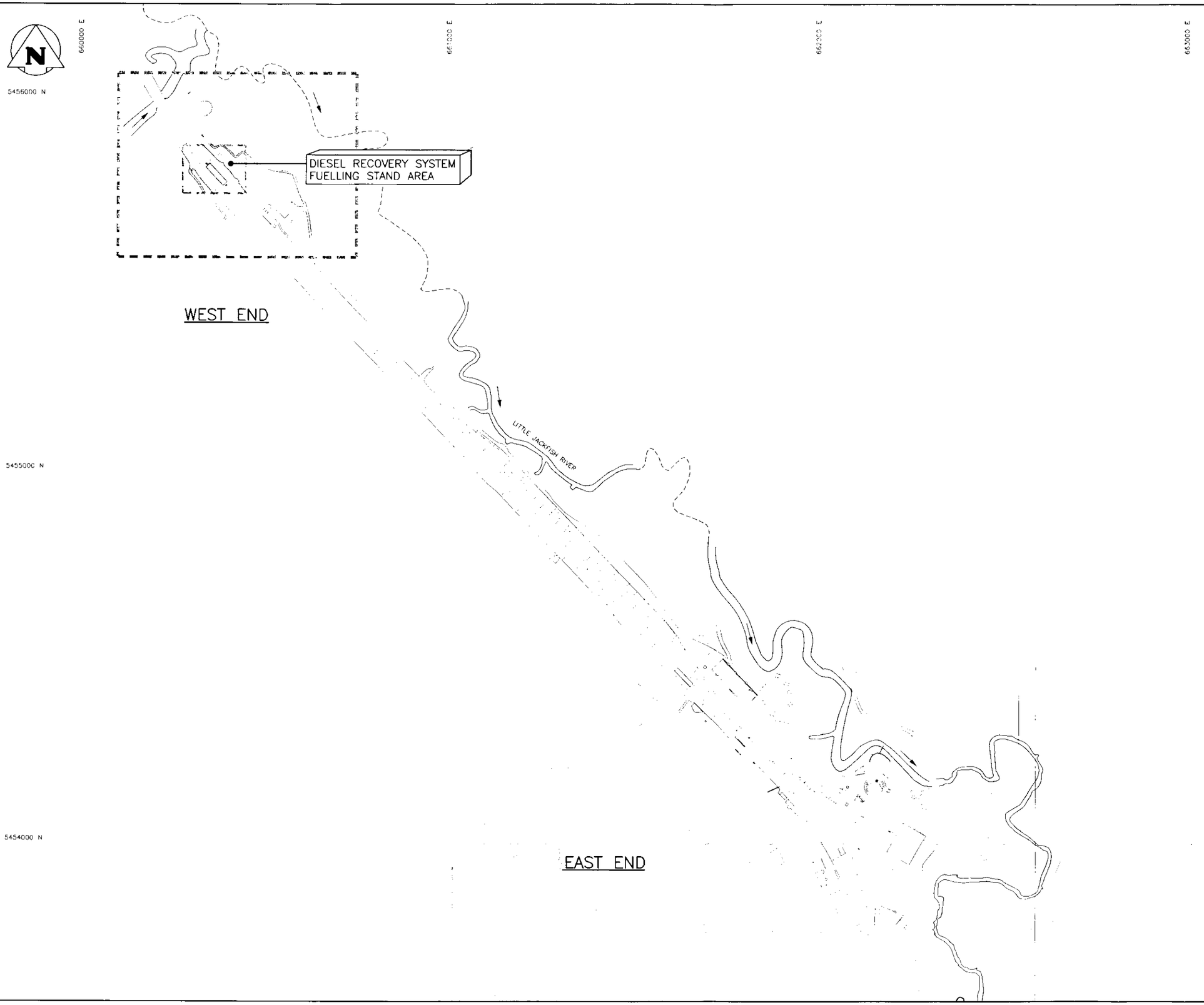
2012 REMEDIAL OPERATIONS
PIN# 1000/ONPR/100586, 100587 & 100591 – HORNEPAYNE YARD, ON

SITE LOCATION PLAN

JANUARY 2013 | FIGURE 01 | B

000857

FileName: P:\Projects\2012\12-0434-004\dwg\env\2012 MOE Report\MOE Final Report\12-0434-004_FIG 01.dwg – Tab: FIG 01 Plotted By: TWilkinson 01/30/2013 [Wed 10:09am]
24"x36" PLOT SCALE: 1:1 11"x17" PLOT SCALE: 1:2



LEGEND

- PLAN LIMITS
- DIESEL RECOVERY SYSTEM DETAIL PLANS
- RIVER FLOW DIRECTION

0 100 200 300 400 500m

SCALE: 1:5000 METRIC 24"x36"
1:10000 METRIC 11"x17"

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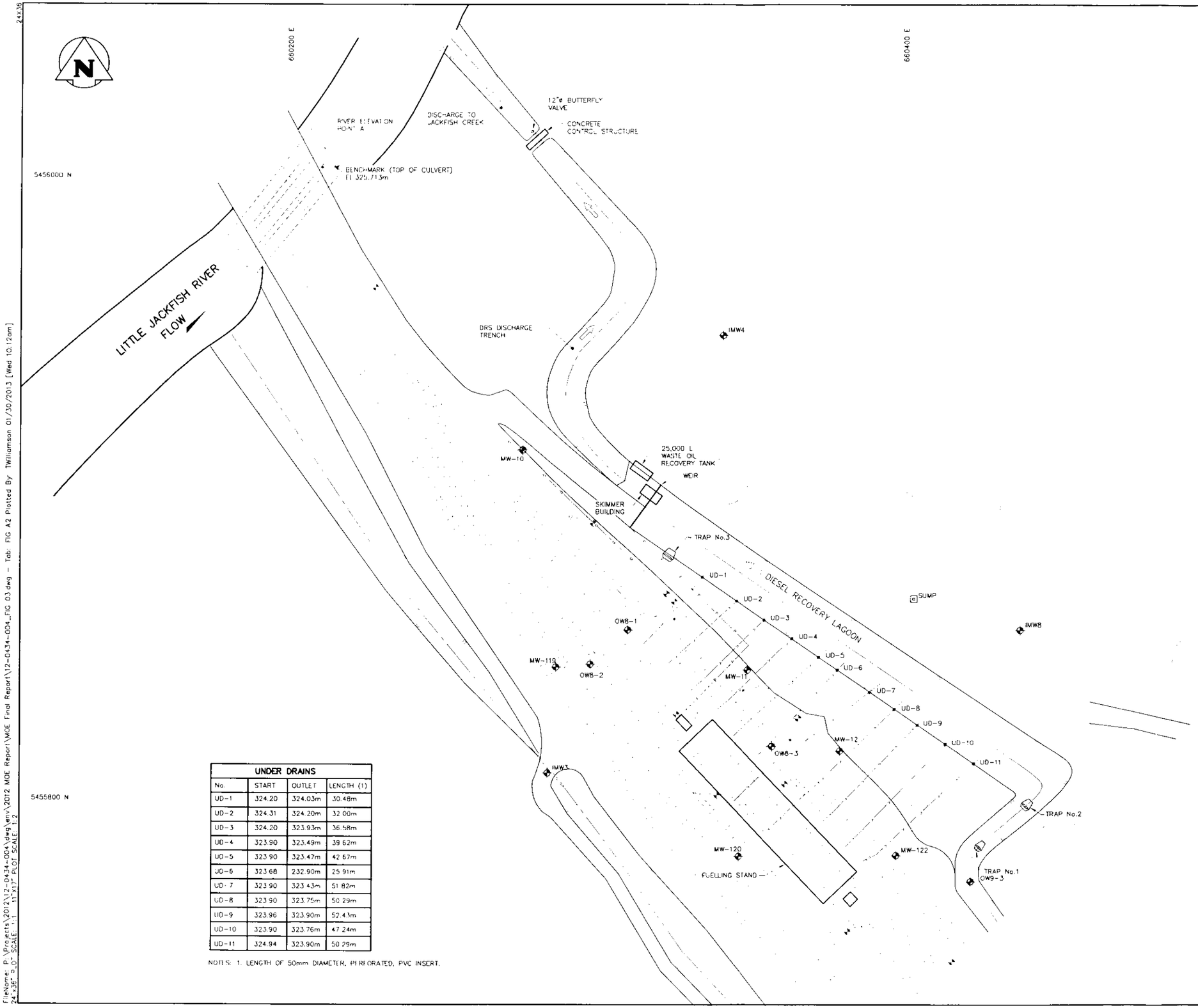
2012 REMEDIAL OPERATIONS
PIN# 1000/ONPR/100587
HORNEPAYNE YARD, ON

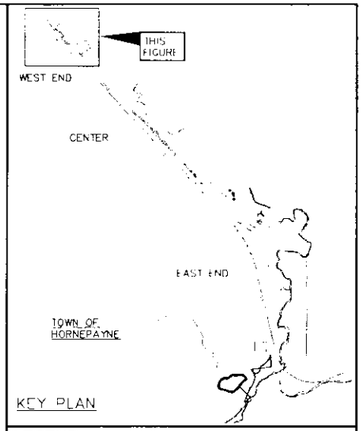
WEST END YARD PLAN

JANUARY 2013 | FIGURE 02 | B



UNDER DRAINS			
No.	START	OUTLET	LENGTH (1)
UD-1	324.20	324.03m	30.48m
UD-2	324.31	324.20m	32.00m
UD-3	324.20	323.93m	36.58m
UD-4	323.90	323.49m	39.62m
UD-5	323.90	323.47m	42.67m
UD-6	323.68	232.90m	25.91m
UD-7	323.90	323.43m	51.82m
UD-8	323.90	323.75m	50.29m
UD-9	323.96	323.90m	52.43m
UD-10	323.90	323.76m	47.24m
UD-11	324.94	323.90m	50.29m

NOTES: 1. LENGTH OF 50mm DIAMETER, PERFORATED, PVC INSERT.



LEGEND:

- BERM
- CENTERLINE OF DITCH
- FENCE
- BURIED ELECTRICAL CABLE
- BENCHMARK
- MW-119 MONITORING WELL (INSTALLED BY KGS) (MW101-MW133, MW140-MW147)
- MW-10 MONITORING WELL (INSTALLED BY OTHERS) (ALL OTHER WELLS)
- RWB-1 RECOVERY WELL
- SUMP SUMP WELL
- RAILROAD TRACKS
- UNDERGROUND DRAIN
- DESTROYED

NOTES:

1. SITE PLAN BASED ON AUTOCAD FILE PROVIDED BY CN.

0 12 24 36 48 60m

SCALE: 1:600 METRIC 24"x36"
1:1200 METRIC 11"x17"

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PIN# 1000/ONPR/100587
HORNEPAYNE YARD, ON

WEST END SITE PLAN AND DIESEL RECOVERY SYSTEM COMPONENTS

JANUARY 2013 | FIGURE 03 | B

FileName: P:\Projects\2012\12-0434-004\dwg\env\2012 MOE Report\MOE Final Report\12-0434-004_FIG 03.dwg — Tab: FIG A2 Plotted By: TWilliamson 01/30/2013 [Wed 10:12am]
24.36" x 0" SCALE: 1:1 11"x17" PLOT SCALE: 1:2

0008659

24x36

660000 E

661000 E

662000 E

663000 E

5456000 N

5455000 N

5454000 N

WEST END

EAST END

LITTLE JACKFISH RIVER

LAGOON NO. 2 AND FPH AREA

DIESEL CONTAINMENT SYSTEM
LAGOON NO. 2

LEGEND

PLAN LIMITS

DIESEL RECOVERY SYSTEM DETAIL PLANS

RIVER FLOW DIRECTION

0 100 200 300 400 500m

SCALE: 1:5000 METRIC 24"x36"
1:10000 METRIC 11"x17"

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CN CANADIAN NATIONAL

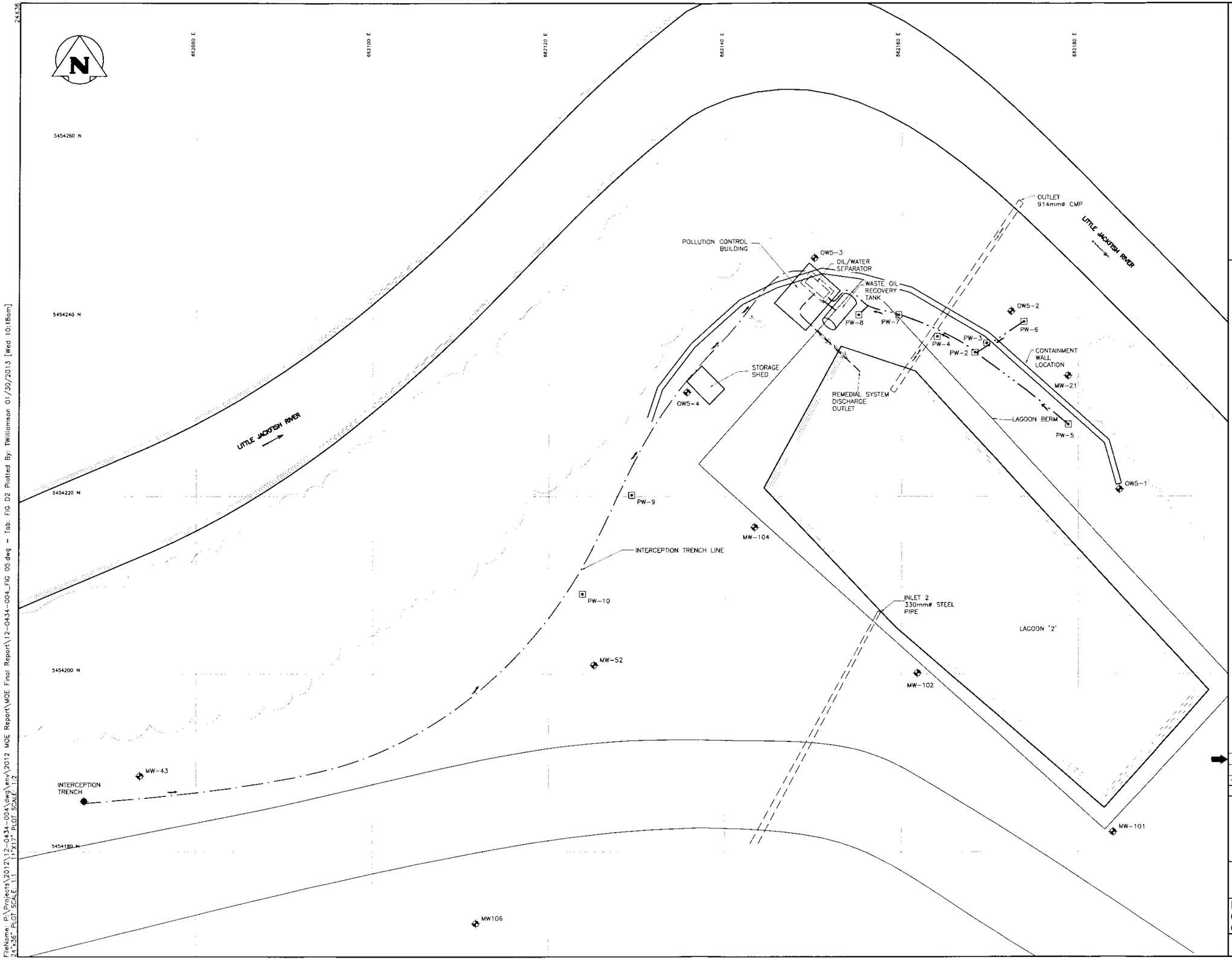
2012 REMEDIAL OPERATIONS
PIN# 1000/ONPR/100591
HORNEPAYNE YARD, ON

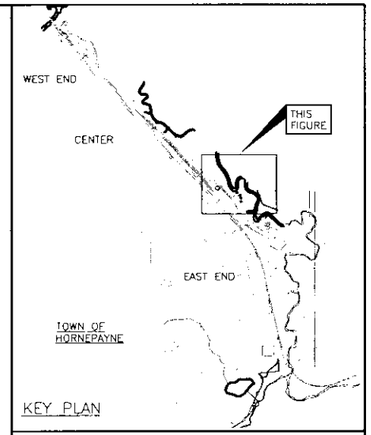
LAGOON No.2 SITE PLAN

JANUARY 2013 | FIGURE 04 | B

FileName: P:\Projects\2012\12-0434-004\dwg\env\2012 MOE Report\MOE Final Report\12-0434-004_FIG 04.dwg — Tab: FIG D1 Plotted By: TWilliamson 01/30/2013 [Wed 10:17am]
24"x36" PLOT SCALE: 1:1 11"x17" PLOT SCALE: 1:2

098000





LEGEND

- APPROXIMATED LIMITS OF TREED AREA
- EDGE OF WATER
- CULVERT
- DISCHARGE LINE
- INTERCEPTION TRENCH LINE
- MW-104 MONITORING WELL (INSTALLED BY KGS) (MW101-MW133, MW140-MW147)
- MW-52 MONITORING WELL (INSTALLED BY OTHERS) (ALL OTHER WELLS)
- INTERCEPTION TRENCH
- PW-1 PUMPING WELL
- CATCHBASIN
- TOTAL FLUIDS FLOW DIRECTION
- LPH FLOW DIRECTION
- WATER FLOW DIRECTION
- SURFACE WATER FLOW DIRECTION
- DESTROYED

NOTES:

1. DRAWING BASED ON BIOGENIE ENVIRONMENTAL CN AUTO CAD FILE.

0 4 8 12 16 20m

SCALE: 1:200 METRIC 24"x36"
1:400 METRIC 11"x17"

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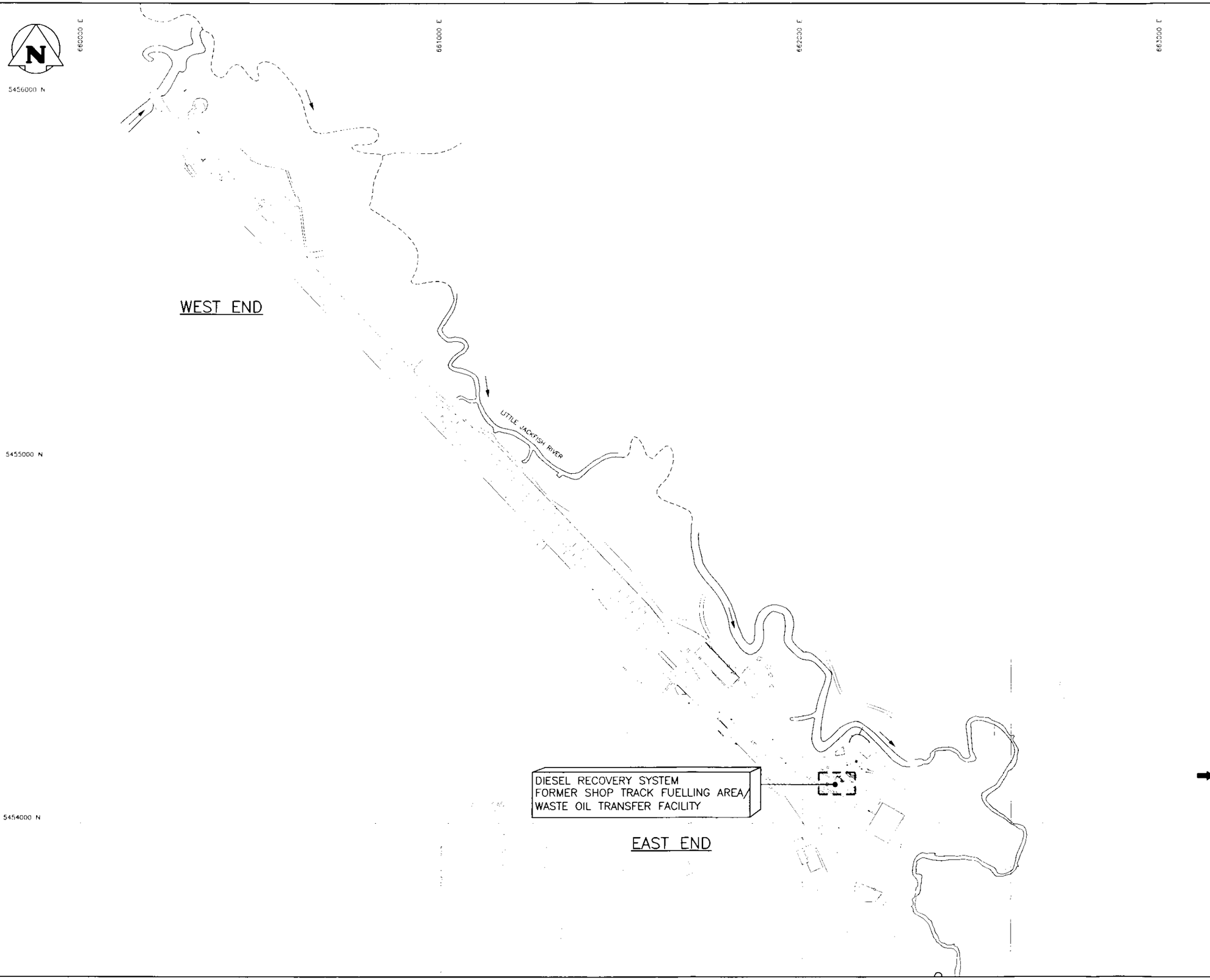
2012 REMEDIAL OPERATIONS
PIN# 1000/ONPR/100591
HORNEPAYNE YARD, ON

LAGOON NO.2
CONTAINMENT SYSTEM
COMPONENTS

JANUARY 2013 | FIGURE 05 | REV. B

FileName: P:\Projects\2012\12-0434-004\dwg\env\2012 MOE Report\MOE Final Report\12-0434-004_FIG 05.dwg - Tab: FIG D2
24"x36" PLOT SCALE: 1:1
11"x17" PLOT SCALE: 1:2
Plotted By: TWilliamson 01/30/2013 [Wed 10:18am]



LEGEND

DIESEL RECOVERY SYSTEM DETAIL PLANS

RIVER FLOW DIRECTION

0 100 200 300 400 500m

SCALE: 1:5000 METRIC 24"x36"
1:10000 METRIC 11"x17"

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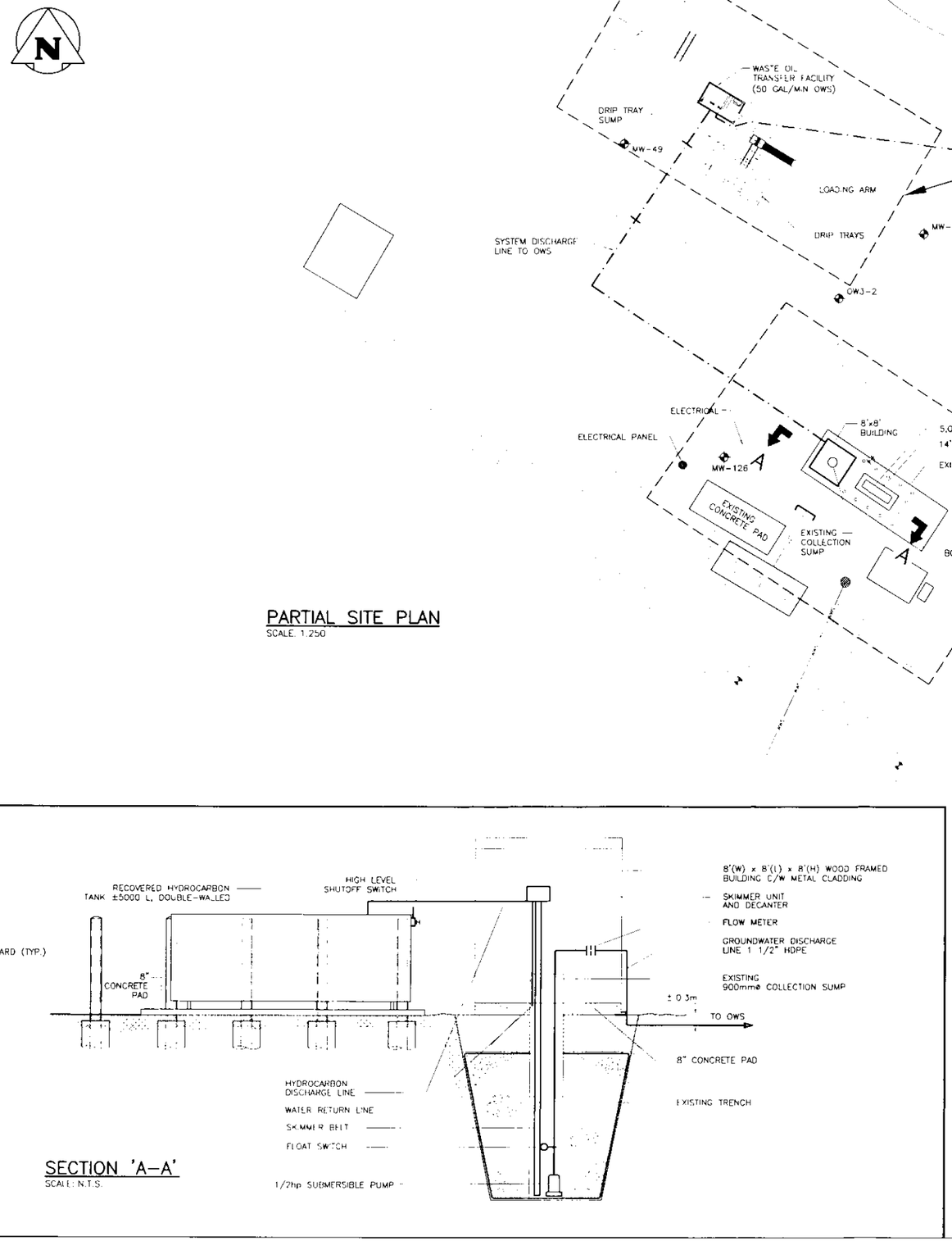
2012 REMEDIAL OPERATIONS
PIN# 1000/ONPR/100591
HORNEPAYNE YARD, ON

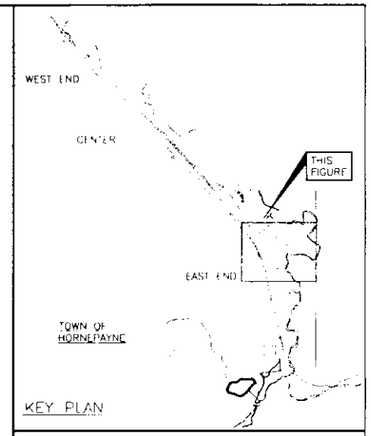
FORMER SHOP TRACK FUELLING AREA SITE PLAN

JANUARY 2013 | FIGURE 06 | B



PARTIAL SITE PLAN
SCALE: 1:250

SECTION 'A–A'
SCALE: N.T.S.



KEY PLAN

LEGEND

- RAILROAD TRACK
- SANITARY SEWER
- STORM SEWER
- DISCHARGE LINE
- MW-126 MONITORING WELL (INSTALLED BY KGS) (MW101-MW133, MW140- MW147)
- MW-50 MONITORING WELL (INSTALLED BY OTHERS) (ALL OTHER WELLS)
- DESTROYED
- MANHOLES

0 5 10 15 20 25m

SCALE: 1:250 METRIC 24"x36"
1:500 METRIC 11"x17"

B	13/01/31	ISSUED WITH FINAL REPORT	TG
A	13/01/25	ISSUED WITH MOE DRAFT REPORT	TG
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2012 REMEDIAL OPERATIONS
PIN# 1000/ONPR/100591
HORNEPAYNE YARD, ON

FORMER SHOP TRACK FUELLING AREA SYSTEM COMPONENTS

JANUARY 2013 | FIGURE 07 | REV. B

24X36

660000 E

661000 E

662000 E

663000 E

5456000 N

5455000 N

5454000 N

WEST END

LITTLE JACKFISH RIVER

DIESEL RECOVERY SYSTEM
FORMER SHOP TRACK FUELLING AREA/
WASTE OIL TRANSFER FACILITY

EAST END

LEGEND

PLAN LIMITS

DIESEL RECOVERY SYSTEM DETAIL PLANS

RIVER FLOW DIRECTION

0 100 200 300 400 500m

SCALE: 1:5000 METRIC 24"x36"
1:10000 METRIC 11"x17"

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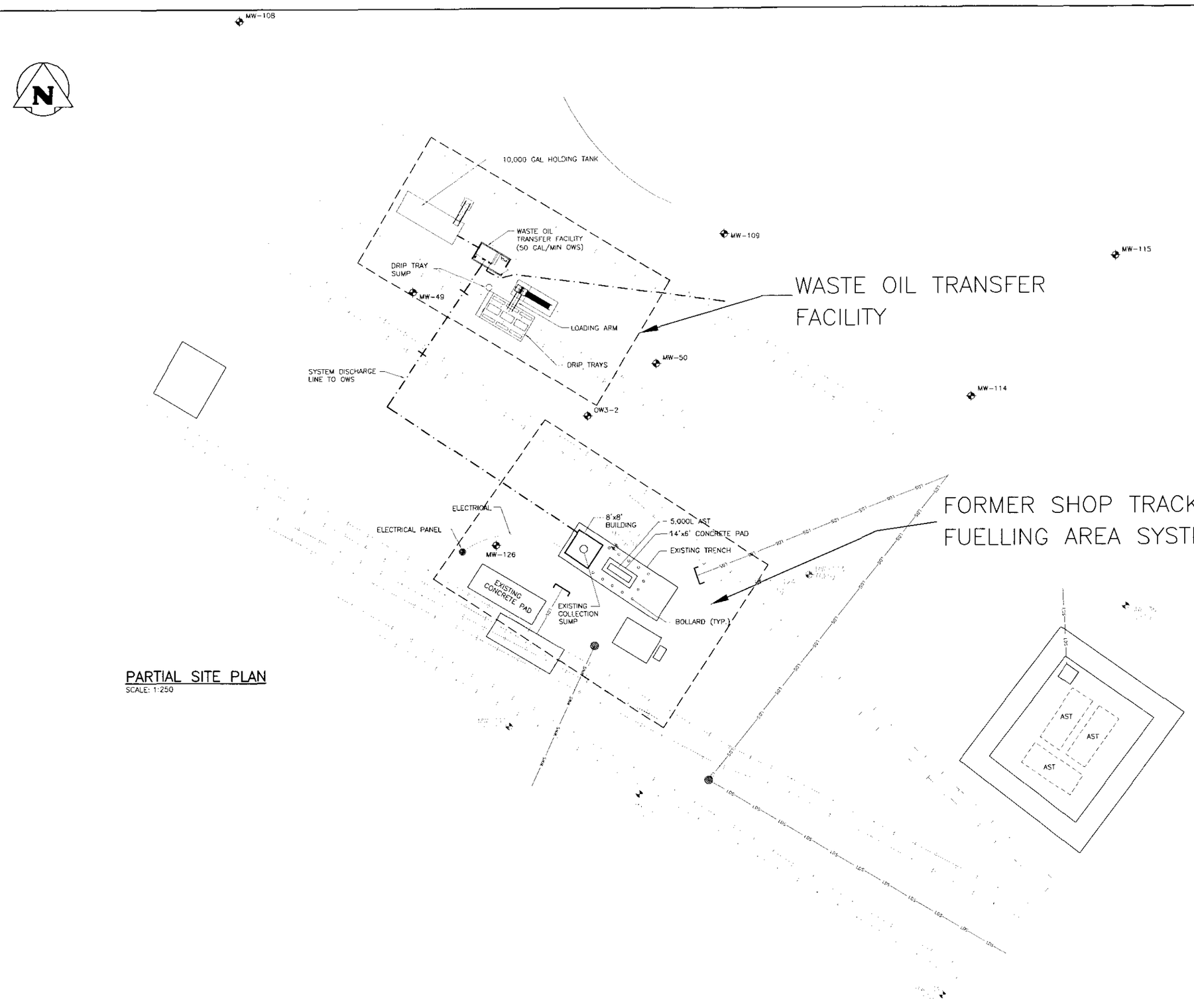
2012 REMEDIAL OPERATIONS
PIN# 1000/ONPR/100591
HORNEPAYNE YARD, ON

WASTE OIL TRANSFER FACILITY
SITE PLAN

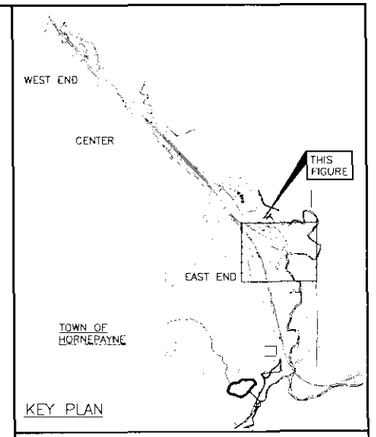
JANUARY 2013 | FIGURE 08 | REV B

FileName: P:\Projects\2012\12-0434-004\dwg\env\2012 MOE Report\MOE Final Report\12-0434-004_FIG 08.dwg - Tab: FIG F1 Plotted By: TWilliamson 01/30/2013 [Wed 10:22am]
24"x36" PLOT SCALE: 1:1 11"x17" PLOT SCALE: 1:2

000864



PARTIAL SITE PLAN
SCALE: 1:250



KEY PLAN

LEGEND

- RAILROAD TRACK
- SANITARY SEWER
- STORM SEWER
- DISCHARGE LINE
- MW-126 MONITORING WELL (INSTALLED BY KGS) (MW101-MW133, MW140-MW147)
- MW-50 MONITORING WELL (INSTALLED BY OTHERS) (ALL OTHER WELLS)
- DESTROYED
- MANHOLES

0 5 10 15 20 25m

SCALE: 1:250 METRIC 24"x36"
1:500 METRIC 11"x17"

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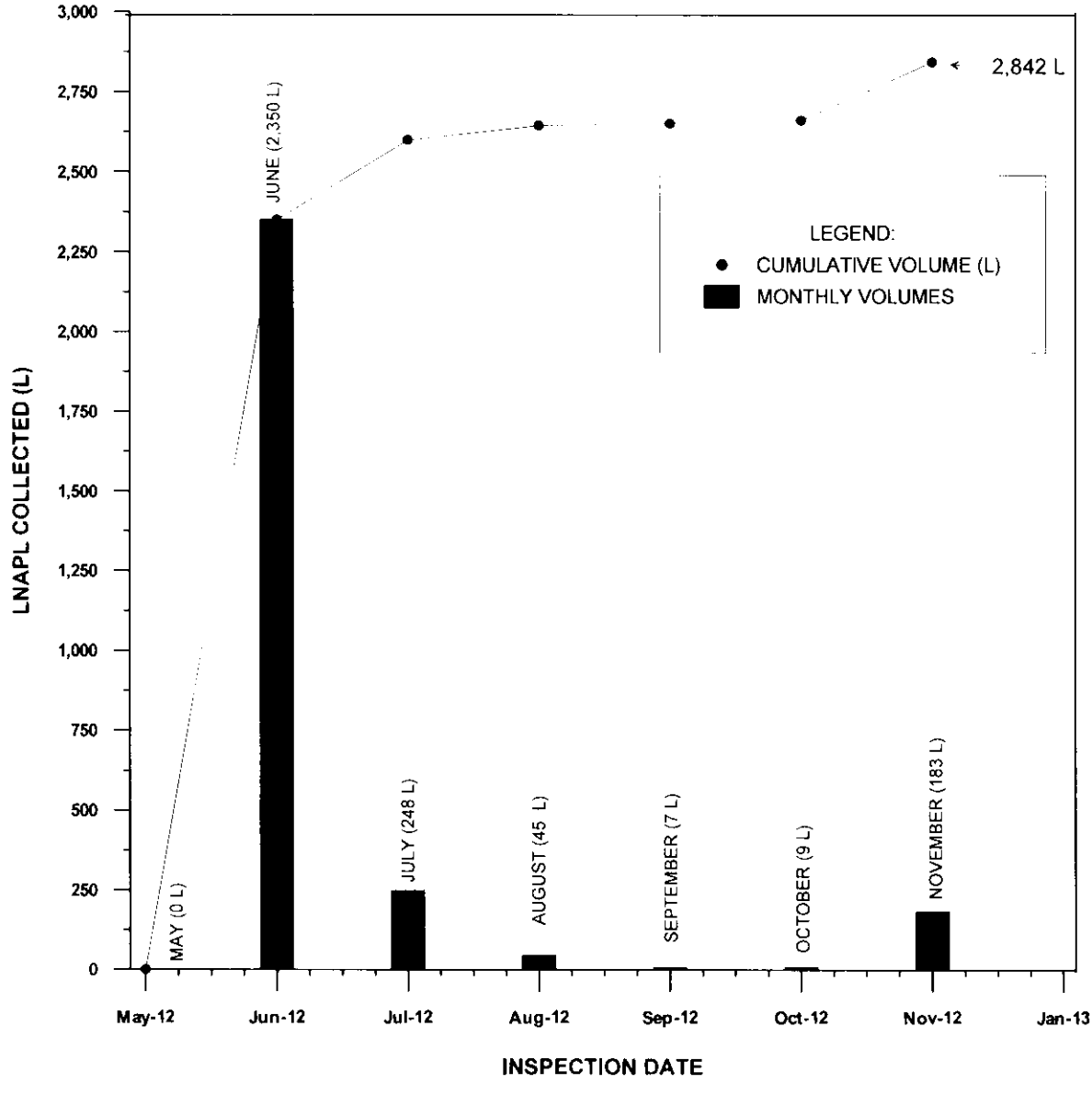
2012 REMEDIAL OPERATIONS
PIN# 1000/ONPR/100591
HORNEPAYNE YARD, ON

WASTE OIL TRANSFER FACILITY
SYSTEM COMPONENTS

JANUARY 2013 | FIGURE 09 | REV. B



NOTES: 2,842 L OF LNAPL WAS COLLECTED AT THE WEST END IN 2012

May
- Skimmer belt was installed on May 15 and the system was started.
- Skimmer unit operated within normal parameters.

June
- Skimmer unit operated within normal parameters.
- 2,350 L of LNAPL was collected.
- GFL removed approximately 2,350 L of LNAPL from Lagoon No. 5

July
- Skimmer unit operated within normal parameters.
- 248 L of LNAPL was collected.

August
- Skimmer unit operated within normal parameters.
- 45 L of LNAPL was collected.

September
- Skimmer unit operated within normal parameters.
- 7 L of LNAPL was collected.

October
- Skimmer unit operated within normal parameters.
- 9 L of LNAPL was collected.

November
- GFL removed approximately 125 L of LNAPL from the skimmer unit and discharge lines
- Skimmer unit shutdown and winterized.
- 58 L of LNAPL was collected.

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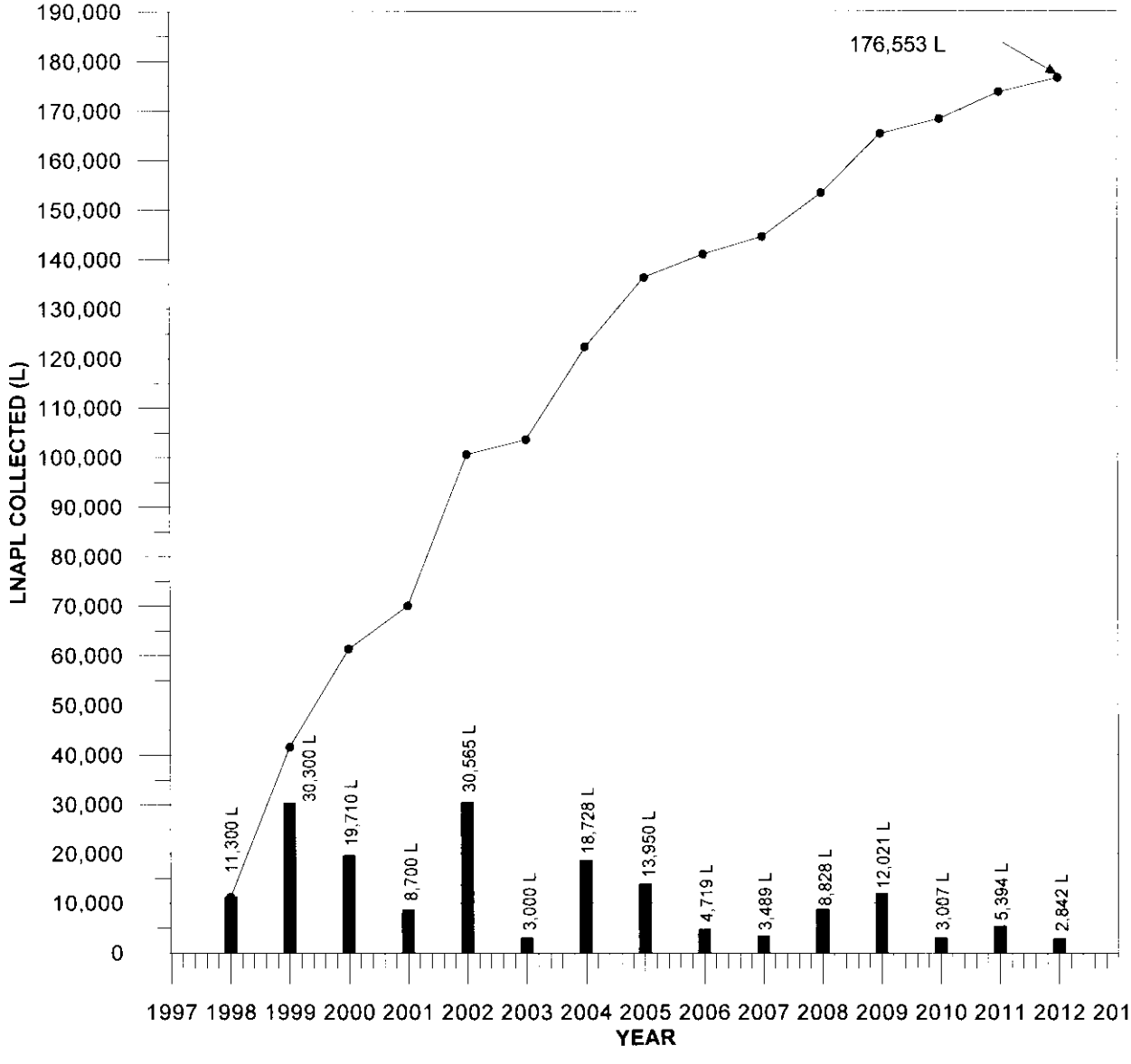
CANADIAN NATIONAL

2012 REMEDIAL OPERATIONS
PIN# 1000/ONPR/100587, 100586
AND 100591 HORNEPAYNE YARD, ON.

2012 LNAPL COLLECTION DATA
WEST END

JANUARY 2013 FIGURE 10 REV B

P:\Projects\2012\12-0434-004\gen\docs\ 2012 grapher\Figure 10



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B	13/01/31	ISSUED WITH FINAL REPORT	TG

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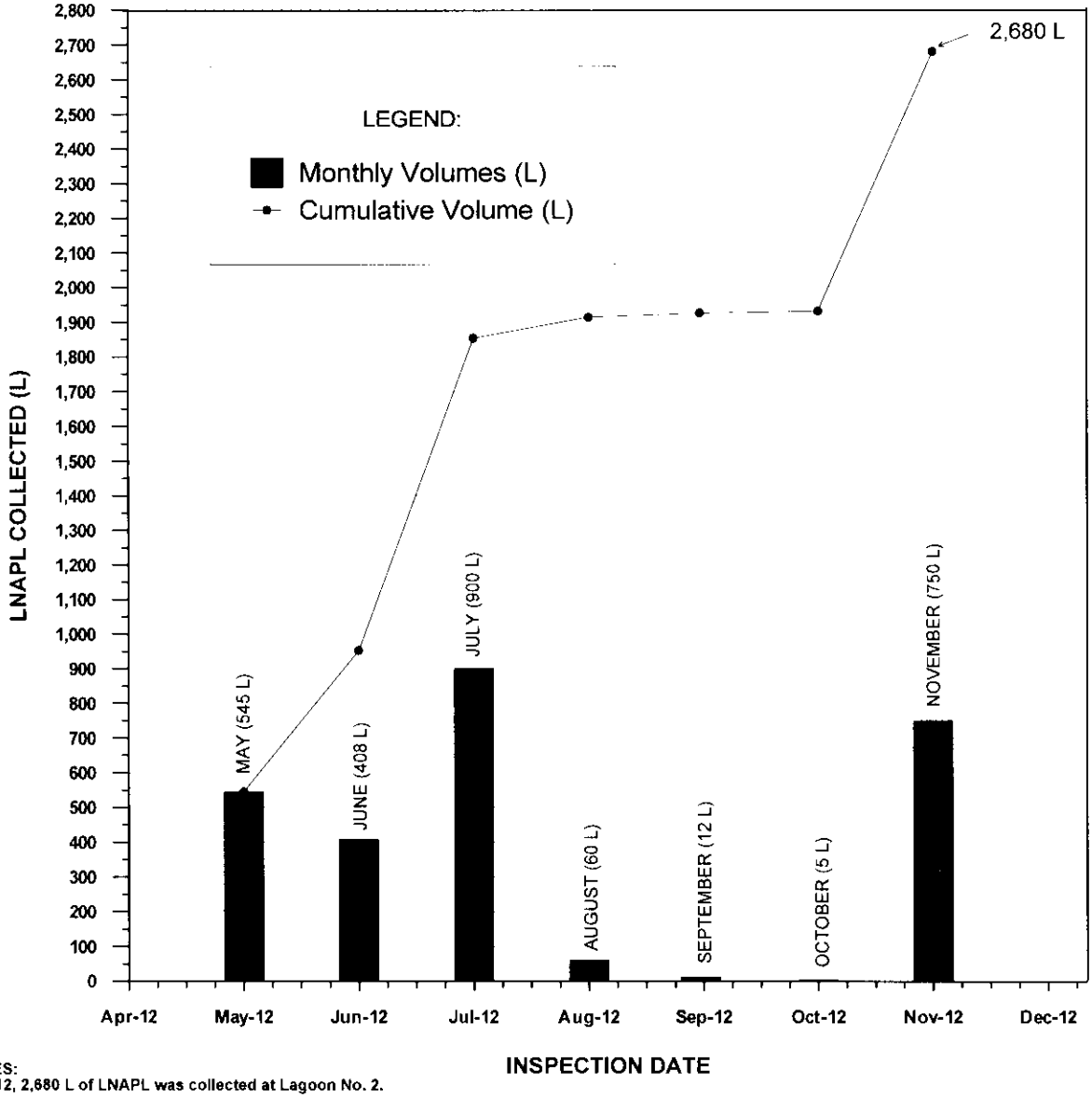
CANADIAN NATIONAL

2012 REMEDIAL OPERATIONS
PIN# 1000/ONPR/100587, 100586
AND 100591 HORNEPAYNE YARD, ON.

HISTORICAL LNAPL COLLECTION DATA
WEST END

JANUARY 2013 | FIGURE 11 | REV B

P:\Projects\2012\12-0434-004\dwg\env\2012 grapher\FIG 11



NOTES:
In 2012, 2,680 L of LNAPL was collected at Lagoon No. 2.

