MORROW ENVIRONMENTAL CONSULTANTS INC.

A DECADE OF SERVICE 10

1997 09 17

Project: C4-140

Imperial Oil Limited
Products and Chemical Division
3535 Research Road NW
Calgary, AB
T2L 2K8

ATTENTION: **Leslie R. Young, P.Eng., Site Remediation Specialist**

REFERENCE: **Confirmatory Soil and Groundwater Sampling**
Former Imperial Oil Limited Service Station
Highway 2 Northbound, Bowden, AB (Location 882527)

As requested by Imperial Oil (IOL), Morrow Environmental Consultants Inc. (MECI) has completed a limited environmental assessment at the former IOL Service Station located at Highway 2, Northbound, Bowden, Alberta (Site). The Site location and Site plan are presented on Drawings C4-140-001 and C4-140-002R1, Appendix V, respectively.

Background information regarding the Site is presented in Attachment 1, enclosed. Previous reports written regarding the Site are summarized as follows:

- Imperial Oil Limited, Former Bowden Service Station, Highway 2 Northbound, Bowden, Alberta, (Location: 882527), Environmental Assessment dated 1995 01 16, (ESA); and

- Site Sensitivity Assessment and Clean-up Criteria, Former Bowden Service Station, Highway 2 Northbound, Bowden, Alberta, (Location: 882527), dated 1995 01 16. The appropriate Alberta Environmental Protection (AEP) Risk Management Criteria (RMC) for the Site was determined to be Level II for coarse-grained soils (inhalation), (Site Sensitivity Assessment).

Remediation at the Site consisted of excavating soils from the 2 areas identified in the ESA (i.e. Excavation 1 and 2) that potentially had residual hydrocarbon concentrations exceeding the AEP Level II RMC. The location of excavation 1 and 2 are presented in Drawing C4-140-002-R1, Appendix V. Excavation 1 was located in the area of the former underground storage tanks. Excavation 2 was located in the area of the former pump islands and is adjacent to the western property line. Soils were excavated and stockpiled on-site for treatment. Confirmatory soil samples were collected and analyzed from the walls and base of the excavations and of the excavated soils. Excavated soils were treated on-site to levels that were less than the AEP Level II RMC for coarse-grained soils (inhalation), as demonstrated by confirmatory analyses. The soils were then re-used as backfill material in the previous excavation areas. The remediation of soils and confirmatory analyses results are summarized in MECI's letter report to IOL dated 1997 02 28.

Also, in our 1997 02 28 letter, MECI identified the potential for residual hydrocarbon impacted soils may exist in the area west of the previous Excavation 2. A confirmatory soil sampling program was conducted off-site on 1997 05 12 in the area west of previous Excavation 2. The off-site investigation was conducted to assess the potential of hydrocarbon impacted soils off-site. In addition, an on-site investigation was also conducted in the area of the previous Excavation 1, southwest of the service station building and from the base of the previous Excavation 2, to further assess the potential for groundwater related impacts. The following short form report summarizes the field work conducted on 1997 05 12, subsequent soil and groundwater analytical results, and discussion related to redevelopment of the Site. The following Tables, Attachments and Appendices are enclosed:

Tables:
1 Soil Chemistry Results
2 Groundwater Chemistry Results

Attachments:
1 Background Information
2 Field Work Methodology
3 Standard Limitations and Consultant Qualifications

Appendices:
I Borehole Logs
II Photographs
III Site Inspection Report
IV Laboratory Analytical Reports
V Drawings

DRILLING INVESTIGATION

Boreholes (BHs) were installed and soil samples were collected on 1997 05 12 on and off-site. The field work methodology is presented in Attachment 2, enclosed. The following summarizes the drilling activities and the results of the soil samples that were collected:

- Five BHs were installed (i.e. BHs 12, 13, 14, 15 and 16). BHs 12, 13 and 16 are located on-site and BHs 14 and 15 are located off-site. The location of the BHs are presented on Drawing C4-140-002-R1, Appendix V, enclosed. The Borehole Logs are presented in Appendix I, enclosed. Field measurements of the combustible vapour concentrations ranged from 15 ppm to 990 ppm. Soil samples were collected of the highest measured combustible vapour concentration from each BH location and analyzed for benzene, toluene, ethylbenzene, xylenes (BTEX) and total petroleum hydrocarbons (TPH) at BHs 12, 13 and 14.

- BHs 12, 13, 15 and 16 were completed as monitoring wells (MWs). BH 14 was backfilled with native material.

- Groundwater samples were collected from monitoring wells (MWs) 8, 12, 13 and 15 on 1997 05 12 and were analyzed for BTEX. MW 12 was analyzed for both BTEX and lead.

Photographs of the intrusive investigation are presented in Appendix II, enclosed.

SOIL AND GROUNDWATER SAMPLING AND ANALYTICAL RESULTS

Soil and groundwater samples were collected on 1997 05 12 by MECI. The Site inspection and groundwater monitoring report are presented in Appendix III, enclosed. Estimated groundwater contours for the Site were based on water level measurements taken on 1997 05 12 and are presented in Drawing C4-140-003, Appendix V. The inferred groundwater flow direction is estimated to be toward the west. It should be noted that a groundwater mound was observed in the area of MW 13, which was previously the location of excavation number 2 and where the 25 mil liner was installed as a precautionary measure.

Analyses of soil and groundwater samples were performed by Philip Analytical Services of Burnaby, BC and are summarized on Tables 1 and 2, respectively. The complete analytical reports are presented in Appendix IV, enclosed. The following discusses the soil and groundwater analytical results:

- Benzene, toluene, ethylbenzene and xylene (BTEX) concentrations in the soil samples analyzed were less than the AEP Level II RMC BTEX concentrations for coarse-grained soils (inhalation). Concentrations of benzene, toluene, and ethylbenzene were less than the laboratory method detection levels of 0.040 mg/kg. Xylene was detected at BHs 12 and 13 each at a concentration of 0.040 mg/kg.

- TPH concentrations in the soil samples analyzed were less than the TPH AEP Level II RMC concentrations of 2,000 mg/kg for coarse-grained soils (inhalation). TPH concentrations in the soil samples were detected at BHs 12, 13 and 14 at concentrations of 1,860, 1,970, and 27 mg/kg, respectively.

- All of the BTEX concentrations in the groundwater samples analyzed were less than the BTEX AEP Level II RMC concentrations for coarse-grained soils (inhalation). Benzene concentrations in the groundwater were detected in MWs 12, 13, and 15 at 0.071, 0.0037, and 0.066 mg/L, respectively. Toluene concentrations in the groundwater were not detected at the laboratory method detection level of 0.0005 mg/L. Ethylbenzene was only detected in MW 15 at a concentration of 0.0007 mg/L but was not detected at the laboratory method detection levels of 0.0005 mg/L in the remaining monitoring wells. Xylene was detected in the groundwater at MWs 12 and 15 at concentrations of 0.103 mg/L and 0.0061 mg/L, respectively. However the remaining monitoring wells did not have xylene concentrations greater than the laboratory detection level of (0.0005 mg/L).

- Lead was not detected at the laboratory method detection level of 0.001 mg/L in the groundwater sample collected from MW 12.

DISCUSSION

Based on the previous remedial activities conducted at the Site and subsequent additional investigation conducted on and off-site, it was determined that all samples collected, which were representative of the current groundwater and soil conditions on and off-site, had hydrocarbon constituents which were less than the AEP Level II RMC for coarse-grained soils (inhalation).

Therefore, no further investigation regarding potential hydrocarbon constituent impacts is warranted at this time. The Site should be suitable for redevelopment with regard to environmental issues.

CLOSURE

This report has been prepared by MECI for the exclusive use of Imperial Oil Limited, subject to the limitations presented in Attachment 3, enclosed.

Prepared by

Peter Dimmell, M.A.Sc., P.Eng.

Reviewed by

Grahame Bensted, CET
Regional Manager

MORROW ENVIRONMENTAL CONSULTANTS INC.

PJD/laa
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Encs.

c.c.: Bob Peverelle, Imperial Oil Limited, Edmonton, AB

MECI Reports:	- Environmental Assessment dated 1995 01 06 - Site Sensitivity Assessment and clean-up criteria dated 1995 01 16
Site Location: *(Drawing C4-140-001)*	Former Bowden Esso Service Station, East of Highway 2, Bowden, Alberta
Legal Description:	SW 1/4 Section 24, Township 34, Range 1, W5M (Formerly Block Plan A, Plan Bowden 3029JK)
Topography:	Ground surface of the Site is flat and generally covered with gravel.
Groundwater Flow:	Based on groundwater elevations measured on 1997 05 12, the inferred groundwater flow direction is estimated to be toward the west. Drawing C4-140-003 presents the estimated groundwater contours.
Previous Site Facilities:	- Former service station building. - Three former underground storage tanks removed during 1994 - Three former pump islands removed during 1994
Adjacent Land Use:	East - agricultural lands South - vacant West - Highway 2 North - vacant, approximately 100 m to the north residence with a potable water well and 200 m to the northeast residence with a potable water well.
Nearest Surface Water:	Lagoon located approximately 50 m southeast
Surficial Geology:	Soil conditions encountered at the Site in descending order generally consisted of sand and gravel underlain by silty clay, silty sand and/or bedrock.
Service Station Age:	Service station operation commenced sometime between 1950 to 1959. The service station terminated operations sometime prior to September, 1994 when 3 underground storage tanks were removed.

Drilling

- The boreholes were drilled using a truck-mounted auger drilling rig, owned and operated by Mobile Augers & Research Limited of Calgary, Alberta. The boreholes were advanced utilizing 150 mm diameter solid stem continuous flight augers.
- As the boreholes were advanced, soil conditions were logged in detail with respect to composition, density, moisture content, and apparent hydrocarbon contamination. Representative soil samples were collected at various depth intervals using a split-spoon sampler or directly from the auger flights, for field screening of soil headspace vapour concentrations and potential laboratory analysis. The augers were pressure washed between boreholes and the split-spoon samples were scrubbed and rinsed between samples to prevent cross-contamination.

Soil Sampling

- The outer surface of split-spoon and auger flight soil samples was scraped off to minimize cross-contamination.
- Soil samples were collected in duplicate. One portion was placed into sealable polyethylene bags for field screening of headspace. The other portion was placed in laboratory prepared containers.
- One sample was field screened for headspace vapour concentrations utilizing a Gastech Tracetechtor, calibrated to a hexane standard. The sample was allowed to warm to ambient temperature for at least 20 minutes, then the combustible gas concentration in the headspace above the soil sample was measured.
- Based on field observations and field screening results, selected samples were stored in an ice-chilled cooler, and delivered to Philip Analytical Services (Philip) located in Burnaby, BC within 24 hours of sample collection.

