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C42520

SEACOR
ENVIRONMENTAL
ENGINEERING INC.

REMEDIAL ACTIVITIES REPORT
FORMER BARONS TURBO BULK STATION C42520
235 MAIN STREET
BARONS, ALBERTA

SEACOR JOB #H0031-093/203.01667.003

Submitted By:
SEACOR Environmental Engineering Inc.

for
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EXECUTIVE SUMMARY

SEACOR Environmental Engineering Inc. (SEACOR) of Calgary, Alberta was retained by Shell Canada Products Limited (Shell) to oversee remedial activities at the former Barons Turbo Bulk Station #C42520 located at 235 Main Street in Barons, Alberta (Site). The remediation program involved an excavation on the west side of the Site, with off-site disposal, and an excavation on the east side of the Site, with on-site treatment.

In July 1999, approximately 509 m^3 of soil suspected of exceeding the AE *Level II* FGS RMC was excavated from the west side of the Site and was disposed at the Shell Soil Recycling Facility in Balzac, Alberta. On the east side of the Site, approximately 1400 m^3 of soil was excavated and mixed with approximately 240 kg of nitrogen fertilizer, and treated in an on-site biopile. In late October 1999, an additional 27 m^3 of soil was excavated from the east side of the Site and was disposed at the Lethbridge Regional Landfill.

During the remediation program off-site hydrocarbon impacts exceeding the AE *Level II* FGS RMC were identified along the east and west property boundaries. Consequently, oil-resistant RP 260 HD liners were installed along these property boundaries to prevent migration on-site. All on-site confirmatory and biopile samples submitted for laboratory analyses contained hydrocarbon concentrations that were less than the AE *Level II* FGS RMC. The east excavation was backfilled with remediated soil compacted in thirty centimetre lifts. The west excavation was backfilled with clean overburden and imported fill and also compacted in thirty centimetre lifts.

Groundwater samples were collected from the west excavation and from three off-site boreholes located near the east side of the Site. Laboratory analysis indicated that the groundwater samples were within the AE *Level II* RMC for groundwater in fine-grained soils.

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1.0 INTRODUCTION

Shell Canada Products Limited (Shell) retained SEACOR Environmental Engineering Inc. (SEACOR) of Calgary, Alberta to provide environmental services during the remedial activities conducted at the former Barons Turbo Bulk Station located at 235 Main Street in Barons, Alberta (Site).

The environmental works were conducted following recognized industry and regulatory protocols, and in accordance with the Shell document entitled, *"Retail Petroleum Marketing Site Closure and Decommissioning"*, dated April 22, 1998. The Site specific remediation criteria was determined according to the Alberta Environment (AE) document, *"Remediation Guidelines for Petroleum Storage Tank Sites"* draft July 1994. Authorization to proceed with the decommissioning and remediation program was provided by Mr. Robert Harriott, on behalf of Shell.

Figures illustrating the Site plan and soil sample locations are included at the end of this report. Appendix A presents fieldwork methodology and the analytical methods. Appendix B presents a summary of field observations. The analytical chemistry results have been presented in Appendix C. A summary of applicable environmental standards has been presented in Appendix D.

2.0 SITE SENSITIVITY ASSESSMENT

A Site sensitivity assessment was undertaken in accordance with the procedure outlined in the Alberta Environment (AE) document "Remediation Guidelines for Petroleum Storage Tank Sites" Draft July 1994. Table 1 outlines the descriptive points required to determine the Site sensitivity. The Site location and surrounding land use plans are provided as Figures 1 and 2, respectively.

TABLE 1: SITE SENSITIVITY FACTORS

Factor	Site Characteristics		
Site Description	Former bulk retail station comprising an above-ground tank farm office building, and warehouse		
Land Use	Commercial		
Surrounding Land Use	Roads	Buildings	Distance (m)
N	lane	residential	10
NE	Progress Avenue	residential	15
E	Progress Avenue	church	10
SE	Main Street	none	20
S	Main Street	commercial	20
SW	Main Street	commercial	20
W	none	commercial	adjacent
NW	lane	residential	10
Groundwater Usage	No known groundwater users. Potable water supplied by the Village of Barons		
Surface Waters	Keho Lake. 6 km southwest		
Nearby Underground Structures	Buried utilities (natural gas, telephone, power, water, and sewer services adjacent to and servicing the Site.		
Subsurface Conditions Soil Type	Native soils are medium plastic clays overlying bedrock		
Groundwater	Approximately 3.0 to 4 0 m below grade. Regional gradient is unknown.		

Table 2 summarizes the sensitivity for the ingestion and inhalation of soil and groundwater.

TABLE 2: SITE SENSITIVITY CLASSIFICATION

Health Concern	Receptor	Receptor Sensitivity	Likelihood of Impact	Sensitivity Ranking
Ingestion: Groundwater	Groundwater or surface water with no current or potential usage	high	low	no ranking
Inhalation	On-Site commercial buildings	medium	medium	moderate
	Residential buildings to the north	high	medium	moderate
	Commercial building to the east	medium	medium	moderate
	Commercial buildings to the south	medium	medium	moderate
	Commercial building to the west	medium	medium	moderate
	Buried utilities (on and adjacent to Site)	medium	medium	moderate

The likelihood of impact to on-site and off-site receptors and the sensitivity of each receptor determined that the Site should be ranked as having moderate sensitivity. Based on the fine-grained nature of the soils and the moderate ranking for the soil receptor pathways, the AE *Level II* Risk Management Criteria (RMC) for fine-grained soils (FGS) was determined to be the appropriate criteria for the soil and groundwater at the Site.