May 2012

- System started at full capacity, with all five groundwater pumps and the interception trench operating.
- System operated within normal parameters.
- 545 L of LNAPL was collected.

June 2012

- System operated within normal parameters.
- 408 L of LNAPL was collected.

July 2012

- System operated within normal parameters until July 19, when the automatic shut down of the system was experienced due to a full waste oil tank.
- Hearst Septic Tank removed the contents of the waste oil tank on July 24. The system was restarted.
- 900 L of LNAPL was collected.

August 2012

- System operated within normal parameters until August 10, when the compressor stopped working. The system was manually shut down on August 13.
- 60 L of LNAPL collected

September 2012

- System remained shut down due to the compressor.
- 12 L of LNAPL was collected by manually bailing pumping wells.

October 2012

- System remained shut down due to the compressor.
- 5 L of LNAPL was collected by manually bailing pumping wells.

November 2012

- System shut down and winterized
- GFL removed approximately 1,000 L of total fluids from system maintenance.

NO.	YY/MM/DD	DESCRIPTION	BY
B	13/01/31	ISSUED WITH FINAL REPORT	TG

REVISIONS / ISSUE

KGS GROUP CONSULTING ENGINEERS

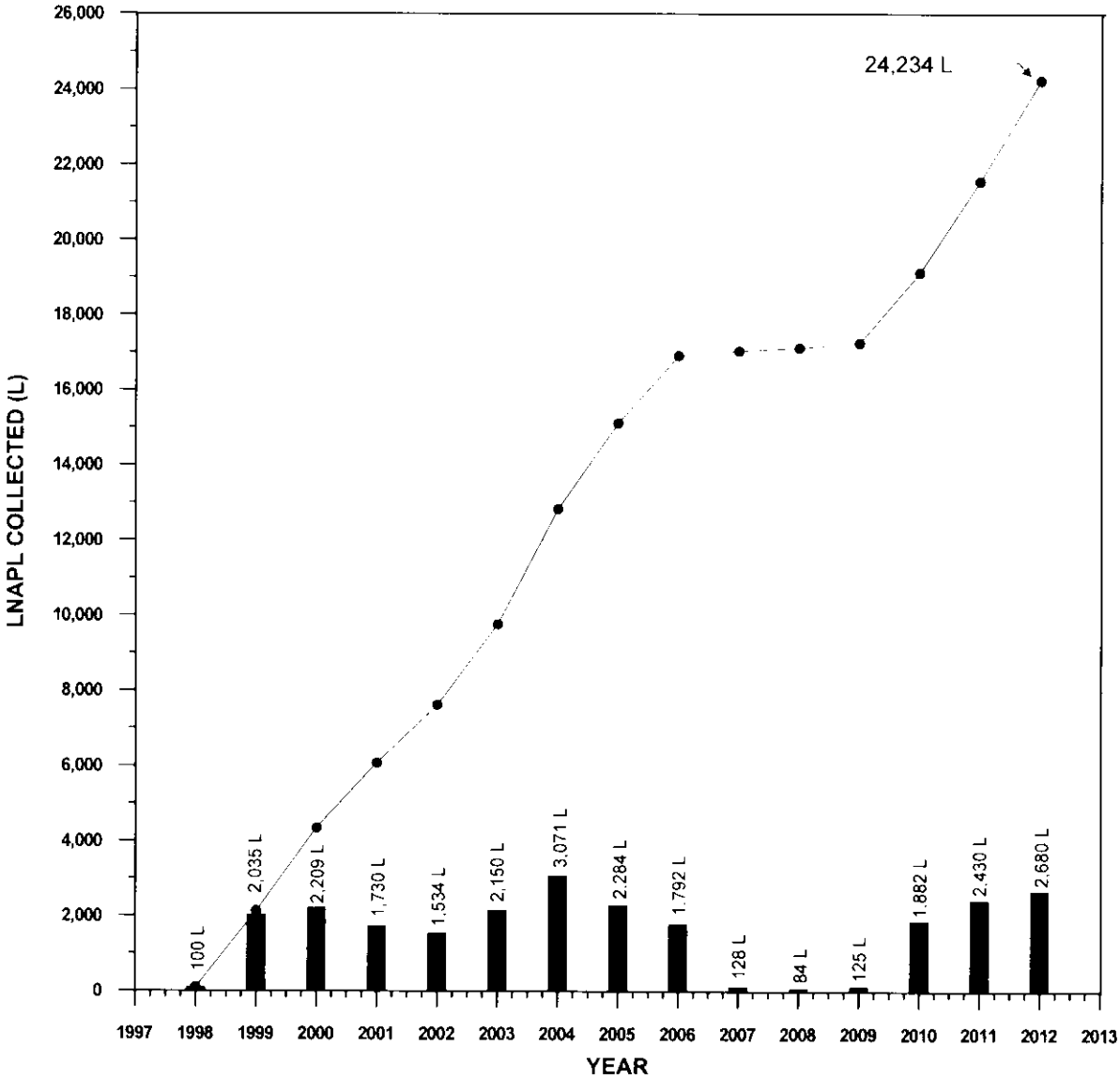
CANADIAN NATIONAL

2012 REMEDIAL OPERATIONS
PIN# 1000/ONPR/100587, 100586
AND 100591 HORNEPAYNE YARD, ON.

2012 LNAPL COLLECTION DATA
LAGOON No. 2

JANUARY 2013 | FIGURE 12 | REV. B

P:\Projects\2012\12-0434-004\gen\doc\2012 graphs\FIG 12



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B	13/01/31	ISSUED WITH FINAL REPORT	TG

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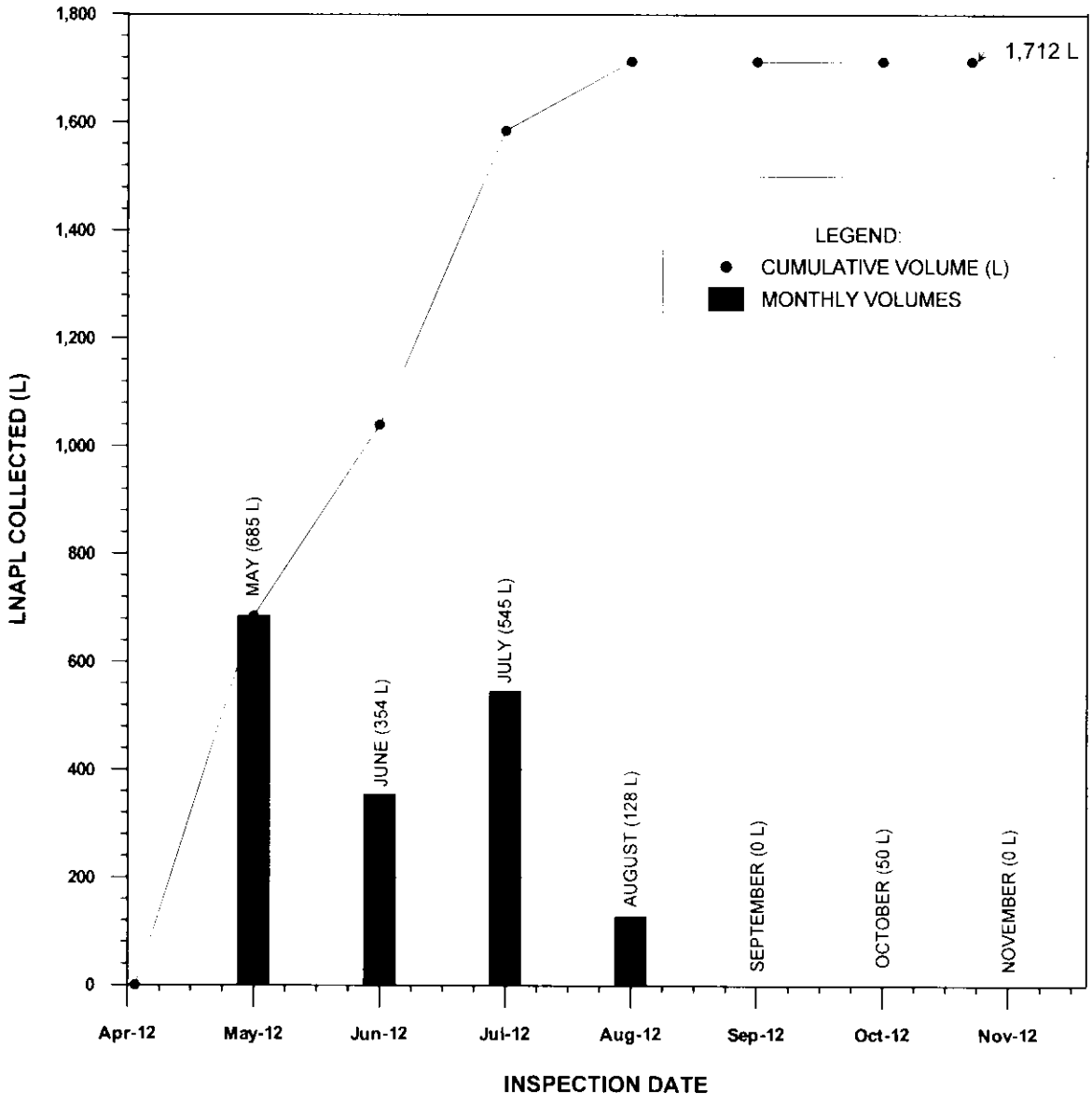
CANADIAN NATIONAL

2012 REMEDIAL OPERATIONS
PIN# 1000/ONPR/100587, 100586
AND 100591 HORNEPAYNE YARD, ON.

HISTORICAL LNAPL COLLECTION DATA
LAGOON No. 2

JANUARY 2013 | FIGURE 13 | REV. B



NOTES: - 1,712 L of LNAPL was manually collected by KGS Group and local CN personnel at the Former Shop Track Fuelling Area in 2012.
- The Shop Track DRS (skimmer unit) operated from June to August 2012.
- The Waste Oil Transfer Facility did not operate in 2012.

May
- Skimmer belt was installed on May 15, but the skimmer unit did not operate due to a power outage.
- 685 L of LNAPL collected by CN forces from January to May 2012

June
- Skimmer unit was activated and operated within normal parameters.
- 354 L of LNAPL was collected.

July
- Skimmer unit operated within normal parameters.
- 545 L of LNAPL was collected.

August
- Skimmer Unit operated within normal parameters until August 14, when the skimmer unit was manually shut down due to low water table within the Shop Track collection sump.
- 128 L of LNAPL was collected in August 2012.

November
- System winterized
- GFL removed approximately 1,000 L of LNAPL

NO	BY/MMDD	DESCRIPTION	BY
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KGS GROUP CONSULTING ENGINEERS

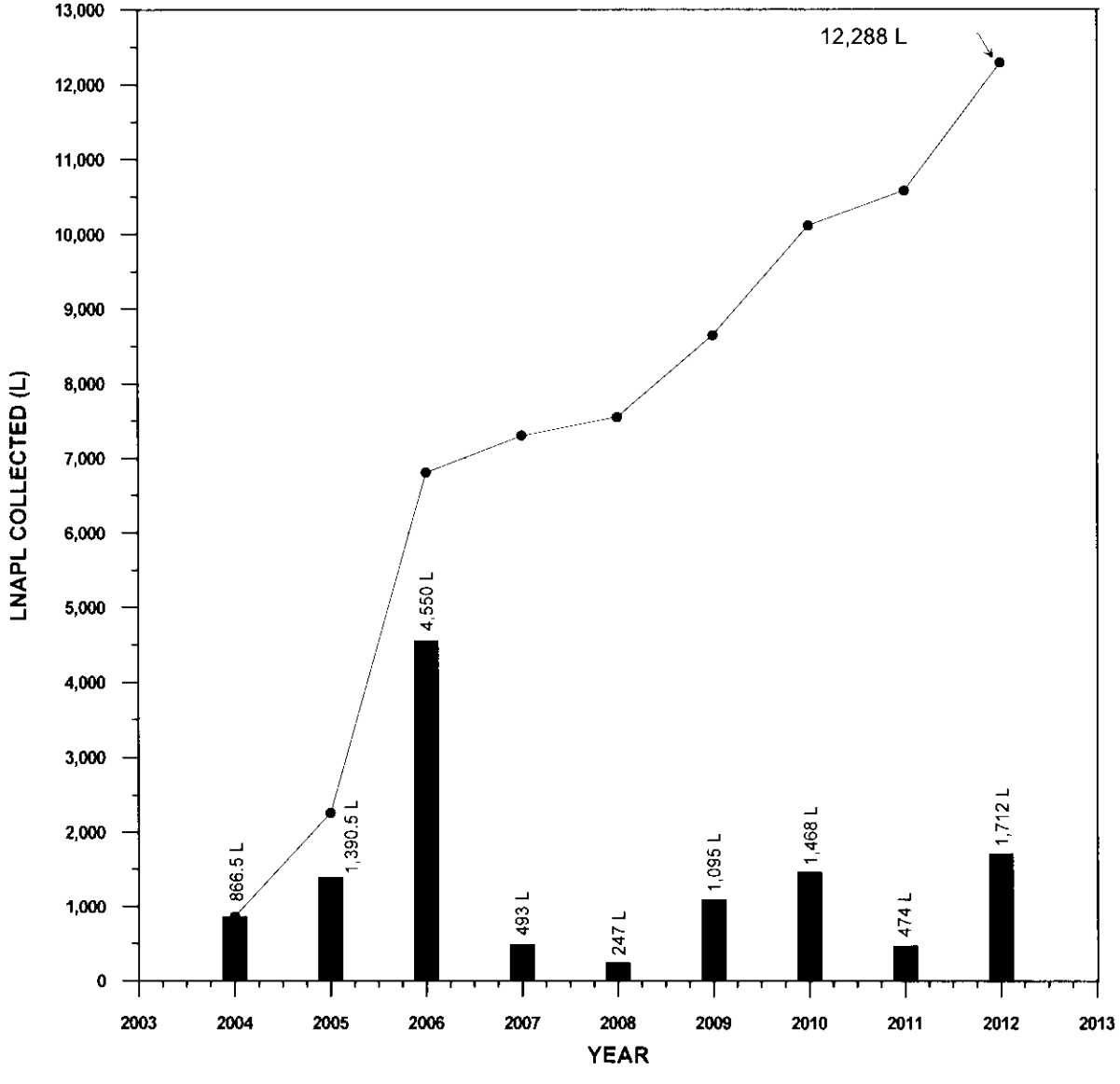
CANADIAN NATIONAL

2012 REMEDIAL OPERATIONS
PIN# 1000/ONPR/100587, 100586
AND 100591 HORNEPAYNE YARD, ON.

2012 LNAPL COLLECTION DATA
FORMER SHOP TRACK FUELLING AREA

JANUARY 2013 | FIGURE 14 | REV B

P:\Projects\2012\12-0434-004\gen\docs\ 2012 graphen\FIG 14



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KGS GROUP CONSULTING ENGINEERS

CANADIAN NATIONAL

2012 REMEDIAL OPERATIONS
PIN# 1000/ONPR/100587, 100586
AND 100591 HORNEPAYNE YARD, ON.

HISTORICAL LNAPL COLLECTION DATA
FORMER SHOP TRACK FUELLING AREA

JANUARY 2013 | FIGURE 15 | REV B

P:\Projects\2012\12-0434-004\dwg\env\2012 grapher\FIG 15

24X36

660000 E

661000 E

662000 E

663000 E

5456000 N

5455000 N

5454000 N

HOR 013 05

HOR 006 05

WEST END

HOR 012 05

LITTLE JACKFISH RIVER

HOR 011 05

HOR 005 05

HOR 001 05

HOR 003 05

HOR 002 05

HOR 004 05

HOR 007 05

HOR 010 05

EAST END

ADDITIONAL OUTFALL

LEGEND

▽ SURFACE WATER SAMPLING LOCATION

HOR 013 05

RIVER FLOW DIRECTION

0 100 200 300 400 500m

SCALE: 1:5000 METRIC 24"x36"
1:10000 METRIC 11"x17"

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KGS GROUP CONSULTING ENGINEERS

CN CANADIAN NATIONAL

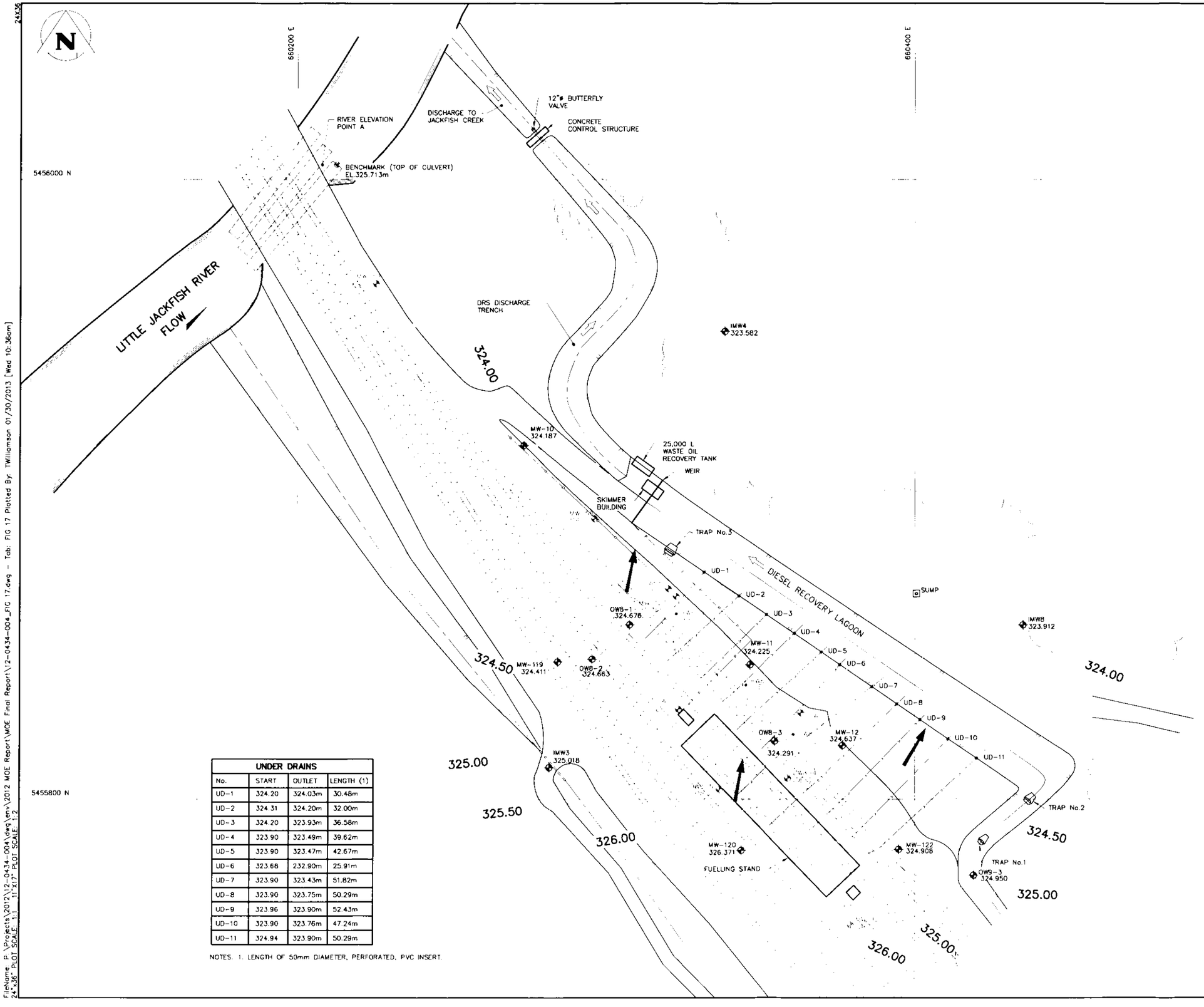
2012 REMEDIAL OPERATIONS
PIN# 1000/ONPR/100587, 100586
AND 100591 HORNEPAYNE YARD, ON

SURFACE WATER SAMPLING LOCATIONS

JANUARY 2013 | FIGURE 16 | REV B

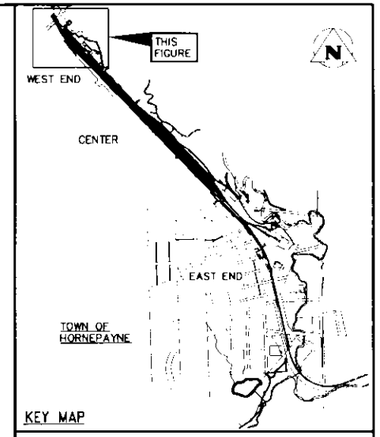
FileName: P:\Projects\2012\12-0434-004\dwg\env\2012 MOE Report\MOE Final Report\12-0434-004_FIG 16.dwg - Tab: FIG 11 Plotted By: TWilliamson 01/30/2013 [Wed 10:34am]
24"x36" PLOT SCALE: 1:1 11"x17" PLOT SCALE: 1:2

000872



UNDER DRAINS			
No.	START	OUTLET	LENGTH (1)
UD-1	324.20	324.03m	30.48m
UD-2	324.31	324.20m	32.00m
UD-3	324.20	323.93m	36.58m
UD-4	323.90	323.49m	39.62m
UD-5	323.90	323.47m	42.67m
UD-6	323.68	232.90m	25.91m
UD-7	323.90	323.43m	51.82m
UD-8	323.90	323.75m	50.29m
UD-9	323.96	323.90m	52.43m
UD-10	323.90	323.76m	47.24m
UD-11	324.94	323.90m	50.29m

NOTES: 1. LENGTH OF 50mm DIAMETER, PERFORATED, PVC INSERT.



KEY MAP

LEGEND:

- BERM
- CENTERLINE OF DITCH
- FENCE
- BURIED ELECTRICAL CABLE
- BENCHMARK
- MW-119 MONITORING WELL (INSTALLED BY KGS) (MW101-MW133, MW140-MW147)
- MW-10 MONITORING WELL (INSTALLED BY OTHERS) (ALL OTHER WELLS)
- RW8-1 RECOVERY WELL
- SUMP SUMP WELL
- RAILROAD TRACKS
- UNDERGROUND DRAIN
- DESTROYED
- GEODETIC GROUNDWATER CONTOUR (m)
- GROUNDWATER FLOW DIRECTION

NOTES:

1. SITE PLAN BASED ON AUTOCAD FILE PROVIDED BY CN.

0 12 24 36 48 60m

SCALE: 1:600 METRIC 24"x36"
1:1200 METRIC 11"x17"

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REVISIONS / ISSUE

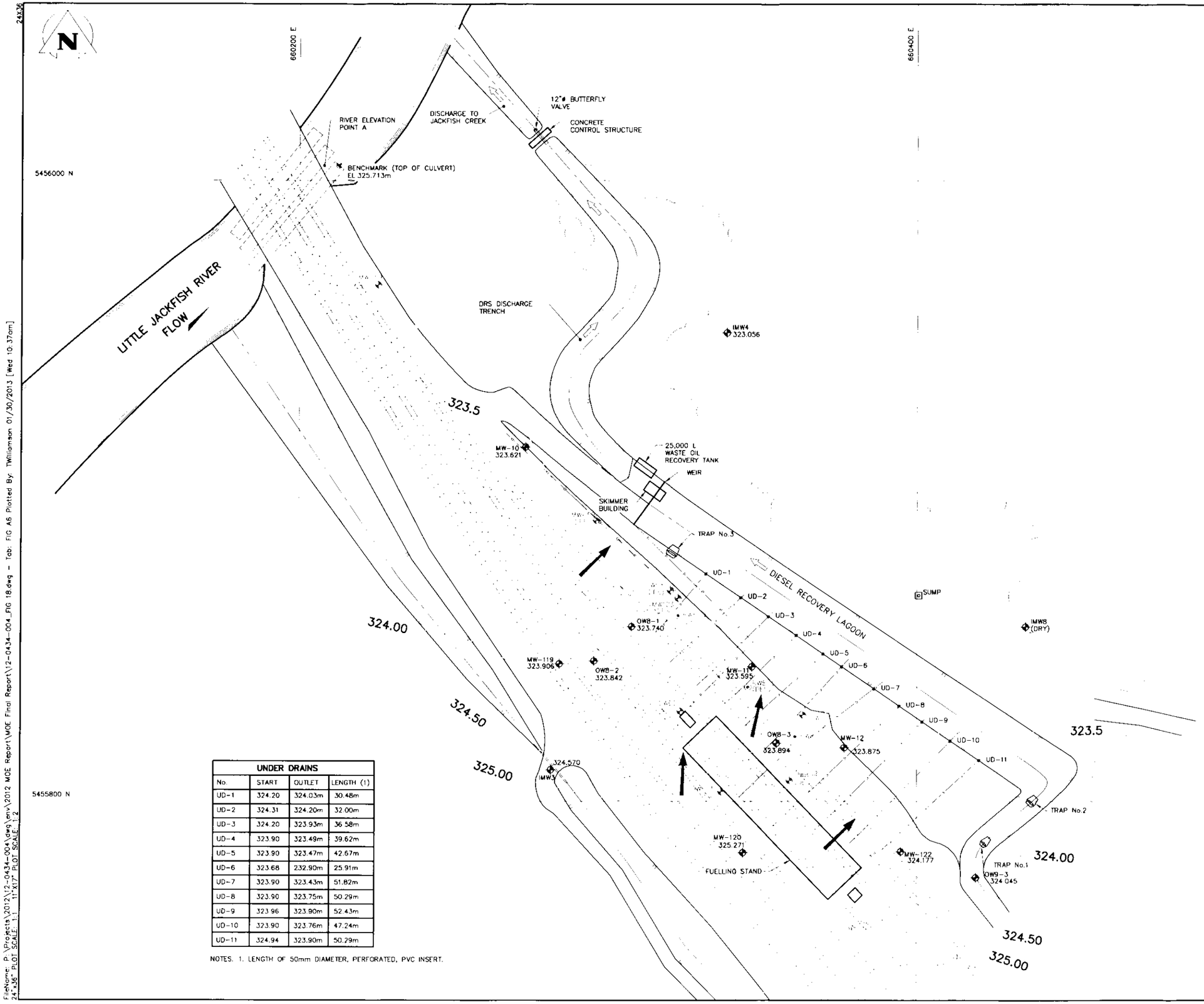
KGS GROUP CONSULTING ENGINEERS

CN CANADIAN NATIONAL

2012 REMEDIAL OPERATIONS
PIN# 1000/ONPR/100587
HORNEPAYNE YARD, ON

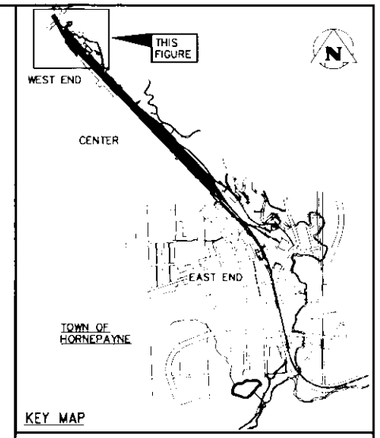
GROUNDWATER SURFACE CONTOURS
WEST END - SPRING 2012

JANUARY 2013 | FIGURE 17 | B



UNDER DRAINS			
No.	START	OUTLET	LENGTH (1)
UD-1	324.20	324.03m	30.48m
UD-2	324.31	324.20m	32.00m
UD-3	324.20	323.93m	36.58m
UD-4	323.90	323.49m	39.62m
UD-5	323.90	323.47m	42.67m
UD-6	323.68	232.90m	25.91m
UD-7	323.90	323.43m	51.82m
UD-8	323.90	323.75m	50.29m
UD-9	323.96	323.90m	52.43m
UD-10	323.90	323.76m	47.24m
UD-11	324.94	323.90m	50.29m

NOTES. 1. LENGTH OF 50mm DIAMETER, PERFORATED, PVC INSERT.



KEY MAP

LEGEND:

- BERM
- CENTERLINE OF DITCH
- FENCE
- BURIED ELECTRICAL CABLE
- BENCHMARK
- MW-117 MONITORING WELL (INSTALLED BY KGS) (MW117-MW133, MW140-MW147)
- MW-10 MONITORING WELL (INSTALLED BY OTHERS) (ALL OTHER WELLS)
- RW8-1 RECOVERY WELL
- SUMP SUMP WELL
- RAILROAD TRACKS
- UNDERGROUND DRAIN
- DESTROYED
- GEODETIC GROUNDWATER CONTOUR (m)
- GROUNDWATER FLOW DIRECTION

NOTES:

1. SITE PLAN BASED ON AUTOCAD FILE PROVIDED BY CN.

SCALE: 1:600 METRIC 24"x36" 1:1200 METRIC 11"x17"

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REVISIONS / ISSUE

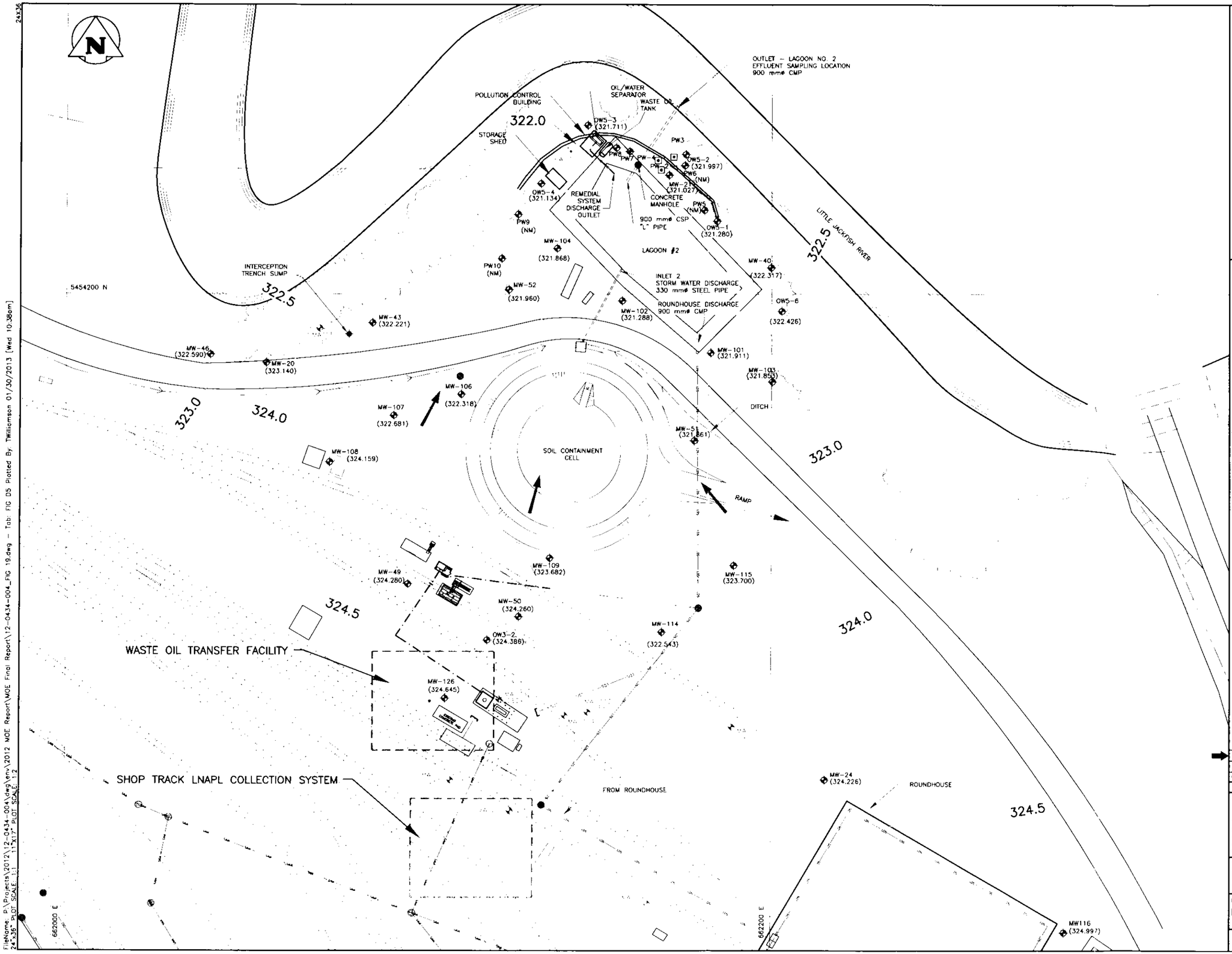
KGS GROUP CONSULTING ENGINEERS

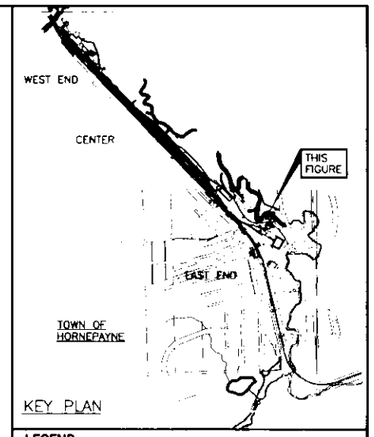
CANADIAN NATIONAL

2012 REMEDIAL OPERATIONS
PIN# 1000/ONPR/100587
WEST END, HORNEPAYNE YARD, ON

GROUNDWATER SURFACE CONTOURS
FALL 2012

JANUARY 2013 | FIGURE 18 | REV B





LEGEND

- RAILROAD TRACK
- CULVERT
- CENTERLINE OF DITCH
- SANITARY SEWER
- STORM SEWER
- FENCE
- DISCHARGE LINE
- TREES/ SHRUBS
- MANHOLES
- SURFACE WATER FLOW DIRECTION
- MW-126 MONITORING WELL (INSTALLED BY KGS) (MW101–MW133, MW140–MW147)
- MW-52 MONITORING WELL (INSTALLED BY OTHERS) (ALL OTHER WELLS)
- PW-1 PUMPING WELL
- 323.00 GEODETIC GROUNDWATER CONTOUR (m)
- GROUNDWATER FLOW DIRECTION
- (323.700) GROUNDWATER ELEVATION AT WELL
- DESTROYED
- (NM) NOT MONITORED

NOTE:

1. REFERENCE JACQUES WHITFORD ENVIRONMENTAL LIMITED PROJECT 31004, DRAWING NO. 2, 1996.
2. ELEVATIONS ARE ADJUSTED FOR PRESENCE OF LNAPL.

0 10 20 30 40 50m

SCALE: 1:500 METRIC 24"x36"
1:1000 METRIC 11"x17"

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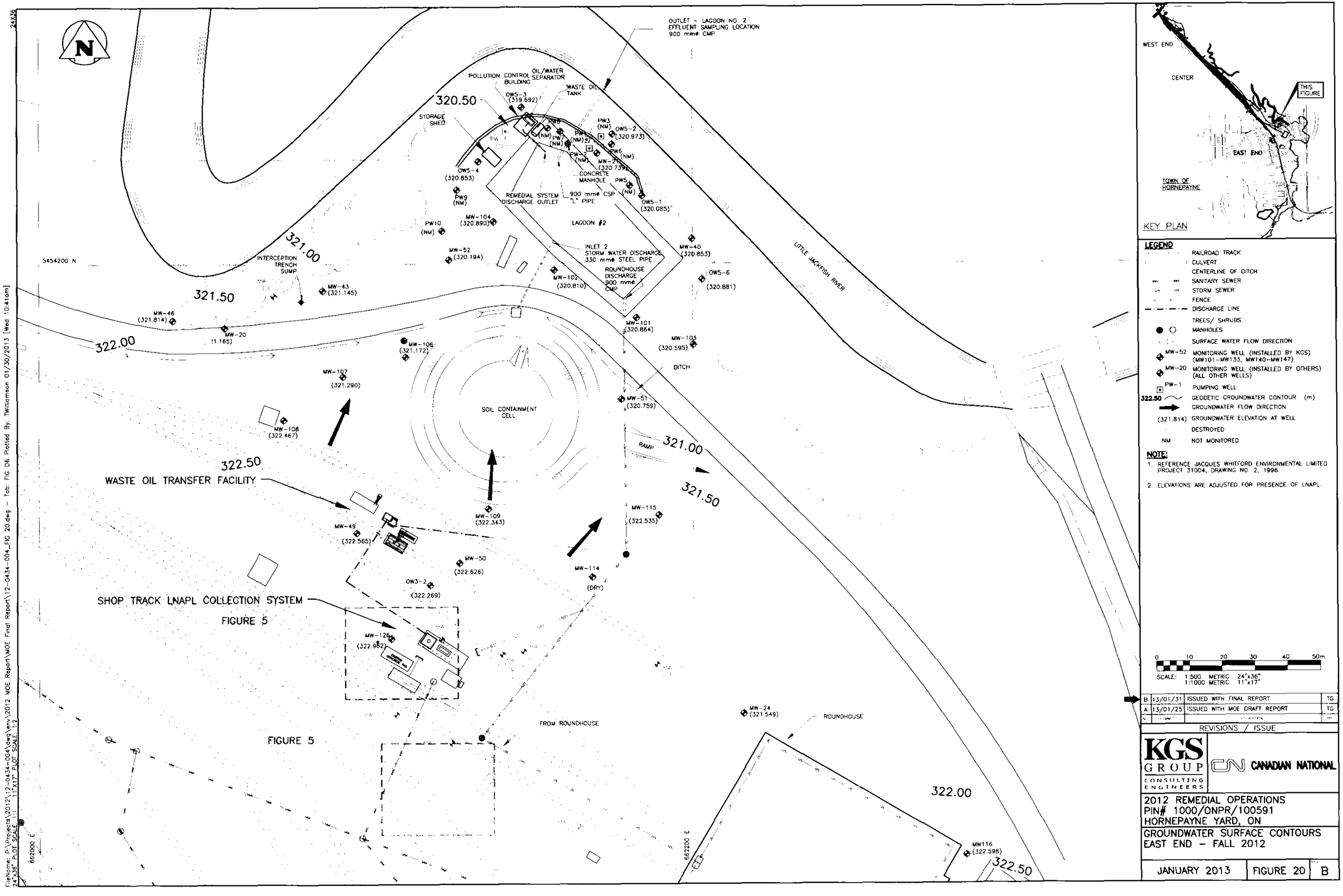
KGS GROUP CONSULTING ENGINEERS

CN CANADIAN NATIONAL

2012 REMEDIAL OPERATIONS
PIN# 1000/ONPR/100591
HORNEPAYNE YARD, ON

GROUNDWATER SURFACE CONTOURS
EAST END – SPRING 2012

JANUARY 2013 | FIGURE 19 | REV B



WASTE OIL TRANSFER FACILITY

SHOP TRACK LNAPL COLLECTION SYSTEM

FIGURE 5

FIGURE 5

LEGEND

- RAILROAD TRACK
- CULVERT
- CENTERLINE OF DITCH
- SANITARY SEWER
- STORM SEWER
- FENCE
- DISCHARGE LINE
- TREES/ SHRUBS
- MANHOLES
- SURFACE WATER FLOW DIRECTION
- MW-52 — MONITORING WELL (INSTALLED BY KGS) (MW101–MW133, MW140–MW147)
- MW-20 — MONITORING WELL (INSTALLED BY OTHERS) (ALL OTHER WELLS)
- PW-1 — PUMPING WELL
- 322.50 — GEODETIC GROUNDWATER CONTOUR (m)
- GROUNDWATER FLOW DIRECTION
- (321.814) — GROUNDWATER ELEVATION AT WELL
- DESTROYED
- NM — NOT MONITORED

NOTE:

1. REFERENCE JACQUES WHITFORD ENVIRONMENTAL LIMITED PROJECT 31004, DRAWING NO. 2, 1996.
2. ELEVATIONS ARE ADJUSTED FOR PRESENCE OF LNAPL.

0 10 20 30 40 50m

SCALE: 1:500 METRIC 24"x36"
1:1000 METRIC 11"x17"

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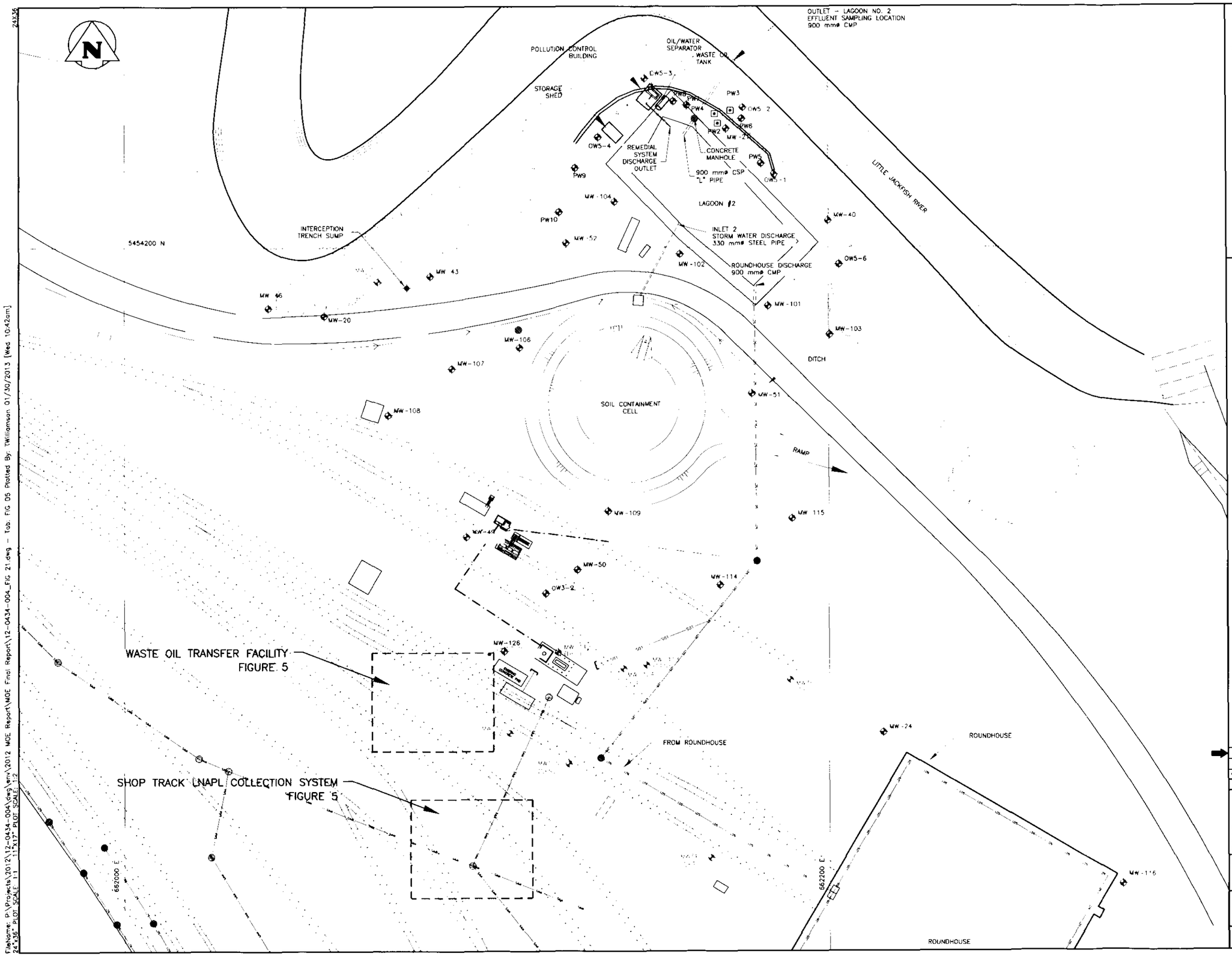
KGS GROUP CONSULTING ENGINEERS

CANADIAN NATIONAL

2012 REMEDIAL OPERATIONS
PIN# 1000/ONPR/100591
HORNEPAYNE YARD, ON

GROUNDWATER SURFACE CONTOURS
EAST END – FALL 2012

JANUARY 2013 | FIGURE 20 | B



LEGEND

- RAILROAD TRACK
- CULVERT
- CENTERLINE OF DITCH
- SANITARY SEWER
- STORM SEWER
- FENCE
- DISCHARGE LINE
- TREES/ SHRUBS
- MANHOLES
- SURFACE WATER FLOW DIRECTION
- MW-126 MONITORING WELL (INSTALLED BY KGS) (MW101-MW133, MW140-MW147)
- MW-50 MONITORING WELL (INSTALLED BY OTHERS) (ALL OTHER WELLS)
- PW-1 PUMPING WELL
- MW20 MONITORING WELLS SAMPLED IN 2011
- DESTROYED

NOTE:

1. REFERENCE JACQUES WHITFORD ENVIRONMENTAL LIMITED PROJECT 31004, DRAWING NO. 2, 1996.
2. ELEVATIONS ARE ADJUSTED FOR PRESENCE OF LNAPL.