Monitoring Well Installation

- Monitoring wells were constructed with threaded 50 mm diameter PVC pipe installed in the borehole, with 0.010 mm slotted screen segments of pipe placed across the estimated water-bearing zone and the solid segments of pipe placed to the top of the well. The borehole annulus, surrounding the screened portion of each well, was backfilled with clean silica sand to approximately 0.3 m above the top of the screened interval. Bentonite chips were placed above the sand pack in each hole to reduce surface water infiltration. Metal roadboxes, concreted at grade, were installed at each monitoring well location to protect the installation and permit future access. Monitoring well casing elevations were surveyed relative to an arbitrary datum.

Groundwater Sampling

- Each well was developed to remove fine-grained material from around the well screen and to allow collection of a sample representative of the groundwater in the surrounding formation.
- Approximately three well volumes of water (one well volume is equal to the volume of water in the PVC pipe plus the volume of water in the porespace of the silica sand pack) was removed from each well prior to sampling.
- Groundwater samples were collected using dedicated inertia style pumps. Each sample was immediately placed in the appropriate laboratory-prepared jars and stored in ice-chilled coolers for shipment to Philip within 24 hours of sample collection.

This report has been prepared by Morrow Environmental Consultants Inc. (MECI) for the exclusive use of Imperial Oil Limited who has been party to the development of the scope of work for this project and understands its limitations.

This report is intended to provide information to Imperial Oil Limited to assist it in making business decisions. MECI is not a party to the various considerations underlying the business decisions, and does not make recommendations regarding such business decisions. In providing this report, MECI accepts no liability or responsibility in respect of the site described in this report or for any business decisions relating to the site, including decisions in respect of the purchase, sale or investment in the site.

Any use, reliance on, or decision made by a third party based on this report is the sole responsibility of such third party. MECI accepts no liability or responsibility for any damages that may be suffered or incurred by any third party as a result of the use of, reliance on, or any decision made based on this report.

The findings, conclusions and recommendations in this report have been developed in a manner consistent with the level of skill normally exercised by environmental professionals currently practising under similar conditions in the area. The findings contained in this report are based, in part, upon information provided by others. If any of the information is inaccurate, modifications to the findings, conclusions and recommendations may be necessary.

The findings, conclusions and recommendations presented by MECI in this report reflect MECI's best judgement based on the site conditions at the time of the site inspection on the date(s) set out in this report and on information available at the time of preparation of this report. They have been prepared for specific application to this site and are based, in part, upon visual observation of the site, subsurface investigation at discrete locations and depths, and specific analysis of specific materials as described in this report during a specific time interval. The findings cannot be extended to previous or future site conditions or to portions of the site which were unavailable for direct observation, subsurface locations which were not

AUTHORIZATION

TRACKER SALES LTD
SUITE 6-105-5018-45TH STREET
RED DEER,AB. T4NIK9
PHONE (403) 887-3638

:

TO WHOM IT MAY CONCERN:

Please treat this as your authority to permit Beta Surveys Ltd Red Deer,to make application,on Tracker Sales Ltd behalf for subdivision approval related to Art Marshall's land of legal description: SW 1/4 24-35-1-5 .

Dated June 6,2000

Witness

Tracker Sales Ltd

Sproule
MacNaughton

Barristers and Solicitors

Kevin M. Sproule*
Patricia J. MacNaughton
John A. MacNaughton

Telephone: (403) 340-1600
Fax: (403) 346-3014
e-mail: sproulemacnaughton@home.com

Our File No. J-6096\6097

This fax transmission consists of 1 page and is intended only for the use of the named addressee. The original will:

____ be sent by mail

_XX_ be kept on file

December 13, 2000

Beta Surveys Limited
4605B – 63 Street
Red Deer, Alberta
T4N 7A6

VIA FAX #342-5334

Attention: Brad Sawchuk

Dear Sir:

Re: Subdivision of Block B, Plan 8111118
And Part of SW ¼ 24-34-1-W5th
Tracker Sales Ltd. / Art Marshall

We understand that the above subdivision plan has been forwarded to the County of Red Deer for endorsement and that the County is currently waiting for a condition to be complied with by Mr. Kinder of Tracker Sales Ltd. We would ask that when the endorsement has been completed and documents returned to your office that you do not submit same to Land Titles Office until January, 2001. We have confirmed with both parties that this is satisfactory.

Should you have any questions, please do not hesitate to contact me.

Yours truly,

SPROULE MacNAUGHTON

Per:
John A. MacNaughton

/cml
pc: Tracker Sales Ltd.
Attention: Kent Kinder

pc: Arthur Marshall

*Professional Corporation

BETA SURVEYS LIMITED

PROFESSIONAL LAND SURVEYORS

4605B - 63 Street Red Deer, Alberta T4N 7A6

Phone (403) 342-6203
Fax (403) 342-5334

File: 3315

November 21, 2000

Red Deer County
4758 - 32 Street
RED DEER, Alberta
T4N 0M8

attn: Brenda Hoskin, Development Officer

Dear Brenda:

re: Subdivision of Part of
SW 1/4 Sec 24, Twp 34, Rge 1, W5M
and Consolidation With
Block B, Plan 8111118
Your File: S-024-00

Enclosed please find a print of a plan of subdivision for the above noted, a copy of a Real Property Report showing the location of existing buildings, a diskette containing an Autocad, Version 14 drawing file for the plan of subdivision, the "Subdivision Authority Approval" form and a cheque in the amount of $400.00 for the endorsement fee.

Our client, Mr. Kent Kinder of Tracker Sales Ltd. has indicated that, to the best of his knowledge, the conditions of the subdivision approval have been met.

Please return the endorsed approval form at your earliest convenience.

Yours truly,

Brad Sawchuk, A.L.S.

cc. Tracker Sales Ltd.

APPENDIX I

BOREHOLE LOGS

CLIENT:	DRILLING CONTRACTOR:		PROJECT No.:
IMPERIAL OIL LIMITED	MOBILE AUGERS AND RESEARCH LTD		C4-140
LOCATION:	**DRILLING METHOD:**	**DIAMETER:**	**BOREHOLE No.:**
EAST OF HWY 2, BOWDEN, AB	SOLID STEM AUGER	150 mm	12

SAMPLE TYPE: CORE | SPLIT SPOON | SHELBY | DISTURBED | NO RECOVERY

ELEV. – DEPTH (m)	SOIL DESCRIPTION	STRATIGRAPHY PLOT	SAMPLE TYPE	SAMPLE NUMBER	SOIL VAPOUR CONCENTRATION (ppm) 10 100 1000 10000	WATER LEVEL	MONITORING WELL INSTALLATION
0	**GRAVEL**						
	SAND – fine-grained, silty, some clay and gravel, loose to compact, brown to black, trace wood and plastic, moist			12-1	▲		
1				12-2	▲		
	– slight silt increase			12-3	▲		
2	**CLAY** – silty, sandy, trace gravel, soft medium plasticity, grey/black, moist			12-4	▲		
3	**SAND** – clayey, silty, loose, grey, moist			12-5	▲		
	– brown/grey						
4	– dense, wet-saturated, trace organics			12-6	▲		
				12-7	▲		
5	– grey, friable, and silt			12-8	▲		
6				12-9	▲		
	End of hole at 6.85m						
7							
8							
9							

LEGEND
- road box
- 50 mm ø PVC pipe
- 50 mm ø slotted PVC pipe
- bentonite seal
- clean silica sand backfill
- concrete seal

MORROW ENVIRONMENTAL CONSULTANTS INC.

GROUND SURFACE ELEVATION (m):	DATE DRILLED:
99.360	97 05 12
TOP OF CASING ELEVATION (m):	**LOGGED BY:**
99.259	TJR

SHEET 1 OF 1

CLIENT:	DRILLING CONTRACTOR:	PROJECT No.:
IMPERIAL OIL LIMITED	MOBILE AUGERS AND RESEARCH LTD	04-140
LOCATION:	**DRILLING METHOD:** / **DIAMETER:**	**BOREHOLE No.:**
EAST OF HWY 2, BOWDEN, AB	SOLID STEM AUGER / 150 mm	13

SAMPLE TYPE: CORE | SPLIT SPOON | SHELBY | DISTURBED | NO RECOVERY

ELEV. – DEPTH (m)	SOIL DESCRIPTION	STRATIGRAPHY PLOT	SAMPLE TYPE	SAMPLE NUMBER	SOIL VAPOUR CONCENTRATION (ppm) 10 100 1000 10000	WATER LEVEL	MONITORING WELL INSTALLATION
0	**GRAVEL**						
	SAND – silty, some clay and gravel, loose to compact, dark brown, moist			13-1	▲		
1				13-2	▲		
	SAND AND CLAY – silty, some clay and gravel, loose to compact, dark brown, moist			13-3	▲		
2				13-4	▲		
3				13-5	▲		
	SAND – dense, brown, moist						
4	**CLAY** – clay, silty, some sand very stiff, low plasticity, blocky, laminated, brown, dry			13-6	▲		
	BEDROCK – weathered sandstone			13-7	▲		
5	End of hole at 5.33m						
6							
7							
8							
9							

LEGEND
- road box
- 50 mm ø PVC pipe
- 50 mm ø slotted PVC pipe
- bentonite seal
- clean silica sand backfill
- concrete seal

MORROW ENVIRONMENTAL CONSULTANTS INC.

GROUND SURFACE ELEVATION (m):	DATE DRILLED:
99.538	97 05 12
TOP OF CASING ELEVATION (m):	**LOGGED BY:**
99.443	TJR

SHEET 1 OF 1

CLIENT:	DRILLING CONTRACTOR:		PROJECT No.:
IMPERIAL OIL LIMITED	MOBILE AUGERS AND RESEARCH LTD		C4-140
LOCATION:	**DRILLING METHOD:**	**DIAMETER:**	**BOREHOLE No.:**
EAST OF HWY 2, BOWDEN, AB	SOLID STEM AUGER	150 mm	14

SAMPLE TYPE: CORE | SPLIT SPOON | SHELBY | DISTURBED | NO RECOVERY

ELEV. – DEPTH (m)	SOIL DESCRIPTION	STRATIGRAPHY PLOT	SAMPLE TYPE	SAMPLE NUMBER	SOIL VAPOUR CONCENTRATION (ppm) 10 100 1000 10000	WATER LEVEL	MONITORING WELL INSTALLATION
0	**GRAVEL**			14-1	▲		NO MONITORING WELL
	SAND AND GRAVEL – loose to compact, trace clay, dark brown, moist						
1	**SAND** – loose to compact, trace silt and clay, light brown, moist			14-2	▲		
	CLAY – some silt, soft, medium-high plasticity, black, wet			14-3	▲		
2	– increased silt, brown						
	– 0.5ft. thick sand layer			14-4	▲		
	– black inclusions, wet-saturated						
3				14-5	▲		
	– yellow/brown/black organics			14-6	▲		
	BEDROCK – sandstone, weathered, light brown			14-7	▲		
4							
5				14-8	▲		
	End of hole at 5.33m						
6							
7							
8							
9							

MORROW ENVIRONMENTAL CONSULTANTS INC.