3.0 BACKGROUND

Site facilities included an office building on the southwest corner of the Site and a warehouse located east of the office building. The former bulk station consisted of an above-ground tank farm which was located within a concrete berm on the east side of the Site (east of the warehouse) The tank farm was decommissioned in 1997; however, the concrete berm remained on-site until July 1999.

3.1 West Side of Site

On June 5, 1998 three probeholes (PH98-9 to PH98-11) were advanced on the west side of the Site. The locations of the probeholes are illustrated on Figure 3. Samples collected from PH98-9 at depths of 2.3 m and 3.4 m bgs had combustible vapour levels of 1600 ppmv and 3800 ppmv, respectively. Laboratory analysis of these samples indicated that the AE *Level II* FGS RMC for benzene was exceeded in the sample collected at a depth of 3.4 m. The remaining BTEX constituents and TPH concentrations were within AE *Level II* criteria for both samples.

In order to delineate hydrocarbon impacts on the west side of the Site, an intrusive investigation consisting of seven boreholes was conducted on October 14, 1998. The boreholes were advanced near the west property line in the vicinity of the office building. The location of each borehole is included on Figure 2. Elevated combustible hydrocarbon vapour levels were recorded in BH98-14, BH98-15, and BH98-17. The maximum combustible vapour level in the remaining boreholes (BH98-12, BH98-13, BH98-16, and BH98-18) was 120 ppmv.

Six soil samples were submitted to Enviro-Test Laboratories for chemical analysis of hydrocarbon constituents. Laboratory analysis indicated that BH98-14 exceeded the AE *Level II* FGS RMC for benzene at a depth of 3.4 m bgs. All remaining analyzed constituents were within the AE RMC *Level II* criteria.

3.2 East Side of Site

In April 1997, approximately 280 m^3 of soils exceeding the AE *Level II* FGS RMC were excavated from east side of the Site near the south property boundary, and disposed of off-site. A 15 mm polyethylene liner was installed along the south property boundary to prevent any off-site residual hydrocarbons from migrating onto the property. Details of the remedial works conducted in April 1997 are presented in the SEACOR report, "*Facility Decommissioning and Remedial Excavation, Barons Turbo Bulk Station*," dated May 23, 1997.

On May 15, 1998 five test pits were excavated within the concrete berm of the former tank farm as illustrated in Figure 3 Laboratory analysis of soil samples collected from TP3 and TP4 exhibited total petroleum hydrocarbon (TPH) concentrations exceeding AE *Level II* RMC criteria on the east side of the tank farm. Results of the test pit investigations are detailed in a May 27, 1998 letter report to Mr. Robert Harriott.

On June 5, 1998 eight boreholes were advanced around the perimeter of the concrete berm. The locations of each borehole are also illustrated on Figure 3. Select soil samples were submitted to Enviro-Test laboratories of Calgary, Alberta for analysis of hydrocarbon constituents. The analytical results determined that hydrocarbon impacts existed on-site that exceeded the AE *Level II* RMC criteria for total petroleum hydrocarbons (TPH).

4.0 SITE DECOMMISSIONING/REMEDIATION PROGRAM

4.1 GENERAL

The Site decommissioning/remediation program comprised the following tasks:

- Prior to all remedial works, the property boundaries were surveyed and marked by Brown, Okamura & Associates Ltd. of Lethbridge, Alberta. The general contractor, JBA Project Engineering Ltd. of Calgary, Alberta (JBA), installed security fencing around the perimeter of the property.
- Excavation and trucking services were provided by Sunshine Excavating Ltd. of Magrath, Alberta.
- The office building was temporarily moved off-site to allow the excavation of soils on the west side of the Site. The warehouse was not moved for excavation activities.
- The concrete berm and asphalt were removed from the former tank farm area prior to excavation activities.
- Two remedial excavations were advanced on-site between July 14 and 27, 1999. The first excavation was advanced on the west side of the property. Excavation activities, soil sampling, and backfilling of the west excavation were completed prior to commencement of the second excavation. The second excavation was advanced on the east side of the property, in the area of the former tank farm.
- The soils from the east excavation were worked into an on-site biopile and were used to backfill the excavation. Laboratory analytical soil data (included in Appendix C) confirmed that the soil was remediated to AE *Level II* FGS RMC prior to backfilling.

The methodology used to conduct the assessment and overview of relevant environmental standards applicable to the assessment program are provided in Appendices A and D, respectively.

4.2 SOIL EXCAVATION PROGRAM

4.2.1 West Excavation

Excavation of soils from the west side of the property took place from July 14 to 21, 1999. Clean overburden soil was stockpiled on-site. Approximately 509 m^3 of soil suspected of exceeding the AE *Level II* FGS RMC was excavated and transported to the Shell Soil Recycling Facility in Balzac, Alberta. A total of one hundred and thirteen soil samples were collected from the excavation, sixty-nine of which defined the confirmatory limits. Selected soil samples were submitted to EnviroTest Laboratories of Calgary, Alberta for confirmatory laboratory analysis. A summary of the field data collected from the confirmatory soil samples is included in Appendix B.