0 10 20 30 40 50m

SCALE: 1:500 METRIC 24"x36"
1:1000 METRIC 11"x17"

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CN CANADIAN NATIONAL

2012 REMEDIAL OPERATIONS
PIN# 1000/ONPR/100591
HORNEPAYNE YARD, ON

GROUNDWATER MONITORING WELL SAMPLING LOCATIONS

JANUARY 2013 | FIGURE 21 | REV. B

APPENDICES

APPENDIX A
CERTIFICATE OF APPROVAL
No. 3528-83LQWT

Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDED CERTIFICATE OF APPROVAL
INDUSTRIAL SEWAGE WORKS
NUMBER 3528-83LQWT
Issue Date: April 29, 2010

Canadian National Railway Company
1 Administration Road
PO Box, No. 1000, Concord, Ontario L4K 1B9

Site Location: 58 Front Street - Hornepayne Yard
East and West End Systems
Hornepayne Township, District of Algoma, ON P0M 1Z0

You have applied in accordance with Section 53 of the Ontario Water Resources Act for approval of:

the establishment of sewage works for the collection, transmission, treatment and disposal of stormwater, contact stormwater runoff from the CN Hornepayne Yard and industrial sewage generated from the Lagoon Light Non-Aqueous Phase Liquid (LNAPL) Containment System, the Shop Track LNAPL Recovery System, the Waste Oil Transfer Facility and melt water/seepage from the soil contaminated cell, discharging to Little Jackfish River, consisting of the following:

EAST END ENVIRONMENTAL PROTECTION SYSTEM

- A Lagoon System to provide quantity and quality controls for both stormwater runoff, off-site discharge of petroleum hydrocarbon spills and industrial sewage. The lagoon consists of:

  - a rectangular lagoon with an impermeable liner for a total capacity of approximately 1,936 m^3, discharging to a 600 mm diameter corrugated steel pipe with an outlet at an elevation of 322.74 m, equipped with a 900 mm diameter concrete manhole acting as an settling basin for hydrocarbon and suspendid solids.

  - an increase in the lagoon berm height by 0.8 m, including 0.3 m of freeboard, to increase the volumetric capacity 835 m^3 for a total capacity of 2,771 m^3, and slopes changes from 3:1 to 4:1.

- A Containment Recovery and Collection System to contain and recover local subsurface LNAPL identified in the area, consisting of:

  - A bentonite / concrete cut-off wall at the northwest corner of the lagoon to prevent the off-site migration of LNAPL into the Little Jackfish River, equipped with ten (10) pumping wells and an interception trench with 4.5 m depth, width of 0.6 to 1.1 m and 78.5 m in length, all located between the former Pump House area and the Little Jackfish River (upgradient and downgradient from the cut-off wall), and discharging into

the oil/water separator.

- An oil/water separator (fiberglass Parkson Model SRM6 OWS, or approved equivalent) located at the Pollution Control Building and discharging into the lagoon, equipped with:

- A transfer tank with a total capacity of 171 L, a transfer pump directing sewage from the transfer tank to a 4,560 L double walled waste oil tank located adjacent to the Pollution Control Building, prior to treatment at the Oil Transfer Facility.

- A Shop Track LNAPL Recovery System to contain and recover local subsurface LNAPL identified in the area, consisting of:

  - An oil skimmer, Abinaki Model 8 Oil Grabber, used to collect LNAPL draining to the Recovery Trech.

  - A rock filled Recovery Trench (20 m long, 5 m wide and 5 m depth) with a non woven geotextile to collect groundwater and LNAPL to be pumped through a 38 mm diameter HDPE discharge line to the oil water separator located at the waste oil transfer facility. This System is equipped with a collection sump located within the Pollution Control Building, transferring collected LNAPL, by gravity, to the oil recovey tank.

  - An oil recovey tank, double walled with a capacity of 5,000 L.

- A Waste Oil Transfer Facility to process petroleum hydrocarbons collected from all LNAPL collection systems within the Yard, as well as waste oil generated from both Yard and remote site operations, consisting of a waste oil holding tank of 38 m^3 double walled discharging to the oil water separator and an oil water separator.

- A Soil Containment Cell to contain hydrocarbon impacted soils generated from former and future spills within the Yard and at remote rail locations, consisting of a circular cell with a non permeable liner with a holding capacity of 13,600 m^3, equipped with a rubber tire excavator to treat top soil at 0.3 to 0.5 m depth.

All other controls, electrical equipment, instrumentation, piping, pumps, valves and appurtenances essential for the proper operation of the aforementioned sewage works.

WEST END FUELLING STAND SYSTEM

These works include the West End Fuelling Stand at the Hornepayne Yard and included in Certificate 5146-7F2H6J issued on June 17, 2008, consisting of the following:

- Approximately eleven (11) 50 mm diameter perforated pipe underdrains installed under the trackage adjacent to the West End Fuelling Platform and the contaminated soil stockpile, discharging to the retention lagoon;

- One (1) retention lagoon with a storage capacity of approximately 960 m^3 (at the maximum operating water elevation of 324.4 m), including a sheet pile weir and belt oil skimmer seasonally operated

(normally April to November) with product recovery storage tank, discharging to the lined drainage ditch;

- One (1) polyvinyl chloride lined drainage ditch extending from the retention pond to the Little Jackfish River, including the relocation of the existing concrete discharge control structure;

All other controls, electrical equipment, instrumentation, piping, valves and appurtenances essential for the proper operation of the aforementioned sewage works

All in accordance with the following submitted supporting documents:

1. Application for Approval of Industrial Sewage Works submitted by Alexandre Borges, CN Environment Officer of Canadian National Railway Company dated August 4, 2009;

2. Application's appendix A to H prepared by KGS Group Consulting Engineers, dated August 10, 2009.

3. Application for the Approval of Industrial Sewage Works submitted by Mr. Erwin Waldinsperger dated January 1998 and attachments and associated drawings, all prepared by KGS Group Consulting Engineers.

For the purpose of this Certificate of Approval and the terms and conditions specified below, the following definitions apply:

"Certificate" means this entire certificate of approval document, issued in accordance with Section 53 of the *Ontario Water Resources Act* , and includes any schedules;

"Director" means any Ministry employee appointed by the Minister pursuant to section 5 of the *Ontario Water Resources Act* ;

"District Manager" means the District Manager of the Thunder Bay District Office of the Ministry;

"Ministry" means the Ontario Ministry of the Environment;

"Regional Director" means the Regional Director of the Northern Region of the Ministry;

"Source Protection Plan" means a drinking water source protection plan prepared under the *Clean Water Act, 2006* ;

"Owner" means Canadian National Railway Company and includes its successors and assignees; and

"works" means the sewage works described in the Owner's application, this certificate and in the supporting documentation referred to herein, to the extent approved by this certificate.

You are hereby notified that this approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. GENERAL CONDITION

(1) Except as otherwise provided by these Conditions, the Owner shall design, build, install, operate and maintain the works in accordance with the description given in this Certificate, the application for approval of the works and the submitted supporting documents and plans and specifications as listed in this Certificate.

(2) Where there is a conflict between a provision of any submitted document referred to in this Certificate and the Conditions of this Certificate, the Conditions in this Certificate shall take precedence, and where there is a conflict between the listed submitted documents, the document bearing the most recent date shall prevail.

2. CHANGE OF OWNER

(1) The Owner shall notify the District Manager and the Director, in writing, of any of the following changes within 30 days of the change occurring:

(a) change of Owner or operating authority, or both;

(b) change of address of Owner or operating authority or address of new owner or operating authority;

(c) change of partners where the Owner or operating authority is or at any time becomes a partnership, and a copy of the most recent declaration filed under the *Partnerships Registration Act* ;

(d) change of name of the corporation where the Owner or operator is or at any time becomes a corporation, and a copy of the most current "Initial Notice or Notice of Change" (Form 1, 2 or 3 of O. Reg. 189, R.R.O. 1980, as amended from time to time), filed under the *Corporations Information Act* shall be included in the notification to the District Manager;

(2) In the event of any change in ownership of the works, the Owner shall notify in writing the succeeding owner of the existence of this certificate, and a copy of such notice shall be forwarded to the District Manager.

(3) The Owner shall ensure that all communications made pursuant to this condition will refer to this certificate's number.

3. CHANGES IN PROCESSES OR PROCESS MATERIALS

The Owner shall give written notice to the District Manager of any plans to change the processes or process materials in the Owner's enterprise serviced by the works where the change may significantly

alter the quantity or quality of the influent to or effluent from the works, and no such change(s) shall be made unless with the written concurrence or approval of the District Manager.

4. OPERATIONS MANUAL

(1) The Owner shall prepare an operations manual prior to the commencement of operation of the sewage works, that includes, but not necessarily limited to, the following information:

(a) operating procedures for routine operation of the works;

(b) inspection programs, including frequency of inspection, for the works and the methods or tests employed to detect when maintenance is necessary;

(c) repair and maintenance programs, including the frequency of repair/maintenance;

(d) contingency plans and procedures for dealing with potential spill, bypasses and any other abnormal situations and for notifying the District Manager; and

(e) complaint procedures for receiving and responding to public complaints.

(2) The Owner shall maintain the operations manual up to date through revisions undertaken from time to time and retain a copy at the location of the sewage works. Upon request, the Owner shall make the manual available for inspection and copying by Ministry personnel.

5. EFFLUENT LIMITS

(1) The Owner shall design, construct and operate the works that discharge to the Little Jackfish River such that the concentrations of the materials named below as effluent parameters are not exceeded in the effluent from the works.

Table 2 - Effluent Limits

Effluent Parameter	**Concentration Limit (mg/L)**
Column 1	Column 2
Petroleum Hydrocarbons (F1+F2)	1000
Petroleum Hydrocarbons (F3+F4)	1000
Benzene	5
Toluene	0.8
Ethylbenzene	2.4
m&p-Xylene	32
o-Xylene	40
Methyl-t-butyl-Ether (MTBE)	200
Lead	See subsection 2
pH of the effluent maintained between 6.5 to 8.5, inclusive, at all times	

(2) The limit for Lead shall be determined based on the hardness of the water. If the hardness is less than 30 mg/L, the limit is 1 µg/L. If the hardness is between 30 mg/L and 80 mg/L, inclusive, the limit is 3 µg/L. If the hardness is greater than 80 mg/L, the limit is 5 µg/L.

(3) For the purposes of determining compliance with and enforcing subsection (1):

(a) non-compliance with respect to a Concentration Limit is deemed to have occurred when any single sample analyzed for a parameter named in Column 1 of subsection (1) is greater than the corresponding maximum concentration set out in Column 2 of subsection (1);

(b) non-compliance with respect to pH is deemed to have occurred when any single measurement is outside of the indicated range.

6. EFFLUENT - VISUAL OBSERVATIONS

Notwithstanding any other condition in this certificate, the Owner shall ensure that the effluent from the works is essentially free of floating and settleable solids and does not contain oil or any other substance in amounts sufficient to create a visible film, sheen or foam on the receiving waters.

7. EFFLUENT MONITORING - SURFACE WATER

(1) All samples and measurements taken for the purposes of this certificate are to be taken at a time and in a location characteristic of the quality and quantity of the effluent stream over the time period being monitored.

(2) Samples shall be collected and analyzed at the following sampling point(s), at the sampling frequencies and using the sample type specified for each parameter listed:

Table 3 - Effluent Monitoring - Surface Water

Sample Points: To be established to the satisfaction of the District Manager prior to commencement of operations of the works. Sampling includes estimated flows. Sampling locations at a minimum to include (as per Drawing No. 09-0434-01 H1, Rev. A, Appendix H of the Application package dated August 2009, prepared by KGS Group):

1. Effluent from Discharge Control Gate;
2. Little Jackfish River: HOR 005 05 (mid stream); and HOR 004 05 (down stream)
3. Yard discharge: HOR 002 05 (Lagoon No.2), at the end of the discharge culvert.

Frequency	Once each month (April to November) in ice-free conditions
Sample Type	Grab
Parameters	Petroleum Hydrocarbons (F1+F2), Petroleum Hydrocarbons (F3+F4), Benzene, Toluene, Ethylbenzene, m&p-Xylene, o-Xylene, Methyl-t-butyl-Ether (MTBE), Lead, pH, hardness, alkalinity, Total Purgeable Hydrocarbons, Total Extractable Hydrocarbons, Total Oil and Grease, and Mineral Oil and Grease

(3) The Owner shall supplement the monitoring program in subsection (1) with visual inspections which shall include, but not be limited to the following:

(a) A weekly inspection (April to November) of the effluent from the Discharge Control Gate and the river during discharge of treated wastewater for any visible oil sheens, colour and odours; and

(b) A weekly inspection (April to November) of the level of material in the recovered product storage tank.

(4) The methods and protocols for sampling, analysis, toxicity testing, and recording shall conform, in order of precedence, to the methods and protocols specified in the following:

(a) the Ministry's publication "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater" (August 1994), ISBN 0-7778-1880-9, as amended from time to time by more recently published editions;

(b) the publication "Standard Methods for the Examination of Water and Wastewater" (21st edition) as amended from time to time by more recently published editions; and,

(c) the Environment Canada publications "Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout" (July 1990) and "Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Daphnia magna" (July 1990);

(5) The measurement frequencies specified in subsection (2) in respect of any parameter are minimum requirements which may, after twelve (12) months of monitoring in accordance with this Condition, be modified by the District Manager in writing from time to time.

(6) A continuous flow measuring device(s) or an alternate method approved by the District Manager shall be installed and maintained to measure the flowrate of the effluent from the sewage works, with an accuracy to within plus or minus twenty per cent (20%) of the actual flowrate for the entire design range of the flow measuring device and the Owner shall measure, record and calculate the flowrate for each effluent stream on each day of sampling.

8. EFFLUENT MONITORING - GROUNDWATER

(1) All samples and measurements taken for the purposes of this certificate are to be taken at a time and in a location characteristic of the quality and quantity of the groundwater over the time period being monitored.

(2) Samples shall be collected and analyzed at the following sampling point(s), at the sampling frequencies, including groundwater levels and thickness of any light non-aqueous phase liquids (LNAPLs) using an interface probe (IP) at all monitoring wells:

Table 3 - Effluent Monitoring - Groundwater Sample Points: Sampling locations as per Drawing No. 09-0434-01 G1, Rev. A, Appendix G of the Application package dated August 2009, prepared by KGS Group).		
Effluent Parameter	**Frequency**	**Sample Location**
Benzene, Toluene, Ethylbenzene, Xylenes (BTEX), and Hydrocarbon fraction F1	Monitored and sampled once per year	Wells: MW-20, MW-40, MW-43, MW-46, MW-52, OW 5-1, OW 5-2 and OW 5-3
Hydrocarbon fraction F2 to F4	Monitored twice per year (Spring and Fall)and Sampled once per year	Wells: MW-21, MW-24, MW-49, MW-51, MW-52, MW-101, MW-102, MW-103, MW-104, MW-106, MW-107, MW-108, MW-109, MW-114, MW-115, MW-126, and OW 3-2
Hydrocarbon fraction F2 to F4	Monitored and sampled twice per year (Spring and Fall)	Wells: MW-20, MW-40, MW-43, MW-46, MW-52, OW 5-1, OW 5-2 and OW 5-3

Note: Duplicate groundwater samples shall be taken for field monitoring of Dissolved Oxygen, pH, Conductivity, Temperature and Oxidation-reduction potential.

(3) The methods and protocols for sampling, analysis, toxicity testing, and recording shall conform, in order of precedence, to the methods and protocols specified in the following:

(a) the Ministry's publication "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater" (August 1994), ISBN 0-7778-1880-9, as amended from time to time by more recently published editions.

(b) the publication "Standard Methods for the Examination of Water and Wastewater" (21st edition) as amended from time to time by more recently published editions.

(5) The measurement frequencies specified in subsection (2) in respect of any parameter are minimum requirements which may, after twelve (12) months of monitoring in accordance with this Condition, be modified by the District Manager in writing from time to time.

9. REPORTING

(1) The Owner shall report to the District Manager or designate, any exceedance of any parameter specified in Condition 6 orally, as soon as reasonably possible, and in writing within seven (7) days of the exceedance.

(2) In addition to the obligations under Part X of the *Environmental Protection Act* , the Owner shall, within 10 working days of the occurrence of any reportable spill as defined in Ontario Regulation 675/98, bypass or loss of any product, by-product, intermediate product, oil, solvent, waste material or any other polluting substance into the environment, submit a full written report of the occurrence to the District Manager describing the cause and discovery of the spill or loss, clean-up and recovery measures taken, preventative measures to be taken and schedule of implementation.

(4) The Owner shall prepare and submit a performance report to the District Manager on an annual basis within thirty (30) days following the end of the period being reported upon. The first such report shall cover the first annual period following the commencement of operation of the works and subsequent reports shall be submitted to cover successive annual periods following thereafter. The reports shall contain, but shall not be limited to, the following information:

(a) a summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Condition 5, including an overview of the success and adequacy of the sewage works;

(b) a description of any operating problems encountered and corrective actions taken;

(c) a summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the sewage works;

(d) a summary of any effluent quality assurance or control measures undertaken in the reporting period;

(e) a summary of the calibration and maintenance carried out on all effluent monitoring equipment;

(f) a site plan illustrating the location of all site infrastructure, environmental protection system components, monitoring wells and surface water monitoring stations;

(g) a location map illustrating the site relative to nearby potentially sensitive groundwater/surface water features (i.e., lakes, streams, wells);

(h) a water level contour map for each monitoring event carried out during the previous year;

(i) stratigraphic cross-sections which clearly illustrate the subsurface distribution of geological materials;

(j) boreholes logs for all monitoring wells;

(k) tables illustrating historical chemistry and water level data;

(l) graphs illustrating historical water quality trends for hydrocarbon parameters at key monitoring wells;

(m) an assessment of monitoring data to evaluate system effectiveness and compliance with the applicable water quality protection criteria;

(n) recommendations for future monitoring and/or further remedial actions;

(o) a section detailing the field sampling protocols and QA/QC measures;

(p) a copy of the Certificate of Approval and any amendments;

(q) copies of laboratory reports for all sampling events in that year; and

(r) all monitoring and sampling data should also be submitted in an electronic format (i.e. a Microsoft Excel spreadsheet).

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is imposed to ensure that the works are built and operated in the manner in which they were described for review and upon which approval was granted. This condition is also included to emphasize the precedence of Conditions in the Certificate and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review.

2. Condition 2 is included to ensure that the Ministry records are kept accurate and current with respect to approved works and to ensure that subsequent owners of the works are made aware of the certificate and continue to operate the works in compliance with it.

3. Condition 3 is included to ensure that the works is operated in accordance with the information submitted by the owner relating to the process and materials which are served by the works, and to ensure that any contemplated changes in them which could potentially affect the characteristics of effluent from the works will be properly reviewed and approved.

4. Condition 4 is included to ensure that a comprehensive operations manual governing all significant areas of operation, maintenance and repair is prepared, implemented and kept up-to-date by the owner and made available to the Ministry. Such a manual is an integral part of the operation of the works. Its compilation and use should assist the owner in staff training, in proper plant operation and in identifying and planning for contingencies during possible abnormal conditions. The manual will also act as a benchmark for Ministry staff when reviewing the owner's operation of the work.

5. Conditions 5 and 6 are imposed to ensure that the effluent discharged from the works to the Little Jackfish River meets the Ministry's effluent quality requirements thus minimizing environmental impact on the receiver.

6. Conditions 7 and 8 are included to require the owner to demonstrate on a continual basis that the quality and quantity of the effluent from the approved works is consistent with the design and effluent limits specified in the certificate and that the approved works does not cause any impairment to the receiving

watercourse.

7. Condition 9 is included to provide a performance record for future references and to ensure that the Ministry is made aware of problems as they arise, so that the Ministry can work with the Owner in resolving the problems in a timely manner.

This Certificate of Approval revokes and replaces Certificate(s) of Approval No. 5146-7F2H6J issued on June 17, 2008.

In accordance with Section 100 of the Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, as amended, you may by written notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 101 of the Ontario Water Resources Act , R.S.O. 1990, Chapter 0.40, provides that the Notice requiring the hearing shall state:

1. The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the works are located;

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, 15th Floor
Toronto, Ontario
M5G 1E5

AND

The Director
Section 53, *Ontario Water Resources Act*
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca**

The above noted sewage works are approved under Section 53 of the Ontario Water Resources Act.

DATED AT TORONTO this 29th day of April, 2010

Mansoor Mahmood, P.Eng.
Director
Section 53, *Ontario Water Resources Act*

ET/

c: District Manager, MOE Sault Ste. Marie Area Office
Tony Gallo, Kontzamanis Graumann Smith MacMillan Inc.

APPENDIX B
WASTE MANIFEST FORMS

MANIFEST - MANIFESTE

This Manifest conforms to all Federal and Provincial transport and environmental legislation governing manifesting.
Ce manifeste est conforme aux législations fédérale et provinciale sur l'environnement et le transport régissant les manifestes.

Manifest Reference No. / N° de référence du manifeste **CM13606-9**

A Consignor (Generator) / Expéditeur (Producteur)

Provincial ID No. / N° d'id. provincial

Company name / Nom de l'entreprise

Mailing address / Adresse postale | City / Ville | Province | Postal code / Code postal

Shipping site address / Origine de l'expédition

City / Ville | Province | Postal code / Code postal

Intended consignee / Destinataire prévu | Provincial ID No. / No d'id. provincial

Address / Adresse | City / Ville | Province | Postal code / Code postal

Receiving site address / Destination de l'expédition

City / Ville | Province | Postal code / Code postal

B Carrier / Transporteur

Provincial ID No. / N° d'id. provincial

Company name / Nom de l'entreprise

Address / Adresse

City / Ville | Prov. | Postal code / Code postal

Registration No. / N° d'immatriculation | Prov.

Vehicle / Véhicule

Trailer/Rail Car No. 1 / 1er remorque - wagon

Trailer/Rail Car No. 2 / 2e remorque - wagon

Point of entry / Point d'entrée | Point of exit / Point de sortie

Carrier Certification: *I declare that I have received waste as offered by the consignor in Part A for delivery to the intended consignee and that the information contained in Part B is complete and correct. / **Déclaration du transporteur:** J'atteste avoir reçu les déchets offerts par l'expéditeur dans la partie A en vue de leur livraison au destinataire choisi et que les renseignements inscrits à la partie B sont exacts et complets.*

Year / Année | Month / Mois | Day / Jour | Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie)

Signature | Tel. No. / N° de tél.

Reference nos. of other Manifest(s) used / N°s de références des autres manifestes utilisés

C Consignee (Receiver) / Destinataire (Réceptionnaire)

Provincial ID No. / N° d'id. provincial

Consignee information same as Intended Consignee in Part A / L'information à fournir par le destinataire est la même qu'en A

☐ Yes / Oui ☐ No, complete the boxed area below / Non, compléter la boîte ci-dessous

Company name / Nom de l'entreprise

Address / Adresse

City / Ville | Province | Postal code / Code postal

Receiving site address / Destination de l'expédition

City / Ville | Province | Postal code / Code postal

Date received / Date de réception: Year / Année | Month / Mois | Day / Jour

Time / Heure ☐ A.M. ☐ P.M.

Physical state / Etat physique	Shipping name of waste / Appellation réglementaire du déchet	Waste identification / Identification du déchet: Provincial No. / N° (Quebec, Ontario only) (Québec, Ontario seul)	TDGA/PIN LTMD/NIP	Quantity shipped / Quantité expédiée	Units L or kg / ou kg unités	Classification	Packing group / Groupe d'emballage	Packaging / Contenants: No. / Nbre	Codes int. / ext.	Quantity received / Quantité reçu	Units L or kg / ou kg unités	Identify any shipment discrepancy problems. Attach addendum if necessary. / Indiquer toute différence relative à l'expédition. Annexer une feuille au besoin.	Handling code / Code de manutention	Decontamination Packaging / Contenants: Yes / Oui	Decontamination Packaging / Contenants: No / Non	Decontamination Vehicle / Véhicule: Yes / Oui	Decontamination Vehicle / Véhicule: No / Non

Special handling/Emergency instructions / Manutention spéciale/instructions d'urgence ☐ Attached / Ci-jointes ☐ Below / Ci-dessous

Circulation no. - Quebec only / N° de circulation - Réservée au Québec

If handling code "Other" (specify) / Si code de manutention "divers", spécifier

Date shipped / Date d'expédition: Year / Année | Month / Mois | Day / Jour

Time / Heure ☐ A.M. ☐ P.M.

Scheduled arrival date / Date d'arrivée prévue: Year / Année | Month / Mois | Day / Jour

If waste to be transferred, specify intended company name / Si les déchets doivent être transférés, préciser le nom du destinataire | Provincial ID No. / N° d'id. provincial

Address / Adresse | City / Ville | Prov.

Consignor Certification: *I declare that the information contained in Part A is correct and complete.*
Déclaration de l'expéditeur: *Je déclare que tous les renseignements à la partie A sont véridiques et complets.*

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie) | Signature | Tel. no. / N° de tél.

Consignee Certification: *I declare that the information contained in Part C is correct and complete.*
Déclaration du l'expéditeur: *Je déclare que tous les renseignements à la partie C sont véridiques et complets.*

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie)

Signature | Tel. no. / N° de tél.

000893

MOE 04-1917 (12/01)

Retained by Consignor (Generator) - Gardée par l'expéditeur

Copy / Copie 2 (green / verte)

MANIFEST - MANIFESTE

This Manifest conforms to all Federal and Provincial transport and environmental legislation requiring manifesting
Ce manifeste est conforme aux législations fédérale et provinciale sur l'environnement et le transport requérant un manifeste

Manifest Reference No.
Nº de référence du manifeste **CM13611-9**

A Consignor (Generator) / Expéditeur (Producteur)

Provincial ID No. / Nº d'id. provincial

Company name / Nom de l'entreprise

Mailing address / Adresse postale | City / Ville | Province | Postal code / Code postal

Shipping site address / Origine de l'expédition

City / Ville | Province | Postal code / Code postal

Intended consignee / Destinataire prévu | Provincial ID No. / No d'id. provincial

Address / Adresse | City / Ville | Province | Postal code / Code postal

Receiving site address / Destination de l'expédition

City / Ville | Province | Postal code / Code postal

B Carrier / Transporteur

Provincial ID No. / Nº d'id. provincial

Company name / Nom de l'entreprise

Address / Adresse

City / Ville | Prov. | Postal code / Code postal

	Registration No. / Nº d'immatriculation	Prov.
Vehicle / Véhicule		
Trailer/Rail Car No. 1 / 1re remorque – wagon		
Trailer/Rail Car No. 2 / 2e remorque – wagon		

Point of entry / Point d'entrée | Point of exit / Point de sortie

***Carrier Certification:** I declare that I have received waste as offered by the consignor in Part A for delivery to the intended consignee and that the information contained in Part B is complete and correct. / **Déclaration du transporteur:** J'atteste avoir reçu les déchets offerts par l'expéditeur dans la partie A en vue de leur livraison au destinataire choisi et que les renseignements inscrits à la partie B sont exacts et complets.*

Year / Année | Month / Mois | Day / Jour | Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie)

Signature | Tel. No. / Nº de tél. ( )

C Consignee (Receiver) / Destinataire (Réceptionnaire)

Reference nos. of other Manifest(s) used / Nºs de références des autres manifestes utilisés

Provincial ID No. / Nº d'id. provincial

Consignee information same as intended Consignee in Part A
L'information à fournir par le destinataire est la même qu'en A
☐ Yes / Oui ☐ No, complete the boxed area below / Non, compléter la boîte ci-dessous

Company name / Nom de l'entreprise

Address / Adresse

City / Ville | Province | Postal code / Code postal

Receiving site address / Destination de l'expédition

City / Ville | Province | Postal code / Code postal

Date received / Date de réception: Year / Année | Month / Mois | Day / Jour | Time / Heure ☐ A.M. ☐ P.M.

Physical state / État physique	Shipping name of waste / Appellation réglementaire du déchet	Waste identification / Identification du déchet: Provincial No. / Nº (Quebec-Ontario only) (Québec-Ontario seul)	TDGA PIN / LTMD NIP	Quantity shipped / Quantité expédiée	Units L or ou kg / unités	Classification	Packing group / Groupe d'emballage	Packaging / Contenants: No. / Nbre	Codes int. ext.	Quantity received / Quantité reçue	Units L or ou kg / unités	Identify any shipment discrepancy problems. Attach addendum if necessary / Indiquer toute différence relative à l'expédition. Annexer une feuille au besoin	Handling code / Code de manutention	Decontamination / Décontamination: Packaging / Contenants Yes / Oui	No / Non	Vehicle / Véhicule Yes / Oui	No / Non

Special handling/Emergency instructions / Manutention spéciale/Instructions d'urgence | ☐ Attached / Ci-jointes | ☐ Below / Ci-dessous

Circulation no. – Quebec only / Nº de circulation – Réservée au Québec

If handling code "Other" (specify) / Si code de manutention "divers", spécifier

If waste to be transferred, specify intended company name / Si les déchets doivent être transférés, préciser le nom du destinataire | Provincial ID No. / Nº d'id. provincial

Address / Adresse | City / Ville | Prov.

Date shipped / Date d'expédition: Year / Année | Month / Mois | Day / Jour | Time / Heure ☐ A.M. ☐ P.M.

Scheduled arrival date / Date d'arrivée prévue: Year / Année | Month / Mois | Day / Jour

***Consignor Certification:** I declare that the information contained in Part A is correct and complete.*
***Déclaration de l'expéditeur:** Je déclare que tous les renseignements à la partie A sont véridiques et complets*

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie) | Signature | Tel. no. / Nº de tél. ( )

***Consignee Certification:** I declare that the information contained in Part C is correct and complete. **Déclaration du "expéditeur":** Je déclare que tous les renseignements à la partie C sont véridiques et complets*

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie)

Signature | Tel. no. / Nº de tél.

000894

MOE-04-19:7 (1 [redacted] Re[redacted]d by[redacted]igno[redacted]nera[redacted]Gar[redacted]ar l'e[redacted]iteu[redacted]opy[redacted]ie 2[redacted]en / [redacted])

MOVEMENT DOCUMENT / MANIFEST
DOCUMENT DE MOUVEMENT / MANIFESTE

This Movement document/manifest conforms to all federal and provincial transport and environmental legislation
Ce document de mouvement/manifeste est conforme aux législations fédérale et provinciale sur l'environnement et le transport.

2536765-7

Movement Document / Manifest Reference No.
N° de référence du document de mouvement/manifeste

A Generator / consignor
Producteur / expéditeur

Registration No. / Provincial ID No.
N° d'immatriculation - d'id. provinciale

Company name / Nom de l'entreprise

Mailing address / Adresse postale | City / Ville | Province | Postal code / Code postal

E-mail / Courriel électronique | Tel No. / N° de tél.

Shipping site address / Adresse du lieu de l'expédition

City / Ville | Province | Postal code / Code postal

B Carrier
Transporteur

Registration No. / Provincial ID No.
N° d'immatriculation - d'id. provinciale

Company name / Nom de l'entreprise

Mailing address / Adresse postale | City / Ville | Province | Postal code / Code postal

E-mail / Courriel électronique | Tel No. / N° de tél.

Vehicle / Véhicule | Registration No. / N° d'immatriculation | Prov.

Trailer - Rail car No. 1 / 1re remorque - wagon

Trailer - Rail car No. 2 / 2e remorque - wagon

Port of entry / Point d'entrée | Port of exit / Point de sortie

C Receiver / consignee
Réceptionnaire / destinataire

Registration No. / Provincial ID No.
N° d'immatriculation - d'id. provinciale

Reference Nos. of other movement documents/manifests used / N° de référence des autres documents de mouvement/manifestes utilisés

Receiver / consignee information same as in Part A
Les renseignements du réceptionnaire / destinataire est la même qu'à la Partie A
☐ Yes / Oui ☐ No, complete the box below / Non, remplir la case ci-dessous

Company name / Nom de l'entreprise

Mailing address / Adresse postale

City / Ville | Province | Postal code / Code postal

E-mail / Courriel électronique | Tel No. / N° de tél.

Receiving site address / Adresse du lieu de destination

Intended Receiver / consignee
Réceptionnaire / destinataire prévu

Registration No. / Provincial ID No.
N° d'immatriculation - d'id. provinciale

GFL Environmental West Corp. A591103

Mailing address / Adresse postale | City / Ville | Province | Postal code / Code postal

3659 Hwy 11 17 Rossiyn, ON P7K 0S8

E-mail / Courriel électronique | Tel No. / N° de tél.

jcook@gflenv.com (807) 939-1717

Receiving site address / Adresse du lieu de l'expédition

Lot 13 Con II, Paipoonge Twp

City / Ville | Province | Postal code / Code postal

Rossiyn, ON P7K 0S8

Carrier Certification - *I certify that I have received waste or recyclable material from the generator / consignor for delivery to the receiver / consignee as set out in Part A and that the information contained in Part B is complete and correct.*
Attestation du transporteur - *J'atteste avoir reçu les déchets ou matières recyclables du producteur / expéditeur en vue de leur livraison au récipiendaire / destinataire, tels qu'ils figurent à la partie A et que les renseignements inscrits à la partie B sont exacts et complets.*

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie) | Tel No. / N° de tél.

Year / Année | Month / Mois | Day / Jour | Signature

Prov. code / Code prov.	Shipping name / Appellation réglementaire	Class / Classe Sub. class(es) / Classe(s) sub.	UN No. / N° NU	Packing / Mark gr. / Gr. d'emballage / de risque	Quantity shipped / Quantité expédiée	Units / L or / ou kg / Unités	Packaging / Containers No. / N°	Packaging / Containers Codes	Phys. state / État phys.
(i) ON	WASTE OILY WATER				2500	L	01	DR	
(ii)									
(iii)									
(iv)									

Notice No. / N° de notification	Notice Line No. / N° de ligne de la notification	Shipment Envoi	Of / De	D or R code / Code É ou R	C code / Code C	Basel Annex VIII or OECD Code / Annexe VIII de Bâle ou Code OCDE	H code / Code H	Y code / Code Y	National code in country of Export / Code du pays Exportation	Import / Importation	Customs code(s) / Code(s) de douanes
(i)											
(ii)											
(iii)											
(iv)											

Generator / consignor certification - *I certify that the information contained in Part A is correct and complete.*
Attestation du producteur / expéditeur - *J'atteste que tous les renseignements à la partie A sont exacts et complets.*

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie) | Signature | Tel No. / N° de tél.

Quantity received / Quantité reçue	Units / L or / ou kg / Unités	Comments / Commentaires	Handling Code / Code de manutention	Shipment / Envoi Accepted / Accepté	Shipment / Envoi Refused / Refusé	Docont Pack. Cont.	Docont Veh. Véh.

If waste or recyclable material to be transferred, specify intended company name / Si les déchets ou matières recyclables doivent être transférés, préciser le nom du destinataire

Registration No. / Provincial ID No. / N° d'immatriculation/d'id provinciale

If handling code "Other" (specify) / Si code de manutention « autre » (spécifier)

Receiver / consignee certification - *I certify that the information contained in Part C is correct and complete.*
Attestation du réceptionnaire / destinataire - *J'atteste que tous les renseignements à la partie C sont exacts et complets.*

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie)

Signature | Tel No. / N° de tél.

Special handling / Manutention spéciale
☐ Attached / Ci-joint ☒ As follows / Ci-contre

In Case of Spill Call 24 hr # (807) 939-1717

Date shipped / Date d'expédition: Year / Année | Month / Mois | Day / Jour | Time / Heure ☐ A.M. ☐ P.M.

Scheduled arrival date / Date d'arrivée prévue: Year / Année | Month / Mois | Day / Jour

MOE 04-1917 (07/07)

Retained by Consignor (Generator) - Gardée par l'expéditeur

Copy / Copie 2 (green / verte)

000895

APPENDIX C
DRILL LOGS

XCG Environmental Services Inc.

Log of Well MW-10
PHASE 2
CN
HORNEPAYNE, ONTARIO

Sheet 1 of 1

Job Number: 94560

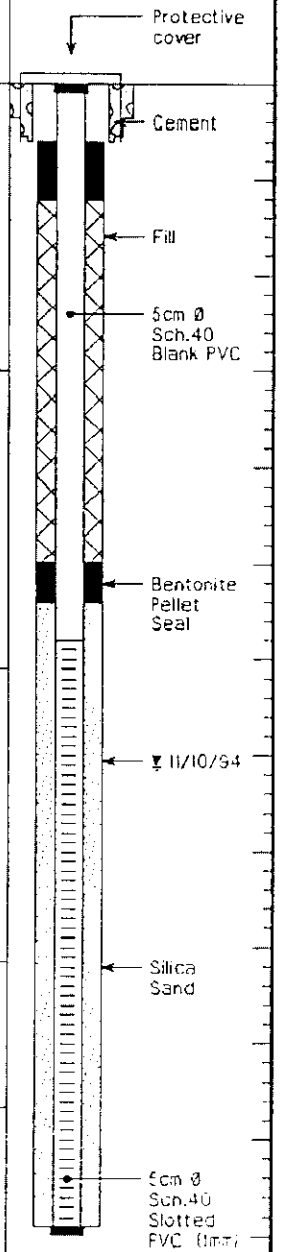
G.S. Elevation: 327.365m

Driller: BOART LONGYEAR DRILLING INC.	**Drilling**	**Date**	**Time**
Drill Method: AD-2 TRACK MOUNTED	**Started**	NOVEMBER 10/94	
Sample Method: STANDARD SPLIT SPOON	**Finished**	NOVEMBER 10/94	

Borehole Diameter: 15.2 cm | **Water Level T.O.P:** 3.53m | **Logged By:** D. G. W. | **Checked By:** O. P. L.

Sample No.	Blow Counts	HNu	Depth (meters)	Graphic Log	Materials Description
			1		SAND AND GRAVEL:sand and gravel fill, occasional cobbles
SS1		<1			
SS2	5/18 27/27	<1	2		SILTY SAND:medium brown grey with stone and cobbles, dry to moist, no odour
SS3	13/41 58	<1	3		grey, densely packed, gravel, dry
SS4	8/23 32/24	<1			SAND:densely packed coarse and fine grained sand, moist, no odour
SS5	3/1 3/4	<1	4		dark red brown peat, moist, no odour
SS6	5/11 11/8	<1	5		SILTY SAND:grey, moist to wet, no odour
SS7	3/5 7/8	<1	6		COARSE SAND:grey, fine gravel, saturated, no odour
					END OF BOREHOLE

Well Completion



000897

XG Environmental Services Inc.

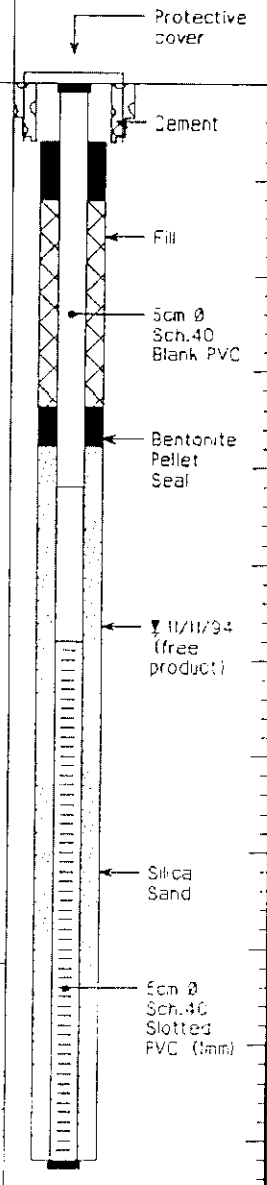
Log of Well MW-11
PHASE 2
CN
HORNEPAYNE, ONTARIO

Sheet 1 of 1
Job Number: 94560
G.S. Elevation: 327.184m

Driller: BOART LONGYEAR DRILLING INC.	**Drilling**	**Date**	**Time**
Drill Method: AD-2 TRACK MOUNTED	**Started**	NOVEMBER 11/94	
Sample Method: STANDARD SPLIT SPOON	**Finished**	NOVEMBER 11/94	
Borehole Diameter: 15.2 cm / **Water Level T.O.P:** 2.82m	**Logged By:** D. G. W.	**Checked By:** O. P. L.	

Sample No.	Blow Counts	HNu	Depth (meters)	Graphic Log	Materials Description
					SAND AND GRAVEL:sand and gravel fill
SS1		1.5	1		medium brown sand and gravel, dry, no odour
					dark grey sand and gravel, no odour
SS2	refusal	2			grey sand and gravel fill, boulders and cobbles
SS3	refusal	140	2		
SS4	17/27 15/7	90	3		grey stained coarse sand with gravel, odours
SS5	7/21 21/18	58	4		moist
SS6	8/12 12/11	135	5		FINE SAND:grey stained, odourous, saturated, free product in split spoon
					END OF BOREHOLE
			6		

Well Completion



XCG Environmental Services Inc.

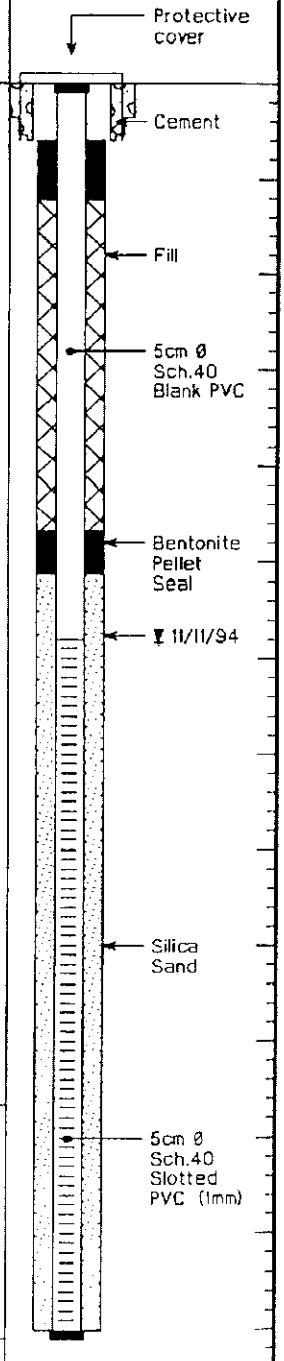
Log of Well MW-12
PHASE 2
CN
HORNEPAYNE, ONTARIO

Sheet 1 of 1
Job Number: 94560
G.S. Elevation: 326.965m

Driller: BOART LONGYEAR DRILLING INC.	**Drilling**	**Date**	Time
Drill Method: AD-2 TRACK MOUNTED	**Started**	NOVEMBER 11/94	
Sample Method: STANDARD SPLIT SPOON	**Finished**	NOVEMBER 11/94	
Borehole Diameter: 15.2 cm	**Water Level T.O.P:** 2.26m	**Logged By:** D. G. W.	**Checked By:** D. P. L.

Sample No.	Blow Counts	HNu	Depth (meters)	Materials Description
				SAND AND GRAVEL: medium brown sand and gravel, dry, no odours
				odourous
SS1		80	1	
SS2	4/4 6/11	18	2	
				occasional rocks, cobbles and boulders
SS3	14/19 11/12	8		
			3	
SS4	3/9 4/4	11		grey, coarse sand and fine gravel, wet, odourous
				red brown peat and bits of wood
				coarse sand and gravel, grey with traces of silt, odourous, wet to saturated
SS5	4/7 9/8	30	4	red grey oily sand with gravel, odourous
				saturated
SS8	22 refusal	30/40	5	
				SILTY SAND: grey, slight odour
SS7	20/8 5/8	40	6	
				END OF BOREHOLE

Well Completion



000899

XCG Environmental Services Inc.

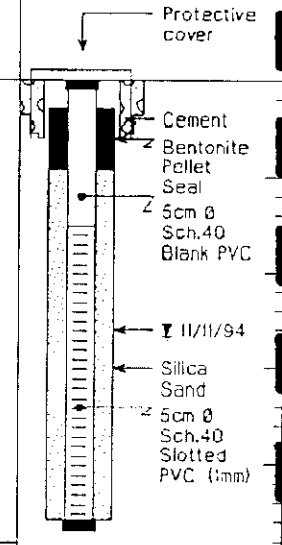
Log of Well MW-16
PHASE 2
CN
HORNEPAYNE, ONTARIO

Sheet 1 of 1
Job Number: 94560
G.S. Elevation: 325.474m

Driller: BOART LONGYEAR DRILLING INC.	Drilling	Date	Time
Drill Method: AD-2 TRACK MOUNTED	Started	NOVEMBER 11/94	
Sample Method: STANDARD SPLIT SPOON	Finished	NOVEMBER 11/94	
Borehole Diameter: 15.2 cm / Water Level T.O.P: 1.3m	Logged By: P. M.	Checked By: O. P. L.	

Sample No.	Blow Counts	HNu	Depth (meters)	Graphic Log	Materials Description
SS1		1.3	1		SILTY SAND:light brown, moist, no odour
SS2	8/13 14/7	2	2		wet to saturated, some iron staining in fractures
SS3	4 spoon refusal	2	3		END OF BOREHOLE (refusal on bedrock)
			4		
			5		
			6		

Well Completion



000900

XCG Environmental Services Inc.

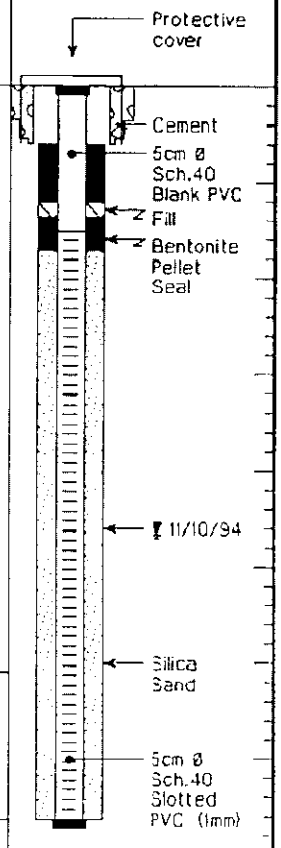
Log of Well MW-17
PHASE 2
CN
HORNEPAYNE, ONTARIO

Sheet 1 of 1
Job Number: 94560
G.S. Elevation: 325.481m

Driller: BOART LONGYEAR DRILLING INC.	**Drilling**	**Date**	**Time**
Drill Method: AD-2 TRACK MOUNTED	**Started**	NOVEMBER 10/94	
Sample Method: STANDARD SPLIT SPOON	**Finished**	NOVEMBER 10/94	
Borehole Diameter: 15.2 cm	**Water Level T.O.P:** 2.3m	**Logged By:** P. M.	**Checked By:** O. P. L.