GROUND SURFACE ELEVATION (m):	DATE DRILLED:
99.421	97 05 12
TOP OF CASING ELEVATION (m):	**LOGGED BY:**
–	TJR

CLIENT:	DRILLING CONTRACTOR:		PROJECT No.:
IMPERIAL OIL LIMITED	MOBILE AUGERS AND RESEARCH LTD		C4-140
LOCATION:	**DRILLING METHOD:**	**DIAMETER:**	**BOREHOLE No.:**
EAST OF HWY 2, BOWDEN, AB	SOLID STEM AUGER	150 mm	15

SAMPLE TYPE: CORE | SPLIT SPOON | SHELBY | DISTURBED | NO RECOVERY

ELEV. – DEPTH (m)	SOIL DESCRIPTION	STRATIGRAPHY PLOT	SAMPLE TYPE	SAMPLE NUMBER	SOIL VAPOUR CONCENTRATION (ppm) 10 100 1000 10000	WATER LEVEL	MONITORING WELL INSTALLATION
0	**GRAVEL**						
	SAND AND GRAVEL – loose to compact, trace clay, dark brown, moist			15-1	▲		
1	**SAND** – fine grained, silty, some clay, compact, brown, moist			15-2	▲		
	CLAY – silty, trace sand and gravel, firm, low to medium plasticity, black, moist			15-3	▲		
2	– grey/brown, low plasticity						
	– 0.2m thick saturated sand			15-4	▲		
	– stiff clay, sandy						
3				15-5	▲		
	– black organics, trace yellow			15-6	▲		
	BEDROCK – weathered sandstone			15-7	▲		
4							
5				15-8	▲		
	End of hole at 5.33						
6							
7							
8							
9							

LEGEND
- road box
- 50 mm ø PVC pipe
- 50 mm ø slotted PVC pipe
- bentonite seal
- clean silica sand backfill
- concrete seal
- sloughed sand

MORROW ENVIRONMENTAL CONSULTANTS INC.

GROUND SURFACE ELEVATION (m):	DATE DRILLED:
99.432	97 05 12
TOP OF CASING ELEVATION (m):	**LOGGED BY:**
99.420	TJR

SHEET 1 OF 1

CLIENT:	DRILLING CONTRACTOR:		PROJECT No.:
IMPERIAL OIL LIMITED	MOBILE AUGERS AND RESEARCH LTD		C4-140
LOCATION:	**DRILLING METHOD:**	**DIAMETER:**	**BOREHOLE No.:**
EAST OF HWY 2, BOWDEN, AB	SOLID STEM AUGER	150 mm	16

SAMPLE TYPE: CORE | SPLIT SPOON | SHELBY | DISTURBED | NO RECOVERY

ELEV. – DEPTH (m)	SOIL DESCRIPTION	STRATIGRAPHY PLOT	SAMPLE TYPE	SAMPLE NUMBER	SOIL VAPOUR CONCENTRATION (ppm) 10 100 1000 10000	WATER LEVEL	MONITORING WELL INSTALLATION
0	**ASPHALT**						
	SAND AND GRAVEL – loose to compact, brown, moist			16-1	▲		
1	**SILT** – clayey, trace sand, soft, low plasticity, grey, moist			16-2	▲		
	SAND – very fine grained, silty, some clay, brown/grey, moist			16-3	▲		
2	**BEDROCK** – weathered sandstone			16-4	▲		
	SAND – very fine grained, silty, some clay, brown, moist			16-5	▲		
3	**BEDROCK**– weathered sandstone			16-6	▲		
4	End of hole at 3.96m						
5							
6							
7							
8							
9							

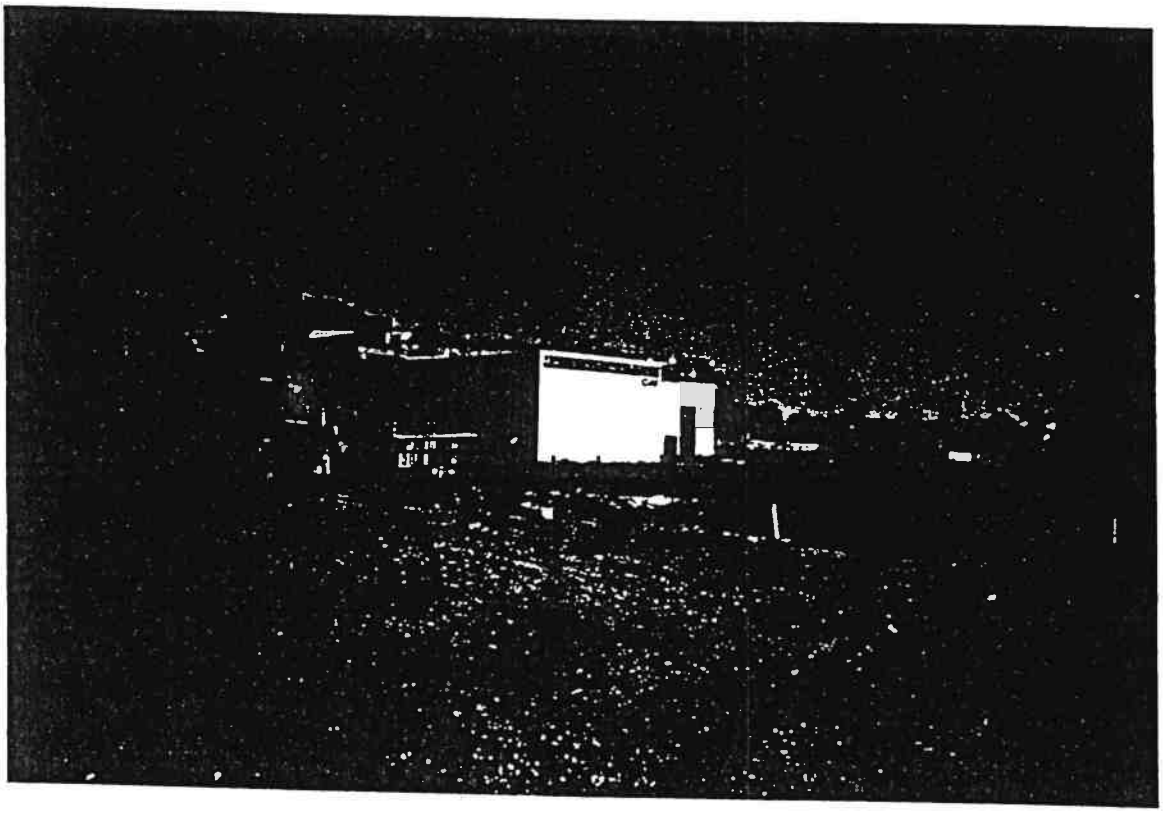
LEGEND
- road box
- 50 mm ø PVC pipe
- 50 mm ø slotted PVC pipe
- bentonite seal
- clean silica sand backfill
- concrete seal

MORROW ENVIRONMENTAL CONSULTANTS INC.

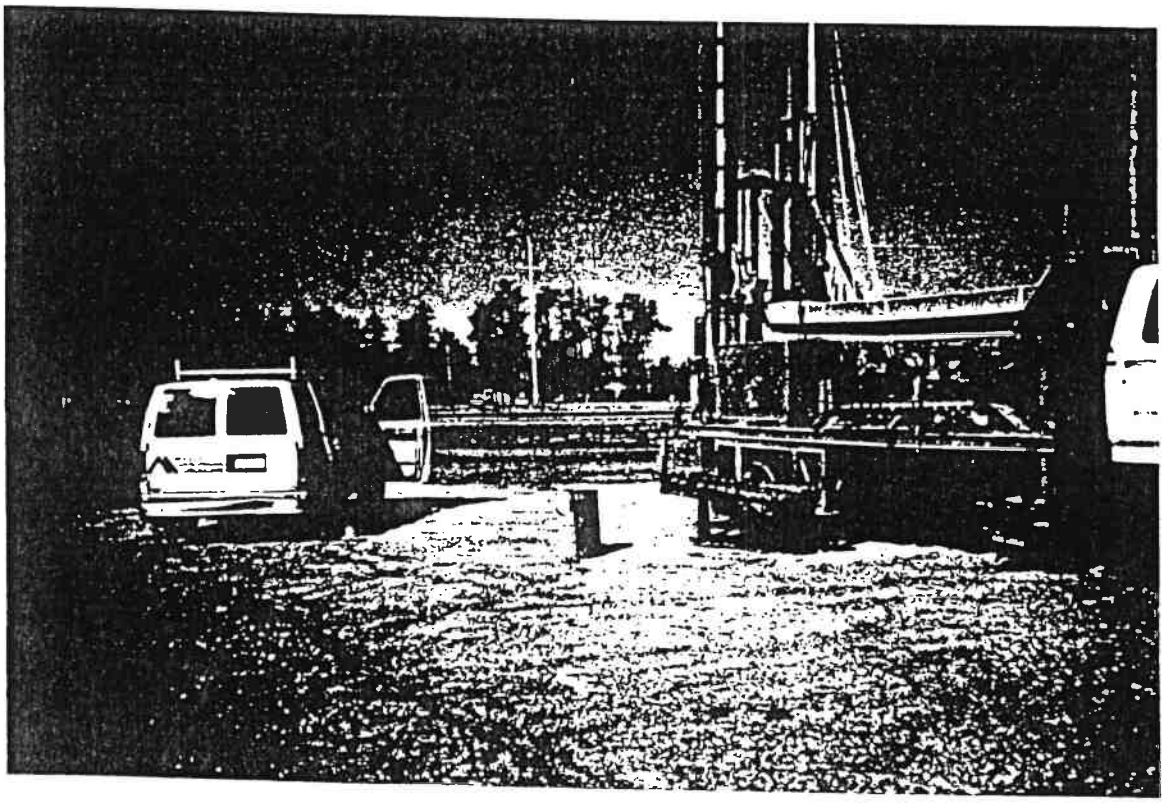
GROUND SURFACE ELEVATION (m):	DATE DRILLED:
99.834	97 05 12
TOP OF CASING ELEVATION (m):	**LOGGED BY:**
100.401	TJR

APPENDIX II

PHOTOGRAPHS



Photograph 1: View to north setting up drilling of BH 12. Excavation area #1 and MW 6 in foreground.



Photograph 2: View to west drilling MW 13, mid excavation area #2.

investigated directly, or materials or analysis which were not specified. Substances other than those described may exist within the site, reported substance parameters may exist in areas of the site not investigated, and concentrations of substances greater than those reported may exist between sample locations.