Groundwater that collected in the base of the excavation was pumped into a temporary storage tank delivered to the Site. The groundwater was aerated with a venturi to volatalize any residual hydrocarbons that may have been

dissolved in the groundwater. A water sample was collected from the tank and was analyzed for hydrocarbon constituents. The analytical results determined that the water was within the AE *Level II* FGS RMC. The stored groundwater was later used during remedial activities conducted on the east side of the Site.

Once the confirmatory limits were established, an RP 260 HD oil-resistant liner was installed along the south and west walls of the excavation (property boundaries) to prevent any off-site residual hydrocarbons from migrating onto the property. Two soil samples were submitted for laboratory analysis from the stockpile of overburden soil to confirm the soil's suitability for use as backfill material. The excavation was then backfilled and compacted in thirty centimetre lifts using the stockpile of overburden soils and imported soil backhauled from the Shell Soil Recycling Facility.

4.2.2 East Excavation

Remedial activities on the east side of the Site began on July 21, 1999. Approximately 1400 m^3 of soil suspected of exceeding the AE *Level II* FGS RMC was systematically excavated and stockpiled on polyplastic on-site. A total of one hundred and one soil samples were collected from the excavation, ninety of which defined the confirmatory limits. A summary of the field data collected from the confirmatory soil samples is included in Appendix B.

The soil suspected of exceeding *Level II* criteria was remediated on-site using a biopile. The biopile was formed by mixing 240 kg of Nitrogen (34-0-0) fertilizer with the impacted soil and loosely placing the soil back into the excavation. The soil and fertilizer were hydrated using the stored groundwater from the west excavation. Laboratory analysis of a sample of the stored groundwater indicted that it was within the AE *Level II* FGS RMC and was therefore suitable to be returned to the Site. An RPE HD oil resistant liner was installed along the east wall of the biopile excavation (property boundary) to prevent off-site hydrocarbon impacts from migrating onto the Site.

The soil within the biopile was mixed on September 1, 1999, for aeration purposes. This procedure was repeated on October 5, 1999, at which time 30 soil samples were collected from the biopile to assess the level of bioremediation. Laboratory analysis of six of the samples indicated that the soil within the biopile had been remediated to AE *Level II* FGS RMC levels. Confirmatory samples were collected from the base and walls of the biopile excavation to ensure that the biopile had not impacted the surrounding in-situ soil.

Investigative sampling identified residual hydrocarbon impacts greater than the AE *Level II* FGS RMC off the southwest corner of the biopile excavation. Approximately 27 m^3 of impacted soils were excavated from this area on October 26, 1999. The soils were transported to the Lethbridge Regional Landfill for off-site disposal.

After confirmatory samples were collected from the excavation, the remediated soil was backfilled and compacted in thirty centimetre lifts into the excavation. Additional clean backfill was imported from an off-site location.

4.3 FIELD RESULTS OF THE REMEDIAL EXCAVATION PROGRAM

4.3.1 West Excavation

A total of one-hundred-and-thirteeen soil samples were collected from the west excavation and were field-screened for combustible hydrocarbon vapour levels. Of these samples, seventy were of a confirmatory nature, defining the limits of the excavation. Table 3 summarizes all of the confirmatory samples from the west excavation. A list of the confirmatory field results is provided in Appendix B.

TABLE 3: FIELD OBSERVATIONS - CONFIRMATORY SAMPLES (Combustible Hydrocarbon Vapour Levels)
WEST EXCAVATION

Sample Location	Number of Samples Collected	Depth Interval (mbgs)	Combustible Hydrocarbon Vapour Level Range (ppmv)
North Wall	12	1.0 – 4.0	20 – 100
East Wall	15	2.0 – 4.0	30 – 500
South Wall	4	1.0 – 4.0	30 – 60
West Wall (property line)	10	2.0 – 4.5	1000 - >10000
Base	29	4.0 – 5.5	14 - 520

Note:
- ppmv - parts per million by volume
- m bgs – metres below ground surface

4.3.2 East Excavation

In July 1999, one-hundred-and-one soil samples were collected from the east excavation, ninety of which determined the limits of the excavation. In October 1999, seventy-eight soil samples were collected from the base and walls of the excavation, of which seventy-four were confirmatory. In October 1999, an additional thirty soil samples were collected from the soil within the biopile. Table 4 summarizes all of the confirmatory samples collected during each sampling program in the east excavtion. A list of the confirmatory field results is provided in Appendix B.

TABLE 4: FIELD OBSERVATIONS – CONFIRMATORY SAMPLES (Combustible Hydrocarbon Vapour Levels) EAST EXCAVATION

Sample Location	Number of Samples Collected	Depth Interval (m bgs)	Combustible Hydrocarbon Vapour Level Range (ppmv)
July 1999			
North Wall	7	1.0 – 2.5	34 – 860
East Wall (property line)	10	1.0 – 2.8	51 – 1000
South Wall	14	1.0 – 2.5	27 – 860
West Wall	9	1.0 – 2.0	40 – 62
Base	50	2.5 – 3.5	22 - 760
October 1999			
North Wall	8	1.0 – 2.8	37 – 200
South Wall	15	1.0 – 3.0	20 - 200
West Wall	12	1.0 – 3.0	34 – 100
Base	39	2.8 – 3.5	12 – 400
Biopile	30	not applicable	18 - 500

Note:
- ppmv - parts per million by volume
- m bgs – metres below ground surface

4.4 CONFIRMATORY SOIL ANALYTICAL RESULTS

Select duplicate soil samples recovered from the excavations were submitted to EnviroTest Laboratories (ETL), in Calgary, Alberta, for confirmatory laboratory analysis. The detailed analytical reports are provided for reference in Appendix C. An additional two soil samples were collected from the east excavation at a depth of 2 m and were submitted to M&B Technical Testing Services Ltd (M&B) of Calgary, Alberta, for sieve analysis. The samples were classified as fine-grained after 93.6 % of sample CS49 and 90.5 % of sample CS235 passed the 75 micron sieve.