Sample No.	Blow Counts	HNu	Depth (meters)	Graphic Log	Materials Description
			0		SAND:reddish brown, dry
SS1		2	1		
SS2	3/5 5/8	2			light brown, coarse sand, dry, moist, no odour
SS3	3/4 4/2	2	2		light brown, fine sand, wet to saturated, no odour
SS4	4/9 11/11	1	3		SILTY SAND:saturated, no odour
			4		END OF BOREHOLE
			5		
			6		

Well Completion



000901

XCG Environmental Services Inc.

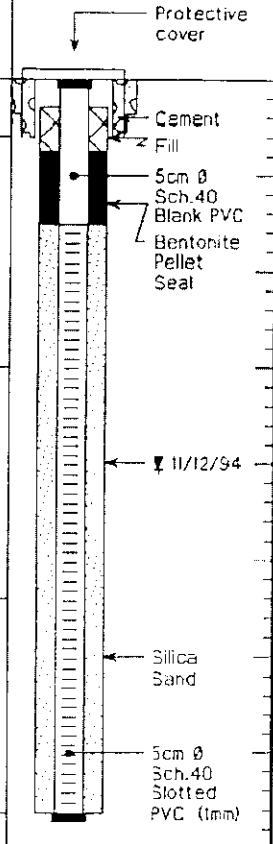
Log of Well MW-20
PHASE 2
CN
HORNEPAYNE, ONTARIO

Sheet 1 of 1
Job Number: 94560
G.S. Elevation: 324.676m

Driller: BOART LONGYEAR DRILLING INC.	Drilling	Date	Time
Drill Method: AD-2 TRACK MOUNTED	Started	NOVEMBER 12/94	
Sample Method: STANDARD SPLIT SPOON	Finished	NOVEMBER 12/94	
Borehole Diameter: 15.2 cm	**Water Level T.O.P:** 1.992m	**Logged By:** D. G. W.	**Checked By:** O. P. L.

Sample No.	Blow Counts	HNu	Depth (meters)	Graphic Log	Materials Description
					SAND AND GRAVEL:light brown
					SILTY SAND:dark brown black, organic topsoil
					grey, moist
AS1		1.5	1		
					black, organic, topsoil, slight oily odour
AS2		2.0			
SS3	4/8 8/7	100			coarse sand with grey staining, hydrocarbon odours
			2		
SS4	4/4 7/8	75			coarse sand, heavily stained, grey oily, saturated
			3		
SS5		55			light brown grey, saturated, odourous
			4		END OF BOREHOLE
			5		
			6		

Well Completion



000902

XCG Environmental Services Inc.

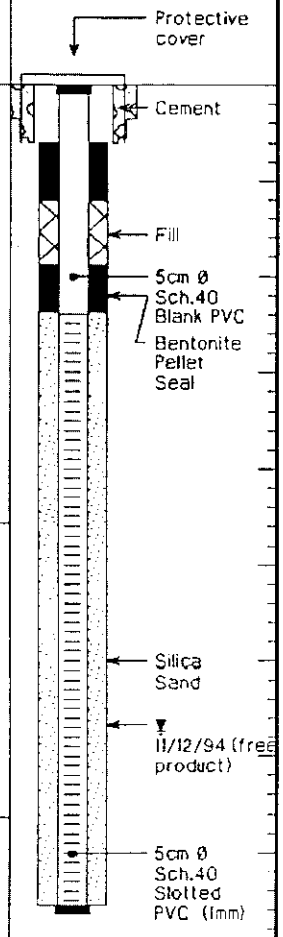
Log of Well MW-21
PHASE 2
CN
HORNEPAYNE, ONTARIO

Sheet 1 of 1
Job Number: 94560
G.S. Elevation: 324.549m

Driller: BOART LONGYEAR DRILLING INC.	Drilling	Date	Time
Drill Method: AD-2 TRACK MOUNTED	Started	NOVEMBER 12/94	
Sample Method: STANDARD SPLIT SPOON	Finished	NOVEMBER 12/94	
Borehole Diameter: 15.2 cm	Water Level T.O.P: 3.335m	Logged By: D. G. W.	Checked By: O. P. L.

Sample No.	Blow Counts	HNu	Depth (meters)	Graphic Log	Materials Description
			0		SAND AND GRAVEL:light brown
					grey brown
SS1		3	1		
					sand and gravel fill, red brick, loosely packed, slight hydrocarbon odour
SS2	3/4 4/4	30	2		
					SILTY SAND:dark brown black, topsoil, slight odour
SS3	1/2 4/10	95			light brown, grey staining, slight odour
			3		moist, slight staining and odour
SS4	12/18 17/12	80			
			4		SAND AND GRAVEL:coarse, grey staining, saturated, slight odour
SS5	11/12 10/10	75			
			5		END OF BOREHOLE
			6		

Well Completion



000903

XG Environmental Services Inc.

Log of Well MW-24
PHASE 2
CN
HORNEPAYNE, ONTARIO

Sheet 1 of 1

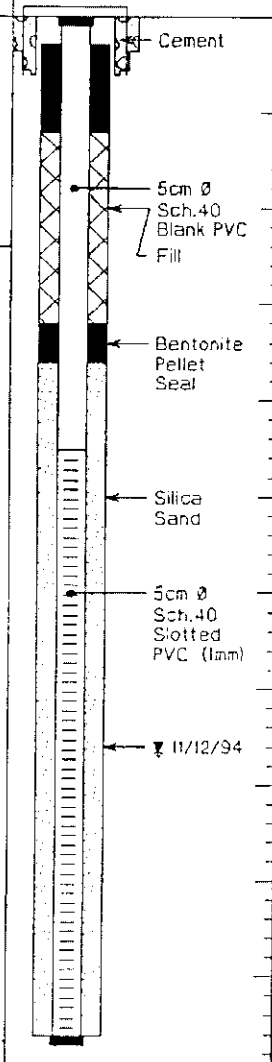
Job Number: 94560

G.S. Elevation: 325.959m

Driller: BOART LONGYEAR DRILLING INC.	**Drilling**	**Date**	**Time**
Drill Method: AD-2 TRACK MOUNTED	**Started**	NOVEMBER 12/94	
Sample Method: STANDARD SPLIT SPOON	**Finished**	NOVEMBER 12/94	
Borehole Diameter: 15.2 cm	**Water Level T.O.P:** 3.795m	**Logged By:** D. G. W.	**Checked By:** O. P. L.

Sample No.	Blow Counts	HNu	Depth (meters)	Graphic Log	Materials Description
			0		
SS1		0	1		FILL:slag ballast pieces of iron
SS2	8/10 11/10	0	2		SILTY SAND:light brown, dry to moist light brown grey, moist to wet, no odour
SS3	5/8 5/8	0			
SS4	11/12 15/8	0	3		
SS5	4/7 7/8	0	4		wet to saturated
SS6	4/8 5/10	0	5		saturated
					END OF BOREHOLE
			6		

Well Completion



000904

XCG Environmental Services Inc.

Log of Well MW-32
PHASE 2
CN
HORNEPAYNE, ONTARIO

Sheet 1 of 1

Job Number: 94560

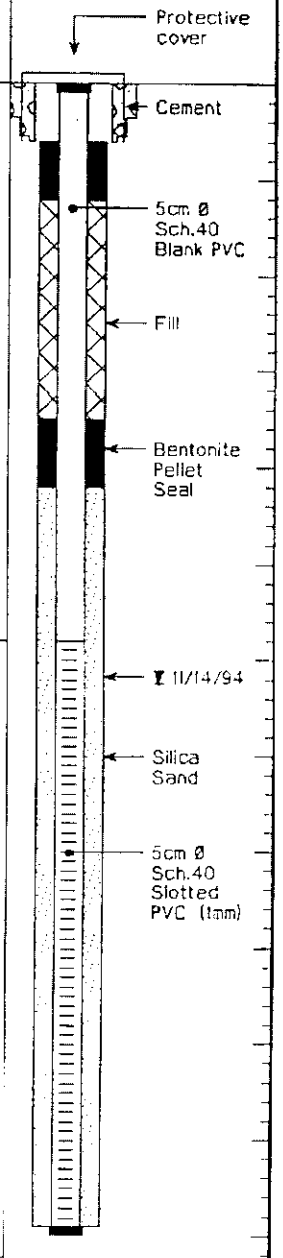
G.S. Elevation: 326.718m

Driller: BOART LONGYEAR DRILLING INC.	**Drilling**	**Date**	**Time**
Drill Method: AD-2 TRACK MOUNTED	**Started**	NOVEMBER 14/94	
Sample Method: STANDARD SPLIT SPOON	**Finished**	NOVEMBER 14/94	

Borehole Diameter: 15.2 cm | **Water Level T.O.P:** 3.08m | **Logged By:** D. G. W. | **Checked By:** O. P. L.

Sample No.	Blow Counts	HNu	Depth (meters)	Graphic Log	Materials Description
					SAND AND GRAVEL:coarse, dry
SS1		2	1		
					light brown, fine sand and gravel, dry
SS2	4/8 5/4	<1	2		
					wet, slight odour
SS3	1/0.5 0.5/1	5.5			
			3		SILTY SAND:light brown grey, moist
SS4	8/9 8/4	85			light brown grey with black grey staining in fractures, slight odour
			4		grey stained, heavy staining in fractures, wet to saturted, odourous
SS5	4/7 4/8	45			
			5		
			6		END OF BOREHOLE

Well Completion



000905

XG Environmental Services Inc.

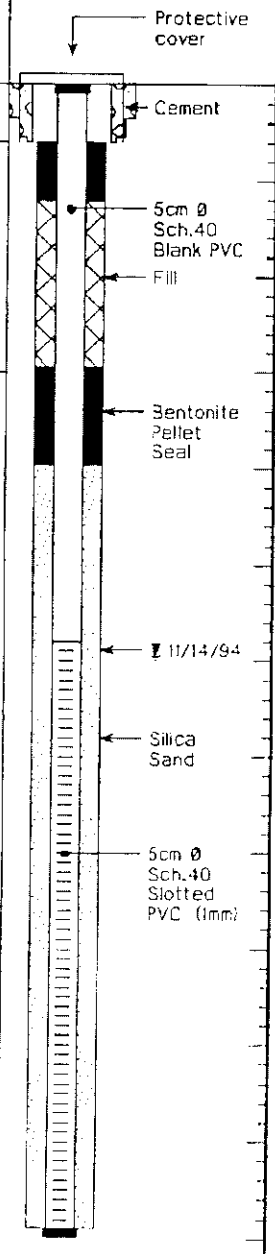
Log of Well MW-33
PHASE 2
CN
HORNEPAYNE, ONTARIO

Sheet 1 of 1
Job Number: 94560
G.S. Elevation: 326.730n

Driller: BOART LONGYEAR DRILLING INC.	**Drilling**	**Date**	**Time**
Drill Method: AD-2 TRACK MOUNTED	**Started**	NOVEMBER 14/94	
Sample Method: STANDARD SPLIT SPOON	**Finished**	NOVEMBER 14/94	
Borehole Diameter: 15.2 cm	**Water Level T.O.P:** 2.94m	**Logged By:** D. G. W.	**Checked By:** O. P. L.

Sample No.	Blow Counts	HNu	Depth (meters)	Graphic Log	Materials Description
					SAND AND GRAVEL:light brown, dry to moist
					TOPSOIL:dark brown, silty clay, moist, slight odour
SS1		25	1		
SS2	4/8 5/4	2	2		SILTY CLAY:light brown grey, moist, no odour
SS3	1/2 4/9	8.5			slight grey staining, wet, no odour red brown, peat, soft, no odour light brown grey green, dry
SS4	3/7 10/9	45	3		slight dark, grey staining in silt fractures, slight odour
SS5	5/8 7/5	25	4		black grey staining in fracture, odourous
SS6	3/4 4/5	3	5		grey, saturated, slight odour
			6		END OF BOREHOLE

Well Completion



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XCG Environmental Services Inc.

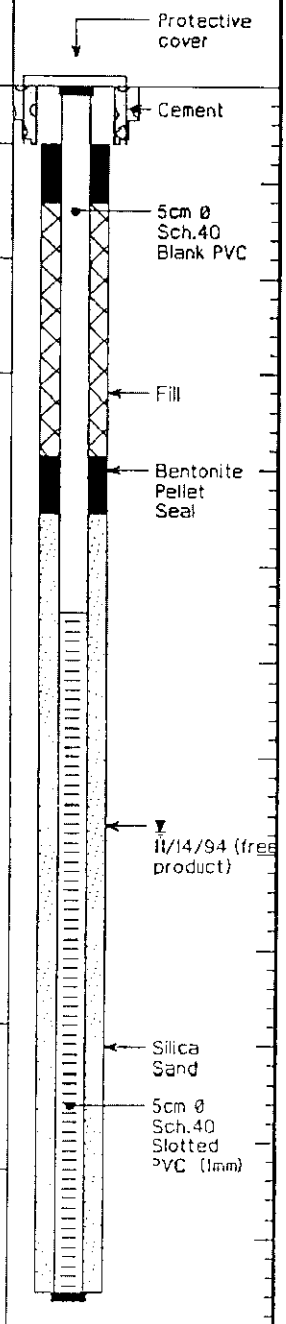
Log of Well MW-34
PHASE 2
CN
HORNEPAYNE, ONTARIO

Sheet 1 of 1
Job Number: 94560
G.S. Elevation: 325.787m

Driller: BOART LONGYEAR DRILLING INC.	Drilling	Date	Time
Drill Method: AD-2 TRACK MOUNTED	Started	NOVEMBER 14/94	
Sample Method: STANDARD SPLIT SPOON	Finished	NOVEMBER 14/94	
Borehole Diameter: 15.2 cm / Water Level T.O.P: 3.85m	Logged By: D. G. W.	Checked By: O. P. L.	

Sample No.	Blow Counts	HNu	Depth (meters)	Graphic Log	Materials Description
					SAND AND GRAVEL:medium brown, crushed stone
					SAND:black slag sand, dry
SS1		2	1		SILTY SAND:light brown , moist
SS2	8/8 8/8	1	2		SAND AND GRAVEL:light brown, fine grain, moist
SS3	4/7 11/9	23			
			3		grey, moist, slight odour
SS4	4/10 15/10	120			black grey stained, fine gravel chips, oily odours
SS5	5/10 14/10	130	4		
SS6	4/7 18/17	130			
			5		SAND:fine sand, grey stained, odourous
SS7	15/25 23/23	70			layered black grey stained sand
			6		SAND AND GRAVEL:densely packed sand and coarse gravel
SS8	8/11 25/21	55			
					END OF BOREHOLE (SILTY SAND:grey, slight odour)

Well Completion



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XG Environmental Services Inc.

Log of Well MW-36
PHASE 2
CN
HORNEPAYNE, ONTARIO

Sheet 1 of 2

Job Number: 94580

G.S. Elevation: 325.912m

Driller: BOART LONGYEAR DRILLING INC.	**Drilling**	**Date**	**Time**
Drill Method: AD-2 TRACK MOUNTED	**Started**	NOVEMBER 14/94	
Sample Method: STANDARD SPLIT SPOON	**Finished**	NOVEMBER 14/94	
Borehole Diameter: 15.2 cm	**Water Level T.O.P:** 3.95m	**Logged By:** D. G. W.	**Checked By:** O. P. L.

Sample No.	Blow Counts	HNu	Depth (meters)	Graphic Log	Materials Description
					SAND AND GRAVEL:light brown
SS1		1	1		SILTY SAND:light brown, moist
SS2		<1	2		
SS3		1			
SS4		<1	3		wet
SS5		0	4		
SS6		<1	5		
SS7		<1			grey, saturated
			6		

Well Completion

- Protective cover
- Cement
- 5cm Ø Sch.40 Blank PVC
- Fill
- Bentonite Pellet Seal
- ▼ 11/14/94
- Silica Sand
- 5cm Ø Sch.40 Slotted PVC

000908

XCG Environmental Services Inc.

Log of Well MW-36
PHASE 2
CN
HORNEPAYNE, ONTARIO

Sheet 2 of 2

Job Number: 94560

G.S. Elevation: 325.912m

Sample No.		Blow Counts	HNu	Depth (meters)	Graphic Log	Materials Description	Well Completion
						END OF BOREHOLE	

8
9
10
11
12
13
14

XCG Environmental Services Inc.

Log of Well MW-40
PHASE 3
CN
HORNEPAYNE, ONTARIO

Sheet 1 of 1

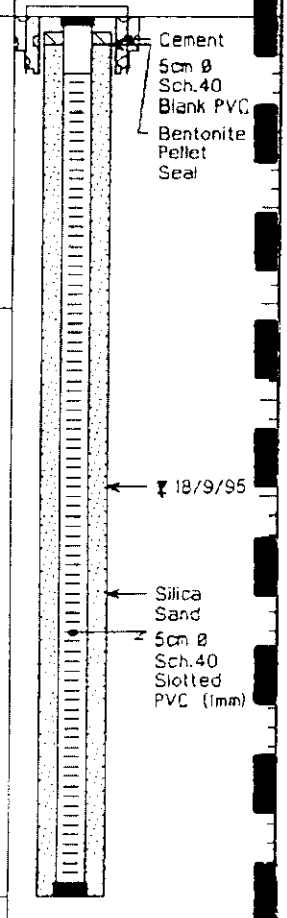
Job Number: 4057-02-02

G.S. Elevation: 324.34

Driller: BOART LONGYEAR DRILLING INC.	**Drilling**	**Date**	**Time**
Drill Method: Track Mounted CME 75	**Started**	September 7/95	
Sample Method: STANDARD SPLIT SPOON	**Finished**	September 7/95	
Borehole Diameter: 15.2 cm	**Water Level T.O.P:** 2.45	**Logged By:** TMM	**Checked By:** OPL

Sample No.	Blow Counts	HNu	Depth (meters)	Graphic Log	Materials Description
SS1	7/2 3/1	33	1		SAND: medium to coarse, brown colour, trace of gravel, moist
SS2	1/8 8/8	34	2		SANDY SILT: fine grained, tan colour, trace of clay and gravel, no odours
SS3	4/5 8/5	52	3		saturated at 2.88 metres below ground surface
SS4	4/4 4/3	23	4		
SS5	2/3 4/3	29	5		END OF BOREHOLE
			6		

Well Completion



XCG Environmental Services Inc.

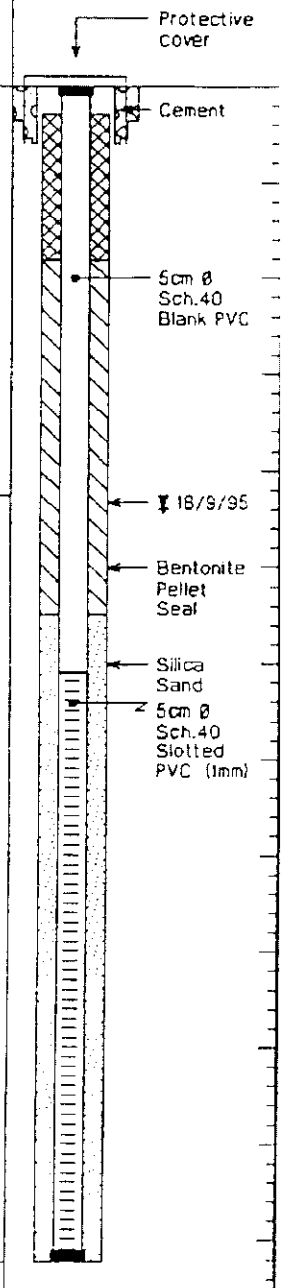
Log of Well MW-43
PHASE 3
CN
HORNEPAYNE, ONTARIO

Sheet 1 of 1
Job Number: 4057-02-02
G.S. Elevation: 323.66

Driller: BOART LONGYEAR DRILLING INC.	**Drilling**	**Date**	**Time**
Drill Method: Track Mounted CME 75	**Started**	September 8/95	
Sample Method: STANDARD SPLIT SPOON	**Finished**	September 8/95	
Borehole Diameter: 15.2 cm	**Water Level T.O.P:** 2.16	**Logged By:** TMM	**Checked By:** OPL

Sample No.	Blow Counts	HNu	Depth (meters)	Graphic Log	Materials Description
SS1	4/5 7/4	300	1		SAND: fine to medium, grey brown colour, trace of gravel, moist
SS2	5/8 7/7	53	2		saturated at 1.68 metres below ground surface
SS3	5/7 8/8	148	3		SANDY SILT: fine grained, grey colour, trace of clay, slight HC odour
SS4	4/4 4/4	83			
SS5	3/3 5/3	92	4		
SS6	1/1 2/1	57	5		
SS7	1/3 4/3	102	6		END OF BOREHOLE

Well Completion



000911

XG Environmental Services Inc.

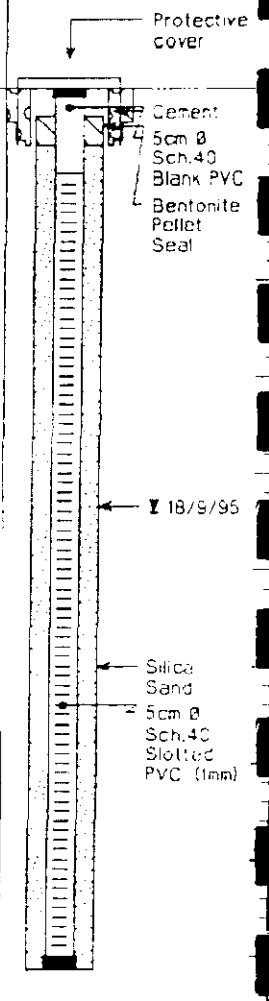
Log of Well MW-48
PHASE 3
CN
HORNEPAYNE, ONTARIO

Sheet 1 of 1
Job Number: 4057-02-02
G.S. Elevation: 324.66

Driller: BOART LONGYEAR DRILLING INC.	**Drilling**	**Date**	**Time**
Drill Method: Track Mounted CME 75	**Started**	September 8/95	
Sample Method: STANDARD SPLIT SPOON	**Finished**	September 8/95	
Borehole Diameter: 15.2 cm	**Water Level T.O.P:** 2.17	**Logged By:** TMM	**Checked By:** OPL

Sample No.	Blow Counts	HNu	Depth (meters)	Graphic Log	Materials Description
SS1	5/5 3/5	45	1, 2		SAND: medium dark brown colour, trace of gravel, no odour trace of organic material, becomming coarser with depth
SS2	1/1 1/1	48			
SS3	1/8 7/8	28	3		
SS4	1/4 4/5	38	4		SANDY SILT: fine grained, grey mottled, trace of clay, saturated no odour
			5, 6		END OF BOREHOLE

Well Completion



XG Environmental Services Inc.

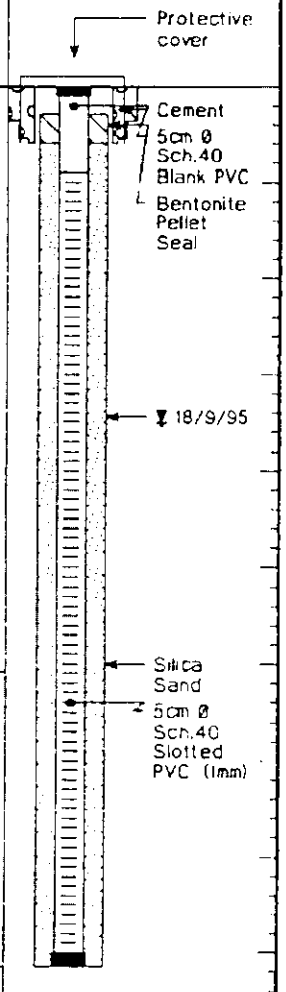
Log of Well MW-48
PHASE 3
ON
HORNEPAYNE, ONTARIO

Sheet 1 of 1
Job Number: 4057-02-02
G.S. Elevation: 325.63

Driller: BOART LONGYEAR DRILLING INC.	**Drilling**	**Date**	**Time**
Drill Method: Track Mounted CME 75	**Started**	September 8/95	
Sample Method: STANDARD SPLIT SPOON	**Finished**	September 8/95	
Borehole Diameter: 15.2 cm	**Water Level T.O.P:** 1.72	**Logged By:** TMM	**Checked By:** OPL

Sample No.	Blow Counts	HNu	Depth (meters)	Graphic Log	Materials Description
SS1	6/5 4/2	10	1		SAND: medium, tan colour, trace of gravel and cobbles, no HC odour
SS2	6/3 3/3	11	2		
SS3	4/2 2/1	38	3		becomming finer
SS4	4/3 2/2	11	4		SANDY SILT: fine grained, grey colour, trace of clay and gravel, slight HC odour, saturated
SS5	1/1 1/1	18	5		END OF BOREHOLE
			6		

Well Completion



000913

XG Environmental Services Inc.

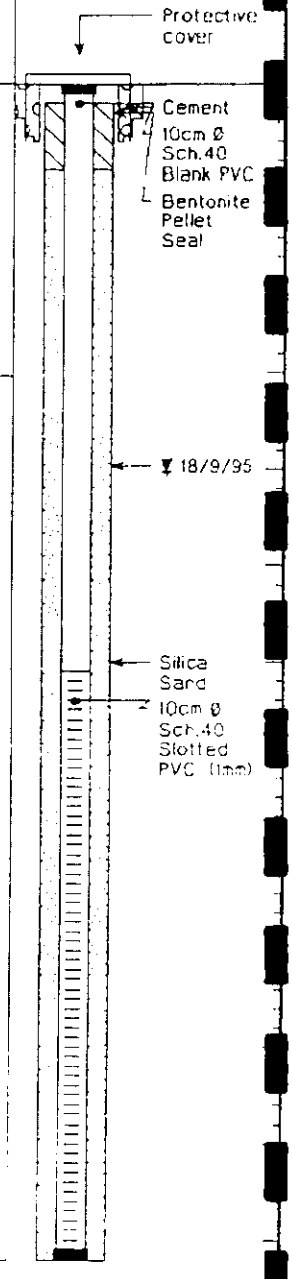
Log of Well MW/PW-50
PHASE 3
CN
HORNEPAYNE, ONTARIO

Sheet 1 of 1
Job Number: 4057-02-02
G.S. Elevation: 325.81

Driller: BOART LONGYEAR DRILLING INC.	**Drilling**	**Date**	**Time**
Drill Method: Track Mounted CME 75	**Started**	September 9/95	
Sample Method: STANDARD SPLIT SPOON	**Finished**	September 9/95	
Borehole Diameter: 38 cm	**Water Level T.O.P:** 1.98	**Logged By:** TMM	**Checked By:** OPL

Sample No.	Blow Counts	HNu	Depth (meters)	Graphic Log	Materials Description
SS1	2/2/2	15	1		SAND: medium to coarse, grey black colour, trace of gravel, moist no odour
SS2	2/8/8	88	2		SANDY SILT: fine grained, grey colour, trace of clay, slight HC odour, saturated. HC odour increases with depth
SS3	3/8/7	87	3		
SS4	8/5/5	39	4		
SS6	4/3/3	11	5		
SS7	2/3/2	28	6		END OF BOREHOLE

Well Completion



XCG Environmental Services Inc.

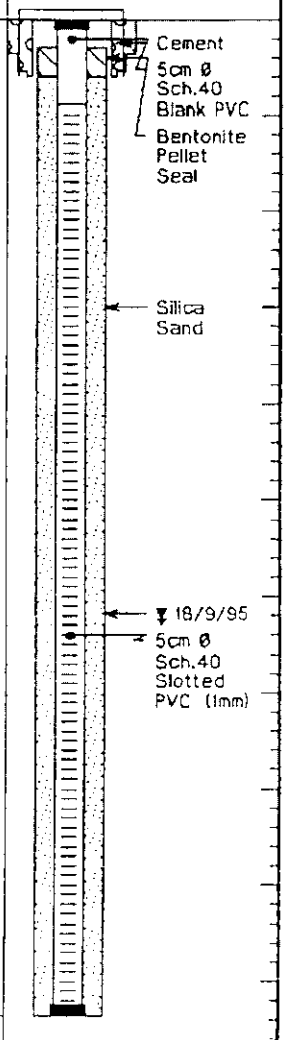
Log of Well MW-51
PHASE 3
CN
HORNEPAYNE, ONTARIO

Sheet 1 of 1
Job Number: 4057-02-02
G.S. Elevation: 324.26

Driller: BOART LONGYEAR DRILLING INC.	**Drilling**	**Date**	**Time**
Drill Method: Track Mounted CME 75	**Started**	September 9/95	
Sample Method: STANDARD SPLIT SPOON	**Finished**	September 9/95	
Borehole Diameter: 15.2 cm	**Water Level T.O.P:** 3.09	**Logged By:** TMM	**Checked By:** OPL

Sample No.	Blow Counts	HNu	Depth (meters)	Graphic Log	Materials Description
					SAND: fine, medium and coarse, brown/black colour with slight HC odour
SS1	no recovery		1		
SS2	3/2 2/2	29	2		
SS3	3/4 4/7	33			
SS4	3/3 7/4	42	3		saturated at 3.04 metres below ground surface.
SS5	3/2 2/2	15	4		
SS6	5/4 3/2	38	5		
			6		END OF BOREHOLE

Well Completion



XCG Environmental Services Inc.

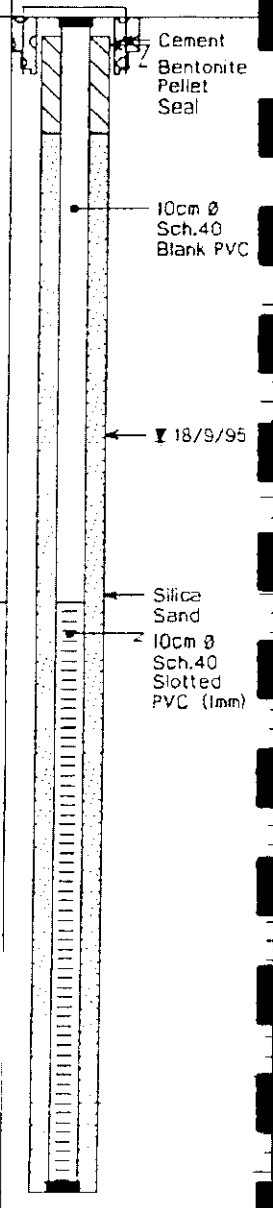
Log of Well MW/PW-52
PHASE 3
CN
HORNEPAYNE, ONTARIO

Sheet 1 of 1
Job Number: 4057-02-02
G.S. Elevation: 323.91

Driller: BOART LONGYEAR DRILLING INC.	**Drilling**	**Date**	**Time**
Drill Method: Track Mounted CME 75	**Started**	September 9/95	
Sample Method: STANDARD SPLIT SPOON	**Finished**	September 9/95	
Borehole Diameter: 38 cm	**Water Level T.O.P:** 2.17	**Logged By:** TMM	**Checked By:** OPL

Sample No.	Blow Counts	HNu	Depth (meters)	Graphic Log	Materials Description
SS1	2/4/5	54	1–3		SAND: fine, tan grey colour trace of gravel, moist no odour
SS2	3/5/3	19	3–6		FINE SAND AND SILT: saturated at 3.04 mbgs
SS3	1/1/1	21	4–5		becomming finer with depth
SS4	no recovery		6		END OF BOREHOLE

Well Completion



XCG Environmental Services Inc.

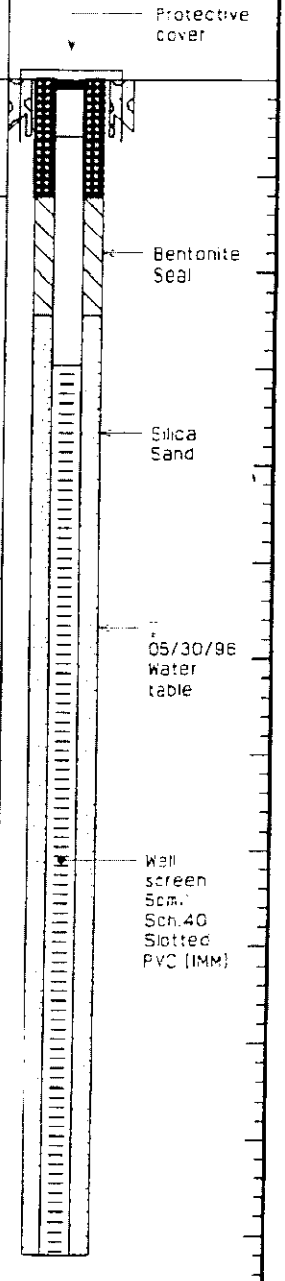
Log of Well MW-58
PHASE 3
CN
HORNEPAYNE, ONTARIO

Sheet 1 of 1
Job Number: 4057-02-04
Ground Elevation: 327.63 masl

Driller: BOART LONGYEAR DRILLING INC.	**Drilling**	**Date**	**Time**
Drill Method: Track Mount Hollow Stem Auger, CME 75	**Started**	May 14, 1996	NA
Sample Method: STANDARD SPLIT SPOON	**Finished**	May 14, 1996	NA
Borehole Diameter: 38 cm	**Water Level:**	**Logged By:** TMM	**Checked By:** KMM

SAMPLE NO.	BLOW COUNTS	MINIRAE (ppm)	Depth (meters)	Graphic Log	Materials Description
SS1					**FILL** -Coarse grained sand and gravel.
SS2	20/50	5.5	1		**SAND** -Grey/green sand and silt, fine grained with pebbles and trace of gravel (till like), moist to wet (partially frozen), dense.
SS3	20/50	14.9			-As above, with more fine grained sand, uniform, no odour.
SS4	5/50	8.5	2		-As above, no odour.
			3		No sample recovery in this interval.
SS5	7/9 14/8	7.7	4		**SAND AND GRAVEL** -Coarse grained, moderately saturated, faint hydrocarbon odour. -Moist to wet.
SS6	4/6 7/9	5.3			**PEAT**
			5		**SAND AND GRAVEL**
SS7	5/9 8/12	6.7			**SAND** -Tan/grey fine grained, uniform, saturated.
			6		End of borehole at 6.10 m.b.g.s.

Well Completion



000917

XG Environmental Services Inc.

Log of Well MW-59
PHASE 3
CN
HORNEPAYNE, ONTARIO

Sheet 1 of 1

Job Number: 4057-02-04

Ground Elevation: 327.58 masl

Driller: BOART LONGYEAR DRILLING INC.	**Drilling**	**Date**	**Time**
Drill Method: Track Mount Hollow Stem Auger, CME 75	**Started**	May 15, 1996	NA
Sample Method: STANDARD SPLIT SPOON	**Finished**	May 15, 1996	NA
Borehole Diameter: 38 cm	**Water Level:**	**Logged By:** TMM	**Checked By:** KMM

SAMPLE NO.	BLOW COUNTS	MINIRAE (ppm)
SS1		
SS2	10/25 35/50	5.5
SS3	30/50	4.8
SS4	3/5 50	21.3
SS5	50/17 21/20	8.4
SS6	15/17 14/10	8.2
SS7	4/5 6/72	7.5
SS8	11/22 24/20	9.1
SS9	3/5 4/2	9.3

Depth (meters) / Graphic Log

FILL
-Sand and gravel.

-Brown to tan sand and silt, fine grained, with gravel, some pebbles, dense, frozen.

SAND AND GRAVEL
-Coarse grained sand, moist with some saturated zones.

-Dry to moist.

SAND
-Fine to medium grained, trace gravel.

SAND AND GRAVEL
-Tan to brown medium and coarse grained sand.

PEAT
-Dark brown peat layer, moist, musty odour, soft.

SAND
-Grey, fine grained, uniform, saturated.

End of borehole at 6.9 m.b.g.s.

Well Completion

Protective cover

Backfill

05/30/96 water table

Bentonite seal

Silica sand

Well screen 5cm. Sch.40 Slotted PVC (1MM)

000918

XCG Environmental Services Inc.

Log of Well MW-66
PHASE 3
CN
HORNEPAYNE, ONTARIO

Sheet 1 of 1

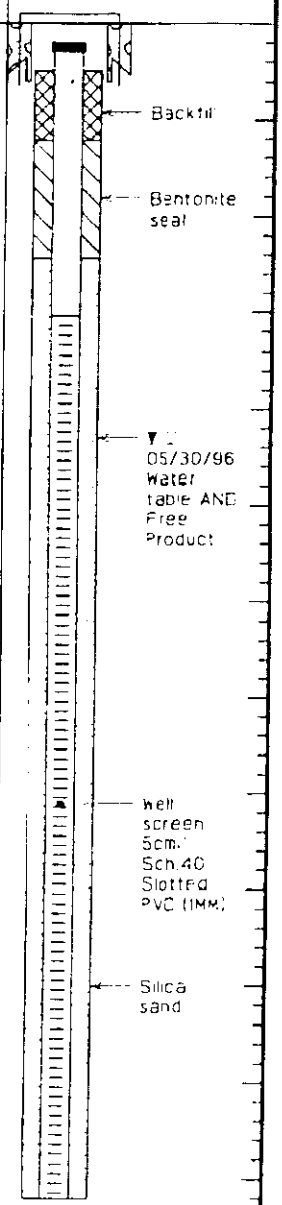
Job Number: 4057-02-04

Ground Elevation: 326.84 masl

Driller: BOART LONGYEAR DRILLING INC.	**Drilling**	**Date**	**Time**
Drill Method: TRACK MOUNT HOLLOW STEM AUGER, CME 75	**Started**	May 16, 1996	NA
Sample Method: Standard Split Spoon	**Finished**	May 16, 1996	NA
Borehole Diameter: 38 cm	**Water Level:**	**Logged By:** TMM	**Checked By:** KMM

SAMPLE NO.	BLOW COUNTS	MINIRAE (ppm)	Depth (meters)	Graphic Log	Materials Description
			1		Straight auger to 6.10 m.b.g.s.
			2		
			3		
			4		
			5		
			6		End of borehole at 6.10 m.b.g.s.

Well Completion



BIOGÉNIE Inc
ENVIRONMENTAL SPECIALISTS
350 Racquet Street, Suite 10 Ste Foy, Quebec G1P 4P3
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BOREHOLE LOG

CONFIDENTIAL AND PRIVILEGED DOCUMENT

BOREHOLE #: OW3-2
SHEET: 1 OF 1
FILE #: CN-6089

PROJECT: HORNEPAYNE CN
LOCATION: AREA OF PLUME 3
CONTRACTOR: Boart Longyear Drilling Inc.
OPERATOR: C. Pullen
TYPE OF TUBING: PVC

STARTING DATE: 28-09-96
SLOTTED PIPE Ø : 50 mm
DRILL TYPE: CME 75
METHOD (SOIL): Auger
DRILLING FLUID: ---

COMPLT. DATE: 28-09-96
TUBING Ø : 50 mm
CORE SAMPLER Ø : ---
METHOD (ROCK): ---
COMPILED BY: P. Ouellette

LEVELING			MONITORING WELL		SAMPLE						GEOLOGY		
DEPTH (meters)	ELEVATION (meters)	WATER TABLE	WELL DESIGN	NOTES	SAMPLE STATE	SAMPLE TYPE AND NUMBER	RECOVERY %	N VALUE	ANALYZED PARAMETERS	VOLATILE HYDROCARBON RECORD (PPM)	STRATIGRAPHY	SOIL/ROCK DESCRIPTION	OBSERVATIONS (ODOR, VISUAL)
0.00	325.51			Steel Cap								No Soil Description	
				Cap									
				Cement									
				Bentonite									
				PVC Tubing									
2.13	323.38												
				Silica Sand									
				Screen, Opening 0.05 cm									
5.15	320.36			Cap								End of Borehole at a Depth of 5.15 m	

STATE OF SAMPLE:
INTACT DISTURBED LOST CORE SAMPLE

TYPE OF SAMPLE:
SS — SPLIT SPOON SAMPLER
TW — THIN WALL SAMPLER
CS — CORE SAMPLER

OBSERVATIONS
O — ODORLESS
W — WEAK
I — INTERMEDIATE
P — PERSISTENT
NE — NON EXISTENT
SC — SCATTERED
SA — SATURATED

▽ = WATER TABLE
** = FIELD DUPLICATE
* = ANALYZED SAMPLE

SURFACE PROTECTION: Steel Cap
SURFACE SEALANT: Cement/Bentonite
SEALANT DEPTH: 1.00 m
SCREEN LENGTH: 4.00 m
TUBING LENGTH: 1.15 m

ELEVATION REFERENCE LEVEL: Real
BEDROCK LEVEL: ---
GROUND LEVEL: 325.51 m
WATER TABLE LEVEL:
48 HOUR(s) AFTER DRILLING: 323.38

000920

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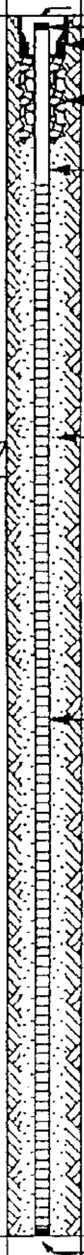
BOREHOLE LOG

CONFIDENTIAL AND PRIVILEGED DOCUMENT

BOREHOLE #: OW5-1
SHEET: 1 OF 1
FILE #: CN-6089

PROJECT: HORNEPAYNE CN	STARTING DATE: 01-10-96	COMPLT. DATE: 01-10-96
LOCATION: AREA OF PLUME 8	SLOTTED PIPE Ø : 50 mm	TUBING Ø : 50 mm
CONTRACTOR: Boart Longyear Drilling Inc	DRILL TYPE: CME 75	CORE SAMPLER Ø : ---
OPERATOR: C. Pullen	METHOD (SOIL): Auger	METHOD (ROCK): ---
TYPE OF TUBING: PVC	DRILLING FLUID: ---	COMPILED BY: P. Ouellette

DEPTH (meters)	ELEVATION (meters)	SOIL/ROCK DESCRIPTION
0.00	324.47	Light Brown Sand and Gravel, Dry
0.60	323.87	Medium Brown Fine Sand with Traces of Gravel, Dry
2.40	322.07	Dark Brown Sandy Silt with Traces of Gravel, Dry
3.10	321.37	Light Brown Sandy Silt with Traces of Gravel, Humid
3.27	321.20	
6.00	318.47	Grey Clayey Silt, Humid
8.68	315.79	End of Borehole at a Depth 8.68 m



STATE OF SAMPLE: INTACT DISTURBED LOST CORE SAMPLE

TYPE OF SAMPLE:
SS — SPLIT SPOON SAMPLER
TW — THIN WALL SAMPLER
CS — CORE SAMPLER

OBSERVATIONS
O — ODORLESS
W — WEAK
I — INTERMEDIATE
P — PERSISTENT
NE — NON EXISTENT
SC — SCATTERED
SA — SATURATED

∇ = WATER TABLE
** = FIELD DUPLICATE
* = ANALYZED SAMPLE

SURFACE PROTECTION: Steel Cap
SURFACE SEALANT: Bentonite
SEALANT DEPTH: 0.90 m
SCREEN LENGTH: 7.48 m
TUBING LENGTH: 1.20 m

ELEVATION:
REFERENCE LEVEL: Real
BEDROCK LEVEL: ---
GROUND LEVEL: 324.47 m
WATER TABLE LEVEL:
24 HOUR(s) AFTER DRILLING: 321.20

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BOREHOLE LOG

CONFIDENTIAL AND PRIVILEGED DOCUMENT

BOREHOLE #: OW5-2
SHEET: 1 OF 1
FILE #: CN-6089

PROJECT: HORNEPAYNE CN
LOCATION: AREA OF PLUME B
CONTRACTOR: Boart Longyear Drilling Inc
OPERATOR: C. Pullen
TYPE OF TUBING: PVC

STARTING DATE: 01-10-96
SLOTTED PIPE Ø : 50 mm
DRILL TYPE: CME 75
METHOD (SOIL): Auger
DRILLING FLUID: ---

COMPLT. DATE: 01-10-96
TUBING Ø : 50 mm
CORE SAMPLER Ø : ---
METHOD (ROCK): ---
COMPILED BY: P. Ouellette

DEPTH (meters)	ELEVATION (meters)	WATER TABLE	WELL DESIGN	NOTES	SAMPLE STATE	SAMPLE TYPE AND NUMBER	RECOVERY %	N VALUE	ANALYZED PARAMETERS	VOLATILE HYDROCARBON RECORD (PPM)	STRATIGRAPHY	SOIL/ROCK DESCRIPTION	OBSERVATIONS: ODOR (O W I P NE SC SA) / VISUAL
0.00	323.69			Steel Cap									
				Cap								Light Brown Sand and Gravel, Dry	
				Bentonite									
				PVC Tubing									
1.80	321.89												
				Silica Sand								Greyish Clayey Silt	
2.40	321.29												
												Brown Clayey Silt	
2.89	320.80												
3.00	320.69			Screen, Opening 0.05 cm								Grey Sandy Silt, Saturated	
4.00	319.69			Cap								End of Borehole at a Depth of 4.00 m	

NOTE: 0.22 m of Free-phase product observed on 02-10-96

0.51 m Top Section of Observation Well Installed Aboveground. Elevation of 323.69 m Taken at Ground Level. Water Elevation Measurements Taken from Protective Casing at an Elevation of 324.20 m