If site conditions change or if any additional information becomes available at a future date, modifications to the findings, conclusions and recommendations may be necessary.

APPENDIX III

SITE INSPECTION REPORT

INSPECTION REPORT

Project No.: C4-140

Client: **Imperial Oil Limited**
Project: **Bowden Service Station**
Highway 2, Bowden, AB

Loc. No: 882527

Date: 1997 05 12
Time: 15:30
Observer: TJR
Conditions: 25°C, Windy

Monitoring Well Number	Reference Elevation[1] (m)	Depth to LHC[2] (m)	Apparent LHC Thickness (mm)	Depth to Water (m)	Relative Groundwater Elevations[3] (m)	Combustible Gas Conc. (ppm)	Comments
6	99.788	-	0	2.068	97.720	55	
8	100.632	-	0	2.938	97.694	<10	Sampled for BTEX
12	99.259	-	0	1.583	97.676	350	Sampled for BTEX, Pb
13	99.443	-	0	0.801	98.642	420	Sampled for BTEX
15	99.420	-	0	1.998	97.422	75	Sampled for BTEX
16	100.401			2.727	97.674	80	Sampled for BTEX

Notes:

1 All elevations are referenced from an arbitrary datum.
2 Depth to liquid hydrocarbon (LHC) and depth to water are referenced from the top of casing.
3 If hydrocarbon accumulations are present, the groundwater elevation is corrected using an estimated fuel density of 0.8.

Morrow Environmental Consultants Inc.
Prepared by: L. Aksenchuk

P:\C4140\monitor\SIC4140.xls

Table 1: Soil Chemistry Results
Collected on 1997 05 12

Borehole	12	13	14	Risk Management Criteria for Coarse-Grained Soil[1]		
Sample I.D.	12-5	13-3	14-6	Vapour Inhalation Pathway		
Depth (m)	3.1-3.4	1.5-1.7	3.4-3.5			
CVC (ppm)	990	400	495	I	II	III
Benzene	<0.04	<0.04	<0.04	0.04	0.3	1.6
Toluene	<0.04	<0.04	<0.04	10	60	320
Ethylbenzene	0.10	<0.04	<0.04	70	400	400
Xylene (m,p)	0.04	<0.03	<0.03	-	-	-
Xylene (o)	<0.03	0.04	<0.03	-	-	-
Total Xylene	0.04	0.04	<0.03	25	130	130
TVH	360	170	<10	-	-	-
TEH	1,500	1,800	27	-	-	-
TPH[2]	1,860	1,970	27	1,000	2,000	5,000

Notes:
All results and criteria expressed in milligrams per kilogram (ppm), dry weight
< = Less than detection limit indicated
CVC = Combustible Vapour Concentrations
TVH = Total Volatile Hydrocarbons (Total Purgeable Hydrocarbons) (C_3 to C_9)
TEH = Total Extractable Hydrocarbons (C_{10} to C_{30})

[1] - Coarse-Grained Soil defined as soil having a median grain size (D_{50}) greater than 75 microns (µm), based on Alberta Environmental Protection, draft 1994, "Remediation Guidelines for Petroleum Storage Tank Sites"
[2] - TPH = Total Petroleum Hydrocarbons, calculated by adding total purgeable hydrocarbons plus total extractable hydrocarbons (C_3 to C_{30})

Table 2: Groundwater Chemistry Results
Collected on 1997 05 12

Monitoring Well No.	8	12	13	15	Risk Management Criteria for Coarse-Grained Soil[1] Vapour Inhalation Pathway I	II	III
Benzene	<0.0005	0.071	0.0037	0.066	0.3	1.6	7.5
Toluene	<0.0005	<0.005	<0.0005	<0.0044	15	90	430
Ethylbenzene	<0.0005	<0.005	<0.0005	0.0007	30	30	30
Xylene (m,p)	<0.0005	0.036	<0.0005	0.0042	-	-	-
Xylene (o)	<0.0005	0.067	<0.0005	0.0019	-	-	-
Total Xylene	<0.0005	0.103	<0.0005	0.0061	50	50	50
Lead	-	<0.001	-	-	-	-	-

Notes:
All results and criteria expressed in milligrams per litre (ppm)

[1] - Coarse-Grained Soil defined as soil having a median grain size (D_{50}) greater than 75 microns (µm), based on Alberta Environmental Protection, draft 1994 "Remediation Guidelines for Petroleum Storage Tank Sites"

APPENDIX IV

LABORATORY ANALYTICAL REPORTS

PHILIP
ANALYTICAL SERVICES

8577 Commerce Court
Burnaby, B.C.
Canada V5A 4N5
Tel 604 444 4808
Fax 604 444 4511

Certificate of Analysis

Reported To :

MORROW ENVIRONMENTAL CONSULTANTS Client Code 5K

UNIT 5, 6125-12th ST. SE
CALGARY, AB
T2H 2K1

Attention : T.RITTALER
Phone : (403) 253-4333
FAX : (403) 253-1975

Project Information :

Project ID : C4-140
Submitted By : T.RITTALER

Requisition Forms :

Form 06128689 logged on 15-May-97 completed on 29-May-97

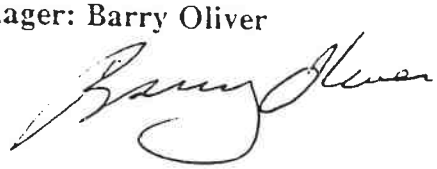
Remarks :

- All organic data is blank corrected except for PCDD/F, Hi-res MS and CLP volatile analyses
- 'MDC' = Minimum Detectable Concentration, '<' = Less than MDC, '---' = Not analyzed
- Solids results are based on dry weight except Biota Analyses & Special Waste Oil & Grease
- Organic analyses are not corrected for extraction recovery standards except for Isotope Dilution methods. (i.e. CARB 429 PAH, all PCDD/F and DBD/DBF analyses)
- All Groundwater samples are decanted and/or filtered prior to analysis

Methods used by Philip are based upon those found in 'Standard Methods for the Examination of Water and Wastewater', 18th Edition, published by the American Public Health Association, or on US EPA protocols found in the 'Test Methods For Evaluating Solid Waste, Physical/Chemical Method, SW846', 3rd Edition. Other procedures are based on methodologies accepted by the appropriate regulatory agency. Methodology briefs are available by written request.

All work recorded herein has been done in accordance with normal professional standards using accepted testing methodologies, quality assurance and quality control procedures except where otherwise agreed to by the client and testing company in writing. Any and all use of these test results shall be limited to the actual cost of the pertinent analysis done. There is no other warranty expressed or implied.
Your samples will be retained at Philip for a period of 30 days from receipt of data or as per contract.

PHILIP Project Manager: Barry Oliver



PHILIP
ANALYTICAL SERVICES

29-May-97

ANALYTICAL REPORT
Form 06128689

Client : MORROW ENVIRONMENTAL CONSULTANTS
Project : C4-140

Sparcode	Parameter	Unit	MDC	Philip ID: 97011451 / Client ID: 12-3	METHOD BLANK	97011452 / 12-5	97011452 / Duplicate	97011453 / 12-7	97011454 / 13-3
PHYSICAL									
00250760	Moisture	%(W/W)	0.1	---	---	12.6	---	---	13.2
HYDROCARBONS									
H108PT12	Purgeable Hydrocarbons	ug/g	10	---	n/a	360	---	---	170
EX024020	Extraction TEH	date		---		970523		---	970523
H109P108	TEH (C10 - C30)	ug/g	5	---	< 5	1500	1500	---	1800
H111P108	TEH Heavy Oil (>C30)	ug/g	5	---	< 5	< 5	< 5	---	69
H107CALC	VPH (BC Guidelines)	ug/g		---		360		---	170
H910CALC	TPH (Alta MUST)	ug/g		---		1900		---	1900
VOLATILE ORGANICS									
EX014000	Extraction:MeOH BTEX	date		---		970516		---	970516
B020PT12	Benzene	ug/g	0.04	---	< 0.04	< 0.04	---	---	< 0.04
T001PT12	Toluene	ug/g	0.04	---	< 0.04	< 0.04	---	---	< 0.04
B021PT12	Ethylbenzene	ug/g	0.04	---	< 0.04	0.10	---	---	< 0.04
X003PT12	m,p - Xylene	ug/g	0.03	---	0.04	0.10	---	---	< 0.03
X002PT12	o - Xylene	ug/g	0.03	---	< 0.03	0.10	---	---	0.04
SURROGATE RECOVERY									
VS03PT12	d8-Toluene	%	0	---	97	96	---	---	101
	Matrix :			Soil		Soil		Soil	Soil
	Sampled on:			97/05/12		97/05/12		97/05/12	97/05/12

PHILIP
ANALYTICAL SERVICES

29-May-97

ANALYTICAL REPORT
Form 06128689

Client : MORROW ENVIRONMENTAL CONSULTANTS
Project : C4-140

Sparcode	Parameter	Unit	MDC	Philip ID :	97011455	97011456	97011457	97011458
				Client ID :	14-2	14-6	15-5	16-3
PHYSICAL								
00250760	Moisture	%(W/W)	0.1		---	19.0	---	---
HYDROCARBONS								
H108PT12	Purgeable Hydrocarbons	ug/g	10		---	< 10	---	---
EX024020	Extraction TEH	date			---	970523	---	---
H109P108	TEH (C10 - C30)	ug/g	5		---	27	---	---
H111P108	TEH Heavy Oil (>C30)	ug/g	5		---	38	---	---
H107CALC	VPH (BC Guidelines)	ug/g			---	< 10	---	---
H910CALC	TPH (Alta MUST)	ug/g			---	27	---	---
VOLATILE ORGANICS								
EX014000	Extraction:MeOH BTEX	date			---	970516	---	---
B020PT12	Benzene	ug/g	0.04		---	< 0.04	---	---
T001PT12	Toluene	ug/g	0.04		---	< 0.04	---	---
B021PT12	Ethylbenzene	ug/g	0.04		---	< 0.04	---	---
X003PT12	m,p - Xylene	ug/g	0.03		---	< 0.03	---	---
X002PT12	o - Xylene	ug/g	0.03		---	< 0.03	---	---
SURROGATE RECOVERY								
VS03PT12	d8-Toluene	%	0		---	95	---	---
				Matrix :	Soil	Soil	Soil	Soil
				Sampled on:	97/05/12	97/05/12	97/05/12	97/05/12