4.4.1 West Excavation

All confirmatory samples were collected from the west excavation in July 1999. Two samples from each of the north, east, and west walls were submitted for laboratory analysis as well as one sample from the south wall and three samples from the base of the excavation. In addition, two soil samples (BF1 and BF2) were submitted for laboratory analysis from the stockpile of overburden soil. The analytical results are summarized in Table 5 along with the applicable environmental criteria.

TABLE 5: CONFIRMATORY SOIL SAMPLE ANALYTICAL RESULTS
WEST EXCAVATION

Sample Number	Location	Depth (m bgs)	Combustible Hydrocarbon Vapour Level (ppmv)	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	Xylenes (ppm)	TPH (ppm)
CS18	base	5.0	420	0.22	0.60	<0.01	0.09	na
CS48	north wall	3.0	38	<0.01	<0.01	<0.01	<0.01	na
CS52	east wall	4.0	260	0.16	1.9	0.39	3.0	na
CS59	east wall	4.0	500	0.02	<0.01	<0.01	0.01	<7.3
CS65	base	4.5	520	0.61	0.29	0.25	2.0	12.7
CS75	north wall	2.0	48	<0.01	<0.01	<0.01	0.04	na
S92	south wall	4.0	60	<0.01	<0.01	<0.01	0.05	na
S96	base	5.0	95	0.33	<0.01	<0.01	<0.01	na
BF1	backfill	na	52	<0.01	<0.01	<0.01	<0.01	na
BF2	backfill	na	150	<0.01	<0.01	<0.01	<0.01	na
S5	west wall (off-site)	3.0	>10000	**9.2**	220	190	**880**	na
S98	west wall (off-site)	3.0	6000	**13**	<0.01	31	73	na
AE *Level II* FGS RMC				1.5	340	400	130	4000

Notes
- m bgs – meters below ground surface
- ppm – parts per million (milligrams per dry kilogram)
- ppmv – parts per million by volume
- < - less than the analytical detection limit indicated
- TPH – total petroleum hydrocarbons ($C_5 - C_{30}$)
- **bold** – exceeds AE *Level II* FGS RMC
- AE *Level II* FGS RMC– moderate Site sensitivity ranking for fine grained soil (FGS) as outlined in the Alberta Environment (AE), Risk Management Criteria (RMC) document "*Remediation Guidelines for Petroleum Storage Tank Sites – July 1994*"

The analytical results from the west excavation indicated that off-site sample S5 exceeded the AE *Level II* FGS RMC for benzene and xylenes, and off-site sample S98 exceeded the criteria for benzene. Both of these samples were located on the west wall of the excavation, along the west property boundary and were collected to help characterize the off-site soil conditions. Consequently, an RPE260 HD oil-resistant liner was installed along the west wall of the excavation. The analyzed hydrocarbon constituents for all on-site confirmatory samples collected from the west excavation were less than the AE *Level II* FGS RMC. Laboratory results also indicated that samples CS59 and CS65 had concentrations of 11 mg/kg and 12 mg/kg, respectively, of lead. Both samples are within the AE *Level II* FGS RMC for lead of 200 mg/kg. Samples BF1 and BF2 had concentrations of hydrocarbon constituents well below the AE *Level II* FGS RMC, confirming that the stockpiled overburden soil was suitable for use as backfill material.

4.4.2 East Excavation

The limits of the east excavation were determined from confirmatory samples collected in July 1999. Four samples from the base of the excavation, three samples from the south wall, two samples from both the north wall and the east wall, and one sample from the west wall were submitted for laboratory analysis of hydrocarbon constituents. The analytical results are summarized in Table 6 along with the applicable environmental criteria.

Confirmatory samples were collected from the soil within the biopile in October 1999. Six of these samples were submitted for laboratory analysis. In October 1999, additional soil was excavated from the southwest corner of the biopile for off-site disposal. Confirmatory samples were collected from this excavation area, as well as from the base and walls of the biopile excavation to ensure that the biopile had not impacted the surrounding soil. Three base samples, two samples from the north wall, and two samples from the west wall were submitted for laboratory analysis. The analytical results are summarized in Table 6 along with the applicable environmental criteria.