STATE OF SAMPLE:
INTACT DISTURBED LOST CORE SAMPLE

TYPE OF SAMPLE:
SS — SPLIT SPOON SAMPLER
TW — THIN WALL SAMPLER
CS — CORE SAMPLER

OBSERVATIONS
O — ODORLESS
W — WEAK
I — INTERMEDIATE
P — PERSISTENT
NE — NON EXISTENT
SC — SCATTERED
SA — SATURATED

▽ = WATER TABLE
** = FIELD DUPLICATE
* = ANALYZED SAMPLE

SURFACE PROTECTION: Steel Cap
SURFACE SEALANT: Bentonite
SEALANT DEPTH: 0.90 m
SCREEN LENGTH: 3.10 m
TUBING LENGTH: 1.20 m

ELEVATION:
REFERENCE LEVEL: Real
BEDROCK LEVEL: ---
GROUND LEVEL: 323.69 m
WATER TABLE LEVEL:
24 HOUR(s) AFTER DRILLING: 320.80

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BOREHOLE LOG

CONFIDENTIAL AND PRIVILEGED DOCUMENT

BOREHOLE #: OW5-3
SHEET: 1 OF 1
FILE #: CN-6089

PROJECT: HORNEPAYNE CN
LOCATION: AREA OF PLUME 8
CONTRACTOR: Boart Longyear Drilling Inc
OPERATOR: C. Pullen
TYPE OF TUBING: PVC

STARTING DATE: 28-09-96
SLOTTED PIPE Ø : 50 mm
DRILL TYPE: CME 75
METHOD (SOIL): Hollow Stem Auger
DRILLING FLUID: ---

COMPLT. DATE: 28-09-96
TUBING Ø : 50 mm
CORE SAMPLER Ø : ---
METHOD (ROCK): ---
COMPILED BY: P. Ouellette

LEVELING			MONITORING WELL		SAMPLE						GEOLOGY		
	DEPTH (meters)	ELEVATION (meters)	WATER TABLE	WELL DESIGN	NOTES	SAMPLE STATE	SAMPLE TYPE AND NUMBER	RECOVERY %	N VALUE	ANALYZED PARAMETERS	VOLATILE HYDROCARBON RECORD (PPM)	STRATIGRAPHY	SOIL/ROCK DESCRIPTION	OBSERVATIONS (ODOR, VISUAL)
	0,00	323.75			Steel Cap									
					Cap		SS1	75	N=5	---	---		**Fine to Coarse Sand** with Traces of Gravel, Loose, Dry	
					Bentonite		SS2	100	N=8	---	---			
					PVC Tubing		SS3	100	N=15	---	---			
	1.60	322.15											**Dark Brown Organic Matter** with Traces of Glass	
							SS4	50	N=8	---	---			
	2.20	321.55											**Brown Clayey Silt**, Dry	
	2.74	321.01	▽				SS5	100	N=8	---	---			
							SS6	16	N=16	---	---		-**Presence of Pieces of Wood**	
	3.60	320.25											**Black Fine to Coarse Sand**, Dense, Saturated	
					Silica Sand		SS7	25	N=17	---	---			
	4.26	319.60											**Ligth Brown Coarse Sand**, Medium to Very Dense, Saturated, Presence of Gravel	
							SS8	50	N=32	---	---			
							SS9	50	N=57	---	---			
					Screen, Opening 0.05 cm		SS10	16	N=21	---	---			
							SS11	50	N=15	---	---			
							SS12	16	N=35	---	---			
	7.20	316.55			Cap								**End of Borehole at a Depth of 7.20 m**	

STATE OF SAMPLE:
INTACT DISTURBED LOST CORE SAMPLE

TYPE OF SAMPLE:
SS — SPLIT SPOON SAMPLER
TW — THIN WALL SAMPLER
CS — CORE SAMPLER

OBSERVATIONS
O — ODORLESS
W — WEAK
I — INTERMEDIATE
P — PERSISTENT
NE — NON EXISTENT
SC — SCATTERED
SA — SATURATED

▽ = WATER TABLE
** = FIELD DUPLICATE
* = ANALYZED SAMPLE

SURFACE PROTECTION: Steel Cap
SURFACE SEALANT: Bentonite
SEALANT DEPTH: 0.80 m
SCREEN LENGTH: 6.00 m
TUBING LENGTH: 1.20 m

ELEVATION:
REFERENCE LEVEL: Real
BEDROCK LEVEL: ---
GROUND LEVEL: 323.76 m
WATER TABLE LEVEL:
48 HOUR(s) AFTER DRILLING 321.01

000923

BIOGÉNIE Inc
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BOREHOLE LOG

CONFIDENTIAL AND PRIVILEGED DOCUMENT

BOREHOLE #: OW5-4
SHEET: 1 OF 1
FILE #: CN-6089

PROJECT: HORNEPAYNE CN
LOCATION: AREA OF PLUME 8
CONTRACTOR: Boart Longyear Drilling Inc
OPERATOR: C. Pullen
TYPE OF TUBING: PVC

STARTING DATE: 28-09-96
SLOTTED PIPE Ø : 50 mm
DRILL TYPE: CME 75
METHOD (SOIL): Hollow Stem Auger
DRILLING FLUID: ---

COMPLT. DATE: 28-09-96
TUBING Ø : 50 mm
CORE SAMPLER Ø : ---
METHOD (ROCK): ---
COMPILED BY: P. Ouellette

DEPTH (meters)	ELEVATION (meters)	WATER TABLE	WELL DESIGN	NOTES	SAMPLE STATE	SAMPLE TYPE AND NUMBER	RECOVERY %	N VALUE	ANALYZED PARAMETERS	VOLATILE HYDROCARBON RECORD (PPM)	STRATIGRAPHY	SOIL/ROCK DESCRIPTION
0.00	324.46			Steel Cap								
				Cap		SS1	79	N=13	---	---		Light Brown Fine to Coarse Sand with Traces of Gravel, Medium Dense, Dry
				Bentonite		SS2	100	N=13	---	---		
				PVC Tubing		SS3	100	N=20	---	---		
1.90	322.56					SS4	100	N=17	---	---		Gray Fine Sand with Traces of Silt, Medium Dense, Dry to Humid
						SS5	100	N=12	---	---		
						SS6	100	N=7	---	---		
3.68	320.78	▽										-Becomming Loose and Saturated, Sheen of the Water
3.80	320.66					SS7	75	N=13	---	---		Gray Medium to Coarse Sand with Little Gravel, Loose, Saturated
				Silica Sand								
4.25	320.21					SS8	100	N=8	---	---		Light Brown Coarse Sand with Some Gravel, Medium Dense, Saturated
						SS9	75	N=12	---	---		
				Screen, Opening 0.05 cm		SS10	60	N=16	--	---		
						SS11	25	N=13	---	---		
						SS12	0	N=24	---	---		
7.20	317.26			Cap								End of Borehole at a Depth 7.20 m
												NOTE: 0.29 m of Free-phase product observed on 08-10-96

STATE OF SAMPLE:
INTACT DISTURBED LOST CORE SAMPLE

TYPE OF SAMPLE:
SS — SPLIT SPOON SAMPLER
TW — THIN WALL SAMPLER
CS — CORE SAMPLER

OBSERVATIONS
O — ODORLESS
W — WEAK
I — INTERMEDIATE
P — PERSISTENT
NE — NON EXISTENT
SC — SCATTERED
SA — SATURATED

▽ = WATER TABLE
** = FIELD DUPLICATE
* = ANALYZED SAMPLE

SURFACE PROTECTION: Steel Cap
SURFACE SEALANT: Bentonite
SEALANT DEPTH: 0.80 m
SCREEN LENGTH: 6.00 m
TUBING LENGTH: 1.20 m

ELEVATION:
REFERENCE LEVEL: Real
BEDROCK LEVEL: ---
GROUND LEVEL: 324.46 m
WATER TABLE LEVEL:
24 HOUR(s) AFTER DRILLING: 320.78

000924

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BOREHOLE LOG

CONFIDENTIAL AND PRIVILEGED DOCUMENT

BOREHOLE #: OW5-6
SHEET: 1 OF 1
FILE #: CN-6089

PROJECT: HORNEPAYNE CN
LOCATION: AREA OF PLUME 8
CONTRACTOR: Boart Longyear Drilling Inc
OPERATOR: C. Pullen
TYPE OF TUBING: PVC

STARTING DATE: 28-09-96
SLOTTED PIPE Ø : 50 mm
DRILL TYPE: CME 75
METHOD (SOIL): Hollow Stem Auger
DRILLING FLUID: ---

COMPLT. DATE: 28-09-96
TUBING Ø : 50 mm
CORE SAMPLER Ø : ---
METHOD (ROCK): ---
COMPILED BY: P. Ouellette

LEVELING			MONITORING WELL		SAMPLE						GEOLOGY		OBSERVATIONS	
DEPTH (meters)	ELEVATION (meters)	WATER TABLE	WELL DESIGN	NOTES	SAMPLE STATE	SAMPLE TYPE AND NUMBER	RECOVERY %	N VALUE	ANALYZED PARAMETERS	VOLATILE HYDROCARBON RECORD (PPM)	STRATIGRAPHY	SOIL/ROCK DESCRIPTION	ODOR	VISUAL
0.00	324.30			Steel Cap										
				Cap		SS1	4	N=12	---	---		**Light Brown Fine to Coarse Sand,** Traces of Silt, Loose, Dry		
				Bentonite		SS2	4	N=4	---	---				
				PVC Tubing		SS3	100	N=12	---	---		**Light Brown Clayey Silt with Traces of** Sand, Stiff, Humid		
1.50	322.80					SS4	100	N=15	---	---				
						SS5	75	N=18	---	---				
2.80	321.50	▽				SS6	75	N=8	---	---				
				Silica Sand		SS7	91	N=11	---	---				
						SS8	79	N=3	---	---				
4.80	319.50					SS9	100	N=3	---	---		**Light Brown Fine Sand to Sandy Silt,** Very Loose, Saturated		
				Screen, Opening 0.05 cm		SS10	100	N=5	---	---				
6.00	318.30					SS11	25	N=7	---	---		**Light Brown Medium to Coarse Sand,** with Traces of Gravel, Loose, Saturated		
				Cap		SS12		N=6	---	---				
7.20	317.10											**End of Borehole at a Depth of 7.20 m**		

STATE OF SAMPLE:
INTACT DISTURBED LOST CORE SAMPLE

TYPE OF SAMPLE:
SS — SPLIT SPOON SAMPLER
TW — THIN WALL SAMPLER
CS — CORE SAMPLER

OBSERVATIONS
O — ODORLESS
W — WEAK
I — INTERMEDIATE
P — PERSISTENT
NE — NON EXISTENT
SC — SCATTERED
SA — SATURATED

▽ = WATER TABLE
** = FIELD DUPLICATE
* = ANALYZED SAMPLE

SURFACE PROTECTION: Steel Cap
SURFACE SEALANT: Bentonite
SEALANT DEPTH: 0.80 m
SCREEN LENGTH: 6.00 m
TUBING LENGTH: 0.70 m

ELEVATION:
REFERENCE LEVEL: Real
BEDROCK LEVEL: ---
GROUND LEVEL: 324.30 m
WATER TABLE LEVEL:
48 HOUR(s) AFTER DRILLING: 321.50

000925

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BOREHOLE LOG

CONFIDENTIAL AND PRIVILEGED DOCUMENT

BOREHOLE #: OW6-1

SHEET: 1 OF 1

FILE #: CN-6089

PROJECT:	HORNEPAYNE CN	STARTING DATE:	30-09-96	COMPLT. DATE:	30-09-96
LOCATION:	AREA OF PLUME 8	SLOTTED PIPE Ø :	50 mm	TUBING Ø :	50 mm
CONTRACTOR:	Boart Longyear Drilling Inc.	DRILL TYPE:	CME 75	CORE SAMPLER Ø :	---
OPERATOR:	C. Pullen	METHOD (SOIL):	Auger	METHOD (ROCK):	---
TYPE OF TUBING:	PVC	DRILLING FLUID:	---	COMPILED BY:	P. Oullette

DEPTH (meters)	ELEVATION (meters)	WATER TABLE	MONITORING WELL NOTES	SOIL/ROCK DESCRIPTION
0.00	326.91		Steel Cap; Cap; Cement; Bentonite	Black Sandy Silt with Traces of Coal Residues
1.20	325.71		PVC Tubing	Light Brown Clayey Silt, Humid
2.26	324.65	▽	Silica Sand; Screen, Opening 0.05 cm	
6.00	320.91		Cap	End of Borehole at a Depth of 6.00 m

Column headings: LEVELING (DEPTH (meters), ELEVATION (meters), WATER TABLE); MONITORING WELL (WELL DESIGN, NOTES); SAMPLE (SAMPLE STATE, SAMPLE TYPE AND NUMBER, RECOVERY %, N VALUE, ANALYZED PARAMETERS, VOLATILE HYDROCARBON RECORD (PPM)); GEOLOGY (STRATIGRAPHY, SOIL/ROCK DESCRIPTION); OBSERVATIONS (ODOR: O W I P; VISUAL: NE SC SA)

Depth scale: 0 1 2 3 4 5 6 7 8 9

STATE OF SAMPLE: INTACT · DISTURBED · LOST · CORE SAMPLE

TYPE OF SAMPLE:
SS — SPLIT SPOON SAMPLER
TW — THIN WALL SAMPLER
CS — CORE SAMPLER

OBSERVATIONS:
O — ODORLESS
W — WEAK
I — INTERMEDIATE
P — PERSISTENT
NE — NON EXISTENT
SC — SCATTERED
SA — SATURATED

▽ = WATER TABLE
** = FIELD DUPLICATE
* = ANALYZED SAMPLE

SURFACE PROTECTION:	Steel Cap	ELEVATION:	
SURFACE SEALANT:	Cement/Bentonite	REFERENCE LEVEL:	Real
SEALANT DEPTH:	0.90 m	BEDROCK LEVEL:	---
SCREEN LENGTH:	4.40 m	GROUND LEVEL:	326.91 m
TUBING LENGTH:	1.60 m	WATER TABLE LEVEL:	
		24 HOUR(s) AFTER DRILLING:	324.65

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BOREHOLE LOG

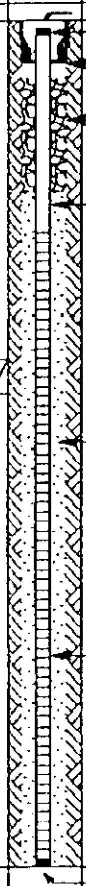
CONFIDENTIAL AND PRIVILEGED DOCUMENT

BOREHOLE #: OW6-3
SHEET: 1 OF 1
FILE #: CN-6089

PROJECT:	HORNEPAYNE CN	STARTING DATE:	30-09-96	COMPLT. DATE:	30-09-96
LOCATION:	AREA OF PLUME 8	SLOTTED PIPE Ø:	50 mm	TUBING Ø:	50 mm
CONTRACTOR:	Boart Longyear Drilling Inc.	DRILL TYPE:	CME 75	CORE SAMPLER Ø:	---
OPERATOR:	C. Pullen	METHOD (SOIL):	Auger	METHOD (ROCK):	---
TYPE OF TUBING:	PVC	DRILLING FLUID:	---	COMPILED BY:	P. Ouellette

LEVELING: DEPTH (meters) / ELEVATION (meters) / WATER TABLE — MONITORING WELL: WELL DESIGN / NOTES — SAMPLE: SAMPLE STATE / SAMPLE TYPE AND NUMBER / RECOVERY % / N VALUE / ANALYZED PARAMETERS / VOLATILE HYDROCARBON RECORD (PPM) — GEOLOGY: STRATIGRAPHY / SOIL/ROCK DESCRIPTION — OBSERVATIONS: ODOR / VISUAL

Depth (m)	Elevation (m)	Well notes	Soil/Rock description
0.00	326.61	Steel Cap; Cap; Cement; Bentonite; PVC Tubing	Black Silt, Presence of Coal Residues, Dry
2.45	324.16		
2.64	323.97	Silica Sand; Screen, Opening 0.05 cm	Light Brown Sandy Silt, Dry -Presence of Much Gravel from a Depth of 4.50 m
6.00	320.61	Cap	End of Borehole at a Depth of 6.00 m



STATE OF SAMPLE: INTACT, DISTURBED, LOST, CORE SAMPLE

TYPE OF SAMPLE:
SS — SPLIT SPOON SAMPLER
TW — THIN WALL SAMPLER
CS — CORE SAMPLER

OBSERVATIONS:
O — ODORLESS
W — WEAK
I — INTERMEDIATE
P — PERSISTENT
NE — NON EXISTENT
SC — SCATTERED
SA — SATURATED

∇ = WATER TABLE
** = FIELD DUPLICATE
* = ANALYZED SAMPLE

SURFACE PROTECTION: Steel Cap
SURFACE SEALANT: Cement/Bentonite
SEALANT DEPTH: 1.20 m
SCREEN LENGTH: 4.50 m
TUBING LENGTH: 1.50 m

ELEVATION:
REFERENCE LEVEL: Real
BEDROCK LEVEL: ---
GROUND LEVEL: 326.61
WATER TABLE LEVEL:
24 HOUR(s) AFTER DRILLING: 323.97

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BOREHOLE LOG

CONFIDENTIAL AND PRIVILEGED DOCUMENT

BOREHOLE #: OW6-4
SHEET: 1 OF 1
FILE #: CN-6089

PROJECT: HORNEPAYNE CN
LOCATION: AREA OF PLUME 8
CONTRACTOR: Boart Longyear Drilling Inc.
OPERATOR: C. Pullen
TYPE OF TUBING: PVC

STARTING DATE: 30-09-96
SLOTTED PIPE Ø : 50 mm
DRILL TYPE: CME 75
METHOD (SOIL): Auger
DRILLING FLUID: ---

COMPLT. DATE: 30-09-96
TUBING Ø : 50 mm
CORE SAMPLER Ø : ---
METHOD (ROCK): ---
COMPILED BY: P. Ouellette

LEVELING			MONITORING WELL		SAMPLE						GEOLOGY		
DEPTH (meters)	ELEVATION (meters)	WATER TABLE	WELL DESIGN	NOTES	SAMPLE STATE	SAMPLE TYPE AND NUMBER	RECOVERY %	N VALUE	ANALYZED PARAMETERS	VOLATILE HYDROCARBON RECORD (PPM)	STRATIGRAPHY	SOIL/ROCK DESCRIPTION	OBSERVATIONS
0.00	327.26			Steel Cap								Light Brown Sand and Gravel, Dry	
				Cap									
				Cement									
0.60	326.66			Bentonite								Brown Silt, with Traces of Gravel, Dry	
1.20	326.06			PVC Tubing								Black Sandy Silt with Traces of Gravel, Humid	
2.21	325.05	▽											
2.45	324.81											Grey-Brown Clayey Silt, Humid	
				Silica Sand									
4.60	322.66			Screen, Opening 0.05 cm								Grey Clayey Silt with Traces of Sand, Humid	
6.00	321.26			Cap								End of Borehole at a Depth of 6.00 m	

STATE OF SAMPLE:
INTACT DISTURBED LOST CORE SAMPLE

TYPE OF SAMPLE:
SS — SPLIT SPOON SAMPLER
TW — THIN WALL SAMPLER
CS — CORE SAMPLER

OBSERVATIONS
O — ODORLESS
W — WEAK
I — INTERMEDIATE
P — PERSISTENT
NE — NON EXISTENT
SC — SCATTERED
SA — SATURATED

▽ — WATER TABLE
** = FIELD DUPLICATE
* = ANALYZED SAMPLE

SURFACE PROTECTION: Steel Cap
SURFACE SEALANT: Cement/Bentonite
SEALANT DEPTH: 0.80 m
SCREEN LENGTH: 4.60 m
TUBING LENGTH: 1.40 m

ELEVATION:
REFERENCE LEVEL: Real
BEDROCK LEVEL: ---
GROUND LEVEL: 327.26 m
WATER TABLE LEVEL:
24 HOUR(s) AFTER DRILLING: 326.05

000928

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BOREHOLE LOG

CONFIDENTIAL AND PRIVILEGED DOCUMENT

BOREHOLE #: OW8-1
SHEET: 1 OF 1
FILE #: CN-6089

PROJECT: HORNEPAYNE CN
LOCATION: AREA OF PLUME 8
CONTRACTOR: Boart Longyear Drilling Inc
OPERATOR: C. Pullen
TYPE OF TUBING: PVC

STARTING DATE: 27-09-96
SLOTTED PIPE Ø : 50 mm
DRILL TYPE: CME 75
METHOD (SOIL): Auger
DRILLING FLUID: ---

COMPLT. DATE: 27-09-96
TUBING Ø : 50 mm
CORE SAMPLER Ø : ---
METHOD (ROCK): ---
COMPILED BY: P. Ouellette

LEVELING			MONITORING WELL		SAMPLE						GEOLOGY		OBSERVATIONS	
DEPTH (meters)	ELEVATION (meters)	WATER TABLE	WELL DESIGN	NOTES	SAMPLE STATE	SAMPLE TYPE AND NUMBER	RECOVERY %	N VALUE	ANALYZED PARAMETERS	VOLATILE HYDROCARBON RECORD (PPM)	STRATIGRAPHY	SOIL/ROCK DESCRIPTION	ODOR	VISUAL
0.00	327.67			Steel Cap								Light Brown to Grey Fine to Coarse Sand with Traces of Gravel, Dry		
				Cap										
				Cement										
				Bentonite										
				PVC Tubing										
				Silica Sand										
3.70	323.97													
4.30	323.37											Grey Clayey to Sandy Silt, Dry		
				Screen, Opening 0.05 cm										
5.80	321.87											Brown Clayey Silt, Dry		
6.35	321.32											Grey Clayey Silt, Saturated		
8.00	319.67			Cap								End of Borehole at a Depth of 8.00 m		

STATE OF SAMPLE:
INTACT DISTURBED LOST CORE SAMPLE

TYPE OF SAMPLE:
SS — SPLIT SPOON SAMPLER
TW — THIN WALL SAMPLER
CS — CORE SAMPLER

OBSERVATIONS
O — ODORLESS
W — WEAK
I — INTERMEDIATE
P — PERSISTENT
NE — NON EXISTENT
SC — SCATTERED
SA — SATURATED

▽ = WATER TABLE
** = FIELD DUPLICATE
* = ANALYZED SAMPLE

SURFACE PROTECTION: Steel Cap
SURFACE SEALANT: Cement/Bentonit
SEALANT DEPTH: 0.75 m
SCREEN LENGTH: 6.80 m
TUBING LENGTH: 1.20 m

ELEVATION REFERENCE LEVEL: Real
BEDROCK LEVEL: ---
GROUND LEVEL: 327.67 m
WATER TABLE LEVEL:
48 HOUR(s) AFTER DRILLING: 323.97

000929

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BOREHOLE LOG

CONFIDENTIAL AND PRIVILEGED DOCUMENT

BOREHOLE #: OW8-2
SHEET: 1 OF 1
FILE #: CN-6089

PROJECT: HORNEPAYNE CN
LOCATION: AREA OF PLUME B
CONTRACTOR: Boart Longyear Drilling Inc
OPERATOR: C. Pullen
TYPE OF TUBING: PVC

STARTING DATE: 27-09-96
SLOTTED PIPE Ø : 50 mm
DRILL TYPE: CME 75
METHOD (SOIL): Auger
DRILLING FLUID: ---

COMPLT. DATE: 27-09-96
TUBING Ø : 50 mm
CORE SAMPLER Ø : ---
METHOD (ROCK): ---
COMPILED BY: P. Ouellette

DEPTH (meters)	ELEVATION (meters)	WATER TABLE	WELL DESIGN	NOTES	SAMPLE STATE	SAMPLE TYPE AND NUMBER	RECOVERY %	N VALUE	ANALYZED PARAMETERS	VOLATILE HYDROCARBON RECORD (PPM)	STRATIGRAPHY	SOIL/ROCK DESCRIPTION	OBSERVATIONS: ODOR (O W I P)	OBSERVATIONS: VISUAL (NE SC SA)
0.00	327.56			Steel Cap										
				Cap								Light Brown Sand, Dry		
				Cement										
				Bentonite										
				PVC Tubing										
3.00	324.56			Silica Sand								Light Brown Clayey Silt, Dry		
3.60	323.96	▽										Dark Brown Clayey Silt, Dry		
3.87	323.69													
4.90	322.66			Screen, Opening 0.05 cm								Grey Clayey Silt, Saturated		
7.90	319.66			Cap								End of Borehole at a Depth of 7.90 m		

NOTE: 0.34 m of Free-phase product observed on 29-09-96

STATE OF SAMPLE: INTACT | DISTURBED | LOST CORE SAMPLE

TYPE OF SAMPLE:
SS — SPLIT SPOON SAMPLER
TW — THIN WALL SAMPLER
CS — CORE SAMPLER

OBSERVATIONS
O — ODORLESS
W — WEAK
I — INTERMEDIATE
P — PERSISTENT
NE — NON EXISTENT
SC — SCATTERED
SA — SATURATED

▽ = WATER TABLE
** = FIELD DUPLICATE
* = ANALYZED SAMPLE

SURFACE PROTECTION: Steel Cap
SURFACE SEALANT: Cement/Bentonite
SEALANT DEPTH: 0.75 m
SCREEN LENGTH: 6.70 m
TUBING LENGTH: 1.20 m

ELEVATION REFERENCE LEVEL: Reel
BEDROCK LEVEL: ---
GROUND LEVEL: 327.56 m
WATER TABLE LEVEL:
48 HOUR(s) AFTER DRILLING: 323.69

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BOREHOLE LOG

CONFIDENTIAL AND PRIVILEGED DOCUMENT

BOREHOLE #: OW8-3
SHEET: 1 OF 1
FILE #: CN-6089

PROJECT: HORNEPAYNE CN
LOCATION: AREA OF PLUME B
CONTRACTOR: Boart Longyear Drilling Inc
OPERATOR: C. Pullen
TYPE OF TUBING: PVC

STARTING DATE: 27-09-96
SLOTTED PIPE Ø : 50 mm
DRILL TYPE: CME 76
METHOD (SOIL): Auger
DRILLING FLUID: ---

COMPLT. DATE: 27-09-96
TUBING Ø : 50 mm
CORE SAMPLER Ø : ---
METHOD (ROCK): ---
COMPILED BY: P. Ouellette

DEPTH (meters)	ELEVATION (meters)	WATER TABLE	WELL DESIGN	NOTES	SAMPLE STATE	SAMPLE TYPE AND NUMBER	RECOVERY %	N VALUE	ANALYZED PARAMETERS	VOLATILE HYDROCARBON RECORD (PPM)	STRATIGRAPHY	SOIL/ROCK DESCRIPTION	OBSERVATIONS (ODOR / VISUAL)
0.00	327.79			Steel Cap								Light Brown Fine Sand, Dry	
				Cap									
				Cement									
				Bentonite									
				PVC Tubing									
3.00	324.79			Silica Sand								Gray Sand and Gravel with Traces of Silt, Dry	
4.75	323.04	▽											
				Screen, Opening 0.05 cm									
6.80	321.99											Grey Clayey Silt, Saturated	
7.90	319.89			Cap								End of Borehole at a Depth of 7.90 m	
												NOTE: 2.22 m of Free-phase product observed on 29-09-96	

STATE OF SAMPLE:
INTACT DISTURBED LOST CORE SAMPLE

TYPE OF SAMPLE:
SS — SPLIT SPOON SAMPLER
TW — THIN WALL SAMPLER
CS — CORE SAMPLER

OBSERVATIONS
O — ODORLESS
W — WEAK
I — INTERMEDIATE
P — PERSISTENT
NE — NON-EXISTENT
SC — SCATTERED
SA — SATURATED

▽ = WATER TABLE
** = FIELD DUPLICATE
* = ANALYZED SAMPLE

SURFACE PROTECTION: Steel Cap
SURFACE SEALANT: Cement/Bentonite
SEALANT DEPTH: 0.60 m
SCREEN LENGTH: 6.70 m
TUBING LENGTH: 1.20 m

ELEVATION REFERENCE LEVEL: Real
BEDROCK LEVEL: ---
GROUND LEVEL: 327.79 m
WATER TABLE LEVEL:
48 HOUR(s) AFTER DRILLING: 323.04

000931

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BOREHOLE LOG

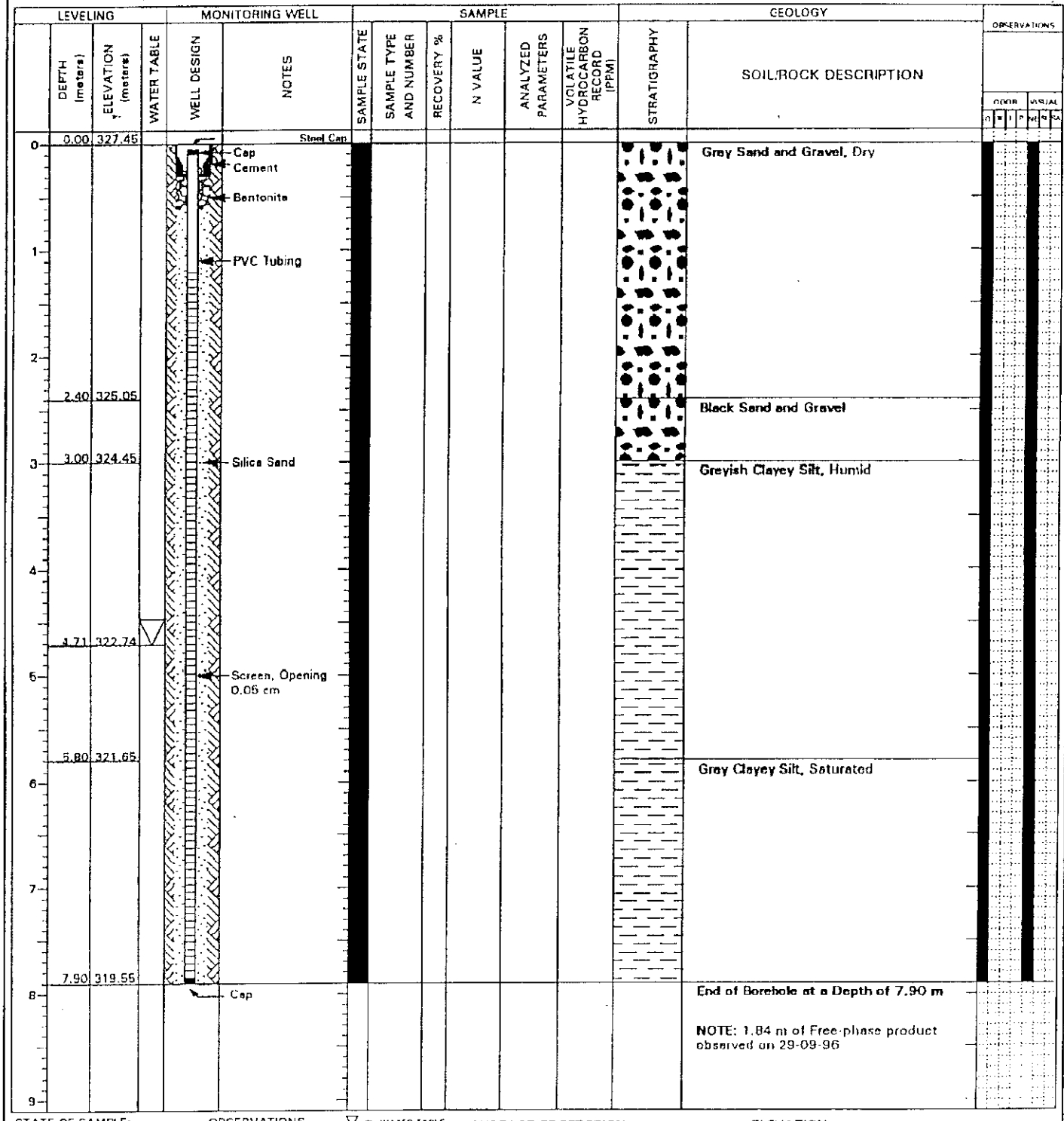
CONFIDENTIAL AND PRIVILEGED DOCUMENT

BOREHOLE #: OW8-4
SHEET: 1 OF 1
FILE #: CN-6089

PROJECT: HORNEPAYNE CN
LOCATION: AREA OF PLUME 8
CONTRACTOR: Boart Longyear Drilling Inc
OPERATOR: C. Pullen
TYPE OF TUBING: PVC

STARTING DATE: 27-09-96
SLOTTED PIPE Ø : 50 mm
DRILL TYPE: CME 75
METHOD (SOIL): Auger
DRILLING FLUID: ---

COMPLT. DATE: 27-09-96
TUBING Ø : 50 mm
CORE SAMPLER Ø : ---
METHOD (ROCK): ---
COMPILED BY: P. Ouellette



STATE OF SAMPLE:
INTACT DISTURBED LOST CORE SAMPLE

TYPE OF SAMPLE:
SS — SPLIT SPOON SAMPLER
TW — THIN WALL SAMPLER
CS — CORE SAMPLER

OBSERVATIONS
O — ODORLESS
W — WEAK
I — INTERMEDIATE
P — PERSISTENT
NE — NON EXISTENT
SC — SCATTERED
SA — SATURATED

▽ = WATER TABLE
** = FIELD DUPLICATE
* = ANALYZED SAMPLE

SURFACE PROTECTION: Steel Cap
SURFACE SEALANT: Cement/Bentonite
SEALANT DEPTH: 0.60 m
SCREEN LENGTH: 6.70 m
TUBING LENGTH: 1.20 m

ELEVATION:
REFERENCE LEVEL: Real
BEDROCK LEVEL: ---
GROUND LEVEL: 327.45 m
WATER TABLE LEVEL:
48 HOUR(s) AFTER DRILLING: 322.74

000932

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BOREHOLE LOG

CONFIDENTIAL AND PRIVILEGED DOCUMENT

BOREHOLE #: OW8-5
SHEET: 1 OF 1
FILE #: CN-6089

PROJECT:	HORNEPAYNE CN	STARTING DATE:	27-09-96	COMPLT. DATE:	27-09-96
LOCATION:	AREA OF PLUME 8	SLOTTED PIPE Ø:	50 mm	TUBING Ø:	50 mm
CONTRACTOR:	Boart Longyear Drilling Inc	DRILL TYPE:	CME 75	CORE SAMPLER Ø:	---
OPERATOR:	C. Pullen	METHOD (SOIL):	Auger	METHOD (ROCK):	---
TYPE OF TUBING:	PVC	DRILLING FLUID:	---	COMPILED BY:	P. Ouellette

LEVELING: DEPTH (meters), ELEVATION (meters), WATER TABLE
MONITORING WELL: WELL DESIGN, NOTES
SAMPLE: SAMPLE STATE, SAMPLE TYPE AND NUMBER, RECOVERY %, N VALUE, ANALYZED PARAMETERS, VOLATILE HYDROCARBON RECORD (PPM)
GEOLOGY: STRATIGRAPHY, SOIL/ROCK DESCRIPTION
OBSERVATIONS: ODOR, VISUAL

Depth (m)	Elevation (m)	Well design notes	Soil/rock description
0.00	327.60	Steel Cap; Cap; Cement; Bentonite; PVC Tubing; Silica Sand	Grey Sand and Gravel, Dry
3.75	323.85	(water table)	
4.60	323.00	Screen, Opening 0.05 cm	Grey Silt with Clay, Saturated
8.00	319.60	Cap	End of Borehole at a Depth of 8.00 m

NOTE: 0.17 m of Free-phase product observed on 29-09-96

STATE OF SAMPLE: INTACT, DISTURBED, LOST, CORE SAMPLE

TYPE OF SAMPLE:
SS — SPLIT SPOON SAMPLER
TW — THIN WALL SAMPLER
CS — CORE SAMPLER

OBSERVATIONS:
O — ODORLESS
W — WEAK
I — INTERMEDIATE
P — PERSISTENT
NE — NON EXISTENT
SC — SCATTERED
SA — SATURATED

∇ = WATER TABLE
** = FIELD DUPLICATE
* = ANALYZED SAMPLE

SURFACE PROTECTION:	Steel Cap	ELEVATION:	
SURFACE SEALANT:	Cement/Bentonite	REFERENCE LEVEL:	Real
SEALANT DEPTH:	0.90 m	BEDROCK LEVEL:	---
SCREEN LENGTH:	6.80 m	GROUND LEVEL:	327.60 m
TUBING LENGTH:	1.20 m	WATER TABLE LEVEL:	48 HOUR(s) AFTER DRILLING: 323.85

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BOREHOLE LOG

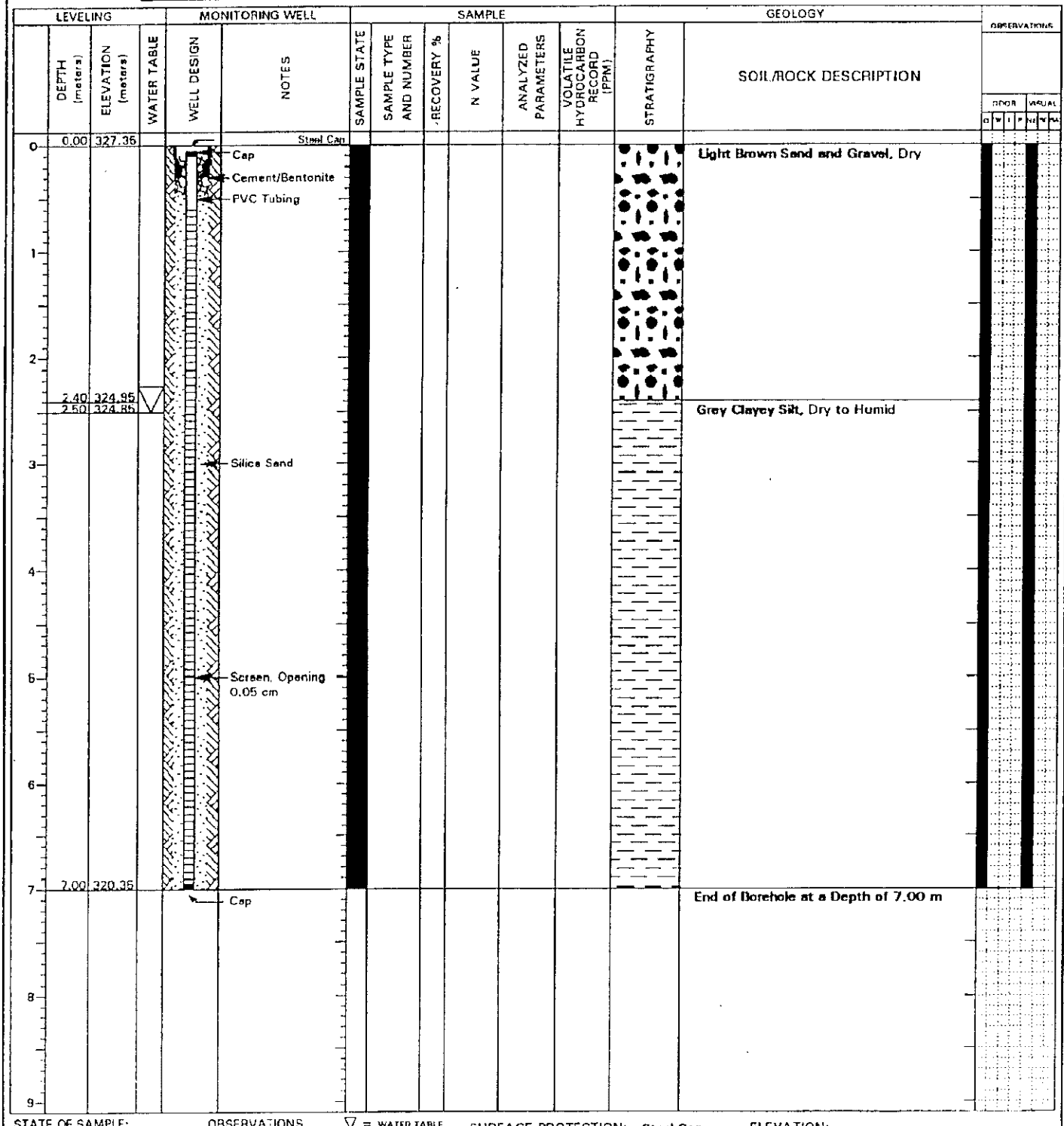
CONFIDENTIAL AND PRIVILEGED DOCUMENT

BOREHOLE #: OW9-1
SHEET: 1 OF 1
FILE #: CN-6089

PROJECT: HORNEPAYNE CN
LOCATION: AREA OF PLUME 9
CONTRACTOR: Boart Longyear Drilling Inc.
OPERATOR: C. Pullen
TYPE OF TUBING: PVC

STARTING DATE: 27-09-96
SLOTTED PIPE Ø : 50 mm
DRILL TYPE: CME 75
METHOD (SOIL): Auger
DRILLING FLUID: ---

COMPLT. DATE: 27-09-96
TUBING Ø : 50 mm
CORE SAMPLER Ø : —
METHOD (ROCK): ---
COMPILED BY: P. Ouellette



STATE OF SAMPLE:
INTACT DISTURBED LOST CORE SAMPLE

TYPE OF SAMPLE:
SS — SPLIT SPOON SAMPLER
TW — THIN WALL SAMPLER
CS — CORE SAMPLER

OBSERVATIONS
O — ODORLESS
W — WEAK
I — INTERMEDIATE
P — PERSISTENT
NE — NON EXISTENT
SC — SCATTERED
SA — SATURATED

▽ = WATER TABLE
** = FIELD DUPLICATE
* = ANALYZED SAMPLE

SURFACE PROTECTION: Steel Cap
SURFACE SEALANT: Cement/Bentonite
SEALANT DEPTH: 0.45 m
SCREEN LENGTH: 6.40 m
TUBING LENGTH: 0.60 m

ELEVATION:
REFERENCE LEVEL: Real
BEDROCK LEVEL: ---
GROUND LEVEL: 327.35 m
WATER TABLE LEVEL:
48 HOUR(s) AFTER DRILLING: 324.85

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BOREHOLE LOG

CONFIDENTIAL AND PRIVILEGED DOCUMENT

BOREHOLE #: OW9-3
SHEET: 1 OF 1
FILE #: CN-6089

PROJECT: HORNEPAYNE CN
LOCATION: AREA OF PLUME 9
CONTRACTOR: Boart Longyear Drilling Inc.
OPERATOR: C. Pullen
TYPE OF TUBING: PVC

STARTING DATE: 29-09-96
SLOTTED PIPE Ø : 50 mm
DRILL TYPE: CME 75
METHOD (SOIL): Auger
DRILLING FLUID: ---

COMPLT. DATE: 29-09-96
TUBING Ø : 50 mm
CORE SAMPLER Ø : ---
METHOD (ROCK): ---
COMPILED BY: P. Ouellette

LEVELING			MONITORING WELL		SAMPLE						GEOLOGY		OBSERVATIONS	
DEPTH (meters)	ELEVATION (meters)	WATER TABLE	WELL DESIGN	NOTES	SAMPLE STATE	SAMPLE TYPE AND NUMBER	RECOVERY %	N VALUE	ANALYZED PARAMETERS	VOLATILE HYDROCARBON RECORD (PPM)	STRATIGRAPHY	SOIL/ROCK DESCRIPTION	ODOR	VISUAL
0.00	325.62			Steel Cap										
				Cap								Light Brown Clayey Silt, Saturated		
				Bentonite										
1.18	324.34	▽		PVC Tubing										
				Silica Sand										
3.60	321.92											Greyish Clayey Silt, Saturated		
				Screen, Opening 0.05 cm										
6.10	319.42			Cap								Refusal of Auger to Penetration at a Depth of 6.10 m		

STATE OF SAMPLE:
INTACT DISTURBED LOST CORE SAMPLE

TYPE OF SAMPLE:
SS — SPLIT SPOON SAMPLER
TW — THIN WALL SAMPLER
CS — CORE SAMPLER

OBSERVATIONS
O — ODORLESS
W — WEAK
I — INTERMEDIATE
P — PERSISTENT
NE — NON EXISTENT
SC — SCATTERED
SA — SATURATED

▽ = WATER TABLE
** = FIELD DUPLICATE
* = ANALYZED SAMPLE

SURFACE PROTECTION: Steel Cap
SURFACE SEALANT: Cement/Bentonite
SEALANT DEPTH: 0.70 m
SCREEN LENGTH: 4.60 m
TUBING LENGTH: 1.50 m

ELEVATION:
REFERENCE LEVEL: Real
BEDROCK LEVEL: ---
GROUND LEVEL: 325.62 m
WATER TABLE LEVEL:
72 HOUR(s) AFTER DRILLING 324.34

BIOGÉNIE Inc

ENVIRONMENTAL SPECIALISTS

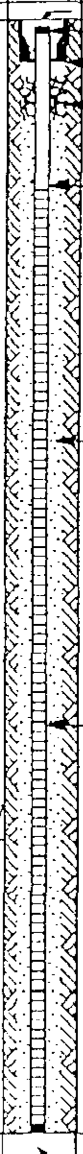
BOREHOLE LOG

CONFIDENTIAL AND PRIVILEGED DOCUMENT

BOREHOLE #: OW53
SHEET: 1 OF 1
FILE #: CN-6089

PROJECT:	HORNEPAYNE CN	STARTING DATE:	03-10-96	COMPLT. DATE:	03-10-96
LOCATION:	AREA OF PLUME 8	SLOTTED PIPE Ø :	50 mm	TUBING Ø :	50 mm
CONTRACTOR:	Boart Longyear Drilling Inc	DRILL TYPE:	CME 75	CORE SAMPLER Ø :	---
OPERATOR:	C. Pullen	METHOD (SOIL):	Auger	METHOD (ROCK):	---
TYPE OF TUBING:	PVC	DRILLING FLUID:	---	COMPILED BY:	P. Ouellette