PHILIP
ANALYTICAL SERVICES

29-May-97

SPIKE SUMMARY
Form 06128689

Parameter	Client ID	Philip ID	Sample Conc.	Sample & Spike Conc.	Spike Amount	Unit	Percent Recovery
Benzene	Blank Spike. Batch :	74501390	< 0.04	20	20	ug/g	100
Toluene	Blank Spike. Batch :	74501390	< 0.04	20	20	ug/g	101
Ethylbenzene	Blank Spike. Batch :	74501390	< 0.04	20	20	ug/g	99
m,p - Xylene	Blank Spike. Batch :	74501390	0.04	39	40	ug/g	97
o - Xylene	Blank Spike. Batch :	74501390	< 0.03	20	20	ug/g	98
TEH (C10 - C30)	12-5	97011452	1500	2400	500	ug/g	175
TEH (C10 - C30)	Blank Spike. Batch :	74501347	< 5	91	100	ug/g	91

PHILIP
ANALYTICAL SERVICES

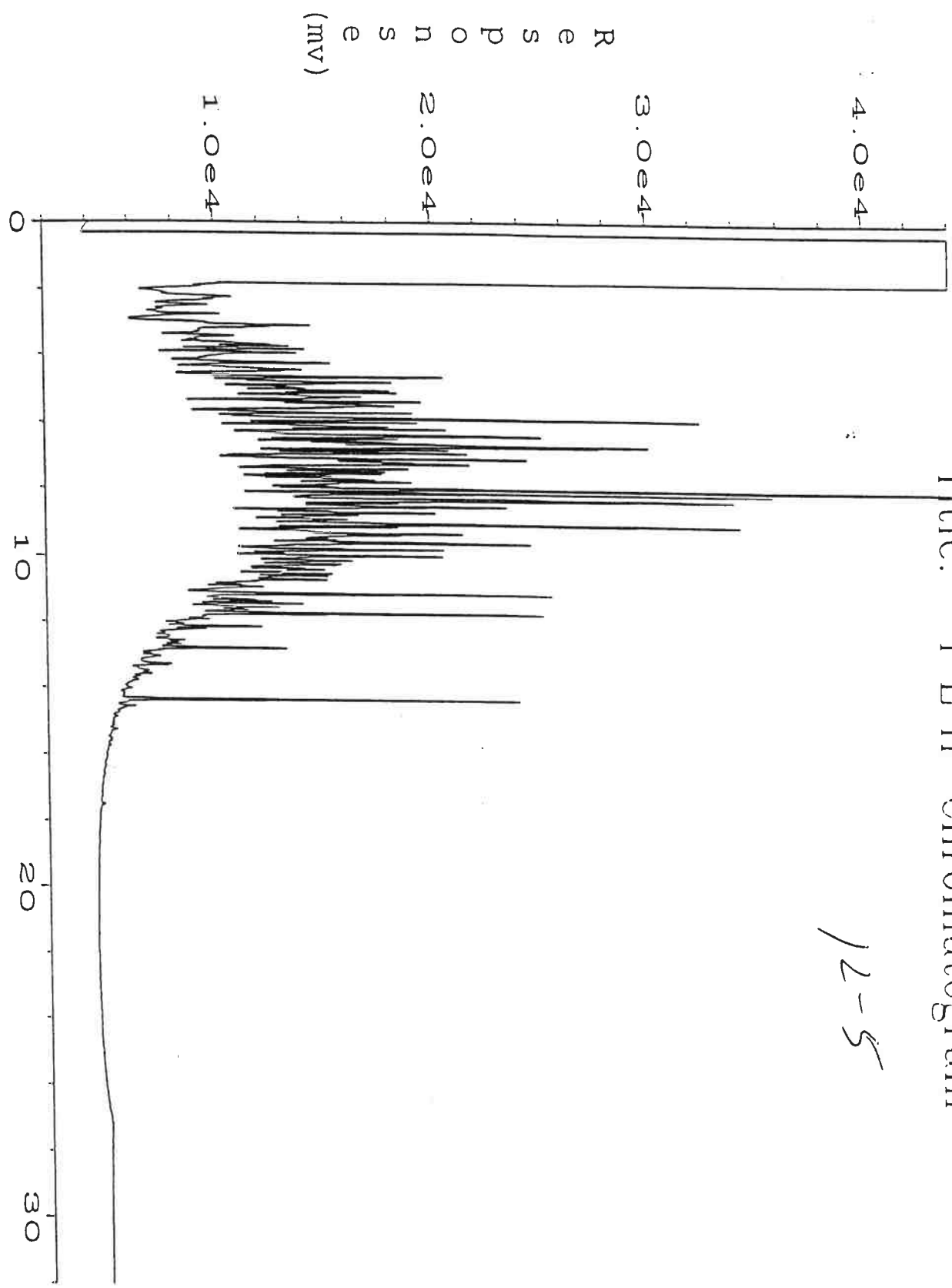
ANALYSIS DATES
Form 06128689

		Philip ID:	97011451	97011452	97011453	97011454
		Client ID:	12-3	12-5	12-7	13-3
00250760	Moisture		---	16-MAY-1997	---	16-MAY-1997
TEHS	TEH SOILS		---	23-MAY-1997	---	23-MAY-1997
PKG-BT18	BTEX by P&T		---	27-MAY-1997	---	27-MAY-1997
		Matrix:	Soil	Soil	Soil	Soil
		Sampled on:	12-MAY-1997	12-MAY-1997	12-MAY-1997	12-MAY-1997

PHILIP
ANALYTICAL SERVICES

ANALYSIS DATES
Form 06128689

		Philip ID:	97011455	97011456	97011457	97011458
		Client ID:	14-2	14-6	15-5	16-3
00250760	Moisture		---	16-MAY-1997	---	---
TEHS	TEH SOILS		---	23-MAY-1997	---	---
PKG-BT18	BTEX by P&T		---	27-MAY-1997	---	---
		Matrix:	Soil	Soil	Soil	Soil
		Sampled on:	12-MAY-1997	12-MAY-1997	12-MAY-1997	12-MAY-1997

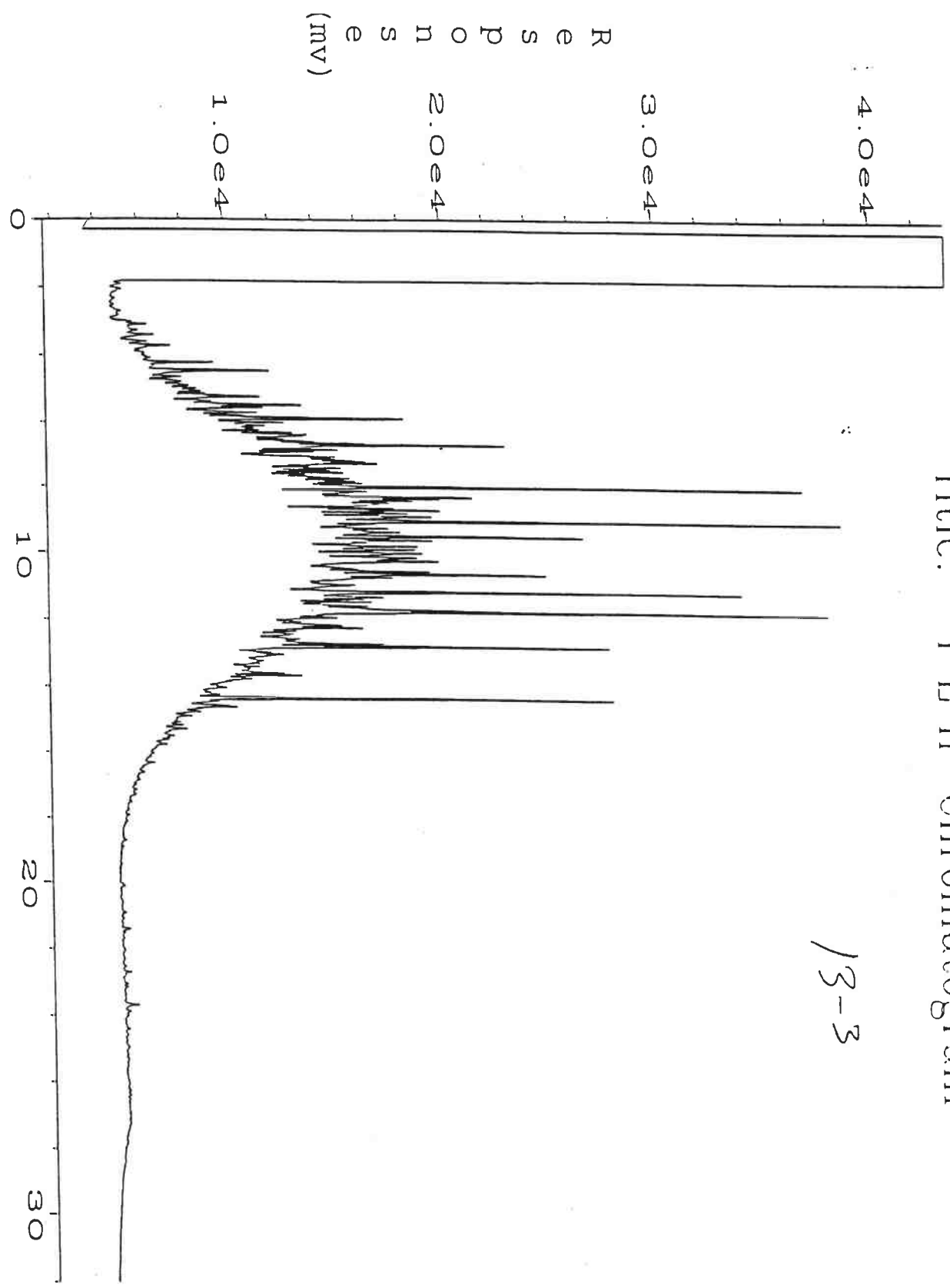


Title: T E H Chromatogram

12-5

Data File Name : C:\HPCHEM\1\DATA\TEH0523\024F0901.D
Operator : AC
Instrument : LEFT GC
Sample Name : 97011452
Run Time Bar Code:
Acquired on : 24 May 97 11:45 AM
Report Created on: 28 May 97 02:23 PM

Page Number : 1
Vial Number : 24
Injection Number : 1
Sequence Line : 9
Instrument Method: TEHSL-D.MTH
Analysis Method : TEHSL-D.MTH