TABLE 6: CONFIRMATORY SOIL SAMPLE ANALYTICAL RESULTS EAST EXCAVATION

Sample Number	Location	Depth (m bgs)	Combustible Hydrocarbon Vapour Level (ppmv)	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	Xylene (ppm)	TPH (ppm)
July 1999								
S200	base	3 0	160	<0 01	<0 01	0 25	0 67	388
CS201	south wall	2 5	520	<0 01	<0 01	0 12	0.41	1112
CS204	south wall	2 0	860	<0 01	<0 01	0 31	0 60	1817
CS212	base	3 0	760	<0 01	<0 01	0 07	0 17	1009
S214	south wall	1 0	52	<0 01	<0 01	<0 01	<0 01	1500
CS225	base	3 5	500	<0 01	<0 01	0 15	0 33	810
S258	north wall	2 5	860	<0 1	0 1	1 9	11	2500
S273	west wall	2 0	62	<0 01	<0 01	<0 01	<0 01	<5.5
CS278	north wall	2 0	46	<0.01	<0 01	<0 01	<0 01	<5.5
CS280	base	3 0	30	<0 01	<0 01	<0 01	<0 01	<5 5
CS288	east wall (off-site)	2 8	1000	<0 01	<0 01	1 3	4 8	4250
CS297	east wall (off-site)	2.8	900	<0 01	<0 01	0 95	4.4	3340
October 1999								
B295A	biopile	na	92	<0 01	<0 01	0 13	0 47	249.9
S300A	base	3.5	400	<0 01	<0 01	0 02	0 46	382
S306	base	3 5	400	<0.01	<0 01	<0 01	0.10	63 4
B317	biopile	na	200	0 02	<0 01	0 21	2 8	1253
S327	base	3 5	180	<0 01	<0 01	<0 01	<0.01	<6.1
B341	biopile	na	160	<0 01	<0.01	0 17	1 0	1341
B345	biopile	na	200	<0 01	<0 01	<0 10	0 42	476
S361	north wall	2 0	48	<0 01	<0 01	<0 01	<0 01	<6 2
B369	biopile	na	500	0 04	<0 01	0.35	1 7	383
B370	biopile	na	100	<0.01	<0 01	0.17	0.77	523
S374	west wall	2 8	200	0 24	<0 01	<0 01	0 01	<11 8
S378	south wall	3 0	200	<0 01	<0 01	0 37	1 8	733
S380	south wall	2 2	90	<0 01	<0 01	<0 01	<0 01	<5 5
AE *Level II* FGS RMC				15	340	400	1300	4000

Notes
- m bgs – meters below ground surface
- ppm – parts per million (milligrams per dry kilogram)
- ppmv – parts per million by volume
- < - less than the analytical detection limit indicated
- TPH – total petroleum hydrocarbons ($C_5 - C_{30}$)
- **bold** – exceeds AE *Level II* FGS RMC
- AE *Level II* FGS RMC– moderate Site sensitivity ranking for fine grained soil (FGS) as outlined in the Alberta Environment (AE), Risk Management Criteria (RMC) document "*Remediation Guidelines for Petroleum Storage Tank Sites – July 1994*"

The analytical results from the east excavation indicated that off-site sample CS288 exceeded the AE *Level II* FGS RMC for total petroleum hydrocarbons (TPH). This sample was located on the east wall of the excavation, along the east property boundary, and was collected to help characterize the off-site soil conditions. Consequently, an RPE260 HD oil-resistant liner was installed along the east wall of the excavation. The analyzed constituents for all on-site confirmatory samples collected from the walls and base of the east excavation were less than the AE *Level II* FGS RMC. The laboratory results of the six biopile samples (B295A, B317, B341, B345, B369, and B370) had concentrations of hydrocarbon constituents less than the AE *Level II* FGS RMC.

4.5 GROUNDWATER ANALYTICAL RESULTS

Groundwater entering the west excavation was pumped to a temporary storage tank located on Site where it was aerated with a venturi. After aeration, one water sample was collected for laboratory analysis (W1). To assess possible hydrocarbon impacts to the groundwater on the west side of the Site, one groundwater sample was collected for laboratory analysis from a small test pit in the base of the west excavation (GW WEST).

To assess possible hydrocarbon impacts to groundwater from the east side of the Site, three groundwater samples were collected from existing off-site boreholes (BH96-1, BH96-8, and BH96-14). The analytical results from all five water samples are presented in Table 7. The analytical reports provided by EnviroTest are provided in Appendix C.

TABLE 7: GROUNDWATER ANALYTICAL CHEMISTRY RESULTS

Sample	Date Sampled	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	Xylenes (ppm)
W1	July 19/00	<0.0005	0.0006	<0.0005	0.0088
GW WEST	July 23/99	0 021	0 012	<0 0005	0.1
BH96-1	Oct 26/99	<0 0005	<0 0005	<0 0005	<0.0005
BH96-8	Oct 6/99	<0 0005	<0 0005	<0 0005	<0.0005
BH96-14	Oct 6/99	<0 0005	<0 0005	<0 0005	<0.0005
AE *Level II* FGS RMC		42	240	50	80

Notes.
- ppm – parts per million (ug/L)
- < - less than the analytical detection limit indicated
- AE *Level II* FGS RMC– moderate Site sensitivity ranking for groundwater in fine grained soil (FGS) as outlined in the Alberta Environment (AE), Risk Management Criteria (RMC) document "*Remediation Guidelines for Petroleum Storage Tank Sites – July 1994*"

As shown in Table 5, all of the water samples were less than the AE *Level II* FGS RMC.

5.0 SUMMARY

Remedial activities conducted at the former Barons Turbo Bulk Station involved the advancement of two excavations: one on the west side of the Site, and one on the east side of the Site.