LEVELING: DEPTH (meters)	ELEVATION (meters)	WATER TABLE	MONITORING WELL: NOTES	SAMPLE STATE	SAMPLE TYPE AND NUMBER	RECOVERY %	N VALUE	ANALYZED PARAMETERS	VOLATILE HYDROCARBON RECORD (PPM)	GEOLOGY: STRATIGRAPHY	SOIL/ROCK DESCRIPTION	OBSERVATIONS: ODOR / VISUAL
0.00	327.09		Steel Cap; Cap; Cement; Bentonite; PVC Tubing; Silica Sand; Screen, Opening 0.05 cm								No Soil Description, Evidences of Hydrocarbons During Drilling	
5.82	321.27	▽										
7.90	319.19		Cap								End of Borehole at a Depth of 7.90 m	
											NOTE: 2.97 m of Free-phase product observed on 12-10-96	



Depth scale: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9

STATE OF SAMPLE: INTACT, DISTURBED, LOST, CORE SAMPLE

TYPE OF SAMPLE:
- SS — SPLIT SPOON SAMPLER
- TW — THIN WALL SAMPLER
- CS — CORE SAMPLER

OBSERVATIONS:
- O — ODORLESS
- W — WEAK
- I — INTERMEDIATE
- P — PERSISTENT
- NE — NON EXISTENT
- SC — SCATTERED
- SA — SATURATED

▽ = WATER TABLE
** = FIELD DUPLICATE
* = ANALYZED SAMPLE

SURFACE PROTECTION:	Steel Cap	ELEVATION:	
SURFACE SEALANT:	Bentonite	REFERENCE LEVEL:	Real
SEALANT DEPTH:	0.70 m	BEDROCK LEVEL:	---
SCREEN LENGTH:	6.70 m	GROUND LEVEL:	327.09 m
TUBING LENGTH:	1.20 m	WATER TABLE LEVEL:	
		>96 HOUR(s) AFTER DRILLING:	321.27

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BOREHOLE LOG

CONFIDENTIAL AND PRIVILEGED DOCUMENT

BOREHOLE #: OW57
SHEET: 1 OF 1
FILE #: CN-6089

PROJECT: HORNEPAYNE CN
LOCATION: AREA OF PLUME 8
CONTRACTOR: Boart Longyear Drilling Inc
OPERATOR: C. Pullen
TYPE OF TUBING: PVC

STARTING DATE: 03-10-96
SLOTTED PIPE Ø : 50 mm
DRILL TYPE: CME 75
METHOD (SOIL): Auger
DRILLING FLUID: ---

COMPLT. DATE: 03-10-96
TUBING Ø : 50 mm
CORE SAMPLER Ø : ---
METHOD (ROCK): ---
COMPILED BY: P. Ouellette

LEVELING			MONITORING WELL		SAMPLE						GEOLOGY		OBSERVATIONS
	DEPTH (meters)	ELEVATION (meters)	WATER TABLE	WELL DESIGN	NOTES	SAMPLE STATE	SAMPLE TYPE AND NUMBER	RECOVERY %	N VALUE	ANALYZED PARAMETERS	VOLATILE HYDROCARBON RECORD (PPM)	STRATIGRAPHY	SOIL/ROCK DESCRIPTION	ODOUR / VISUAL
	0.00	327.09			Steel Cap									
0					Cap Cement								**No Soil Description**	
1					Bentonite PVC Tubing									
2														
3					Silica Sand									
4														
5														
	5.37	321.72	▽											
6					Screen, Opening 0.05 cm									
7														
	7.90	319.19												
8					Cap								**End of Borehole at a Depth of 7.90 m** **NOTE:** 2.80 m of Free-phase product observed on 12-10-96	
9														

STATE OF SAMPLE:
INTACT DISTURBED LOST CORE SAMPLE

TYPE OF SAMPLE:
SS — SPLIT SPOON SAMPLER
TW — THIN WALL SAMPLER
CS — CORE SAMPLER

OBSERVATIONS
O — ODORLESS
W — WEAK
I — INTERMEDIATE
P — PERSISTENT
NE — NON EXISTENT
SC — SCATTERED
SA — SATURATED

▽ = WATER TABLE
** = FIELD DUPLICATE
* = ANALYZED SAMPLE

SURFACE PROTECTION: Steel Cap
SURFACE SEALANT: Bentonite
SEALANT DEPTH: 0,80 m
SCREEN LENGTH: 6,70 m
TUBING LENGTH: 1,20 m

ELEVATION:
REFERENCE LEVEL: Real
BEDROCK LEVEL: ---
GROUND LEVEL: 328.96 m
WATER TABLE LEVEL:
>96 HOUR(s) AFTER DRILLING: 321.72

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BOREHOLE LOG

CONFIDENTIAL AND PRIVILEGED DOCUMENT

BOREHOLE #: OW60
SHEET: 1 OF 1
FILE #: CN-6089

PROJECT: HORNEPAYNE CN
LOCATION: AREA OF PLUME 8
CONTRACTOR: Boart Longyear Drilling Inc.
OPERATOR: C. Pullen
TYPE OF TUBING: PVC

STARTING DATE: 03-10-96
SLOTTED PIPE Ø : 50 mm
DRILL TYPE: CME 75
METHOD (SOIL): Auger
DRILLING FLUID: ---

COMPLT. DATE: 03-10-96
TUBING Ø : 50 mm
CORE SAMPLER Ø : ---
METHOD (ROCK): ---
COMPILED BY: P. Ouellette

LEVELING			MONITORING WELL		SAMPLE						GEOLOGY		OBSERVATIONS	
DEPTH (meters)	ELEVATION (meters)	WATER TABLE	WELL DESIGN	NOTES	SAMPLE STATE	SAMPLE TYPE AND NUMBER	RECOVERY %	N VALUE	ANALYZED PARAMETERS	VOLATILE HYDROCARBON RECORD (PPM)	STRATIGRAPHY	SOIL/ROCK DESCRIPTION	ODOR	VISUAL
0.00	327.82			Steel Cap										
				Cap								Medium Brown Sand and Gravel with Traces of Silt, Dry		
				Cement										
				Bentonite										
				PVC Tubing										
2.35	325.47											Grey Fine to Medium Sand with Traces of Gravel, Humid		
				Silica Sand										
4.60	323.22			Screen, Opening 0.05 cm								Brown Silt, Dry		
6.44	322.38	▽												
6.06	321.77											Grey Clayey Silt, Saturated		
7.90	319.92													
				Cap								End of Borehole at a Depth of 7.90 m		
												NOTE: 2.29 m of Free-phase product observed on 12-10-96		

STATE OF SAMPLE:
INTACT DISTURBED LOST CORE SAMPLE

TYPE OF SAMPLE:
SS — SPLIT SPOON SAMPLER
TW — THIN WALL SAMPLER
CS — CORE SAMPLER

OBSERVATIONS
O — ODORLESS
W — WEAK
I — INTERMEDIATE
P — PERSISTENT
NE — NON EXISTENT
SC — SCATTERED
SA — SATURATED

▽ = WATER TABLE
** = FIELD DUPLICATE
* = ANALYZED SAMPLE

SURFACE PROTECTION: Steel Cap
SURFACE SEALANT: Cement/Bentonite
SEALANT DEPTH: 0.60 m
SCREEN LENGTH: 6.70 m
TUBING LENGTH: 1.20 m

ELEVATION:
REFERENCE LEVEL: Real
BEDROCK LEVEL: ---
GROUND LEVEL: 327.61 m
WATER TABLE LEVEL:
>90 HOUR(s) AFTER DRILLING: 322.38

000938

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BOREHOLE LOG

CONFIDENTIAL AND PRIVILEGED DOCUMENT

BOREHOLE #: RW6-1
SHEET: 1 OF 1
FILE #: CN-6089

PROJECT:	HORNEPAYNE CN	STARTING DATE:	03-10-96	COMPLT. DATE:	03-10-96
LOCATION:	AREA OF PLUME 8	SLOTTED PIPE Ø :	100 mm	TUBING Ø :	100 mm
CONTRACTOR:	Boart Longyear Drilling Inc.	DRILL TYPE:	CME 75	CORE SAMPLER Ø :	---
OPERATOR:	C. Pullen	METHOD (SOIL):	Auger	METHOD (ROCK):	---
TYPE OF TUBING:	PVC	DRILLING FLUID:	---	COMPILED BY:	P. Ouilette

LEVELING: DEPTH (meters)	ELEVATION (meters)	WATER TABLE	MONITORING WELL: NOTES	SOIL/ROCK DESCRIPTION
0.00	326.70		Steel Cap; Cap; Cement; Bentonite; PVC Tubing	**Black Silt**, with Coal Residues
1.50	326.20			**Light Brown Clayey Silt** with Traces of Gravel, Humid
3.25	323.45	▽	Silica Sand	**Grey Clayey Silt**, Saturated
3.40	323.30			
			Screen, Opening 0.05 cm	
7.00	319.70		Cap	End of Borehole at a Depth of 7.00 m
				NOTE: 0.09 m of Free-phase product observed on 06-10-96

SAMPLE columns: SAMPLE STATE | SAMPLE TYPE AND NUMBER | RECOVERY % | N VALUE | ANALYZED PARAMETERS | VOLATILE HYDROCARBON RECORD (PPM)

GEOLOGY: STRATIGRAPHY | SOIL/ROCK DESCRIPTION | OBSERVATIONS (ODOR, VISUAL)

STATE OF SAMPLE: INTACT DISTURBED LOST CORE SAMPLE

TYPE OF SAMPLE:
SS — SPLIT SPOON SAMPLER
TW — THIN WALL SAMPLER
CS — CORE SAMPLER

OBSERVATIONS
O — ODORLESS
W — WEAK
I — INTERMEDIATE
P — PERSISTENT
NE — NON EXISTENT
SC — SCATTERED
SA — SATURATED

▽ = WATER TABLE
•• = FIELD DUPLICATE
• = ANALYZED SAMPLE

SURFACE PROTECTION:	Steel Cap	ELEVATION:	
SURFACE SEALANT:	Cement/Bentonite	REFERENCE LEVEL:	Real
SEALANT DEPTH:	0.95 m	BEDROCK LEVEL:	---
SCREEN LENGTH:	5.60 m	GROUND LEVEL:	326.70 m
TUBING LENGTH:	1.50 m	WATER TABLE LEVEL:	
		72 HOUR(s) AFTER DRILLING:	323.30

BIOGÉNIE Inc
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BOREHOLE LOG

CONFIDENTIAL AND PRIVILEGED DOCUMENT

BOREHOLE #: RW8-1
SHEET: 1 OF 1
FILE #: CN-6089

PROJECT:	HORNEPAYNE CN	STARTING DATE:	02-10-96	COMPLT. DATE:	02-10-96
LOCATION:	AREA OF PLUME B	SLOTTED PIPE Ø :	100 mm	TUBING Ø :	100 mm
CONTRACTOR:	Boart Longyear Drilling Inc	DRILL TYPE:	CME 75	CORE SAMPLER Ø :	---
OPERATOR:	C. Pullen	METHOD (SOIL):	Auger	METHOD (ROCK):	---
TYPE OF TUBING:	PVC	DRILLING FLUID:	---	COMPILED BY:	P. Ouellette

DEPTH (meters)	ELEVATION (meters)	WATER TABLE	WELL DESIGN / NOTES	SOIL/ROCK DESCRIPTION
0.00	327.24		Steel Cap; Cap; Cement; Bentonite; PVC Tubing	Light Brown Fine Sand with Traces of Coarse Sand, Dry
3.00	324.24		Silica Sand	Black Clayey Silt with Traces of Gravel
3.95	323.29			Grey Sandy Silt, Humid
5.41	321.83	▽		
6.05	321.19		Screen, Opening 0.05 cm	Grey Sandy Silt, Saturated, Presence of Free Phase Hydrocarbons
8.23	319.01		Cap	End of Borehole at a Depth of 8.23 m NOTE: 2.59 m of Free-phase product observed on 12-10-96

STATE OF SAMPLE: INTACT, DISTURBED, LOST, CORE SAMPLE

TYPE OF SAMPLE:
SS — SPLIT SPOON SAMPLER
TW — THIN WALL SAMPLER
CS — CORE SAMPLER

OBSERVATIONS
O — ODORLESS
W — WEAK
I — INTERMEDIATE
P — PERSISTENT
NE — NON EXISTENT
SC — SCATTERED
SA — SATURATED

▽ = WATER TABLE
** = FIELD DUPLICATE
* = ANALYZED SAMPLE

SURFACE PROTECTION: Steel Cap
SURFACE SEALANT: Cement/Bentonite
SEALANT DEPTH: 0.80 m
SCREEN LENGTH: 6.73 m
TUBING LENGTH: 1.50 m

ELEVATION:
REFERENCE LEVEL: Real
BEDROCK LEVEL: ---
GROUND LEVEL: 327.24 m
WATER TABLE LEVEL:
>96 HOUR(s) AFTER DRILLING: 321.83

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BOREHOLE LOG

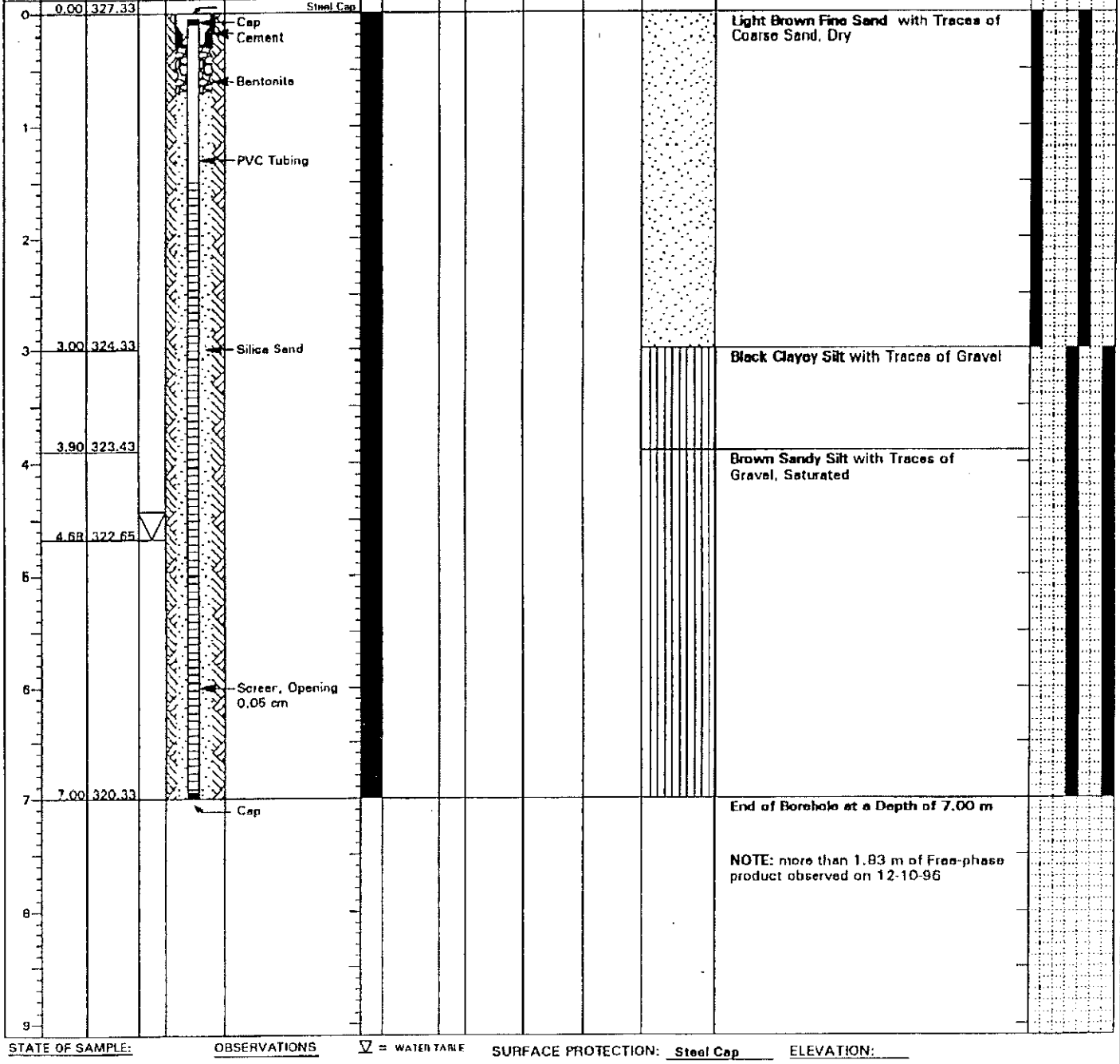
CONFIDENTIAL AND PRIVILEGED DOCUMENT

BOREHOLE #: RW8-2
SHEET: 1 OF 1
FILE #: CN-6089

PROJECT: HORNEPAYNE CN
LOCATION: AREA OF PLUME 8
CONTRACTOR: Boart Longyear Drilling Inc
OPERATOR: C. Pullen
TYPE OF TUBING: PVC

STARTING DATE: 02-10-96
SLOTTED PIPE Ø : 100 mm
DRILL TYPE: CME 75
METHOD (SOIL): Auger
DRILLING FLUID: ---

COMPLT. DATE: 02-10-96
TUBING Ø : 100 mm
CORE SAMPLER Ø : ---
METHOD (ROCK): ---
COMPILED BY: P. Ouellette



STATE OF SAMPLE:
INTACT DISTURBED LOST CORE SAMPLE

TYPE OF SAMPLE:
SS — SPLIT SPOON SAMPLER
TW — THIN WALL SAMPLER
CS — CORE SAMPLER

OBSERVATIONS
O — ODORLESS
W — WEAK
I — INTERMEDIATE
P — PERSISTENT
NE — NON EXISTENT
SC — SCATTERED
SA — SATURATED

▽ = WATER TABLE
** = FIELD DUPLICATE
* = ANALYZED SAMPLE

SURFACE PROTECTION: Steel Cap
SURFACE SEALANT: Cement/Bentonit
SEALANT DEPTH: 0.70 m
SCREEN LENGTH: 5.60 m
TUBING LENGTH: 1.60 m

ELEVATION:
REFERENCE LEVEL: Real
BEDROCK LEVEL: ---
GROUND LEVEL: 327.33 m
WATER TABLE LEVEL:
>96 HOUR(s) AFTER DRILLING: 322.65

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BOREHOLE LOG

CONFIDENTIAL AND PRIVILEGED DOCUMENT

BOREHOLE #: RW8-3
SHEET: 1 OF 1
FILE #: CN-6089

PROJECT: HORNEPAYNE CN
LOCATION: AREA OF PLUME 8
CONTRACTOR: Boart Longyear Drilling Inc
OPERATOR: C. Pullen
TYPE OF TUBING: PVC

STARTING DATE: 02-10-96
SLOTTED PIPE Ø : 100 mm
DRILL TYPE: CME 75
METHOD (SOIL): Auger
DRILLING FLUID: ---

COMPLT. DATE: 02-10-96
TUBING Ø : 100 mm
CORE SAMPLER Ø : ---
METHOD (ROCK): ---
COMPILED BY: P. Ouellette

LEVELING			MONITORING WELL		SAMPLE						GEOLOGY		OBSERVATIONS	
DEPTH (meters)	ELEVATION (meters)	WATER TABLE	WELL DESIGN	NOTES	SAMPLE STATE	SAMPLE TYPE AND NUMBER	RECOVERY %	N VALUE	ANALYZED PARAMETERS	VOLATILE HYDROCARBON RECORD (PPM)	STRATIGRAPHY	SOIL/ROCK DESCRIPTION	ODOR	VISUAL
0.00	327.29			Steel Cap										
				Cap								**Light Brown Fine Sand** with Traces of Gravel, Dry		
				Cement										
				Bentonite										
				PVC Tubing										
1.60	325.79											**Grey Silty Fine Sand** with Traces of Gravel		
				Silica Sand										
												Presence of Gravel		
3.90	323.39											**Grey Coarse Sand** with Little Gravel, Humid		
4.66	322.63	▽												
6.50	321.79											**Brown Silt**, Humid		
				Screen, Opening 0.05 cm										
7.00	320.29			Cap								**End of Borehole at a Depth of 7.00 m**		
												NOTE: 1.51 m of Free-phase product observed on 12-10-96		

STATE OF SAMPLE:
INTACT DISTURBED LOST CORE SAMPLE

TYPE OF SAMPLE:
SS — SPLIT SPOON SAMPLER
TW — THIN WALL SAMPLER
CS — CORE SAMPLER

OBSERVATIONS
O — ODORLESS
W — WEAK
I — INTERMEDIATE
P — PERSISTENT
NE — NON EXISTENT
SC — SCATTERED
SA — SATURATED

▽ = WATER TABLE
** = FIELD DUPLICATE
* = ANALYZED SAMPLE

SURFACE PROTECTION: Steel Cap
SURFACE SEALANT: Cement/Bentonite
SEALANT DEPTH: 0.70 m
SCREEN LENGTH: 5.50 m
TUBING LENGTH: 1.50 m

ELEVATION:
REFERENCE LEVEL: Real
BEDROCK LEVEL: ---
GROUND LEVEL: 327.29 m
WATER TABLE LEVEL:
>96 HOUR(s) AFTER DRILLING: 322.63

KGS GROUP

SUMMARY LOG

HOLE NO. **MW-101**

CLIENT CN ENGINEERING LINE OPERATION EAST

PROJECT CN HORNEPAYNE YARD DRILLING

SITE CN HORNEPAYNE YARD, EAST END

LOCATION 1.5 m East of Southeast Corner of Railing at Lagoon 2

DRILLING METHOD 105 mm ø Hollow Stem Auger, 25 mm ø Split Spoon, ACKER SX

JOB NO. 00-434-08

GROUND ELEV. 324.14 m, Geodetic

TOP OF PVC ELEV. 324.12 m

WATER ELEV. 321.46 m, 26/05/00

DATE DRILLED 09/05/00

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE	NUMBER	RECOVERY %	FIELD HEADSPACE TEST Photolonizable Vapours (ppm) 500 1000 1500 2000
					0.02				
			SAND FILL - Brown, damp, loose, poorly graced, fine grained, some fine grained, subangular gravel, trace silt. -slight petroleum hydrocarbon odour				1		
323.38					0.77				
	1.0		SAND - Grey, damp, loose, poorly graded, fine grained, some fine grained, subangular gravel. -petroleum hydrocarbon odour		1.07		2	25	
			-dense, strong petroleum hydrocarbon odour below 1.5 m				3	40	
	2.0		-saturated below 2.3 m						
			-dark grey petroleum hydrocarbon staining at 2.6 m				4	60	
321.09	3.0		GRAVEL - Grey, saturated, well graded, fine to coarse grained, trace silt. -strong petroleum hydrocarbon odour -dark grey petroleum hydrocarbon staining at 3.35 m				5	40	
	4.0		-sand lense (50 mm thick), dark grey, saturated, dense, poorly graded, fine grained, with oily sheen at 3.81 m				6	20	
							7	20	
	5.0								
318.81			SAND - Grey, saturated, dense, poorly graded, fine grained, trace silt. -slight petroleum hydrocarbon odour -lense of coarse grained gravel (25 mm ø) and cobbles at 5.5 m		5.57		8	30	
318.04	6.0		END OF HOLE @ 6.1 m Note: 1. Well flush mounted to grade.		6.10				

SAMPLE TYPE AUGER GRAB SPLIT BARREL

CONTRACTOR Paddock Drilling Ltd.

INSPECTOR T. GALLO

APPROVED _____ DATE 19/06

000943

KXX 0043408.GPJ

KGS GROUP

SUMMARY LOG

HOLE NO. **MW-102** SHEET 1 of 1

CLIENT CN ENGINEERING LINE OPERATION EAST
PROJECT CN HORNEPAYNE YARD DRILLING
SITE CN HORNEPAYNE YARD, EAST END
LOCATION 220°, 1.5 m from East to North running Barrier
DRILLING METHOD 105 mm ø Hollow Stem Auger, 25 mm ø Split Spoon, ACKER SX

JOB NO. 00-434-08
GROUND ELEV. 324.19 m, Geodetic
TOP OF PVC ELEV. 324.16 m
WATER ELEV. 321.59 m, 26/05/00
DATE DRILLED 09/05/00

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	FIELD HEADSPACE TEST Photoionizable Vapours (ppm) 500 1000 1500 2000
			SAND AND GRAVEL FILL - Brown, damp, loose, poorly graded, fine grained sand and fine grained gravel, subangular grains, trace silt.		0.03	1		
323.43					0.63			
	1.0		SAND - Brown, damp, loose, poorly graded, fine to medium grained, trace fine grained gravel, trace silt.		0.93	2	60	
			-brown to grey with depth below 1.5 m					
	2.0		-slight petroleum hydrocarbon odour at 2.1 m and strong below 2.3 m			3	60	
			-saturated be ow 2.4 m -petroleum hydrocarbon staining between 2.45 and 2.6 m -layer of coarse grained sand and fine grained gravel at 2.6 m			4	50	
	3.0		-grey, fine to coarse grained, with fine to coarse grained gravel, occ. subangular cobbles below 3.05 m			5	5	
320.38			-no sample recovery on cobbles between 3.8 and 4.55 m					
	4.0		SAND AND GRAVEL - Grey, saturated, some cobbles, trace silt. -petroleum hydrocarbon odour			6	10	
	5.0							
318.86			SAND - Grey, saturated, loose, poorly graded, coarse grained, trace gravel and cobbles. -petroleum hydrocarbon odour, sheen on water -fine grained sand lense (25 mm thick), dark grey at 5.5 m		5.44	7	30	
318.09	6.0				6.10			
			END OF HOLE @ 6.1 m					

Note:
1. Well flush mounted to grade.

SAMPLE TYPE AUGER GRAB SPLIT BARREL

CONTRACTOR Paddock Drilling Ltd. INSPECTOR T. GALLO APPROVED DATE 19/06.

000944

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KGS GROUP

SUMMARY LOG

HOLE NO. **MW-103** SHEET 1 of 1

CLIENT CN ENGINEERING LINE OPERATION EAST
PROJECT CN HORNEPAYNE YARD DRILLING
SITE CN HORNEPAYNE YARD, EAST END
LOCATION 154°, 20 m from East-West running Barrier of Lagoon #2
DRILLING METHOD 105 mm ø Hollow Stem Auger, 25 mm ø Split Spoon, ACKER SX

JOB NO. 00-434-08
GROUND ELEV. 323.66 m, Geodetic
TOP OF PVC ELEV. 323.57 m
WATER ELEV. 321.57 m, 26/05/00
DATE DRILLED 10/05/00

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE	NUMBER	RECOVERY %	FIELD HEADSPACE TEST Photoionizable Vapours (ppm) 500 1000 1500 2000
			SILT AND SAND - Dark brown, moist, soft, non plastic, and fine to medium grained sand, trace fine grained gravel.		0.09 0.12 0.37				
					0.67		1		
	1.0		-light brown below 0.75 m -damp between 0.75 and 1.5 m				2		
	2.0		-saturated, silt and fine grained sand, trace oxidation below 1.5 m				3	70	
							4	80	
	3.0								
	4.0								
319.09					4.57				
	5.0		END OF HOLE @ 4.57 m						
	6.0								

Note:
1. Well flush mounted just above grade. Flush mount was built up with cuttings to elev. 323.86 m.

SAMPLE TYPE AUGER GRAB SPLIT BARREL

CONTRACTOR Paddock Drilling Ltd.
INSPECTOR T. GALLO
APPROVED
DATE 19/0(

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KGS GROUP

SUMMARY LOG

HOLE NO. **MW-104**

CLIENT	CN ENGINEERING LINE OPERATION EAST
PROJECT	CN HORNEPAYNE YARD DRILLING
SITE	CN HORNEPAYNE YARD, EAST END
LOCATION	220°, 8 m from East-West running Barrier of Lagoon #2
DRILLING METHOD	105 mm ø Hollow Stem Auger, 25 mm ø Split Spoon, ACKER SX

JOB NO.	00-434-08
GROUND ELEV.	323.99 m, Geodetic
TOP OF PVC ELEV.	323.91 m
WATER ELEV.	321.72 m, 26/05/00
DATE DRILLED	10/05/00

ELEV. (m)	DEPTH (m)	DESCRIPTION AND CLASSIFICATION	DEPTH (m)	SAMPLE NUMBER	RECOVERY %
		SAND FILL - Brown to grey, damp, loose, poorly graded, fine to medium grained, some fine grained gravel, trace silt.	0.08 0.13 0.23 0.53	1	
		-brown below 0.75 m			
	1.0			2	
322.47		SAND - Grey, damp, loose, poorly graded, fine grained. -strong petroleum hydrocarbon odour		3	50
	2.0	-saturated below 2.3 m		4	70
	3.0			5	100
	4.0		4.13		
319.42		END OF HOLE @ 4.57 m Note: 1. Well flush mounted to grade.	4.57		
	5.0				
	6.0				

FIELD HEADSPACE TEST

Photoionizable Vapours (ppm) ●

500 1000 1500 2000

SAMPLE TYPE [auger symbol] AUGER GRAB [split symbol] SPLIT BARREL

CONTRACTOR Paddock Drilling Ltd. INSPECTOR T. GALLO APPROVED DATE 19/06/

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KGS GROUP

SUMMARY LOG

HOLE NO. **MW-105** SHEET 1 of 1

CLIENT CN ENGINEERING LINE OPERATION EAST
PROJECT CN HORNEPAYNE YARD DRILLING
SITE CN HORNEPAYNE YARD, EAST END
LOCATION 173°, 12 m from an exposed rock located 3 m from Jackfish River
DRILLING METHOD 105 mm ø Hollow Stem Auger, 25 mm ø Split Spoon, ACKER SX

JOB NO. 00-434-08
GROUND ELEV. 323.56 m, Geodetic
TOP OF PVC ELEV. 323.43 m
WATER ELEV. 322.58 m, 26/05/00
DATE DRILLED 10/05/00

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE	NUMBER	RECOVERY %	FIELD HEADSPACE TEST Photoionizable Vapours (ppm) 500 1000 1500 2000
			SAND - Brown, damp, loose, poorly graded, fine grained, trace silt.		0.13 0.16 0.23 0.37		1		
	1.0		-grey, saturated, strong petroleum hydrocarbon odour below 0.75 m				2		
			-petroleum hydrocarbon staining between 1.5 and 1.8 m				3	60	
321.73			SILT - Grey, wet, firm, non plastic to low plasticity, trace clay.				4		
	2.0		-trace fine grained sand below 2.3 m				5	80	
	3.0								
	4.0								
318.99			END OF HOLE @ 4.57 m		4.57				
	5.0		Note: 1. Well flush mounted to grade.						
	6.0								

SAMPLE TYPE AUGER GRAB SPLIT BARREL

CONTRACTOR Paddock Drilling Ltd.
INSPECTOR T. GALLC
APPROVED ____ DATE 19/06

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KGS GROUP

SUMMARY LOG

HOLE NO. **MW-106** SHEET 1 of 1

CLIENT CN ENGINEERING LINE OPERATION EAST

PROJECT CN HORNEPAYNE YARD DRILLING

SITE CN HORNEPAYNE YARD, EAST END

LOCATION 250°, 3.5 m from a hydro pole

DRILLING METHOD 105 mm ø Hollow Stem Auger, 25 mm ø Split Spoon, ACKER SX

JOB NO. 00-434-08
GROUND ELEV. 323.95 m, Geodetic
TOP OF PVC ELEV. 323.90 m
WATER ELEV. 322.18 m, 26/05/00
DATE DRILLED 10/05/00

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE	NUMBER	RECOVERY %	FIELD HEADSPACE TEST Photoionizable Vapours (ppm) 500 1000 1500 2000
323.19	0		SAND FILL - Dark brown, damp, loose, poorly graded, fine to medium grained, and silt. -petroleum hydrocarbon odour		0.05 0.08 0.11 0.40		1		
	1.0		SAND AND SILT - Dark grey, moist, loose, poorly graded, fine grained, and silt. -petroleum hydrocarbon odour -wet below 1.2 m				2		
322.43			SILT AND SAND - Grey, saturated, firm, non plastic, and fine grained sand. -petroleum hydrocarbon staining at 1.5 m -sand lense (50 mm thick), fine grained, stained with petroleum hydrocarbons at 1.83 m				3	60	
321.66	2.0		SAND AND SILT - Grey, saturated, dense, poorly graded, fine grained, and silt. -petroleum hydrocarbon staining and odour at 2.44 m -with silt below 3.05 m				4		
	3.0						5	70	
	4.0						6	60	
319.38			END OF HOLE @ 4.57 m		4.45 4.57				
	5.0		Note: 1. Well flush mounted to grade.						
	6.0								

SAMPLE TYPE AUGER GRAB SPLIT BARREL

CONTRACTOR Paddock Drilling Ltd. INSPECTOR T. GALLO APPROVED _____ DATE 19/06/

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KGS GROUP

SUMMARY LOG

HOLE NO. **MW-107** SHEET 1 of 1

CLIENT CN ENGINEERING LINE OPERATION EAST

PROJECT CN HORNEPAYNE YARD DRILLING

SITE CN HORNEPAYNE YARD, EAST END

LOCATION 226°, 14 m from a yellow painted metal well, and 1.5 m from Road

DRILLING METHOD 105 mm ø Hollow Stem Auger, 25 mm ø Split Spoon, ACKER SX

JOB NO. 00-434-08

GROUND ELEV. 324.10 m, Geodetic

TOP OF PVC ELEV. 324.01 m

WATER ELEV. 322.43 m, 26/05/00

DATE DRILLED 10/05/00

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE	NUMBER	RECOVERY %
			SAND FILL - Brown to black, damp, loose, poorly graded, fine to medium grained, trace silt, trace fine grained gravel. -petroleum hydrocarbon odour		0.09 0.12 0.29 0.59		1	
323.19	1.0		SILT - Brown, wet, soft, non plastic, some fine grained sand. -petroleum hydrocarbon staining and odour				2	
322.58			SAND - Brown, saturated, poorly graded, fine grained, trace silt.				3	75
	2.0		-petroleum hydrocarbon staining and odour below 2.3 m				4	75
321.66			SILT - Brown, saturated, non plastic, trace clay.				5	
321.05	3.0		SAND AND SILT - Grey, saturated, loose, poorly graded, fine grained, and silt. -petroleum hydrocarbon odour, sheen on water between 3.05 and 3.8 m				6	80
			-some silt below 3.8 m					
	4.0							
319.83			SILT - Grey, saturated, soft, non plastic, some fine grained sand.		4.49		7	100
319.53			END OF HOLE @ 4.57 m		4.57			
	5.0		Note: 1. Well flush mounted to grade.					
	6.0							

FIELD HEADSPACE TEST

Photoionizable Vapours (ppm)

500 1000 1500 2000

SAMPLE TYPE ▮ AUGER GRAB ▮ SPLIT BARREL

CONTRACTOR Paddock Drilling Ltd.

INSPECTOR T. GALLO

APPROVED

DATE 19/06

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KGS GROUP

SUMMARY LOG

HOLE NO. **MW-108**

SHEET 1 of 1

CLIENT CN ENGINEERING LINE OPERATION EAST

PROJECT CN HORNEPAYNE YARD DRILLING

SITE CN HORNEPAYNE YARD, EAST END

LOCATION 1.5 m from concrete conduite running West from Roundhouse

DRILLING METHOD 105 mm ø Hollow Stem Auger, 25 mm ø Split Spoon, ACKER SX

JOB NO. 00-434-08

GROUND ELEV. 325.01 m, Geodetic

TOP OF PVC ELEV. 324.87 m

WATER ELEV. 323.40 m, 26/05/00

DATE DRILLED 10/05/00

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE	NUMBER	RECOVERY %	FIELD HEADSPACE TEST Photoionizable Vapours (ppm) 500 1000 1500 2000
			SAND AND GRAVEL FILL - Brown, wet, loose, sand fine to coarse grained and fine grained, subangular gravel. -petroleum hydrocarbon odour		0.14 0.17		1		
	1.0		-dark grey, and silt, petroleum hydrocarbon staining and odour below 0.75 m		0.79 1.09		2		
323.49			SILT - Brown, damp, firm, non plastic, trace fine grained sand. -petroleum hydrocarbon odour				3	90	
	2.0						4		
322.72			-sand lense (25 mm thick), grey, saturated, fine grained, petroleum hydrocarbon staining and odour at 2.1 m						
			SILTY SAND - Grey, saturated, dense, poorly graded, fine grained, with silt. -petroleum hydrocarbon staining and odour				5	80	
321.96	3.0		SILT - Brown, wet, firm, non plastic, trace clay.				6	80	
	4.0								
320.44			END OF HOLE @ 4.57 m		4.54 4.57				
	5.0		Note: 1. Well flush mounted to grade.						
	6.0								

SAMPLE TYPE AUGER GRAB SPLIT BARREL

CONTRACTOR Paddock Drilling Ltd.

INSPECTOR T. GALLO

APPROVED

DATE 19/06/00

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KGS GROUP

SUMMARY LOG

HOLE NO. **MW-109**

SHEET 1 of 1

CLIENT CN ENGINEERING LINE OPERATION EAST

PROJECT CN HORNEPAYNE YARD DRILLING

SITE CN HORNEPAYNE YARD, EAST END

LOCATION 90°, 20 m from hydro pole, and 14°, 24 m from Waste Oil/Water Separator Building

DRILLING METHOD 105 mm ø Hollow Stem Auger, 25 mm ø Split Spoon, ACKER SX

JOB NO. 00-434-08

GROUND ELEV. 325.62 m, Geodetic

TOP OF PVC ELEV. 325.48 m

WATER ELEV. 323.08 m, 26/05/00

DATE DRILLED 10/05/00

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION
325.01	0		SAND AND GRAVEL FILL - Brown, damp, loose, with red brick fragments. -petroleum hydrocarbon odour
	1.0		SAND - Brown, wet, loose, poorly graded, fine grained, trace to some silt. -petroleum hydrocarbon staining and odour
324.10			SAND AND SILT - Grey, wet, loose, fine grained sand and silt.
323.33	2.0		SAND - Grey, moist, loose, poorly graded, fine grained, trace silt.
	3.0		-saturated, strong petroleum hydrocarbon odour and staining between 3.05 and 3.35 m
322.27			SILT - Brown, saturated, firm, non plastic, trace fine grained sand, trace clay.
	4.0		
	5.0		
319.52	6.0		END OF HOLE @ 6.1 m

Note:
1. Well flush mounted to grade

PIEZ. LOG

DEPTH (m)	SAMPLE TYPE	NUMBER	RECOVERY %
0.14			
0.17		1	
0.92			
1.23		2	
		3	80
		4	60
		5	70
		6	
		7	60
6.03			
6.10			

FIELD HEADSPACE TEST

Photoionizable Vapours (ppm)

500 1000 1500 2000

>2,000

SAMPLE TYPE: AUGER GRAB | SPLIT BARREL

CONTRACTOR: Paddock Drilling Ltd.

INSPECTOR: T. GALLO

APPROVED

DATE: 19/06/00

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KGS GROUP

SUMMARY LOG

HOLE NO. **MW-110** SHEET 1 of 1

CLIENT CN ENGINEERING LINE OPERATION EAST
PROJECT CN HORNEPAYNE YARD DRILLING
SITE CN HORNEPAYNE YARD, EAST END
LOCATION 236°, 1.5 m from track entering South-West train door in Roundhouse
DRILLING METHOD 105 mm ø Hollow Stem Auger, 25 mm ø Split Spoon, ACKER SX

JOB NO. 00-434-08
GROUND ELEV. 326.13 m, Geodetic
TOP OF PVC ELEV. 325.88 m
WATER ELEV. 325.04 m, 26/05/00
DATE DRILLED 11/05/00

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE	NUMBER	RECOVERY %	FIELD HEADSPACE TEST Photoionizable Vapours (ppm) 500 1000 1500 2000
			SAND FILL - Black, moist, loose, poorly graded, fine to medium grained, trace to some fine grained gravel.		0.25				
			-petroleum hydrocarbon staining and odour		0.28		1		
325.37									
	1.0		SILT AND SAND - Grey, moist, soft, non plastic, and fine to medium grained sand.		0.94				
			-petroleum hydrocarbon staining and odour throughout layer		1.23		2		>2,000
			-wet, firm, some to with fine grained sand below 1.5 m						
			-sand lense, fine to medium grained, stained with petroleum hydrocarbon at 1.68 m				3	70	>2,000
	2.0								
323.84									
			SILT - Grey, wet, firm, trace fine grained sand.				4	60	>2,000
			-petroleum hydrocarbon staining and odour						
			-sand lense (10 mm thick), stained with petroleum hydrocarbon at 2.45 m						
	3.0								
			-saturated, petroleum hydrocarbon sheen on water between 3.05 and 4.55 m				5	70	>2,000
							6	70	>2,000
	4.0								
	5.0				5.14				
			-brown, no petroleum hydrocarbon odour below 5.33 m				7	70	
320.03	6.0				6.10				

END OF HOLE @ 6.1 m

Note:
1. Well flush mounted to grade.

SAMPLE TYPE ▮ AUGER GRAB ▮ SPLIT BARREL

CONTRACTOR Paddock Drilling Ltd. INSPECTOR T. GALLO APPROVED DATE 19/06/00

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KGS GROUP

SUMMARY LOG

HOLE NO. **MW-111**

CLIENT CN ENGINEERING LINE OPERATION EAST

PROJECT CN HORNEPAYNE YARD DRILLING

SITE CN HORNEPAYNE YARD, EAST END

LOCATION 60°, 3 m from mark on track that holds emergency derailment supply and bunk/cook cars

DRILLING METHOD 105 mm ø Hollow Stem Auger, 25 mm ø Split Spoon, ACKER SX

JOB NO. 00-434-08

GROUND ELEV. 326.63 m, Geodetic

TOP OF PVC ELEV. 326.47 m

WATER ELEV. 324.58 m, 26/05/00

DATE DRILLED 11/05/00

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION
	0.0		SAND AND GRAVEL - Brown to black, wet, loose, poorly graded, fine to medium grained sand, and fine grained, subangular gravel, and silt.
	1.0		
325.11			SILT - Brown, moist to wet, firm, non plastic.
	2.0		-organic lense (10 mm thick) at 1.8 m -grey to brown, wet below 1.8 m
	3.0		-trace clay, trace oxidation below 3.05 m
	4.0		
322.06			END OF HOLE @ 4.57 m
	5.0		Note: 1. Well flush mounted to grade.
	6.0		

PIEZ. LOG

DEPTH (m)	SAMPLE TYPE	NUMBER	RECOVERY %
0.16			
0.19		1	
0.91			
1.20		2	
		3	70
		4	75
		5	70
4.50			
4.57			

FIELD HEADSPACE TEST

Photoionizable Vapours (ppm)

500 1000 1500 2000

SAMPLE TYPE AUGER GRAB SPLIT BARREL

CONTRACTOR Paddock Drilling Ltd.

INSPECTOR T. GALLO

APPROVED _____ DATE 19/06

000953

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KGS GROUP

SUMMARY LOG

HOLE NO. **MW-112** SHEET 1 of 1

CLIENT CN ENGINEERING LINE OPERATION EAST
PROJECT CN HORNEPAYNE YARD DRILLING
SITE CN HORNEPAYNE YARD, EAST END
LOCATION 335°, 2 m from yellow post marking concrete underground Oil/Water Separator
DRILLING METHOD 105 mm ø Hollow Stem Auger, 25 mm ø Split Spoon, ACKER SX

JOB NO. 00-434-08
GROUND ELEV. 325.88 m, Geodetic
TOP OF PVC ELEV. 325.81 m
WATER ELEV. 323.12 m, 26/05/00
DATE DRILLED 11/05/00

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE	NUMBER	RECOVERY %	FIELD HEADSPACE TEST Photoionizable Vapours (ppm) 500 1000 1500 2000
			SAND FILL - Brown, damp, loose, poorly graded, fine to medium grained, some fine to medium grained gravel, trace silt.		0.07 0.10		1		
325.27			SILT - Grey, moist, soft, non plastic, trace clay, trace fine grained sand. -petroleum hydrocarbon staining and odour		0.86				
	1.0				1.16		2		
			-no sample recovery between 1.52 and 2.29 m						
	2.0								
323.59			SAND - Grey, saturated, dense, poorly graded, fine grained, some silt. -petroleum hydrocarbon staining and odour -silt content decreased with depth				3	80	
	3.0								
322.71			-trace silt below 3.05 m SILT - Brown to grey, wet, firm, non plastic.				4	80	
			-clay lense (10 mm thick) at 3.35 m						
	4.0						5	80	
			-light brown at bottom of hole		4.46				
321.31			END OF HOLE @ 4.57 m		4.57				
	5.0		Note: 1. Well flush mounted to grade.						
	6.0								

SAMPLE TYPE AUGER GRAB SPLIT BARREL

CONTRACTOR Paddock Drilling Ltd. INSPECTOR T. GALLO APPROVED DATE 29/06/00

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KGS GROUP

SUMMARY LOG

HOLE NO. **MW-113**

CLIENT CN ENGINEERING LINE OPERATION EAST

PROJECT CN HORNEPAYNE YARD DRILLING

SITE CN HORNEPAYNE YARD, EAST END

LOCATION 46°, 5.5 m from furthest Northeast track running into Roundhouse

DRILLING METHOD 105 mm ø Hollow Stem Auger, 25 mm ø Split Spoon, ACKER SX

JOB NO. 00-434-08

GROUND ELEV. 325.93 m, Geodetic

TOP OF PVC ELEV. 325.77 m

WATER ELEV. 324.18 m, 26/05/00

DATE DRILLED 11/05/00

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	FIELD HEADSPACE TEST Photoionizable Vapours (ppm) 500 1000 1500 2000
			SAND FILL - Black, wet, loose, poorly graded, fine to medium grained, trace fine grained gravel, trace silt, oily.		0.16 0.19 0.36			
325.32					0.66	1		
	1.0		SAND - Brown, saturated, loose, poorly graded, fine grained, trace to some silt.			2		
324.41			SILT - Brown, wet, firm, non plastic, trace oxidation.			3	60	
	2.0		-sand lense (25 mm thick), grey, fine grained, stained with petroleum hydrocarbon at 1.68 m -grey below 2.3 m -sand lense (13 mm thick), grey, fine grained, stained with petroleum hydrocarbon at 2.44 m -sand lense (50 mm thick), grey, fine grained, stained with petroleum hydrocarbon at 2.6 m			4	70	
	3.0					5	75	
321.36					4.56 4.57			
	4.0		END OF HOLE @ 4.57 m Note: 1. Well flush mounted to grade.					
	5.0							
	6.0							

SAMPLE TYPE [ ] AUGER GRAB [ ] SPLIT BARREL

CONTRACTOR Paddock Drilling Ltd.