Title: T E H Chromatogram

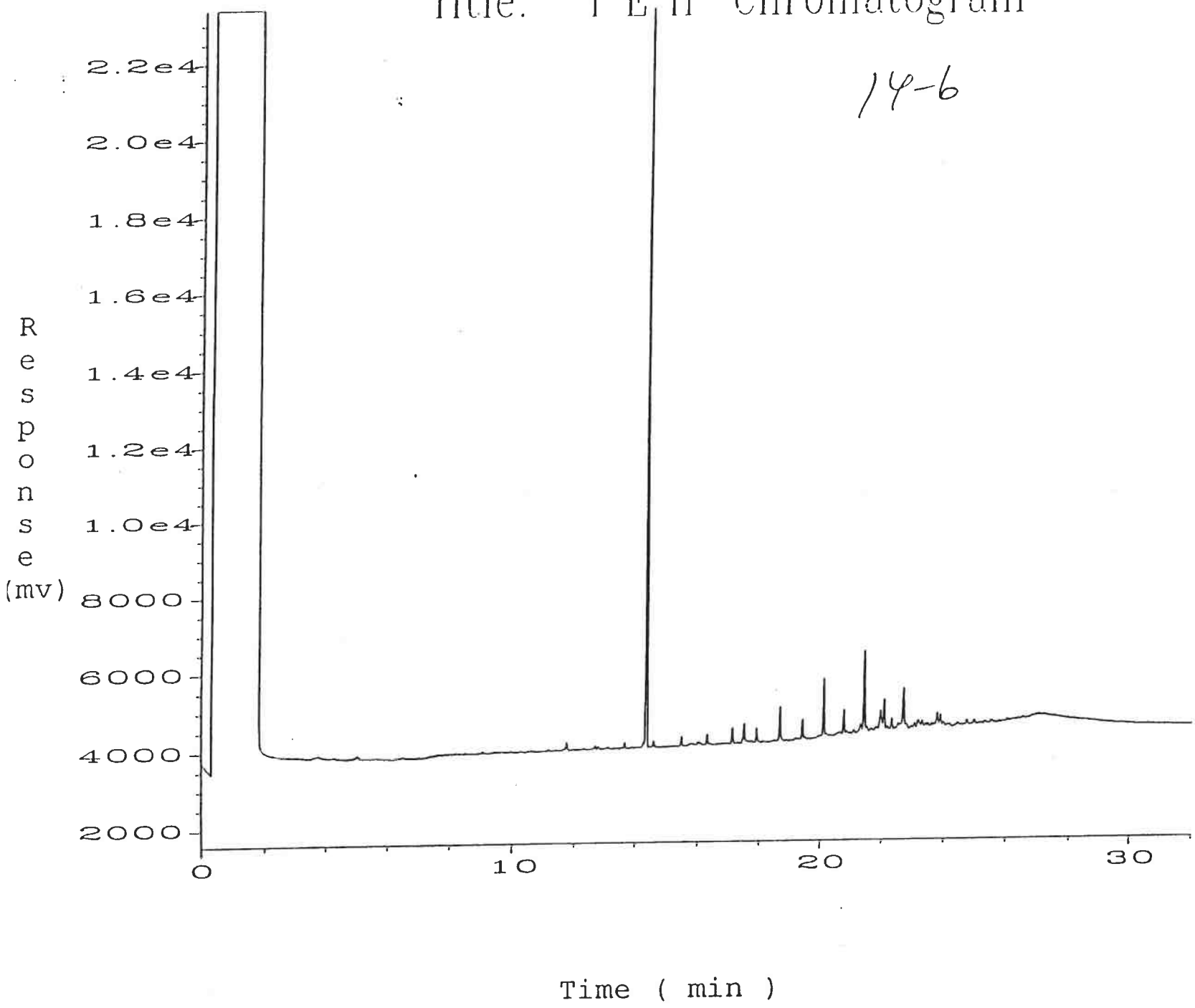
/3-3

Data File Name : C:\HPCHEM\1\DATA\TEH0523\029F0901.D
Operator : AC
Instrument : LEFT GC
Sample Name : 97011454
Run Time Bar Code:
Acquired on : 24 May 97 03:19 PM
Report Created on: 28 May 97 02:23 PM

Page Number : 1
Vial Number : 29
Injection Number : 1
Sequence Line : 9
Instrument Method: TEHSL-D.MTH
Analysis Method : TEHSL-D.MTH

Title: T E H Chromalogram

14-6



Data File Name : C:\HPCHEM\1\DATA\TEH0523\030F0901.D
Operator : AC
Instrument : LEFT GC
Sample Name : 97011456
Run Time Bar Code:
Acquired on : 24 May 97 04:02 PM
Report Created on: 28 May 97 02:23 PM

Page Number : 1
Vial Number : 30
Injection Number : 1
Sequence Line : 9
Instrument Method: TEHSL-D.MTH
Analysis Method : TEHSL-D.MTH

PHILIP ENVIRONMENTAL SERVICES

8577 Commerce Court
Burnaby, B.C. V5A 4N5

Phone: (604) 444-4808
Fax: (604) 444-4511
Toll Free: 1-800-440-4808

ESSO/PHILIP

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

0120009

COMPANY NAME:	PH #: 403-253-4333
MECI	FAX #: 403-253-1975
COMPANY ADDRESS:	CLIENT PROJECT ID: (#)
UNIT 5-6125 12A ST SE CALGARY, AB T2P 2B3	CA-140
SAMPLER NAME (PRINT):	PROJECT MANAGER:
T. RITTALER	T. RITTALER

ANALYSIS REQUEST

FIELD SAMPLE ID	ZENON LAB # (Lab Use Only)	MATRIX: GROUND WATER	MATRIX: SURFACE WATER	MATRIX: SOIL	MATRIX: OTHER	# CONTAINERS	SAMPLING: DATE	SAMPLING: TIME	HEADSPACE VAPOUR	BTEX/LH & TEH	BTEX/VPH/LEPH/HEPH	BTEX LH	BTEX/VPH	TEH	EPH	LEPH/HEPH	PAH'S	LEAD	PHENOLS BY 4AAP	FLASHPOINT	PCB'S	PHENOLS BY GC/MS	VOLATILE ORGANICS (VOC's)	SIMULATED DISTILLATION (GC SCAN)	TOTAL OIL & GREASE	MINERAL OIL & GREASE	ICAP METALS TOTAL	ICAP METALS DISSOLVED	LOW LEVEL As & Se TOTAL	LOW LEVEL As & Se DISSOLVED	MERCURY TOTAL	MERCURY DISSOLVED	TOTALS METALS LEVEL	DISSOLVED METALS LEVEL	NITRATE	NITRITE	AMMONIA	CHLORIDE	FLUORIDE	SULPHATE	TOTAL SUSPENDED SOLIDS (NFR)	CYANIDE SAD	WAD	LEACHABLE LEAD (AA)	(TCLP)	LEACHABLE BTEX (AA)	(TCLP)	DRINKING WATER QUALITY PACKAGE
										✓ BTEX/VPH & EPH																																							
12-3	11451			✓		2	970512		275	HOLD																																					
12-5	11452			✓		2	970512		990	✓																																					
12-7	11453			✓		2	970512		225	HOLD																																					
13-3	11454			✓		2	970512		400	✓																																					
14-2	11455			✓		2	970512		190	HOLD																																					
14-6	11456			✓		2	970512		495	✓																																					
15-5	11457			✓		2	970512		195	HOLD																																					
16-3	11458			✓		2	970512		70	HOLD																																					
8	11459	✓				3	970512					✓																																			
12	11460	✓				4	970512					✓						✓																												
13	11461	✓				3	970512					✓																																			
15	11462	✓				3	970512					✓																																			

TAT

- Regular (10 Days) ☑
- Rush (5 Days) ☐
- Urgent (2 Days) ☐
- Other (Days) ☐

Non Regular TATS require Esso Approval

ESSO SITE LOCATION: 882527

PHILIP COMMITMENT ID: 25290-751-000

ESSO CONTACT: L. YOUNG

SPECIAL DETECTION LIMITS / CONTAMINANT TYPE

AB - AEP Level I RMC

SPECIAL REPORTING OR BILLING INSTRUCTIONS

EDT ☐

LAB USE ONLY

CLIENT CODE ____

ADDRESS CODE ____

PROJECT MANAGER ____

LAB INFORMATION

May 30 ✓

CUSTODY RECORD

	DATE	TIME	
RELINQUISHED BY SAMPLER:	97 05 13	9:45 AM	RECEIVED BY:
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
RELINQUISHED BY:	DATE	TIME	RECEIVED BY LABORATORY:

PHILIP
ANALYTICAL SERVICES

8577 Commerce Court
Burnaby, B.C.
Canada V5A 4N5
Tel 604 444 4808
Fax 604 444 4511

Certificate of Analysis

Reported To :

MORROW ENVIRONMENTAL CONSULTANTS Client Code 5K

UNIT 5, 6125-12th ST. SE
CALGARY, AB
T2H 2K1

Attention : T.RITTALER
Phone : (403) 253-4333
FAX : (403) 253-1975

Project Information :

Project ID : C4-140
Submitted By : T.RITTALER

Requisition Forms :

Form 61286891 logged on 15-May-97 completed on 25-May-97

Remarks :

- All organic data is blank corrected except for PCDD/F, Hi-res MS and CLP volatile analyses
- 'MDC' = Minimum Detectable Concentration, '<' = Less than MDC, '---' = Not analyzed
- Solids results are based on dry weight except Biota Analyses & Special Waste Oil & Grease
- Organic analyses are not corrected for extraction recovery standards except for Isotope Dilution methods, (i.e. CARB 429 PAH, all PCDD/F and DBD/DBF analyses)
- All Groundwater samples are decanted and/or filtered prior to analysis

Methods used by Philip are based upon those found in 'Standard Methods for the Examination of Water and Wastewater', 18th Edition, published by the American Public Health Association, or on US EPA protocols found in the 'Test Methods For Evaluating Solid Waste, Physical/Chemical Method, SW846', 3rd Edition. Other procedures are based on methodologies accepted by the appropriate regulatory agency. Methodology briefs are available by written request.

All work recorded herein has been done in accordance with normal professional standards using accepted testing methodologies, quality assurance and quality control procedures except where otherwise agreed to by the client and testing company in writing. Any and all use of these test results shall be limited to the actual cost of the pertinent analysis done. There is no other warranty expressed or implied.
Your samples will be retained at Philip for a period of 30 days from receipt of data or as per contract.