The west excavation involved the removal of approximately 509 m^3 of soil suspected of exceeding the AE *Level II* FGS RMC. The excavated soil was transported to the Shell Soil Recycling Facility in Balzac, Alberta. Concentrations of hydrocarbon constituents greater than the AE *Level II* FGS RMC were identified off-site along the west property boundary. Consequently, an oil-resistant RP 260 HD liner was installed along the property boundary to prevent migration of impacts onto the Site. The remaining confirmatory samples submitted for laboratory analysis contained hydrocarbon constituents that were less than the AE *Level II* FGS RMC. Once the confirmatory limits of the excavation were established, the excavation was backfilled to grade utilizing clean stockpiled and imported fill materials. Before backfilling, one groundwater sample was collected from the base of the west excavation for laboratory analysis. The analytical results determined that the groundwater was within the AE *Level II* RMC for groundwater in FGS for all analyzed constituents.

The east excavation involved the systematic excavation of approximately 1400 m^3 of soil suspected of exceeding the AE *Level II* FGS RMC. The excavated soil was temporarily stockpiled on polyplastic. Concentrations of hydrocarbon constituents greater than the AE *Level II* FGS RMC were identified off-site along the east property boundary. Consequently, an oil-resistant RP 260 HD liner was installed along the property boundary to prevent migration of impacts onto the Site. The remaining confirmatory samples submitted for laboratory analysis from the base and walls of the east excavation contained hydrocarbon constituents that were less than the AE *Level II* FGS RMC. Once the confirmatory limits of the excavation were established, the stockpiled soil was mixed with approximately 240m kg of 36-0-0 fertilizer and was placed back in the excavation, creating a biopile for on-site remediation of the soil. The soil within the biopile was mixed once in September 1999 and once in October 1999. Soil samples were collected from the biopile during the second mixing. Field and laboratory results indicated that the soil within the biopile had been remediated to within the AE *Level II* FGS RMC. After the biopile sampling, an additional 27 m^3 of soil suspected of exceeding the AE *Level II* FGS RMC was excavated and disposed off-site at the Lethbridge Regional Landfill. Once the confirmatory limits of the excavation were established, the excavation was backfilled to grade utilizing the remediated soil from the biopile and imported fill materials. Three groundwater samples were collected for laboratory analysis from off-site monitoring wells located near the east side of the Site. The analytical results indicated that each of the water samples were within the AE *Level II* RMC for groundwater in FGS for all analyzed constituents.

6.0 CLOSURE

The assessment and conclusions in this report are based on the interpretation of data collected from field investigations and results of the laboratory analyses, which were limited to the quantification of common hydrocarbon indicators in select samples. SEACOR expresses no warranty with respect to the accuracy of the laboratory analyses, methodologies used or presentation of the analytical results by the laboratory. Actual hydrocarbon concentrations in the samples submitted may vary according to the extraction and testing procedures used. The evaluation and conclusions reported herein do not preclude the existence of other chemical compounds and/or that variations of conditions within the Site may be possible. Hence, this report should be used for informational purposes only and should not be construed as a comprehensive hydrogeological or chemical characterization of the Site.

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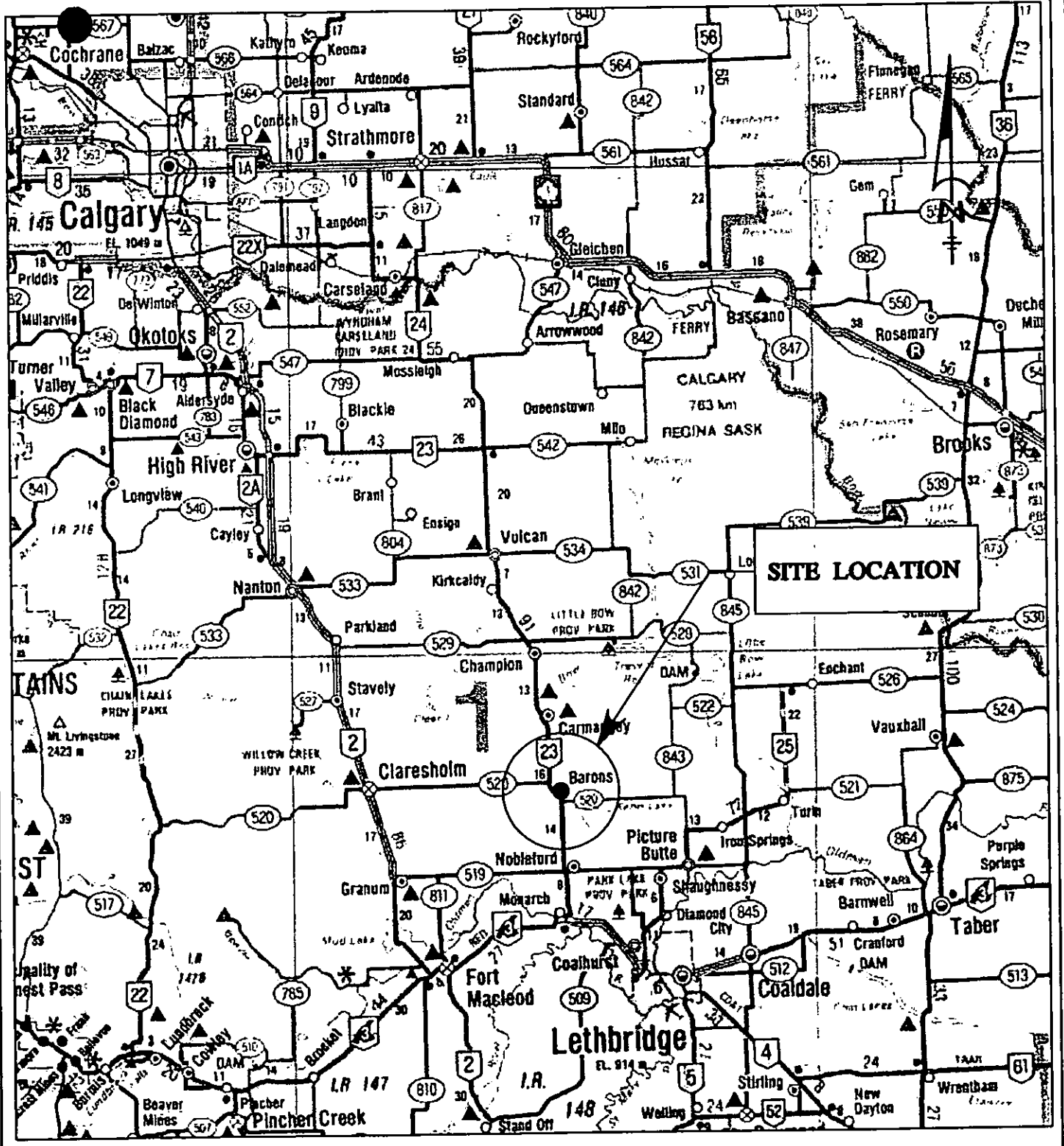
31-093 rar report