INSPECTOR T. GALLO

APPROVED

DATE 19/06

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KGS GROUP

SUMMARY LOG

HOLE NO. **MW-114**

CLIENT CN ENGINEERING LINE OPERATION EAST

PROJECT CN HORNEPAYNE YARD DRILLING

SITE CN HORNEPAYNE YARD, EAST END

LOCATION 223°, 18 m from concrete lid on Manhole #1

DRILLING METHOD 105 mm ø Hollow Stem Auger, 25 mm ø Split Spoon, ACKER SX

JOB NO. 00-434-08

GROUND ELEV. 325.45 m, Geodetic

TOP OF PVC ELEV. 325.41 m

WATER ELEV. 322.41 m, 26/05/00

DATE DRILLED 12/05/00

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE	NUMBER	RECOVERY %	FIELD HEADSPACE TEST Photoionizable Vapours (ppm) 500 1000 1500 2000
			SAND FILL - Black, moist, loose, poorly graded, fine to medium grained, and fine grained, subangular gravel.		0.04 0.07 0.24 0.54		1		
324.54	1.0		SILTY SAND - Grey, moist, loose, poorly graced, fine grained, and silt, with oxidation.				2		
323.93			GRAVEL AND SAND - Grey, damp to moist, fine to coarse grained gravel and fine to medium grained sand.				3	40	
323.16	2.0		SAND - Grey to brown, moist, loose, poorly graded, fine grained. -sand and fine grained gravel below 2.45 m				4	40	
322.40 ▼	3.0		GRAVEL - Saturated, petroleum hydrocarbon staining and odour, with oily sheen on water.				5	30	
	4.0		-some cobbles below 3.8 m				6	10	
321.18			AUGER REFUSAL ON POSSIBLE BOULDER @ 4.27 m Note: 1. Well flush mounted to grade.		4.15 4.27				
	5.0								
	6.0								

SAMPLE TYPE AUGER GRAB SPLIT BARREL

CONTRACTOR Paddock Drilling Ltd.

INSPECTOR T. GALLO

APPROVED

DATE 19/06/

000956

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KGS GROUP

SUMMARY LOG

HOLE NO. **MW-115** SHEET 1 of 1

CLIENT CN ENGINEERING LINE OPERATION EAST
PROJECT CN HORNEPAYNE YARD DRILLING
SITE CN HORNEPAYNE YARD, EAST END
LOCATION 56°, 14 m from Manhole #1
DRILLING METHOD 105 mm ø Hollow Stem Auger, 25 mm ø Split Spoon, ACKER SX

JOB NO. 00-434-08
GROUND ELEV. 325.97 m, Geodetic
TOP OF PVC ELEV. 325.91 m
WATER ELEV. 323.54 m, 26/05/00
DATE DRILLED 12/05/00

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE	NUMBER	RECOVERY %	FIELD HEADSPACE TEST Photoionizable Vapours (ppm) 500 1000 1500 2000
			SILT - Brown, dry to damp, friable, non plastic, trace clay, trace fine grained sand.		0.06 0.09 0.36		1		
	1.0				0.66		2		
			-olive colour, no sand below 1.5 m -moist to wet between 1.5 and 2.3 m				3	75	
	2.0		-saturated below 2.3 m -silt and fine grained sand lense (50 mm thick) at 2.45 m				4	70	
322.92	3.0		SILT AND SAND - Olive colour, saturated, and fine grained sand, with oxidation.				5	70	
322.16			SAND - Brown, saturated, loose, poorly graded, fine to medium grained.				6	70	
	4.0				4.41				
321.40			END OF HOLE @ 4.57 m		4.57				
	5.0		Note: 1. Well flush mounted to grade.						
	6.0								

SAMPLE TYPE AUGER GRAB SPLIT BARREL

CONTRACTOR Paddock Drilling Ltd. INSPECTOR T. GALLC APPROVED DATE 19/06

000957

XXX 0434-08 GPJ

KGS GROUP

SUMMARY LOG

HOLE NO. **MW-116** SHEET 1 of 1

CLIENT CN ENGINEERING LINE OPERATION EAST
PROJECT CN HORNEPAYNE YARD DRILLING
SITE CN HORNEPAYNE YARD, EAST END
LOCATION 120°, 3 m from concrete wall on Northeast corner of Roundhouse
DRILLING METHOD 105 mm ø Hollow Stem Auger, 25 mm ø Split Spoon, ACKER SX

JOB NO. 00-434-08
GROUND ELEV. 326.38 m, Geodetic
TOP OF PVC ELEV. 326.27 m
WATER ELEV. 324.67 m, 26/05/00
DATE DRILLED 12/05/00

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	FIELD HEADSPACE TEST Photoionizable Vapours (ppm) 500 1000 1500 2000
			SAND FILL - Black, moist, loose, poorly graded, fine to medium grained, and fine grained gravel, trace to some silt.		0.11 0.14 0.30 0.61	1		
325.77			SILT - Brown, moist, soft, non plastic.					
	1.0		-petroleum hydrocarbon staining at 1.5 m -saturated below 1.5 m			2		>2,000
	2.0		-sand lense (10 mm thick), medium grained, stained with petroleum hydrocarbon at 1.83 m -firm between 2.3 and 3.8 m -olive colour, some clay below 2.3 m -petroleum hydrocarbon staining at 2.4 m			3	50	
	3.0					4	60	
	4.0		-soft below 3.8 m			5	75	
321.80			-grey at bottom of hole		4.50 4.57	6	90	
	5.0		END OF HOLE @ 4.57 m Note: 1. Well flush mounted to grade.					
	6.0							

SAMPLE TYPE AUGER GRAB SPLIT BARREL

CONTRACTOR Paddock Drilling Ltd. INSPECTOR T. GALLO APPROVED ___ DATE 19/06/

000958

XXX 00-434-08 GPJ

KGS GROUP

SUMMARY LOG

HOLE NO. **MW117**

SHEET 1 of 1

CLIENT CN CORPORATE ENVIRONMENT EAST

PROJECT ENVIRONMENTAL INVESTIGATION

SITE HORNEPAYNE YARD

LOCATION 4m S of Tracks and 3 m W of MW66

DRILLING METHOD 110 mm ø Hollow Stem Auger, ACKER SX Drill Rig

JOB NO. 01-434-07

GROUND ELEV. 326.18 m, Geodetic

TOP OF PVC ELEV. 326.42 m

WATER ELEV. 323.93 m, 09/10/01

DATE DRILLED 25/07/01

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION
325.88	0.0		SAND AND GRAVEL FILL - Black, damp, compact, poorly graded, fine to medium grained sand, and fine grained, subangular gavel.
	0.5		CINDER FILL - Black, moist to wet, compact.
	1.0		
324.66	1.5		SAND - Light brown, damp, loose, poorly graded, fine grained.
	2.0		-moist to wet, fine to medium grained, trace organics below 1.85 m
324.05			PEAT - Black, wet, soft, some wood fragments.
323.62	2.5		SILT - Grey, wet, compact, non plastic.
	3.0		
	3.5		-trace fine grained gravel below 3.35 m -trace petroleum hydrocarbon sheen at 3.35 m -compact to dense below 3.5 m -grey petroleum hydrocarbon staining at 3.5 m -sand lense (10 mm thick), fine to medium grained, black petroleum hydrocarbon staining and sheen at 3.95 m
	4.0		
	4.5		-stained grey from 4.0 to 4.55 m -no staining below 4.55 m
	5.0		
320.70	5.5		END OF HOLE @ 5.49 m
	6.0		Note: 1. Well flush mounted to grade.
	6.5		
	7.0		
	7.5		
	8.0		
	8.5		
	9.0		
	9.5		

PIEZ. LOG/ BACKFILL

DEPTH (m): 1.07, 1.22, 5.49

SAMPLE TYPE NUMBER: 1, 2, 3, 4, 5, 6, 7, 8

FIELD HEADSPACE TEST
Photoionizable Vapours (ppm) ●
500 1000 1500 2000

FIELD SOIL TEST (PETROFLAG)
Diesel Fuel (ppm) ○
1000 2000 3000 4000

SAMPLE TYPE ▯ SPLIT BARREL

CONTRACTOR Paddock Drilling Ltd.

INSPECTOR D. B. KASUR

APPROVED _____ DATE 16/05/02

VAPOURS_FT_M 0143407.GPJ

000959

KGS GROUP

SUMMARY LOG

HOLE NO **MW118**

SHEET 1 of 1

CLIENT	CN CORPORATE ENVIRONMENT EAST
PROJECT	ENVIRONMENTAL INVESTIGATION
SITE	HORNEPAYNE YARD
LOCATION	3 m W of MW33 between Rails
DRILLING METHOD	110 mm ø Hollow Stem Auger, ACKER SX Drill Rig

JOB NO.	01-434-07
GROUND ELEV.	326.98 m, Geodetic
TOP OF PVC ELEV.	327.11 m
WATER ELEV.	324.29 m, 09/10/01
DATE DRILLED	25/07/01

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ LOG/ BACKFILL	DEPTH (m)	SAMPLE TYPE NUMBER
326.83	0		ASPHALT			
	0.5		CINDER FILL - Black, dry, oily odour.		0.76	1
	1.0		-rusty brown below 1.05 m		0.91	
325.61	1.5		SILT - Grey, wet, compact, non plastic, trace organic matter.			2
	2.0		-trace black petroleum hydrocarbon staining between 1.65 and 2.15 m			3
	2.5		-some organic matter, wood fragments, trace petroleum hydrocarbon sheen between 2.15 and 2.45 m -grey and black petroleum hydrocarbon staining, some wood fragments between 2.45 and 3.65 m			4
	3.0					5
	3.5		-trace fine to medium grained, subangular gravel between 3.5 and 3.65 m			6
	4.0		-some grey petroleum hydrocarbon staining between 4.1 and 4.25 m			7
	4.5					8
	5.0					9
	5.5		-silty clay lense (10 mm thick), grey, trace oxidation, trace petroleum hydrocarbon odour at 5.33 m			
320.89	6.0		-trace clay, some oxidation at 5.8 m		6.10	
	6.5		END OF HOLE @ 6.1 m Note: 1. Well flush mounted to grade.			
	7.0					
	7.5					
	8.0					
	8.5					
	9.0					
	9.5					

FIELD HEADSPACE TEST
Photoionizable Vapours (ppm)
500 1000 1500 2000

FIELD SOIL TEST (PETROFLAG)
Diesel Fuel (ppm)
1000 2000 3000 4000

SAMPLE TYPE [I] SPLIT BARREL

CONTRACTOR Paddock Drilling Ltd.

INSPECTOR D. B. KASUR

APPROVED _____ DATE 16/08/02

VAPOURS_FT_M 014347.SP1

KGS GROUP

SUMMARY LOG

HOLE NO. **MW119**

SHEET 1 of 1

CLIENT	CN CORPORATE ENVIRONMENT EAST
PROJECT	ENVIRONMENTAL INVESTIGATION
SITE	HORNEPAYNE YARD
LOCATION	7.5 m S of OW8-2 and 3.5 m W of OW8-2
DRILLING METHOD	125 mm ø Solid Stem Auger, Acker SX Drill Rig
JOB NO.	01-434-07
GROUND ELEV.	327.76 m, Geodetic
TOP OF PVC ELEV.	327.64 m
WATER ELEV.	323.72 m, 22/08/01
DATE DRILLED	26/07/01

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION
	0.5		SAND AND GRAVEL FILL - Brown, damp, loose, poorly graded, fine grained sand, and fine to coarse grained, subangular gavel.
326.85	1.0		SILTY SAND - Brown, moist to wet, loose, poorly graded, fine to medium grained, some silt, trace fine to coarse grained, subangular gravel.
326.09	1.5		-occ. cobbles at 1.2 m
	2.0		SILT - Grey, damp, dense, non plastic, trace fine grained sand and fine grained, subangular gravel.
325.33	2.5		SILTY SAND - Grey, damp, dense, poorly graded, fine grained, some fine grained gravel.
324.72	3.0		PEAT - Black, moist to wet, compact, some wood fragments.
324.56	3.5		SILTY SAND - Grey, moist to wet, dense, poorly graded, medium to coarse grained, some silt, some fine to medium grained gravel.
323.50	4.0		-trace clay between 3.35 and 3.8 m -compact below 3.35 m
	4.5		SILT - Grey, wet, dense, non plastic, trace fine grained sand.
	5.0		
	5.5		
321.67	6.0		END OF HOLE @ 6.1 m
	6.5		Note: 1. Well flush mounted to grade.
	7.0		
	7.5		
	8.0		
	8.5		
	9.0		
	9.5		

PIEZ LOG/ BACKFILL

DEPTH (m): 1.22, 1.52, 3.96, 5.49, 6.10

SAMPLE TYPE NUMBER: 1, 2, 3, 4, 5, 6, 7, 8

FIELD HEADSPACE TEST
Photoionizable Vapours (ppm) ●
500 1000 1500 2000

FIELD SOIL TEST (PETROFLAG)
Diesel Fuel (ppm) ○
1000 2000 3000 4000

SAMPLE TYPE AUGER GRAB

CONTRACTOR Paddock Drilling Ltd.

INSPECTOR D. B. KASUR

APPROVED _____ DATE 16/05

KGS GROUP

SUMMARY LOG

HOLE NO. MW120

SHEET 1 of 1

CLIENT CN CORPORATE ENVIRONMENT EAST

PROJECT ENVIRONMENTAL INVESTIGATION

SITE HORNEPAYNE YARD

LOCATION Halfway between Ends of Concrete Pad, 2 Tracks South of Fuelling Stand

DRILLING METHOD 125 mm ø Solid Stem Auger, Acker SX Drill Rig

JOB NO. 01-434-07

GROUND ELEV. 327.40 m, Geodetic

TOP OF PVC ELEV. 327.33 m

WATER ELEV. 324.14 m, 22/08/01

DATE DRILLED 26/07/01

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG/ BACKFILL	DEPTH (m)	SAMPLE TYPE	NUMBER
	0.5		SAND AND GRAVEL FILL - Brown, moist, loose, fine to coarse grained sand, and medium to coarse grained, subangular gavel.		0.20 0.30		
			-occ. cobbles at 0.45 m				
			-damp between 0.6 and 0.9 m				
	1.0		-wet below 0.9 m		1.07		1
326.18			SILT WITH GRAVEL - Brown, moist, dense, non plastic, with fine to medium grained gravel, trace fine grained sand.				2
	1.5						
	2.0		-dark grey between 2.0 and 2.9 m				3
	2.5						
324.35	3.0		-grey, moist to wet below 2.9 m				4
			-petroleum hydrocarbon odour				
	3.5		SAND - Grey, wet, compact, poorly graded, medium to coarse grained, some medium to coarse grained gravel, some silt.				5
	4.0		-grey and black petroleum hydrocarbon staining and sheen at 3.8 m		4.27		6
	4.5						
	5.0		-trace organic matter at 4.9 m				7
	5.5						
321.61			SILT - Grey, wet, compact, non plastic, trace fine grained sand.				8
	6.0						
320.70	6.5				6.71		9
			END OF HOLE @ 6.7 m				
	7.0		Note: 1. Well flush mounted to grade.				
	7.5						
	8.0						
	8.5						
	9.0						
	9.5						

FIELD HEADSPACE TEST
Photolonizable Vapours (ppm)
500 1000 1500 2000

FIELD SOIL TEST (PETROFLAG)
Diesel Fuel (ppm)
1000 2000 3000 4000

>2,000

SAMPLE TYPE AUGER GRAB

CONTRACTOR Paddock Drilling Ltd.

INSPECTOR D. B. KASUR

APPROVED

DATE 16/05/02

VAPOURS_FT_M 014407.GPJ

KGS GROUP

SUMMARY LOG

HOLE NO. **MW121** SHEET 1 of 1

CLIENT CN CORPORATE ENVIRONMENT EAST
PROJECT ENVIRONMENTAL INVESTIGATION
SITE HORNEPAYNE YARD
LOCATION 1.5 m S and 20 m E of SE Corner of Fuelling Stand Concrete Pad
DRILLING METHOD 125 mm ø Solid Stem Auger, Acker SX Drill Rig

JOB NO. 01-434-07
GROUND ELEV. 327.45 m, Geodetic
TOP OF PVC ELEV. 327.31 m
WATER ELEV. 323.31 m, 22/08/01
DATE DRILLED 26/07/01

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ LOG/ BACKFILL	DEPTH (m)	SAMPLE TYPE	NUMBER
	0.5		SAND AND GRAVEL FILL - Brown, damp, compact, poorly graded, fine to medium grained sand, and medium to coarse grained, subangular gavel, some silt, trace cobbles.		0.46 0.61		1
	1.0		-moist to wet, petroleum hydrocarbon odour at 0.9 m				
326.08	1.5		SILT - Grey, moist, dense, non plastic, some fine grained sand and gravel.				2
	2.0		-brown, damp between 1.5 and 2.45 m -very dense below 1.5 m				
	2.5		-grey, moist to wet, petroleum hydrocarbon odour below 2.45 m				3
324.25	3.0						4
	3.5		PEAT - Dark brown, wet, dense, some wood fragments.				
323.79	4.0		INTERLAYERED SILTY SAND AND SANDY SILT - Grey, moist to wet, compact, interlayered sandy silt and medium to coarse grained sand, with fine to coarse grained gravel, layers 50-125 mm thick.				5
323.03	4.5		PEAT - Dark brown, wet, dense, some wood fragments.				6
322.88			SILT - Grey, wet, dense, non plastic, trace fine grained sand, traces of clay.				
322.27	5.0		SILTY SAND - Grey, wet, loose, poorly graded, medium to coarse grained, some silt, trace fine to medium grained gravel.		5.18		7
	5.5						
321.35	6.0		END OF HOLE @ 6.1 m		6.10		8
	6.5		Note: 1. Well flush mounted to grade.				
	7.0						
	7.5						
	8.0						
	8.5						
	9.0						
	9.5						

FIELD HEADSPACE TEST
Photoionizable Vapours (ppm) ●
500 1000 1500 2000

FIELD SOIL TEST (PETROFLAG)
Diesel Fuel (ppm) ○
1000 2000 3000 4000

SAMPLE TYPE AUGER GRAB

CONTRACTOR Paddock Drilling Ltd.
INSPECTOR D. B. KASUR
APPROVED
DATE 16/0

VAPOURS FT M 0143407.GPJ

KGS GROUP

SUMMARY LOG

HOLE NO **MW122**

CLIENT	CN CORPORATE ENVIRONMENT EAST
PROJECT	ENVIRONMENTAL INVESTIGATION
SITE	HORNEPAYNE YARD
LOCATION	1.5 m N of N Track and 1.25 m W of SE Corner of Concrete Pad Fuelling Stand
DRILLING METHOD	125 mm ø Solid Stem Auger, Acker SX Drill Rig
JOB NO.	01-434-07
GROUND ELEV.	327.45 m, Geodetic
TOP OF PVC ELEV.	327.34 m
WATER ELEV.	324.17 m, 22/08/01
DATE DRILLED	26/07/01

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ LOG/ BACKFILL	DEPTH (m)	SAMPLE TYPE NUMBER
	0.5		SAND AND GRAVEL FILL - Brown, moist, compact, poorly graded, medium to coarse grained sand, and fine to medium grained gravel.		0.15	
	1.0		-some wood fragments at 0.6 m		0.30	
325.92	1.5		SAND - Brown, moist to wet, loose, poorly graded, medium to coarse grained, some fine to medium grained gravel, some silt.			
	2.0		-grey, wet, trace silt below 2.0 m			
	2.5		-trace liquid petroleum hydrocarbon sheen at 2.0 m		2.44	
	3.0					
324.09	3.5		PEAT - Dark brown, wet, dense, some wood fragments.			
323.48	4.0		SAND - Grey, wet, compact, poorly graded, medium to coarse grained, trace fine to medium grained gravel, trace silt, trace grey petroleum hydrocarbon staining.			
322.87	4.5		-liquid petroleum hydrocarbon sheen			
			SILTY SAND - Grey, wet, loose, poorly graded, fine grained.		4.88	
	5.0					
	5.5					
321.35	6.0		END OF HOLE @ 6.1 m		6.10	
	6.5		Note: 1. Well flush mounted to grade.			
	7.0					
	7.5					
	8.0					
	8.5					
	9.0					
	9.5					

FIELD HEADSPACE TEST
Photolonizable Vapours (ppm)
500 1000 1500 2000

FIELD SOIL TEST (PETROFLAG)
Diesel Fuel (ppm)
1000 2000 3000 4000

SAMPLE TYPE AUGER GRAB

CONTRACTOR Paddock Drilling Ltd.

INSPECTOR D. B. KASUR

APPROVED

DATE 16/05/02

KGS GROUP

SUMMARY LOG

HOLE NO. **MW123**

SHEET 1 of 1

CLIENT CN CORPORATE ENVIRONMENT EAST
PROJECT ENVIRONMENTAL INVESTIGATION
SITE HORNEPAYNE YARD
LOCATION 1.5 m S of 2nd Post on Fence and 0.5 m E of OW8-1
DRILLING METHOD 125 mm ø Solid Stem Auger, Acker SX Drill Rig

JOB NO. 01-434-07
GROUND ELEV. 327.40 m, Geodetic
TOP OF PVC ELEV. 327.31 m
WATER ELEV. 323.23 m, 22/08/01
DATE DRILLED 26/07/01

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION
	0.5		SAND AND GRAVEL FILL - Brown, moist, dense, poorly graded, fine to medium grained sand, and medium to coarse grained, subangular gravel.
326.33	1.0		
	1.5		SAND - Dark brown, damp, compact, poorly graded, fine grained, trace fine to medium grained gravel, some organics to 1.4 m depth. -grey below 1.4 m
325.57	2.0		SILT - Grey, damp, dense, non plastic, trace fine grained sand.
	2.5		-brown below 2.45 m
324.35	3.0		SILTY SAND - Grey, moist to wet, dense, poorly graded, medium to coarse grained, some silt, some fine to medium grained gravel.
	3.5		-wet, black petroleum hydrocarbon staining, trace sheen below 3.5 m
323.43	4.0		PEAT - Dark brown, moist to wet, compact, some wood fragments.
	4.5		
322.37	5.0		SILT - Grey, wet, dense, non plastic, trace fine grained sand, petroleum hydrocarbon staining.
	5.5		
321.60	6.0		SAND - Grey, wet, compact, poorly graded, medium to coarse grained, trace fine grained gravel, trace silt, petroleum hydrocarbon staining.
	6.5		
320.69	7.0		SILT - Grey, wet, dense, non plastic, trace fine to medium grained gravel.
319.78	7.5		END OF HOLE @ 7.62 m
	8.0		Note: 1. Well flush mounted to grade.
	8.5		
	9.0		
	9.5		

PIEZ. LOG/ BACKFILL

DEPTH (m): 0.15, 0.91, 4.88, 6.10, 7.62

SAMPLE TYPE NUMBER: 1 2 3 4 5 6 7 8 9 10

FIELD HEADSPACE TEST
Photoionizable Vapours (ppm) ●
500 1000 1500 2000

FIELD SOIL TEST (PETROFLAG)
Diesel Fuel (ppm) ○
1000 2000 3000 4000

SAMPLE TYPE ⊠ AUGER GRAB

CONTRACTOR Paddock Drilling Ltd.
INSPECTOR D. B. KASUR
APPROVED _____ DATE 16/0

VAPOURS FT M 014407 GPJ

KGS GROUP

SUMMARY LOG

HOLE NO. **MW124**

CLIENT CN CORPORATE ENVIRONMENT EAST
PROJECT ENVIRONMENTAL INVESTIGATION
SITE HORNEPAYNE YARD
LOCATION 41 m E of OW3-2, 23.5 m E of small Hydro Post and Light, 0.5 m from Rail
DRILLING METHOD 125 mm ø Solid Stem Auger, Acker SX Drill Rig

JOB NO. 01-434-07
GROUND ELEV. 325.97 m, Geodetic
TOP OF PVC ELEV. 325.79 m
WATER ELEV. 323.06 m, 09/10/01
DATE DRILLED 27/07/01

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ LOG/ BACKFILL	DEPTH (m)	SAMPLE TYPE	NUMBER
325.36	0.5		SAND AND GRAVEL FILL - Brown, damp, dense, poorly graded, medium to coarse grained sand, and medium to coarse grained, subangular gravel.		0.46		
			SILT - Brown, moist, compact, non plastic, trace fine grained sand.		0.61		1
	1.0						
	1.5		-wet below 1.5 m -compact to dense between 1.5 and 3.5 m				2
	2.0						
	2.5		-sand lense (25 mm thick), fine to medium grained, wet, loose at 2.15 m				3
	3.0						4
	3.5		-dense, trace sand seams (1-5 mm thick), trace oxidation below 3.5 m				5
	4.0						
	4.5		-trace clay below 4.25 m		4.57		6
	5.0				5.18		7
	5.5						
	6.0						8
	6.5						
	7.0						9
318.35	7.5				7.62		10
			END OF HOLE @ 7.62 m				
	8.0		Note: 1. Well flush mounted to grade.				
	8.5						
	9.0						
	9.5						

FIELD HEADSPACE TEST
Photolonizable Vapours (ppm)
500 1000 1500 2000

FIELD SOIL TEST (PETROFLAG)
Diesel Fuel (ppm)
1000 2000 3000 4000

SAMPLE TYPE AUGER GRAB

CONTRACTOR Paddock Drilling Ltd.
INSPECTOR D. B. KASUR
APPROVED _____ DATE 16/05/02

VAPOURS_FT M 0:43407.GPJ

KGS GROUP

SUMMARY LOG

HOLE NO **MW125**

SHEET 1 of 1

CLIENT	CN CORPORATE ENVIRONMENT EAST
PROJECT	ENVIRONMENTAL INVESTIGATION
SITE	HORNEPAYNE YARD
LOCATION	10 m E of MW110, 3.5 m S of Rail
DRILLING METHOD	125 mm ø Solid Stem Auger, Acker SX Drill Rig

JOB NO.	01-434-07
GROUND ELEV.	326.08 m, Geodetic
TOP OF PVC ELEV.	325.86 m
WATER ELEV.	321.52 m, 09/10/01
DATE DRILLED	27/07/01

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ LOG/ BACKFILL	DEPTH (m)	SAMPLE TYPE NUMBER
325.31	0.5		SAND AND GRAVEL FILL - Brown, damp, dense, poorly graded, medium to coarse grained sand, and medium to coarse grained, subangular gravel.		0.46 0.61	
	1.0		SILT - Grey, moist, compact to dense, non plastic, trace fine grained sand, some grey and black petroleum hydrocarbon staining.			1
	1.5		-wet below 1.5 m			
	2.0		-silty clay layer (50 mm thick), low plasticity, soft at 2.3 m			2
	2.5		-trace oxidation at 2.45 m			
	3.0					
	3.5		-brown between 3.5 and 5.35 m -dense between 3.5 and 6.7 m		3.66	
	4.0		-silty clay layer (25 mm thick), intermediate plasticity, soft at 3.65 m			3
	4.5				4.57	
	5.0					
	5.5		-grey below 5.35 m			4
	6.0					
	6.5					
	7.0		-loose to compact, some fine grained sand between 6.7 and 7.3 m			5
318.46	7.5		-dense, trace sand below 7.3 m		7.62	
	8.0		END OF HOLE @ 7.62 m Note: 1. Well flush mounted to grade.			
	8.5					
	9.0					
	9.5					

FIELD HEADSPACE TEST
Photoionizable Vapours (ppm) ●
500 1000 1500 2000

FIELD SOIL TEST (PETROFLAG)
Diesel Fuel (ppm) ○
1000 2000 3000 4000

SAMPLE TYPE AUGER GRAB

CONTRACTOR Paddock Drilling Ltd.

INSPECTOR D. B. KASUR

APPROVED _____ DATE 16/0

000967

VAPOURS_FT_M 0143407.GPJ

KGS GROUP

SUMMARY LOG

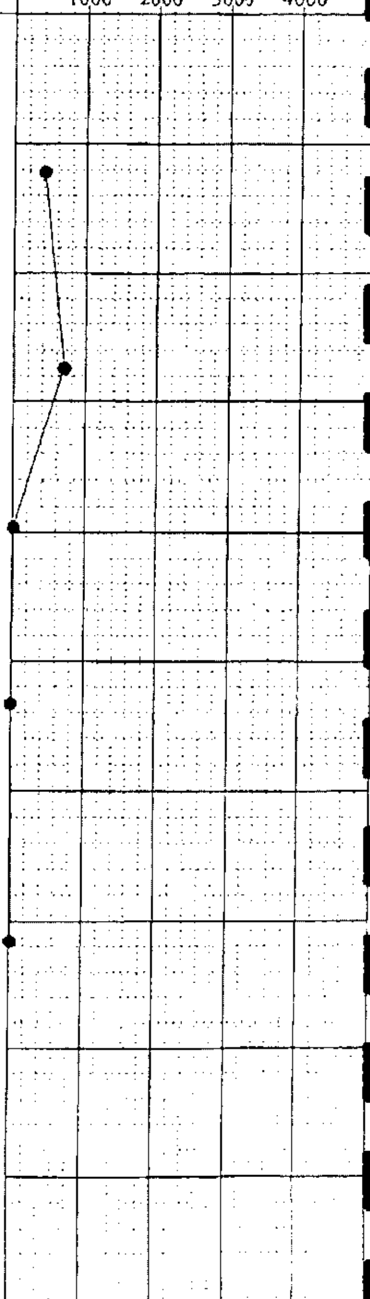
HOLE NO. **MW126**

CLIENT	CN CORPORATE ENVIRONMENT EAST	JOB NO.	01-434-07
PROJECT	ENVIRONMENTAL INVESTIGATION	GROUND ELEV.	325.98 m, Geodetic
SITE	HORNEPAYNE YARD	TOP OF PVC ELEV.	325.82 m
LOCATION	2 m North of NW Corner of Concrete Pad	WATER ELEV.	320.77 m, 09/10/01
DRILLING METHOD	125 mm ø Solid Stem Auger, Acker SX Drill Rig	DATE DRILLED	27/07/01

ELEV. (m)	DEPTH (m)	DESCRIPTION AND CLASSIFICATION	PIEZ LOG/BACKFILL DEPTH (m)	SAMPLE TYPE	NUMBER
	0.5	SAND AND GRAVEL FILL - Brown, damp, loose, poorly graded, fine to medium grained sand, and medium to coarse grained, subangular gravel. -black between 0.45 and 0.53 m -brown between 0.53 and 0.84 m -black below 0.84 m	0.46 0.61		
325.05	1.0	SILT - Grey, moist, compact, non plastic, trace fine grained sand. -wet, trace wood fragments, some black petroleum hydrocarbon staining and sheen at 1.05 m -dark brown below 1.45 m		Auger grab	1
324.30	1.5	SAND - Grey, wet, loose, poorly graded, fine grained, trace silt, some silt lenses (20-50 mm thick) to 2.6 m depth. -stained grey, some petroleum hydrocarbon sheen below 2.6 m		Auger grab	2
322.93	3.0	SILT - Grey, wet, dense, non plastic. -silty clay lense (75 mm thick), intermediate plasticity, soft at 3.95 m -brown, trace oxidation between 4.05 and 6.25 m		Auger grab	3
	5.0		5.18	Auger grab	4
	6.0	-compact, some fine grained sand below 6.1 m -grey below 6.25 m		Auger grab	5
318.36	7.5	END OF HOLE @ 7.62 m Note: 1. Well flush mounted to grade.	7.62		

FIELD HEADSPACE TEST — Photoionizable Vapours (ppm): 500, 1000, 1500, 2000

FIELD SOIL TEST (PETROFLAG) — Diesel Fuel (ppm): 1000, 2000, 3000, 4000



SAMPLE TYPE: AUGER GRAB

CONTRACTOR	INSPECTOR	APPROVED	DATE
Paddock Drilling Ltd.	D. B. KASUR		16/05/

KGS GROUP

SUMMARY LOG

HOLE NO. **MW127**

CLIENT CANADIAN NATIONAL

PROJECT CN HORNEPAYNE YARD - EAST END DRILLING

SITE HORNEPAYNE YARD

LOCATION See Site Plan

DRILLING METHOD 125 mm ø Solid Stem Auger, Acker SX Drill Rig

JOB NO. 02-434-04.600

GROUND ELEV. 327.30 m, Geodetic

TOP OF PVC ELEV. 327.20 m

WATER ELEV. 325.97 m, 16/08/02

DATE DRILLED 01/08/02

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG/ BACKFILL	DEPTH (m)	SAMPLE TYPE	NUMBER	FIELD HEADSPACE TEST Photoionizable Vapours (ppm) 500 1000 1500 2000	FIELD SOIL TEST (PETROFLAG) Diesel Fuel (ppm) 1000 2000 3000 4000
	0.5		SAND AND GRAVEL FILL - Brown, moist, well graded, fine grained sand to coarse grained gravel.		0.40		1	0	
			-dark grey, wet below 0.45 m				2	0	
326.08	1.0								
325.93			SAND FILL - Grey, moist, well graded, fine to coarse grained, trace fine grained gravel, trace silt, trace organic matter.				3	0	
	1.5		PEAT - Dark brown, moist.				4	0	
325.47					1.83				
	2.0		SILT - Olive grey, moist, some clay.				5	0	
324.71	2.5				2.59				
			SANDY SILT - Olive grey, moist, some sand, trace fine to coarse grained gravel, trace clay.				6	0	
	3.0		-light grey, some clay between 3.0 and 4.0 m						
	3.5						7	0	
	4.0		-light brown, trace clay, trace fine grained gravel below 4.0 m				8	0	
322.73	4.5				4.57				
			END OF HOLE @ 4.57 m						
	5.0		Note: 1. Well flush mounted to grade.						
	5.5								
	6.0								
	6.5								

SAMPLE TYPE AUGER GRAB

CONTRACTOR Paddock Drilling Ltd.

INSPECTOR T. GALLO

APPROVED

DATE 06/03/0

KGS GROUP

SUMMARY LOG

HOLE NO. **MW128**

SHEET 1 of 1

CLIENT	CANADIAN NATIONAL
PROJECT	CN HORNEPAYNE YARD - EAST END DRILLING
SITE	HORNEPAYNE YARD
LOCATION	See Site Plan
DRILLING METHOD	125 mm ø Solid Stem Auger, Acker SX Drill Rig

JOB NO.	02-434-04.600
GROUND ELEV.	327.25 m, Geodetic
TOP OF PVC ELEV.	327.10 m
WATER ELEV.	326.48 m, 16/08/02
DATE DRILLED	01/08/02

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG/ BACKFILL	DEPTH (m)	SAMPLE TYPE	NUMBER	FIELD HEADSPACE TEST Photoionizable Vapours (ppm) 500 1000 1500 2000	FIELD SOIL TEST (PETROFLAG) Diesel Fuel (ppm) 1000 2000 3000 4000
	0.5		SAND AND GRAVEL FILL - Brown, wet, well graded, fine grained sand to coarse grained gravel.		0.41		1	0	
326.49					0.77				
	1.0		SILT - Brown, moist, trace clay.				2	0	
325.73	1.5		CLAYEY SILT - Light brown, wet, soft, with clay.						
	2.0		-with clay, with fine to coarse grained sand between 2.1 and 2.4 m				3	0	
	2.5		-saturated, silt and clay, some fine to coarse grained sand below 2.4 m				4	0	
324.21	3.0		END OF HOLE @ 3.05 m		2.90 3.05		5	0	
	3.5		Note: 1. Well flush mounted to grade.						
	4.0								
	4.5								
	5.0								
	5.5								
	6.0								
	6.5								

SAMPLE TYPE AUGER GRAB

CONTRACTOR Paddock Drilling Ltd.

INSPECTOR T. GALLO

APPROVED _____ DATE 25/02/03

000970

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KGS GROUP

SUMMARY LOG

HOLE NO. **MW129**

CLIENT	CANADIAN NATIONAL	JOB NO.	02-434-04.600
PROJECT	CN HORNEPAYNE YARD - EAST END DRILLING	GROUND ELEV.	327.26 m, Geodetic
SITE	HORNEPAYNE YARD	TOP OF PVC ELEV.	327.18 m
LOCATION	See Site Plan	WATER ELEV.	326.47 m, 16/08/02
DRILLING METHOD	125 mm ø Solid Stem Auger, Acker SX Drill Rig	DATE DRILLED	01/08/02

ELEV. (m)	DEPTH (m)	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG/ BACKFILL DEPTH (m)	SAMPLE TYPE / NUMBER	FIELD HEADSPACE TEST Photoionizable Vapours (ppm) ●	FIELD SOIL TEST (PETROFLAG) Diesel Fuel (ppm) ○
	0.0	SAND AND GRAVEL FILL - Dark brown, moist, well graded, fine grained sand to coarse grained gravel.				
	0.5		0.61	1	●	0
326.50		SILT - Grey to brown, moist.	0.77	2	●	0
	1.0					
		-oxidized between 1.2 and 1.5 m		3	●	0
	1.5	-light grey, wet, trace clay below 1.5 m		4	●	0
	2.0					
	2.5			5	●	0
324.21	3.0		2.90 / 3.05			
		END OF HOLE @ 3.05 m Note: 1. Well flush mounted to grade.				

Scale: Photoionizable Vapours (ppm) 500, 1000, 1500, 2000; Diesel Fuel (ppm) 1000, 2000, 3000, 4000. Depth scale 0.5 to 6.5 m.

SAMPLE TYPE: AUGER GRAB

CONTRACTOR: Paddock Drilling Ltd.

INSPECTOR: T. GALLO

APPROVED ______ DATE 25/02/0?

KGS GROUP

SUMMARY LOG

HOLE NO. **MW130**

SHEET 1 of 1

CLIENT CANADIAN NATIONAL

PROJECT CN HORNEPAYNE YARD - EAST END DRILLING

SITE HORNEPAYNE YARD

LOCATION See Site Plan

DRILLING METHOD 125 mm ø Solid Stem Auger, Acker SX Drill Rig

JOB NO. 02-434-04.600

GROUND ELEV. 327.24 m, Geodetic

TOP OF PVC ELEV. 327.17 m

WATER ELEV. 326.27 m, 16/08/02

DATE DRILLED 01/08/02

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG/ BACKFILL	DEPTH (m)	SAMPLE TYPE	NUMBER	FIELD HEADSPACE TEST Photoionizable Vapours (ppm) 500 1000 1500 2000 / FIELD SOIL TEST (PETROFLAG) Diesel Fuel (ppm) 1000 2000 3000 4000
			SAND AND GRAVEL FILL - Brown, dry, well graded, fine grained sand to coarse grained gravel.					
326.63	0.5		SAND FILL - Dark brown, wet, well graded, fine to coarse grained, trace fine grained gravel, trace silt, petroleum hydrocarbon staining.		0.61			
	1.0		-grey to brown, moist, petroleum hydrocarbon staining and odour below 1.2 m		0.91			
	1.5				1.22		1	0.8
325.41	2.0		SILT - Light grey, heavy oxidation, petroleum hydrocarbon staining.				2	162.9
	2.5		-soft, saturated, no petroleum hydrocarbon staining below 2.1 m				3	7.5
324.19	3.0		END OF HOLE @ 3.05 m		2.90 3.05		4	17.3
	3.5		Note: 1. Well flush mounted to grade.					
	4.0							
	4.5							
	5.0							
	5.5							
	6.0							
	6.5							

SAMPLE TYPE AUGER GRAB

CONTRACTOR Paddock Drilling Ltd.

INSPECTOR T. GALLO

APPROVED _____ DATE 06/03/03

000972

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KGS GROUP

SUMMARY LOG

HOLE NO. **MW131**

SHEET 1 of 1

CLIENT	CANADIAN NATIONAL	JOB NO.	02-434-04.600
PROJECT	CN HORNEPAYNE YARD - EAST END DRILLING	GROUND ELEV.	327.21 m, Geodetic
SITE	HORNEPAYNE YARD	TOP OF PVC ELEV.	327.10 m
LOCATION	See Site Plan	WATER ELEV.	326.09 m, 16/08/02
DRILLING METHOD	125 mm ø Solid Stem Auger, Acker SX Drill Rig	DATE DRILLED	01/08/02

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG/ BACKFILL	DEPTH (m)	SAMPLE TYPE NUMBER
	0.5		SAND AND GRAVEL FILL - Brown, moist, fine grained sand to coarse grained gravel.		0.17 0.28	
	1.0		-dark grey, trace silt below 0.75 m			
325.99			SILT - Light grey, moist, trace clay.			
	1.5		-some clay, oxidized below 1.5 m			
	2.0				2.13	
	2.5					
324.16	3.0		END OF HOLE @ 3.05 m		2.92 3.05	
	3.5		Note: 1. Well flush mounted to grade.			
	4.0					
	4.5					
	5.0					
	5.5					
	6.0					
	6.5					

FIELD HEADSPACE TEST
Photoionizable Vapours (ppm) ●
500 1000 1500 2000

FIELD SOIL TEST (PETROFLAG)
Diesel Fuel (ppm) O
1000 2000 3000 4000

1 8.6
2 2
3 397.2

SAMPLE TYPE AUGER GRAB

CONTRACTOR Paddock Drilling Ltd.

INSPECTOR T. GALLO

APPROVED _____ DATE 06/03/

000973

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KGS GROUP

SUMMARY LOG

HOLE NO. **MW132**

CLIENT CANADIAN NATIONAL

PROJECT CN HORNEPAYNE YARD - EAST END DRILLING

SITE HORNEPAYNE YARD

LOCATION See Site Plan

DRILLING METHOD 125 mm ø Solid Stem Auger, Acker SX Drill Rig

JOB NO. 02-434-04.600

GROUND ELEV. 327.22 m, Geodetic

TOP OF PVC ELEV. 327.12 m

WATER ELEV. 326.18 m, 16/08/02

DATE DRILLED 01/08/02

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG/ BACKFILL	DEPTH (m)	SAMPLE TYPE	NUMBER
326.76	0.5		SAND AND GRAVEL FILL - Brown, dry, well graded, fine grained sand to coarse grained gravel.		0.46		
			-wood pieces at 0.45 m				
			SAND FILL - Dark brown, moist, well graded, fine to coarse grained, trace fine grained gravel, trace silt, petroleum hydrocarbon staining.				
326.15	1.0		-silt lense, light to dark brown, wet, some fine to coarse grained sand, petroleum hydrocarbon staining at 0.9 m				
			SILT - Olive grey, moist to wet, firm.				
	1.5		-light grey below 1.5 m -moist, highly oxicized, petroleum hydrocarbon staining between 1.5 and 2.15 m		1.83		
	2.0		-saturated, trace clay below 2.15 m				
	2.5						
324.17	3.0		END OF HOLE @ 3.05 m		2.90 3.05		
	3.5		Note: 1. Well flush mounted to grade.				
	4.0						
	4.5						
	5.0						
	5.5						
	6.0						
	6.5						

FIELD HEADSPACE TEST
Photoionizable Vapours (ppm) ●
500 1000 1500 2000

FIELD SOIL TEST (PETROFLAG)
Diesel Fuel (ppm) ○
1000 2000 3000 4000

1 31
2 17.4
3 180
4 167.1

SAMPLE TYPE AUGER GRAB

CONTRACTOR Paddock Drilling Ltd.

INSPECTOR T. GALLO

APPROVED _____ DATE 25/02/03

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KGS GROUP

SUMMARY LOG

HOLE NO. **MW133**

SHEET 1 of 1

CLIENT CANADIAN NATIONAL

PROJECT CN HORNEPAYNE YARD - EAST END DRILLING

SITE HORNEPAYNE YARD

LOCATION See Site Plan

DRILLING METHOD 125 mm ø Solid Stem Auger, Acker SX Drill Rig

JOB NO. 02-434-04.600

GROUND ELEV. 327.05 m, Geodetic

TOP OF PVC ELEV. 326.91 m

WATER ELEV. 325.68 m, 16/08/02

PRODUCT ELEV. 325.70 m, 16/08/02

DATE DRILLED 01/08/02

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION
326.44	0.5		SAND AND GRAVEL FILL - Dark grey, damp, compact, well graded, fine grained sand to coarse grained gravel.
	1.0		SANDY SILT FILL - Dark grey, moist, some sand, trace fine grained gravel, trace clay.
			-some organic matter between 1.2 and 1.5 m
325.53	1.5		PEAT - Dark brown, moist, soft, some silty clay, petroleum hydrocarbon odour.
	2.0		
324.61	2.5		SANDY SILT - Olive grey, damp, some sand, trace fine grained gravel, petroleum hydrocarbon odour.
	3.0		
323.85	3.5		SAND - Light grey to olive grey, wet, well graded, fine to coarse grained, trace fine grained gravel, trace silt.
323.39	4.0		SILT - Light grey, wet, soft, some clay, trace fine grained sand.
322.48	4.5		END OF HOLE @ 4.57 m
	5.0		Note: 1. Well flush mounted to grade.
	5.5		
	6.0		
	6.5		

PIEZ. LOG/ BACKFILL

DEPTH (m): 0.61, 0.78, 3.20, 4.44, 4.57

SAMPLE TYPE NUMBER: 1, 2, 3, 4, 5, 6

FIELD HEADSPACE TEST
Photoionizable Vapours (ppm) ●
500 1000 1500 2000

FIELD SOIL TEST (PETROFLAG)
Diesel Fuel (ppm) ○
1000 2000 3000 4000

121.1
180.2
334.4
326.2
214
74.7

SAMPLE TYPE ⊠ AUGER GRAB

CONTRACTOR Paddock Drilling Ltd.