PHILIP Project Manager: Barry Oliver

PHILIP
ANALYTICAL SERVICES

25-May-97

ANALYTICAL REPORT
Form 61286891

Client : MORROW ENVIRONMENTAL CONSULTANTS
Project : C4-140

				Philip ID :	METHOD	97011459	METHOD	97011460	METHOD	97011461
				Client ID :	BLANK	8	BLANK	12	BLANK	13
Sparcode	Parameter	Unit	MDC							
METALS TOTAL										
Pb-T0050	Lead	mg/L	0.001	---	---	< 0.001	< 0.001	---	---	
HYDROCARBONS										
H108PT11	Purgeable Hydrocarbons	mg/L	0.10	< 0.10	< 0.10	< 0.10	2.3	< 0.10	< 0.10	
H106CALC	VPH (BC Guidelines)	mg/L			< 0.1		2.1		< 0.1	
VOLATILE ORGANICS										
B020PT11	Benzene	ug/L	0.5	< 0.5	< 0.5	< 0.5	71	< 0.5	3.7	
T001PT11	Toluene	ug/L	0.5	< 0.5	< 0.5	< 0.5	< 5.0 (1)	< 0.5	< 0.5	
B021PT11	Ethylbenzene	ug/L	0.5	< 0.5	< 0.5	< 0.5	< 5.0	< 0.5	< 0.5	
X003PT11	m,p - Xylene	ug/L	0.5	< 0.5	< 0.5	< 0.5	36	< 0.5	< 0.5	
X002PT11	o - Xylene	ug/L	0.5	< 0.5	< 0.5	< 0.5	67	< 0.5	< 0.5	
SURROGATE RECOVERY										
VS01SURR	Bromofluorobenzene	%			---	85	98		---	
VS03PT11	d8-Toluene	%	0	96	97	---	---	=	100	
				Matrix :		Water		Water		Water
				Sampled on:		97/05/12		97/05/12		97/05/12

Result comments and/or text results :

(1) MDC RAISED DUE TO SAMPLE DILUTION

PHILIP
ANALYTICAL SERVICES

25-May-97

ANALYTICAL REPORT
Form 61286891

Client : MORROW ENVIRONMENTAL CONSULTANTS
Project : C4-140

Philip ID : 97011462
Client ID : 15

Sparcode	Parameter	Unit	MDC	
HYDROCARBONS				
H108PT11	Purgeable Hydrocarbons	mg/L	0.10	0.72
H106CALC	VPH (BC Guidelines)	mg/L		0.6
VOLATILE ORGANICS				
B020PT11	Benzene	ug/L	0.5	66
T001PT11	Toluene	ug/L	0.5	4.4
B021PT11	Ethylbenzene	ug/L	0.5	0.7
X003PT11	m,p - Xylene	ug/L	0.5	4.2
X002PT11	o - Xylene	ug/L	0.5	1.9
SURROGATE RECOVERY				
VS03PT11	d8-Toluene	%	0	100

Matrix : Water
Sampled on: 97/05/12

PHILIP
ANALYTICAL SERVICES

SPIKE SUMMARY
Form 61286891

Parameter	Client ID	Philip ID	Sample Conc.	Sample & Spike Conc.	Spike Amount	Unit	Percent Recovery
Benzene	Blank Spike. Batch :	74501319	< 0.5	22	20	ug/L	112
Toluene	Blank Spike. Batch :	74501319	< 0.5	20	20	ug/L	100
Ethylbenzene	Blank Spike. Batch :	74501319	< 0.5	22	20	ug/L	111
m,p - Xylene	Blank Spike. Batch :	74501319	< 0.5	38	40	ug/L	96
o - Xylene	Blank Spike. Batch :	74501319	< 0.5	21	20	ug/L	105
Benzene	Blank Spike. Batch :	74501338	< 0.5	19	20	ug/L	95
Toluene	Blank Spike. Batch :	74501338	< 0.5	20	20	ug/L	98
Ethylbenzene	Blank Spike. Batch :	74501338	< 0.5	22	20	ug/L	111
m,p - Xylene	Blank Spike. Batch :	74501338	< 0.5	40	40	ug/L	101
o - Xylene	Blank Spike. Batch :	74501338	< 0.5	20	20	ug/L	98

PHILIP
ANALYTICAL SERVICES

ANALYSIS DATES
Form 61286891

	Philip ID:	97011459	97011460	97011461	97011462
	Client ID:	8	12	13	15
Ph-T0050	Lead	---	16-MAY-1997	---	---
PKG-BT15	BTEX by P&T	22-MAY-1997	23-MAY-1997	22-MAY-1997	22-MAY-1997
VS01SURR	Bromofluorobenzene	---	24-MAY-1997	---	---
	Matrix:	Water	Water	Water	Water
	Sampled on:	12-MAY-1997	12-MAY-1997	12-MAY-1997	12-MAY-1997

PHILIP ENVIRONMENTAL

8577 Commerce Court
Burnaby, B.C. V5A 4N5

Phone: (604) 444-4808
Fax: (604) 444-4511
Toll Free: 1-800-440-4808

ESSO/PHILIP
CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

6128689 1

COMPANY NAME: MECI	PH. #: 403-253-4333 FAX #: 403-253-1975
COMPANY ADDRESS: UNIT 5-6125 12A ST SE CALGARY, AB T2P 2B3	CLIENT PROJECT ID: (#) CA-140
SAMPLER NAME (PRINT): T. RITTALER	PROJECT MANAGER: T. RITTALER

FIELD SAMPLE ID	ZENON LAB # (Lab Use Only)	MATRIX: GROUND WATER	SURFACE WATER	SOIL	OTHER	# CONTAINERS	SAMPLING: DATE	TIME	HEADSPACE VAPOUR	BTEX / LH & TEH ✓	BTEX NPH & EPH ___	BTEX / VPH / LEPH / HEPH	BTEX ___ LH	BTEX / VPH ___	TEH ___ EPH ___ LEPH/HEPH ___	PAH'S	LEAD	PHENOLS BY 4AAP	FLASHPOINT	PCB'S	PHENOLS BY GC/MS	VOLATILE ORGANICS (VOC's)	SIMULATED DISTILLATION (GC SCAN)	TOTAL OIL & GREASE	MINERAL OIL & GREASE	ICAP METALS TOTAL ___ DISSOLVED ___	LOW LEVEL As & Se TOTAL ___ DISSOLVED ___	MERCURY TOTAL ___ DISSOLVED ___	TOTALS METALS LEVEL ___	DISSOLVED METALS LEVEL ___	NITRATE ___ NITRITE ___ AMMONIA ___	CHLORIDE ___ FLUORIDE ___ SULPHATE ___	TOTAL SUSPENDED SOLIDS (NFR)	CYANIDE SAD ___ WAD ___	LEACHABLE LEAD (AA) ___ (TCLP) ___	LEACHABLE BTEX (AA) ___ (TCLP) ___	DRINKING WATER QUALITY PACKAGE
12-3	11451			✓		2	970512		275	Hold																										
12-5	11452			✓		2	970512		990	✓																										
12-7	11453			✓		2	970512		225	Hold																										
13-3	11454			✓		2	970512		400	✓																										
14-2	11455			✓		2	970512		190	Hold																										
14-6	11456			✓		2	970512		495	✓																										
15-5	11457			✓		2	970512		195	Hold																										
16-3	11458			✓		2	970512		70	Hold																										
8	11459	✓				3	970512						✓																							
12	11460	✓				4	970512						✓				✓																			
13	11461	✓				3	970512						✓																							
15	11462	✓				3	970512						✓																							

ANALYSIS REQUEST

TAT
- Regular (10 Days) ☑
- Rush (5 Days) ☐
- Urgent (2 Days) ☐
- Other (Days) ☐

Non Regular TATS require Esso Approval

CUSTODY RECORD

ESSO SITE LOCATION: 882527

PHILIP COMMITMENT ID: 25290-751-000

ESSO CONTACT: L. YOUNG

SPECIAL DETECTION LIMITS / CONTAMINANT TYPE: AB - AEP Level I RMC

SPECIAL REPORTING OR BILLING INSTRUCTIONS

EDT ☐

LAB USE ONLY

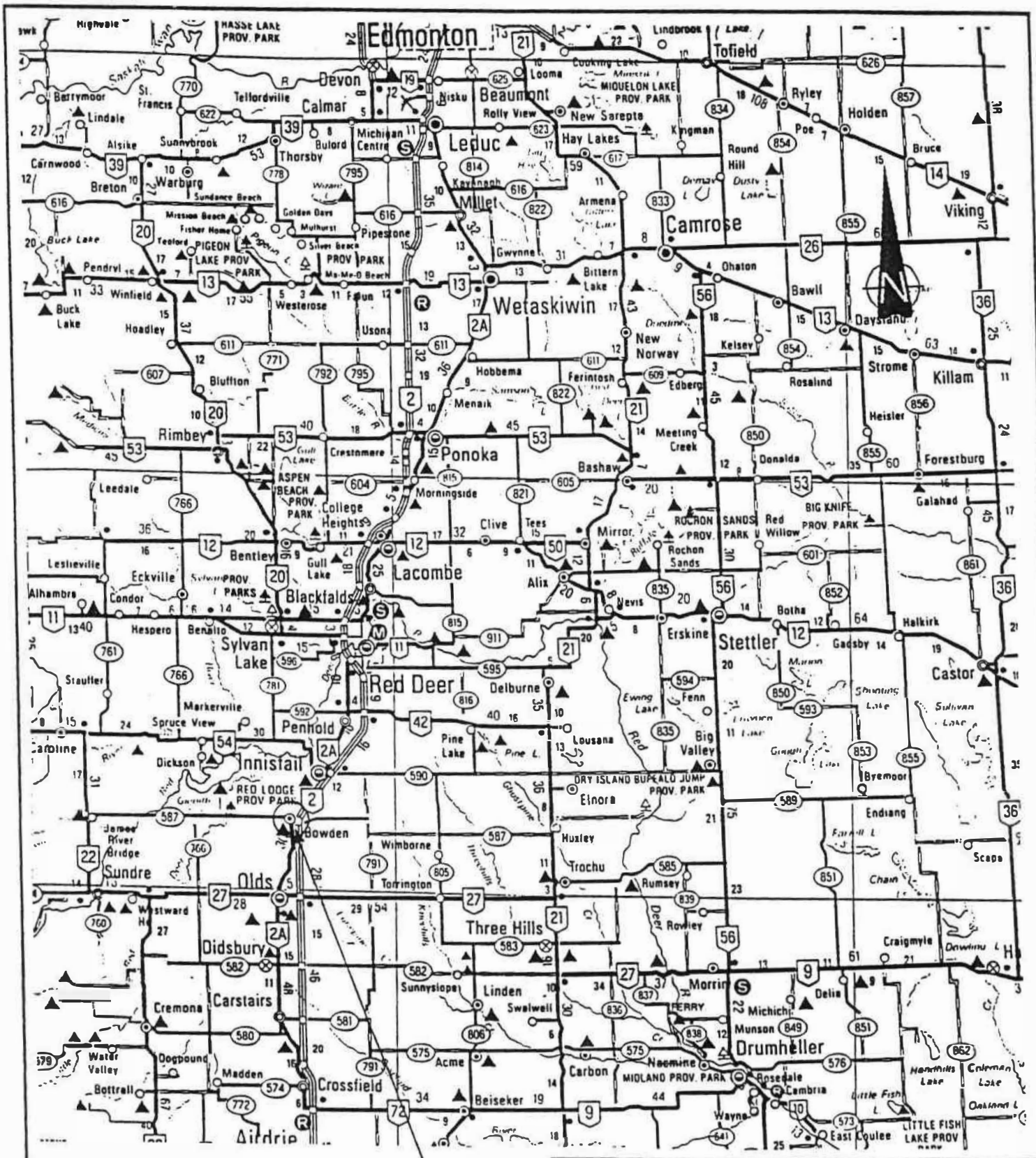
CLIENT CODE ___
ADDRESS CODE ___
PROJECT MANAGER ___