REFERENCED FROM ALBERTA ROAD MAP

SEACOR
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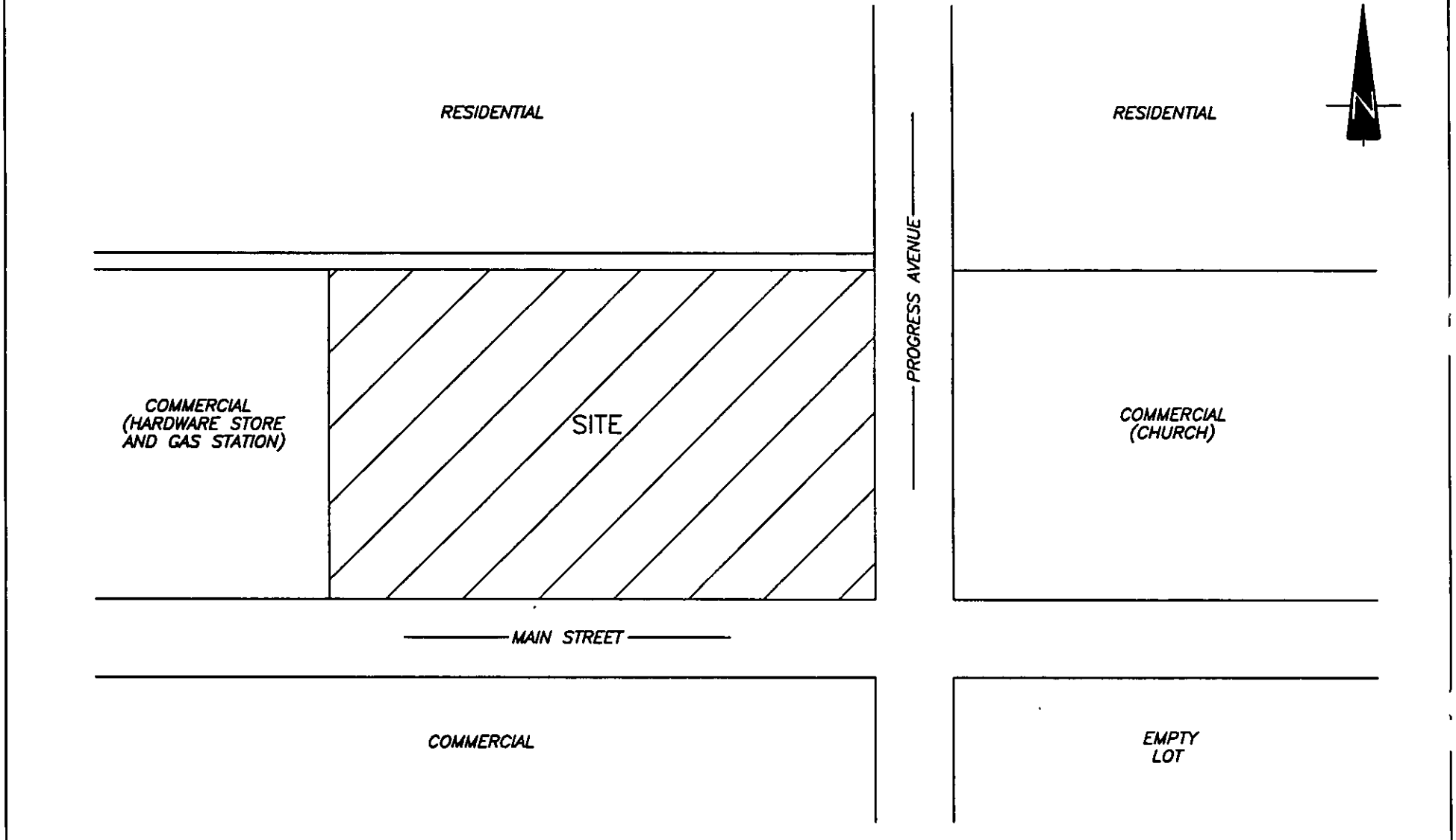
CANADIAN TURBO (1993) INC.
BARONS TURBO BULK STATION #2520
235 MAIN STREET
BARONS, ALBERTA