INSPECTOR T. GALLO

APPROVED _____ DATE 06/03/02

000975

KGS GROUP

SUMMARY LOG

HOLE NO. **MW140**

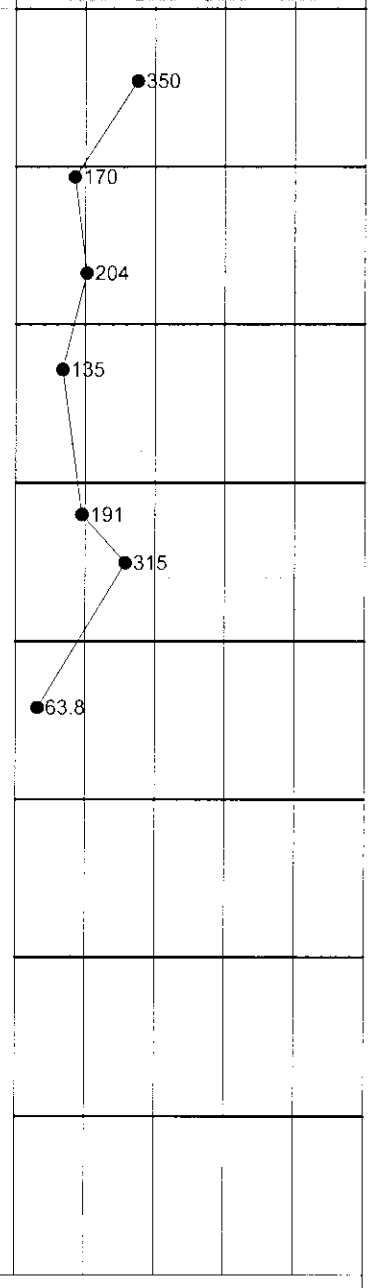
CLIENT	CANADIAN NATIONAL
PROJECT	HORNEPAYNE YARD RAP
SITE	HORNEPAYNE, ONTARIO
LOCATION	FORMER EAST END FUELLING STAND AREA
DRILLING METHOD	100 mm ø Solid Stem Auger, Acker SX Skidder Mounted Rig

JOB NO.	03-434-04
GROUND ELEV.	327.87 m, Geodetic
TOP OF PVC ELEV.	327.84 m
WATER ELEV.	326.80 m (25-Sep-03)
PRODUCT ELEV.	326.85 m (25-Sep-03)
DATE DRILLED	23 Sep 03

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG/ BACKFILL	DEPTH (m)	SAMPLE TYPE	NUMBER
326.96	0.5		**SAND AND GRAVEL FILL**- Grey, dry, loose. Sand is fine to medium grained, poorly graded. Gravel is fine grained, subangular.		0.15 0.45		1
326.65	1.0		**SAND** - Grey, moist, fine to medium grained, poorly grade, petroleum hydrocarbon staining and odour.				2
			SILT - Olive to brown, dry to moist, friable, no hydrocarbon odour.				
326.04	1.5		- Wet at 1.52 m.				3
	2.0		- Trace fine grained sand and gravel below 1.52 m. - Slight petroleum hydrocarbon odours below 1.52 m.				
	2.5		**PEAT** - Brown, wet, fibrous, soft to spongy, slight petroleum hydrocarbon odour.				4
	3.0						
324.52							5
	3.5		**SAND** - Grey/brown, saturated, loose, and fine to coarse gravel, subangular, some silt.				6
	4.0		- Fine grained sand, petroleum hydrocarbon staining and odour between 3.35 and 3.51 m.				
323.30	4.5				4.42 4.57		7
			END OF HOLE AT 4.57 m				
	5.0		Notes: 1. Well installed with geosock and lockable flush mount protective cover.				
	5.5						
	6.0						
	6.5						
	7.0						
	7.5						

FIELD HEADSPACE TEST
Photoionizable Vapours (ppm) ●
200 400 600 800

FIELD SOIL TEST (PETROFLAG)
Diesel Fuel (ppm) ○
1000 2000 3000 4000



SAMPLE TYPE Auger Grab

CONTRACTOR Paddock Drilling Ltd.

INSPECTOR T. GALLO

APPROVED _____ DATE 22/01/04

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KGS GROUP

SUMMARY LOG

HOLE NO. **MW141**

SHEET 1 of 1

CLIENT	CANADIAN NATIONAL
PROJECT	HORNEPAYNE YARD RAP
SITE	HORNEPAYNE, ONTARIO
LOCATION	FORMER EAST END FUELLING STAND AREA
DRILLING METHOD	100 mm ø Solid Stem Auger, Acker SX Skidder Mounted Rig

JOB NO.	03-434-04
GROUND ELEV.	327.90 m, Geodetic
TOP OF PVC ELEV.	327.83 m
WATER ELEV.	326.89 m (25-Sep-03)
PRODUCT ELEV.	
DATE DRILLED	23 Sep 03

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG/ BACKFILL	DEPTH (m)	SAMPLE TYPE	NUMBER	FIELD HEADSPACE TEST Photoionizable Vapours (ppm) ● 200 400 600 800 / FIELD SOIL TEST (PETROFLAG) Diesel Fuel (ppm) ○ 1000 2000 3000 4000
	0.5		**SAND AND GRAVEL FILL**- Brown to grey with depth, dry to wet with depth, loose. Sand is fine to medium grained and poorly graded. Gravel is fine grained and subangular. Petroleum hydrocarbon staining and odour with depth.		0.15 0.23		1	●55.3
	1.0							
326.38	1.5		**SAND** - Brown, saturated, loose, fine to medium grained, poorly graded, dark grey petroleum hydrocarbon staining and odour.				2	●170
325.77	2.0						3	●162
	2.5		**SILT** - Olive to grey, wet, soft, <1.0 cm fine sand lenses throughout, petroleum hydrocarbon staining within sand lenses.				4	●239
325.00	3.0		**PEAT** - Brown, wet, fibrous to decomposed.				5	●49.9
	3.5							
	4.0				4.20			
323.33	4.5				4.57			
			END OF HOLE AT 4.57 m					
	5.0		Notes: 1. Well installed with geosock and lockable flush mount protective cover.					
	5.5							
	6.0							
	6.5							
	7.0							
	7.5							

SAMPLE TYPE Auger Grab

CONTRACTOR Paddock Drilling Ltd.

INSPECTOR T. GALLO

APPROVED _____ DATE 22/01/04

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KGS GROUP

SUMMARY LOG

HOLE NO. **MW142**

SHEET 1 of 1

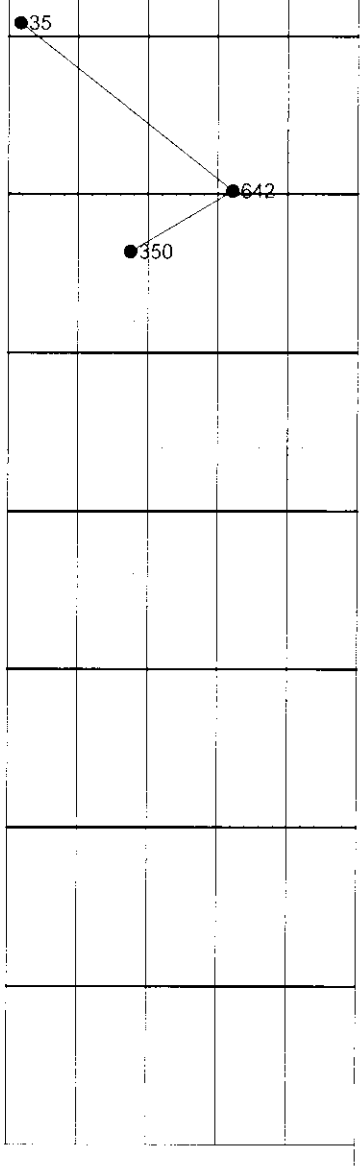
CLIENT	CANADIAN NATIONAL
PROJECT	HORNEPAYNE YARD RAP
SITE	HORNEPAYNE, ONTARIO
LOCATION	FORMER EAST END FUELLING STAND AREA
DRILLING METHOD	100 mm ø Solid Stem Auger, Acker SX Skidder Mounted Rig

JOB NO.	03-434-04
GROUND ELEV.	327.73 m, Geodetic
TOP OF PVC ELEV.	327.66 m
WATER ELEV.	326.83 m (25-Sep-03)
PRODUCT ELEV.	
DATE DRILLED	23 Sep 03

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG/ BACKFILL	DEPTH (m)	SAMPLE TYPE	NUMBER
	0		SAND AND GRAVEL FILL- Brown, damp, loose, trace silt. Sand is fine to medium grained, poorly graded. Gravel is fine to coarse grained, subangular to subrounded.		0.27		
	0.5		- Dark grey at 0.30 m.		0.42		
			- Petroleum hydrocarbon staining and odour below 0.30 m.				1
	1.0						
	1.5		- Moist towards 1.52 m.				
	2.0		- Wet at 1.83 m. Sheen on water. - Increased gravel content and petroleum hydrocarbon odour with depth.		2.25		2
325.29	2.5		- Flat spin at 2.44 m.		2.44		3
			END OF HOLE AT 2.44 m				
	3.0		Notes: 1. Well installed with geosock and lockable flush mount protective cover.				
	3.5						
	4.0						
	4.5						
	5.0						
	5.5						
	6.0						
	6.5						
	7.0						
	7.5						

FIELD HEADSPACE TEST
Photoionizable Vapours (ppm) ●
200 400 600 800

FIELD SOIL TEST (PETROFLAG)
Diesel Fuel (ppm) ○
1000 2000 3000 4000



SAMPLE TYPE ⊠ Auger Grab

CONTRACTOR Paddock Drilling Ltd.

INSPECTOR T. GALLO

APPROVED _____ DATE 22/01/04

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KGS GROUP

SUMMARY LOG

HOLE NO. **MW143**

SHEET 1 of 1

CLIENT	CANADIAN NATIONAL
PROJECT	HORNEPAYNE YARD RAP
SITE	HORNEPAYNE, ONTARIO
LOCATION	FORMER EAST END FUELLING STAND AREA
DRILLING METHOD	100 mm ø Solid Stem Auger, Acker SX Skidder Mounted Rig

JOB NO.	03-434-04
GROUND ELEV.	327.74 m, Geodetic
TOP OF PVC ELEV.	327.66 m
WATER ELEV.	326.69 m (25-Sep-03)
PRODUCT ELEV.	
DATE DRILLED	23 Sep 03

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG/ BACKFILL	DEPTH (m)	SAMPLE TYPE NUMBER
	0.5		**SAND AND GRAVEL FILL**- Brown, dry, loose. Sand is fine to medium grained, poorly graded. Gravel is fine to coarse grained, poorly graded.		0.35	
			- Grey petroleum hydrocarbon staining and odour from 0.46 to 1.22 m.		0.65	1
	1.0					
326.21	1.5		- Wet at 1.37 m.			2
			SILT - Olive, wet, soft.			3
325.60	2.0		- Fine grained sand seam (1 cm thickness) at 1.83 m. Petroleum hydrocarbon staining within sand seam.			
	2.5		**PEAT** - Brown, wet, fibrous to decomposed.			4
	3.0					
324.38	3.5		**SILT** - Beige, wet, soft, trace to some fine grained sand, trace clay.			5
	4.0					
			- Grey below 4.27 m.			
323.16	4.5		**END OF HOLE AT 4.57 m**		4.57	
	5.0		Notes: 1. Well installed with geosock and lockable flush mount protective cover.			
	5.5					
	6.0					
	6.5					
	7.0					
	7.5					

FIELD HEADSPACE TEST
Photoionizable Vapours (ppm) ●
200 400 600 800

FIELD SOIL TEST (PETROFLAG)
Diesel Fuel (ppm) ○
1000 2000 3000 4000

●89.3 ●294 ●291 ●40 ●24.9

SAMPLE TYPE Auger Grab

CONTRACTOR **Paddock Drilling Ltd.**

INSPECTOR **T. GALLO**

APPROVED _____ DATE 22/01/04

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KGS GROUP

SUMMARY LOG

HOLE NO. **MW144**

CLIENT	CANADIAN NATIONAL
PROJECT	HORNEPAYNE YARD RAP
SITE	HORNEPAYNE, ONTARIO
LOCATION	FORMER EAST END FUELLING STAND AREA
DRILLING METHOD	100 mm ø Solid Stem Auger, Acker SX Skidder Mounted Rig

JOB NO.	03-434-04
GROUND ELEV	327.69 m, Geodetic
TOP OF PVC ELEV.	327.64 m
WATER ELEV.	326.50 m (25-Sep-03)
PRODUCT ELEV.	
DATE DRILLED	23 Sep 03

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG/ BACKFILL	DEPTH (m)	SAMPLE TYPE	NUMBER
	0.5		**SAND AND GRAVEL FILL**- Brown, dry, loose, petroleum hydrocarbon odour. Sand is fine to medium grained, poorly graded. Gravel is fine to coarse grained, subangular to subrounded. - Grey/brown between 0.30 to 0.91 m.		0.27 0.57		
	1.0		- Dark grey petroleum hydrocarbon staining between 0.91 and 1.52 m.				1
	1.5		- Damp towards 1.52 m.				
	2.0		- Wet at 1.83 m.				2
325.56			**PEAT** - Brown, moist to wet, soft, fibrous to decomposed.				
	2.5						
	3.0						3
324.34			**SILT** - Olive/brown, wet, soft, and fine grained sand, uniform. Increased medium to coarse grained sand and fine to coarse grained gravel content with depth. Trace clay with depth. - Saturated at 3.66 m.				
	3.5						4
	4.0						
323.12	4.5				4.54 4.57		5
			END OF HOLE AT 4.57 m				
	5.0		Notes: 1. Well installed with geosock and lockable flush mount protective cover.				
	5.5						
	6.0						
	6.5						
	7.0						
	7.5						

FIELD HEADSPACE TEST
Photoionizable Vapours (ppm) ●
200 400 600 800

FIELD SOIL TEST (PETROFLAG)
Diesel Fuel (ppm) ○
1000 2000 3000 4000

243
330
36.4
96.2
182

SAMPLE TYPE Auger Grab

CONTRACTOR Paddock Drilling Ltd.

INSPECTOR T. GALLO

APPROVED _____ DATE 22/01/04

VAPOURS_FT_M P:\PROJECTS\2003\03-0434-04\ENV\LOGS\03-434-04 LOGS.GPJ

KGS GROUP

SUMMARY LOG

HOLE NO. **MW145**

CLIENT	CANADIAN NATIONAL
PROJECT	HORNEPAYNE YARD RAP
SITE	HORNEPAYNE, ONTARIO
LOCATION	FORMER EAST END FUELLING STAND AREA
DRILLING METHOD	100 mm ø Solid Stem Auger, Acker SX Skidder Mounted Rig

JOB NO.	03-434-04
GROUND ELEV.	327.68 m, Geodetic
TOP OF PVC ELEV.	327.59 m
WATER ELEV.	326.53 m (25-Sep-03)
PRODUCT ELEV.	326.54 m (25-Sep-03)
DATE DRILLED	23 Sep 03

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG/ BACKFILL	DEPTH (m)	SAMPLE TYPE NUMBER
	0.5		**SAND AND GRAVEL FILL**- Brown, damp, loose, trace silt. Sand is fine to medium grained, poorly graded. Gravel is fine grained, subangular.		0.33	
	1.0				0.63	1
	1.5		- Wet at 1.37 m. - Purple colour between 1.37 to 1.52 m. - Saturated below 1.52 m. - Petroleum hydrocarbon odours between 1.52 and 1.83 m.			2 3
325.70	2.0		**PEAT** - Brown, wet, soft, decomposed to organic.			4
325.39	2.5		**SILT** - Grey/olive, wet, firm, trace fine to coarse grained sand. Increased moisture content with depth. Decreased sand and gravel content with depth. Increase clay content with depth.			5
	3.0		- Saturated below 3.05 m.			
	3.5					
	4.0					
323.11	4.5		**END OF HOLE AT 4.57 m**		4.57	
	5.0		Notes: 1. Well installed with geosock and lockable flush mount protective cover.			
	5.5					
	6.0					
	6.5					
	7.0					
	7.5					

FIELD HEADSPACE TEST
Photoionizable Vapours (ppm) ●
200 400 600 800

FIELD SOIL TEST (PETROFLAG)
Diesel Fuel (ppm) ○
1000 2000 3000 4000

●47.7 ●112 ●131 ●46.3 ●43.4

SAMPLE TYPE Auger Grab

CONTRACTOR Paddock Drilling Ltd.

INSPECTOR T. GALLO

APPROVED _____ DATE 22/01/04

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KGS GROUP

SUMMARY LOG

HOLE NO. **MW146**

CLIENT	CANADIAN NATIONAL
PROJECT	HORNEPAYNE YARD RAP
SITE	HORNEPAYNE, ONTARIO
LOCATION	FORMER EAST END FUELLING STAND AREA
DRILLING METHOD	100 mm ø Solid Stem Auger, Acker SX Skidder Mounted Rig

JOB NO.	03-434-04
GROUND ELEV.	327.66 m, Geodetic
TOP OF PVC ELEV.	327.61 m
WATER ELEV.	326.70 m (25-Sep-03)
PRODUCT ELEV.	
DATE DRILLED	23 Sep 03

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG/ BACKFILL	DEPTH (m)	SAMPLE TYPE NUMBER
	0.5		**SAND AND GRAVEL FILL**- Brown, dry, loose. Sand is fine to medium grained, poorly graded. Gravel is fine grained and subangular.		0.15 0.23	
	1.0		- Black cinders from 0.91 to 1.07 m. - Dark grey petroleum hydrocarbon staining and odour between 1.07 and 1.37 m. - Wet below 1.37 m.			1
325.83	1.5		**PEAT** - Brown, wet, soft, fibrous to decomposed.			2
	2.0					3
	2.5					
324.76 324.68	3.0		**SAND AND SILT**- Brown, wet, firm. Sand is fine grained and uniform. **SILT** - Olive to beige, wet, soft, trace to some fine grained sand and gravel.			4
	3.5					5
	4.0					
323.08	4.5		END OF HOLE AT 4.57 m		4.57	
	5.0		Notes: 1. Well installed with geosock and lockable flush mount protective cover.			
	5.5					
	6.0					
	6.5					
	7.0					
	7.5					

FIELD HEADSPACE TEST
Photoionizable Vapours (ppm) ●
200 400 600 800

FIELD SOIL TEST (PETROFLAG)
Diesel Fuel (ppm) ○
1000 2000 3000 4000

1 ●10.9
2 ●141
3 ●31.3
4 ●36.5
5 ●27

SAMPLE TYPE Auger Grab

CONTRACTOR Paddock Drilling Ltd.

INSPECTOR T. GALLO

APPROVED _____ DATE 22/01/04

VAPOURS_FT_M P:\PROJECTS\2003\03-0434-04\E'NVLOGS\03-434-04 LOGS.GPJ

KGS GROUP

SUMMARY LOG

HOLE NO. **MW147**

SHEET 1 of 1

CLIENT	CANADIAN NATIONAL
PROJECT	HORNEPAYNE YARD RAP
SITE	HORNEPAYNE, ONTARIO
LOCATION	FORMER EAST END FUELLING STAND AREA
DRILLING METHOD	100 mm ø Solid Stem Auger, Acker SX Skidder Mounted Rig

JOB NO.	03-434-04
GROUND ELEV.	326.68 m, Geodetic
TOP OF PVC ELEV.	326.60 m
WATER ELEV.	323.89 m (25-Sep-03)
PRODUCT ELEV.	
DATE DRILLED	23 Sep 03

ELEV. (m)	DEPTH (m)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG/ BACKFILL	DEPTH (m)	SAMPLE TYPE	NUMBER	FIELD HEADSPACE TEST Photoionizable Vapours (ppm) ● 200 400 600 800 / FIELD SOIL TEST (PETROFLAG) Diesel Fuel (ppm) ○ 1000 2000 3000 4000
	0.5		**SAND AND GRAVEL FILL**- Brown, dry, loose, trace silt. Sand is fine to medium grained, poorly graded. Gravel is fine grained, subangular. Mottled grey/dark brown with depth.				1	●32.9
	1.0		- Brown, damp, soft silt layer from 0.76 to 0.84 m.		1.01			
325.30					1.31		2	●12.9
	1.5		**SILT** - Brown, moist, soft, trace clay, trace fine grained sand.				3	●46.3
324.85								
324.54	2.0		**CINDERS** - Black, dry, loose.				4	●21.6
	2.5		**SAND** - Brown, damp to moist, loose, fine to coarse grained, poorly graded, trace fine to coarse grained gravel.					
	3.0		- Wet towards 3.05 m.				5	●23.7
323.32								
323.17	3.5		**PEAT** - Brown, damp, fibrous to decomposed.					
			SILT - Black, moist, firm, trace clay. Trace to some oxidation with depth. Increase clay content with depth. - Olive to beige below 3.58 m.					
	4.0							
	4.5		- Sand seam (1-2 cm thick) at 4.50 m. Fine grained, uniform sand, petroleum hydrocarbon staining and odour within the seam.				6	●220
	5.0							
	5.5				5.89			
320.58	6.0				6.10		7	●18.6
			END OF HOLE AT 6.1 m					
	6.5		Notes: 1. Well installed with geosock and lockable flush mount protective cover.					
	7.0							
	7.5							

SAMPLE TYPE Auger Grab

CONTRACTOR Paddock Drilling Ltd.

INSPECTOR T. GALLO

APPROVED _____ DATE 22/01/04

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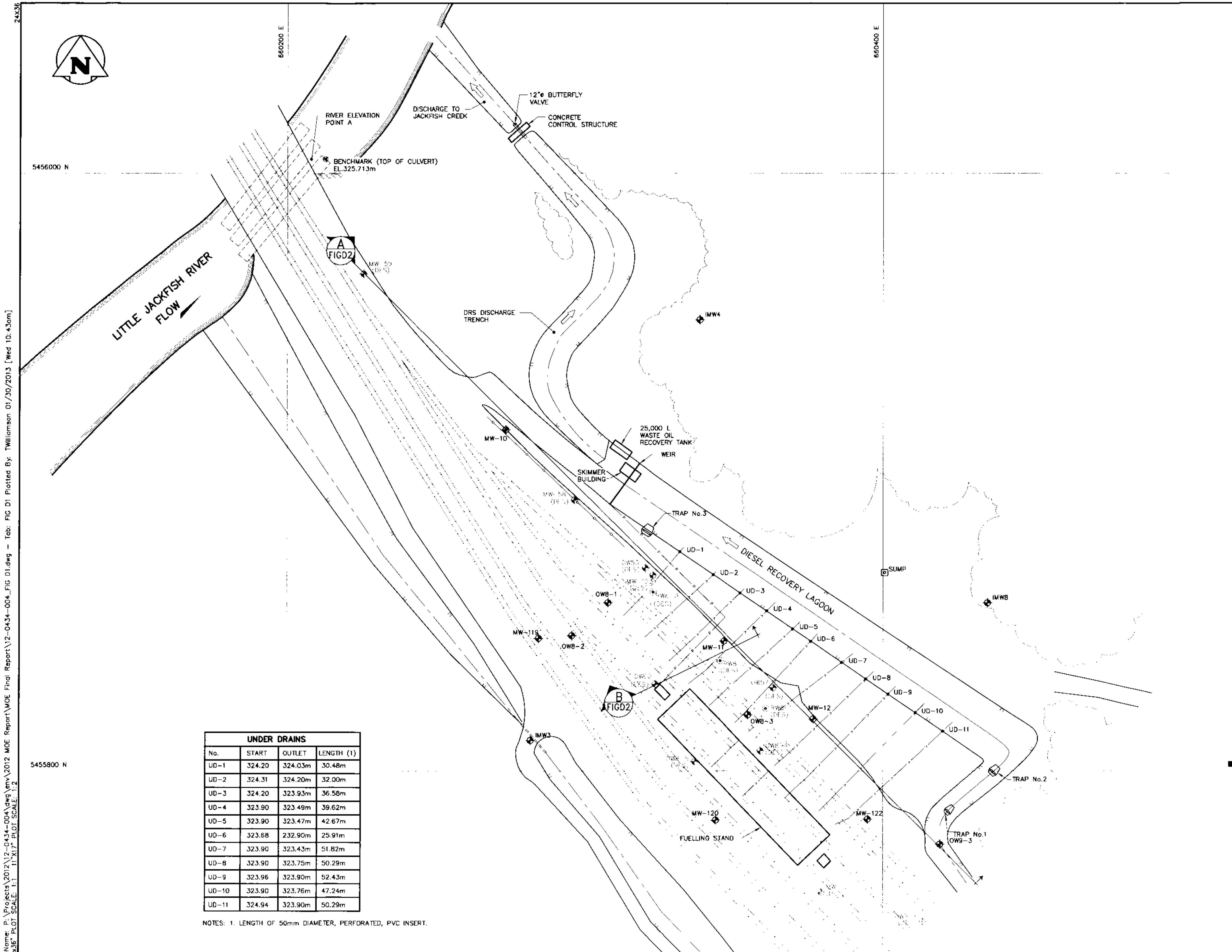
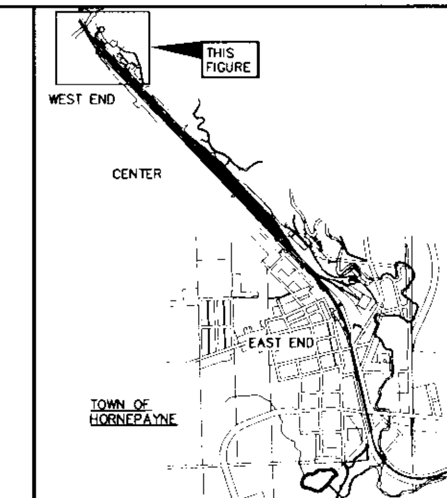
APPENDIX D
STRATIGRAPHIC CROSS SECTIONS



UNDER DRAINS			
No.	START	OUTLET	LENGTH (1)
UD-1	324.20	324.03m	30.48m
UD-2	324.31	324.20m	32.00m
UD-3	324.20	323.93m	36.58m
UD-4	323.90	323.49m	39.62m
UD-5	323.90	323.47m	42.67m
UD-6	323.68	232.90m	25.91m
UD-7	323.90	323.43m	51.82m
UD-8	323.90	323.75m	50.29m
UD-9	323.96	323.90m	52.43m
UD-10	323.90	323.76m	47.24m
UD-11	324.94	323.90m	50.29m

NOTES: 1. LENGTH OF 50mm DIAMETER, PERFORATED, PVC INSERT.



KEY PLAN

LEGEND:

- BERM
- CENTERLINE OF DITCH
- FENCE
- BURIED ELECTRICAL CABLE
- BENCHMARK
- MW-119 MONITORING WELL (INSTALLED BY KGS) (MW101-MW133, MW140-MW147)
- MW-10 MONITORING WELL (INSTALLED BY OTHERS) (ALL OTHER WELLS)
- RW8-1 RECOVERY WELL
- SUMP SUMP WELL
- RAILROAD TRACKS
- UNDERGROUND DRAIN
- DES DESTROYED
- CROSS SECTION LOCATION AND REFERENCE

NOTES:

1. SITE PLAN BASED ON AUTOCAD FILE PROVIDED BY CN.

0 12 24 36 48 60m

SCALE: 1:600 METRIC 24"x36"
1:1200 METRIC 11"x17"

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B	13/01/31	ISSUED WITH FINAL REPORT	TG
A	13/01/25	ISSUED WITH MOE DRAFT REPORT	TG

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2012 REMEDIAL OPERATIONS
PIN# 1000/ONPR/100587
HORNEPAYNE YARD, ON

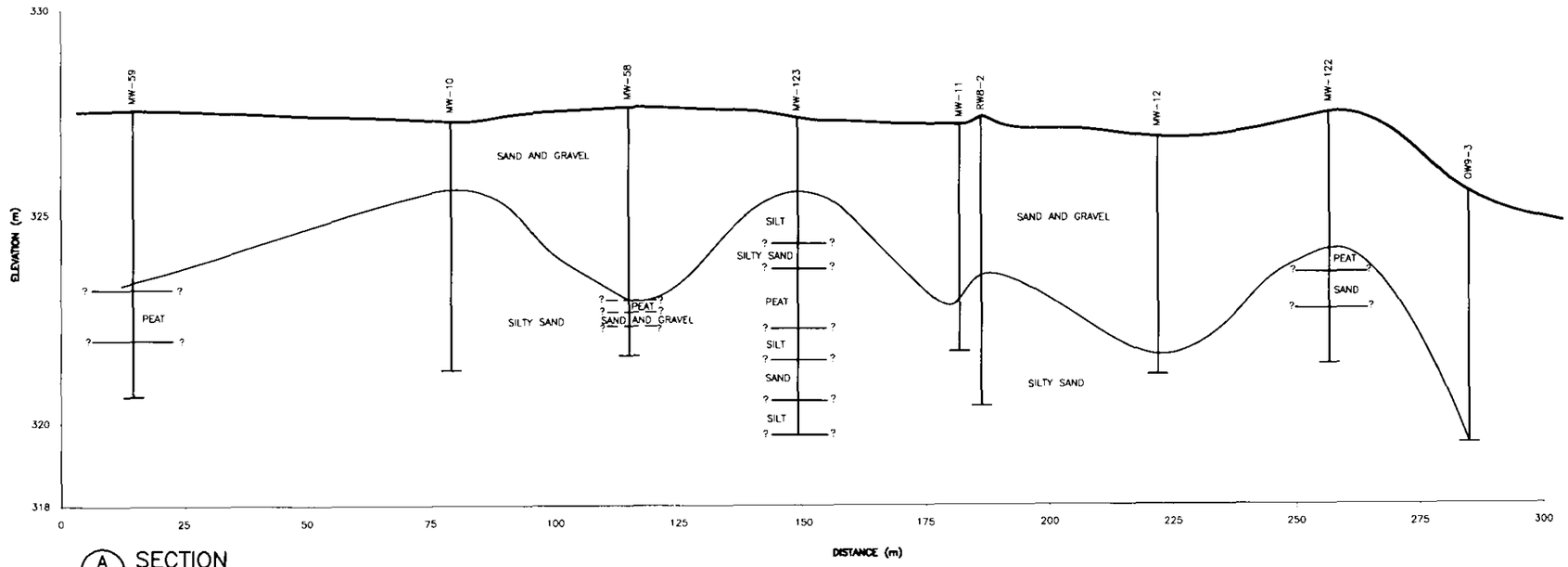
STRATIGRAPHIC CROSS SECTION REFERENCE - WEST END

JANUARY 2013 | FIGURE D1 | REV B

FileName: P:\Projects\2012\12-0434-004\dwg\env\2012 MOE Report\MOE Final Report\12-0434-004_FIG D1.dwg - Tab: FIG D1 Plotted By: TWilliamson 01/30/2013 [Wed 10:43am]
24"x36" PLOT SCALE: 1:1 11"X17" PLOT SCALE: 1:2

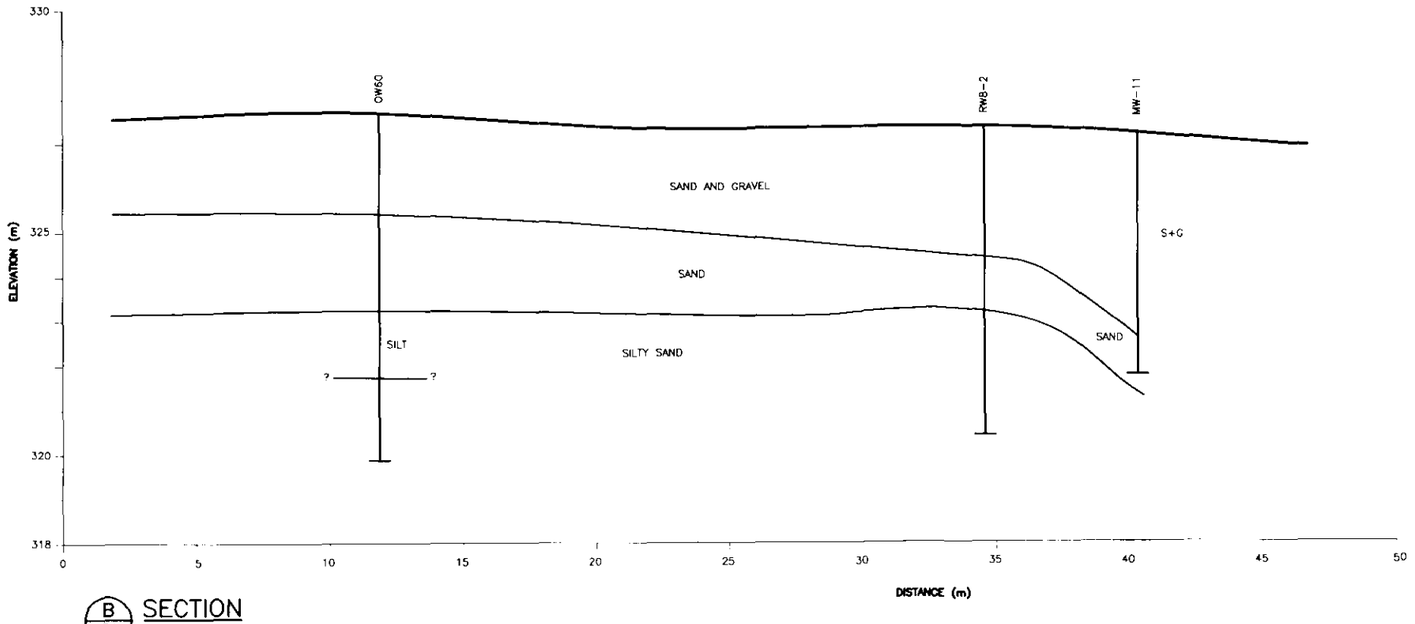
24X36

586000



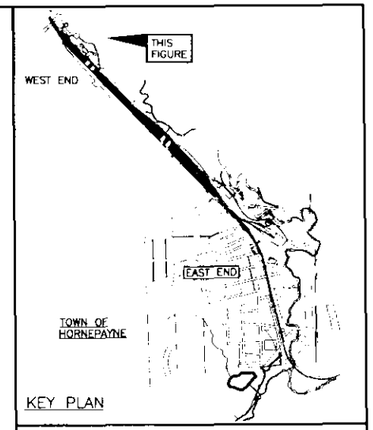
A/D1 SECTION

SECTION A – CROSS SECTION (NORTH TO SOUTH)



B/D1 SECTION

SECTION B – CROSS SECTION (WEST TO EAST)



LEGEND:

MONITORING WELL OFFSET DISTANCE FROM CROSS SECTION A

MW-59 = 0.0m
MW-10 = 3.5m WEST
MW-58 = 3.8m WEST
MW-123 = 3.0m WEST
MW-11 = 2.0m EAST
RW8-2 = 7.0m WEST
MW-12 = 0.0m
MW-122 = 10.7m WEST
OW9-3 = 0.0m

MONITORING WELL OFFSET DISTANCE FROM CROSS SECTION B

OW-60 = 0.0m
RW8-2 = 3.2 m SOUTH
MW-11 = 3.2m NORTH

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HORNEPAYNE YARD, ON

STRATIGRAPHIC CROSS SECTIONS
WEST END

JANUARY 2013 | FIGURE D2 | B

24X36

662000 E

662200 E

5454200 N

N

POLLUTION CONTROL BUILDING

OIL/WATER SEPARATOR

WASTE OIL TANK

OW5-3

STORAGE SHED

PW1 (DES)

PW7 (NM)

PW8 (NM)

PW4 (NM)

PW3 (NM)

OW5-2

PW2 (NM)

PW6 (NM)

MW-20

OW5-4

REMEDIAL SYSTEM DISCHARGE OUTLET

CONCRETE MANHOLE

900 mmø CSP "L" PIPE

PW5 (NM)

OW5-1

PW9 (NM)

MW-104

LAGOON #2

PW10 (NM)

MW-52

INLET 2
STORM WATER DISCHARGE
330 mmø STEEL PIPE

MW-40

OW5-6

ROUNDHOUSE DISCHARGE
900 mmø CMP

MW-102

MW-101

MW-103

OUTLET – LAGOON NO. 2
EFFLUENT SAMPLING LOCATION
900 mmø CMP

LITTLE JACKFISH RIVER

INTERCEPTION TRENCH SUMP

MW-43

B
FIGD4

MW-46

MW-20

MW-105

MW-107

SOIL CONTAINMENT CELL

DITCH

MW-51

RAMP

MW-108

A
FIGD4

WASTE OIL TRANSFER FACILITY
FIGURE 5

MW-109

MW-115

MW-49

MW-50

MW-114

OW3-2

SHOP TRACK LNAPL COLLECTION SYSTEM
FIGURE 5

MW-126

FROM ROUNDHOUSE

MW-24

ROUNDHOUSE

WEST END

CENTER

THIS FIGURE

EAST END

TOWN OF HORNEPAYNE

KEY PLAN

LEGEND

- RAILROAD TRACK
- CULVERT
- CENTERLINE OF DITCH
- SANITARY SEWER
- STORM SEWER
- FENCE
- DISCHARGE LINE
- TREES/ SHRUBS
- MANHOLES
- SURFACE WATER FLOW DIRECTION
- MW-52 MONITORING WELL (INSTALLED BY KGS) (MW101–MW133, MW140–MW147)
- MW-20 MONITORING WELL (INSTALLED BY OTHERS) (ALL OTHER WELLS)
- PW-1 PUMPING WELL
- (DES) DESTROYED
- B FIGD4 CROSS SECTION LOCATION AND REFERENCE

NOTE:

1. REFERENCE JACQUES WHITFORD ENVIRONMENTAL LIMITED PROJECT 31004, DRAWING NO. 2, 1996.

0 10 20 30 40 50m

SCALE: 1:500 METRIC 24"x36"
1:1000 METRIC 11"x17"

NO.	YY/MM/DD	DESCRIPTION	BY
B	13/01/31	ISSUED WITH FINAL REPORT	TG
A	13/01/25	ISSUED WITH MOE DRAFT REPORT	TG

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CN CANADIAN NATIONAL

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PIN# 1000/ONPR/100591
HORNEPAYNE YARD, ON

STRATIGRAPHIC CROSS SECTION
REFERENCE – LAGOON 2

JANUARY 2013 | FIGURE D3 | REV. B

FileName: P:\Projects\2012\12-0434-004\dwg\env\2012 MOE Report\MOE Final Report\12-0434-004_FIG D3.dwg — Tab: FIG D3 Plotted By: TWilliamson 01/30/2013 [Wed 10:48am]
24 X36" PLOT SCALE: 1:1 11"X17" PLOT SCALE: 1:2

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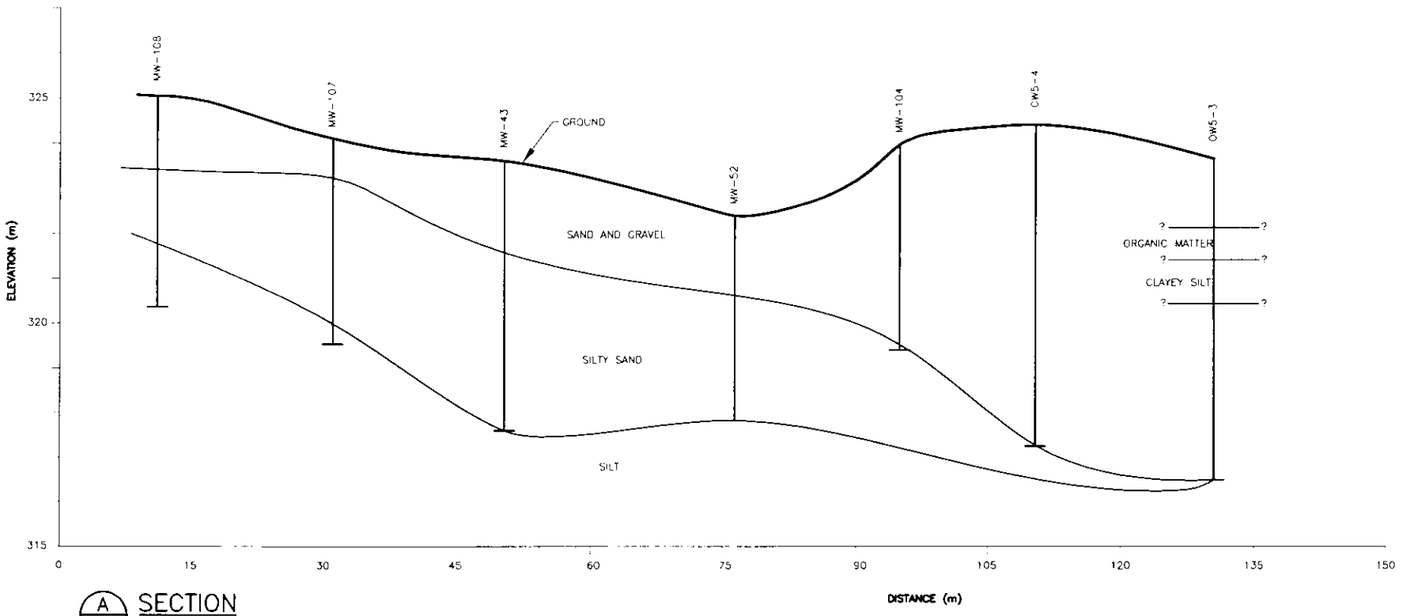
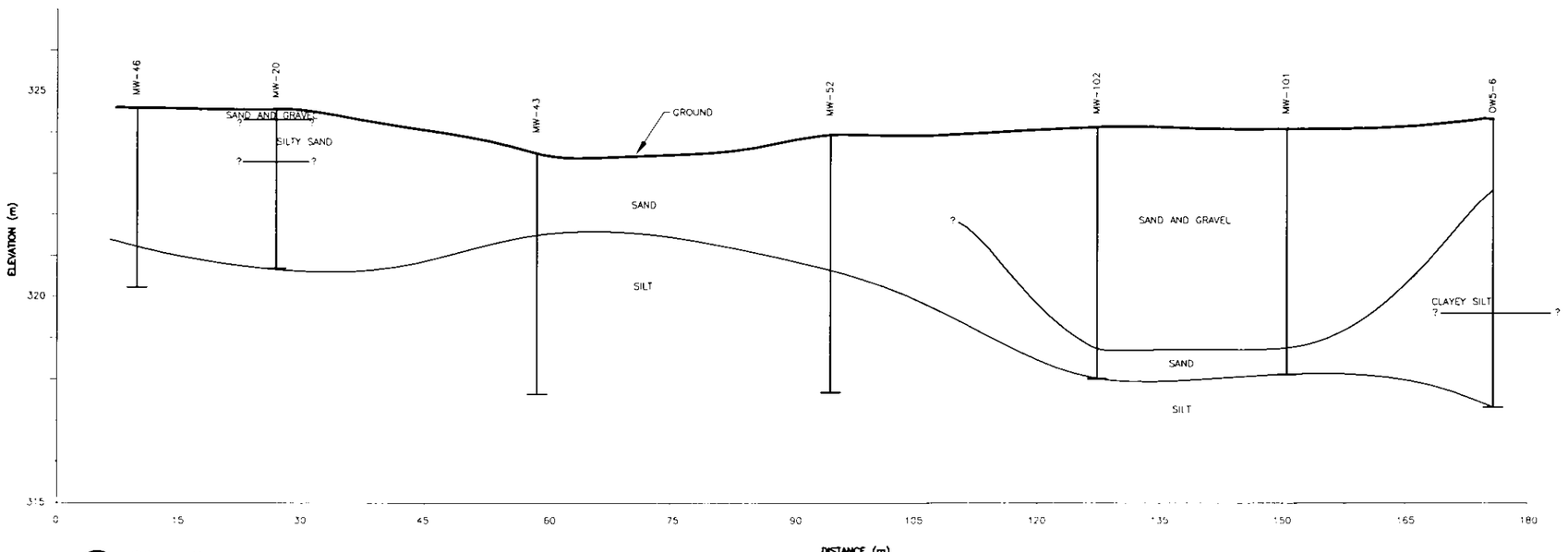


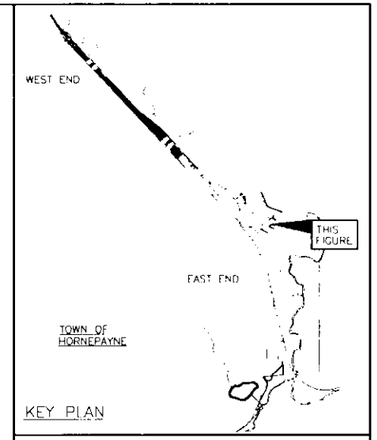
A / D3 SECTION

SECTION A – CROSS SECTION (NORTH TO SOUTH)



B / D3 SECTION

SECTION B – CROSS SECTION (WEST TO EAST)



LEGEND:

MONITORING WELL OFFSET DISTANCE FROM CROSS SECTION A

MW-108 = 0.0m
MW-107 = 7.4m EAST
MW-43 = 16.7m WEST
MW-52 = 10m EAST
MW-104 = 12.6m EAST
OW5-4 = 0.0m
OW5-3 = 0.0m

MONITORING WELL OFFSET DISTANCE FROM CROSS SECTION B:

MW-46 = 0.0m
MW-20 = 3.6m SOUTH
MW-43 = 5.0m NORTH
MW-52 = 11.0m NORTH
MW-102 = 6.6m NORTH
MW-101 = 10.3m SOUTH
OW5-6 = 0.0m

B	13/01/31	ISSUED WITH FINAL REPORT	TG
A	13/01/31	ISSUED WITH MOE DRAFT REPORT	TG
NO.	YY/MM/DD	DESCRIPTION	BY

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2012 REMEDIAL OPERATIONS
PIN# 1000/ONPR/100587
HORNEPAYNE YARD, ON

STRATIGRAPHIC CROSS SECTIONS
LAGOON 2

JANUARY 2013 | FIGURE D4 | B

886000