LAB INFORMATION: May 30 ✓ LB

RELINQUISHED BY SAMPLER:	DATE 97 05 13	TIME 9:45 AM	RECEIVED BY:
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

APPENDIX V

DRAWINGS



SITE LOCATION

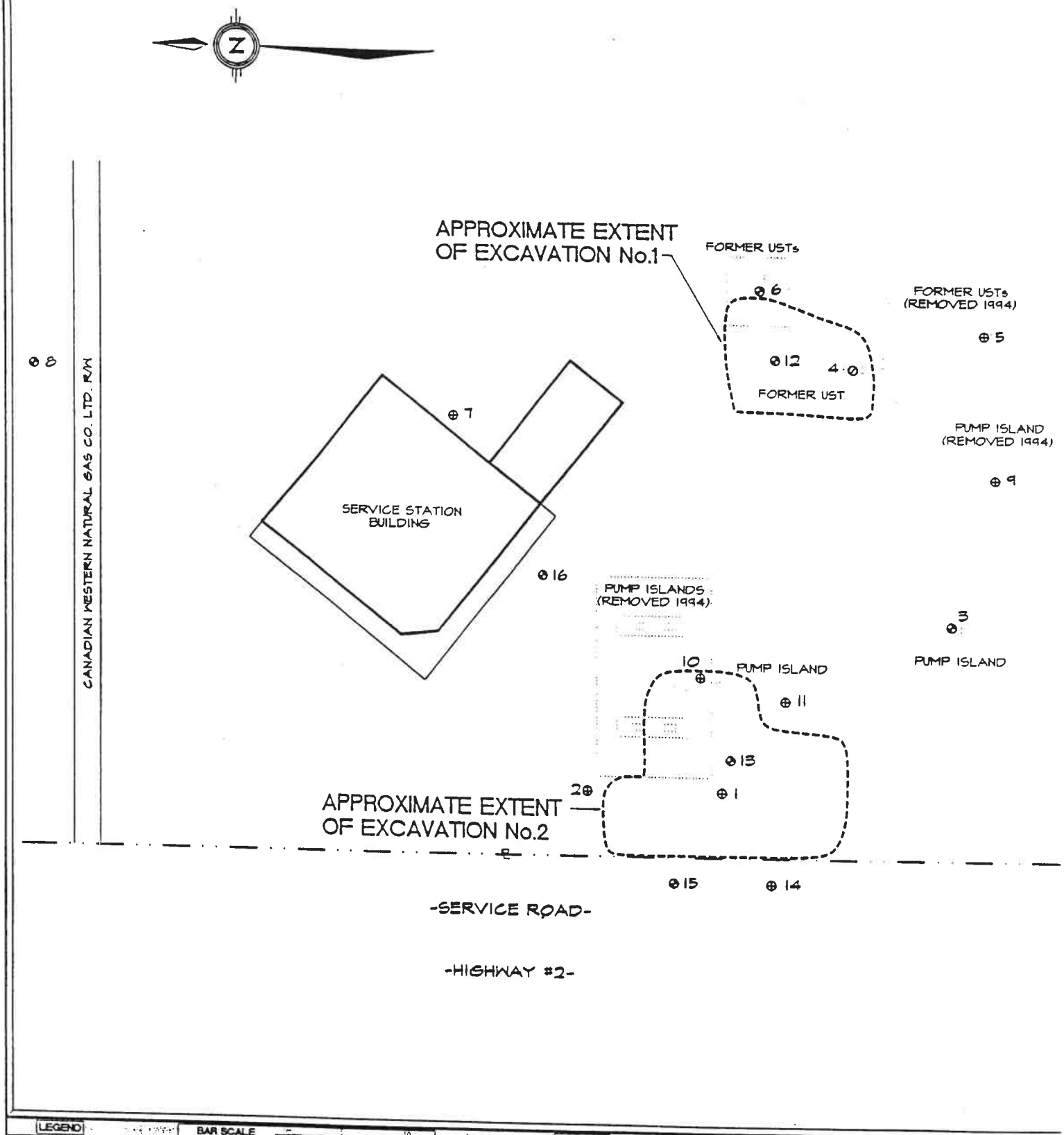
MORROW ENVIRONMENTAL CONSULTANTS INC.

SCALE: N.T.S.	APPROVED BY		DRAWN BY: S.M.C.
DATE: 94-09-23	ENGINEER	CLIENT	CHECKED

KEY PLAN

IMPERIAL OIL LIMITED
HIGHWAY #2 NORTH, BOWDEN, ALBERTA

DRAWING NUMBER
C4-140-001



LEGEND

BAR SCALE

- BOREHOLE LOCATION (MONITORING WELL INSTALLED)
- BOREHOLE LOCATION (MONITORING WELL INSTALLED)
- DESTROYED BOREHOLE
- INDICATES STRUCTURE REMOVED
- EXTENT OF EXCAVATION

REVISIONS

REV.	DATE	DESCRIPTION	BY
2	97 05 13	NEW BH LOC'NS	DJZ
1	97 03 04	EDITS AND SURROUND	RBL

MORROW ENVIRONMENTAL CONSULTANTS INC.

SCALE: 1:400 | APPROVED BY: | DRAWN BY: DHP/RE

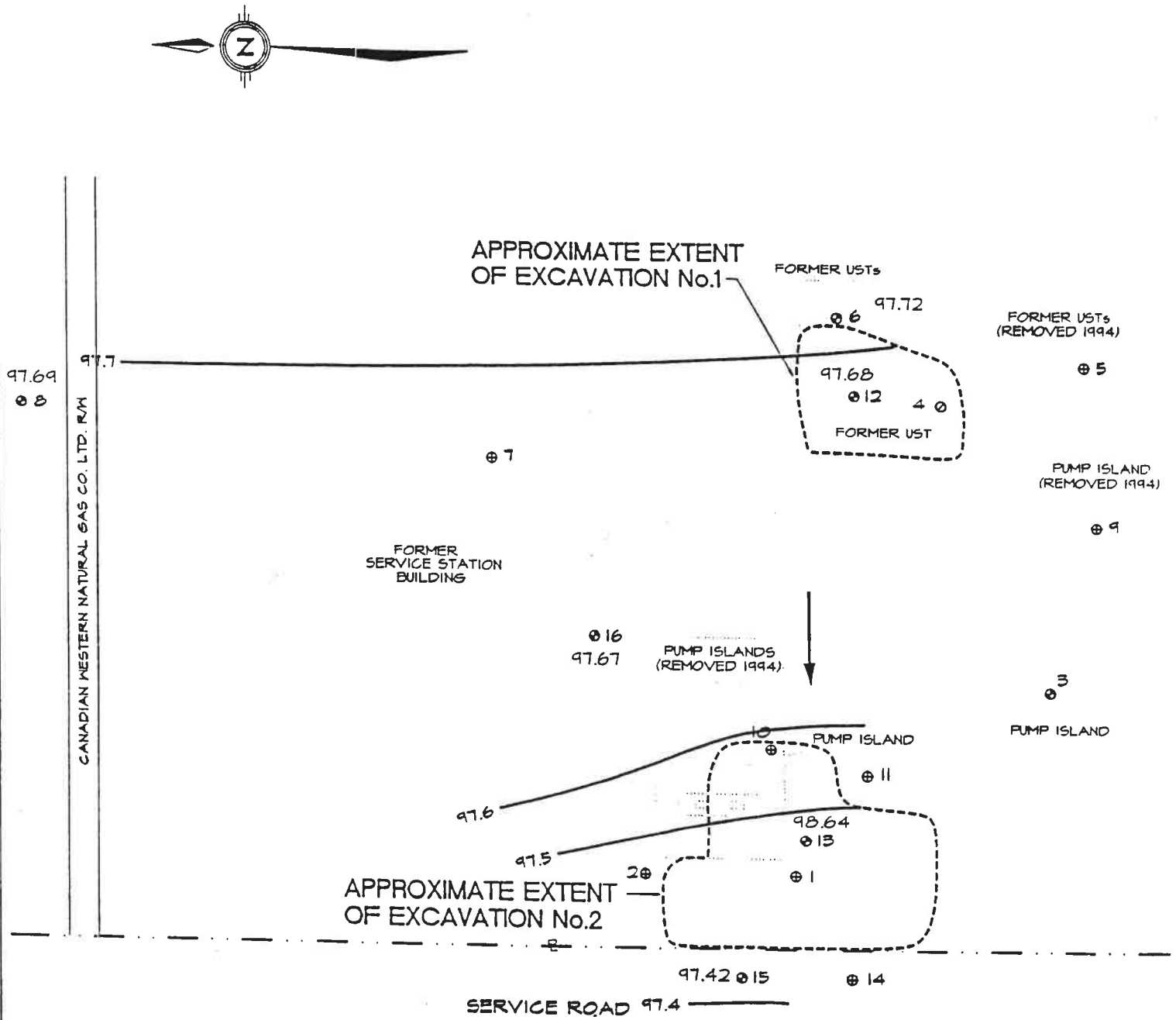
DATE: 97 03 04 | MGR: | CLIENT: | CHECKED: JD

CLIENT NAME: IMPERIAL OIL LIMITED

CLIENT ADDRESS: HIGHWAY No.2 BOWDEN, ALBERTA

SITE PLAN

DRAWING NUMBER: C4-140-002R1



NOTES:
1. ALL ELEVATIONS ARE RELATIVE TO AN ARBITRARY DATUM.
2. GROUNDWATER DATA OBSERVED IN BH13 NOT USED FOR THE PURPOSE OF CONTOURING.

LEGEND

BAR SCALE

- BOREHOLE LOCATION (MONITORING WELL INSTALLED)
- BOREHOLE LOCATION (MONITORING WELL INSTALLED)
- DESTROYED BOREHOLE
- 97.42 GROUNDWATER ELEVATION (1997 05 12)
- INFERRED GROUNDWATER FLOW DIRECTION

REVISIONS

REV.	DATE	DESCRIPTION	BY

MORROW ENVIRONMENTAL CONSULTANTS INC.

SCALE: 1:400	APPROVED BY:		DRAWN BY: DJZ
DATE: 97 08 08	W.O.:	CLIENT:	CHECKED: JD

CLIENT NAME: IMPERIAL OIL LIMITED

CLIENT ADDRESS: HIGHWAY No.2 BOWDEN, ALBERTA

GROUNDWATER SURFACE ELEVATIONS (1997 05 12)

DRAWING NUMBER: C4-140-003