SITE LOCATION MAP

SCALE	DATE	FILE NAME	MADE	CHKD	JOB NO.	FIG
NTS	11/15/99	31-93A8.DWG	TMS	BM	H0031-093	1



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235 MAIN STREET
BARONS, ALBERTA

SURROUNDING LAND USE PLAN

SCALE	DATE	FILE NAME	MADE	CHKD	JOB NO.	FIG
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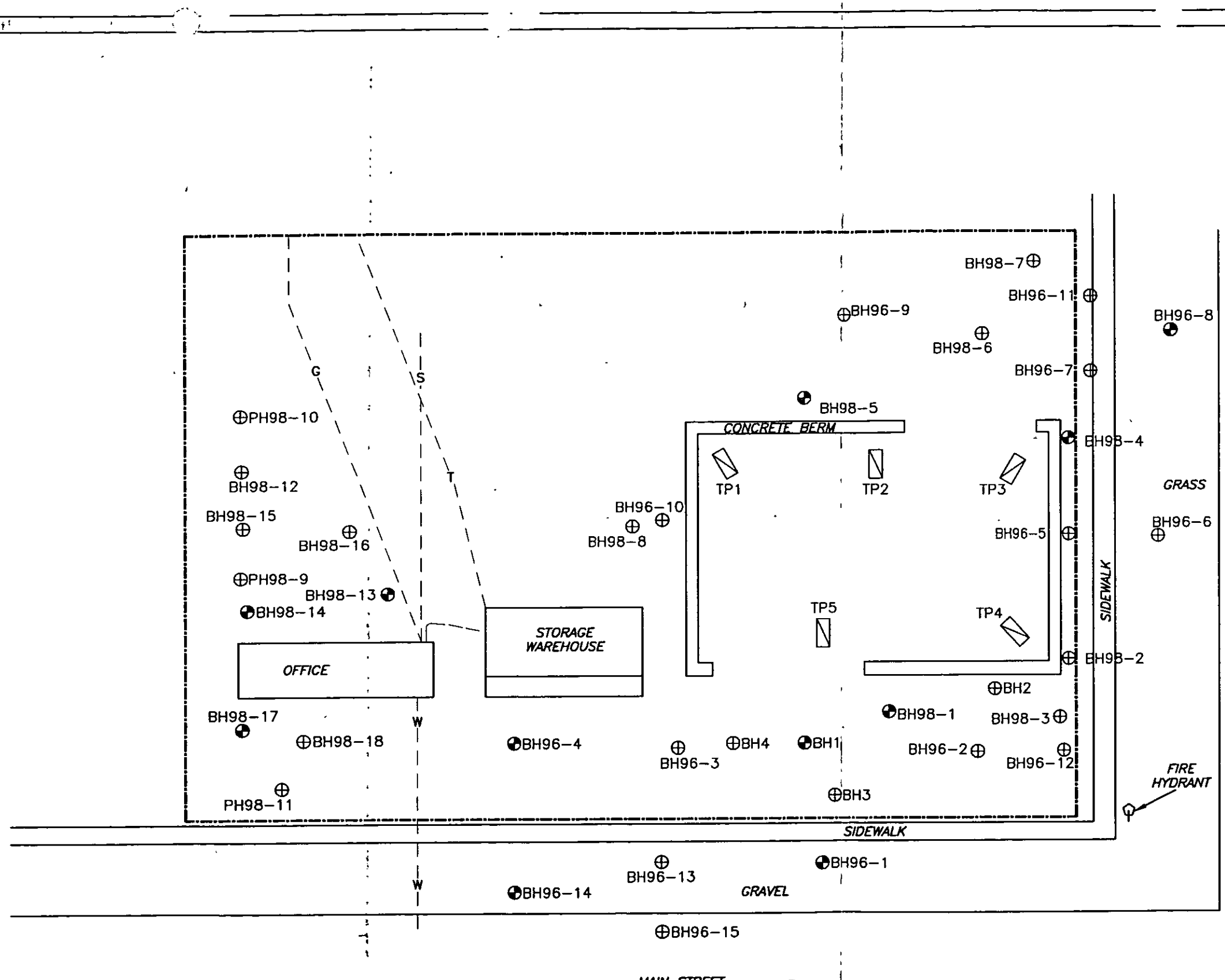

LEGEND

- PROPERTY LINE (APPROXIMATE)
- —W— WATER LINE (UNDERGROUND)
- —S— SEWER LINE (UNDERGROUND)
- —G— GAS LINE (UNDERGROUND)
- —T— TELEPHONE LINE (UNDERGROUND)
- ⊕ BOREHOLE LOCATION
- ◒ BOREHOLE COMPLETED AS A MONITORING WELL
- ▱ TEST PIT LOCATION

SCALE 1:250 (APPROX.)

0 5 10 15 m

REV.	DESCRIPTION	DATE	MADE	CHKD
5				
4				
3				
2				
1	UPDATED	11/15/99	TMS	BM

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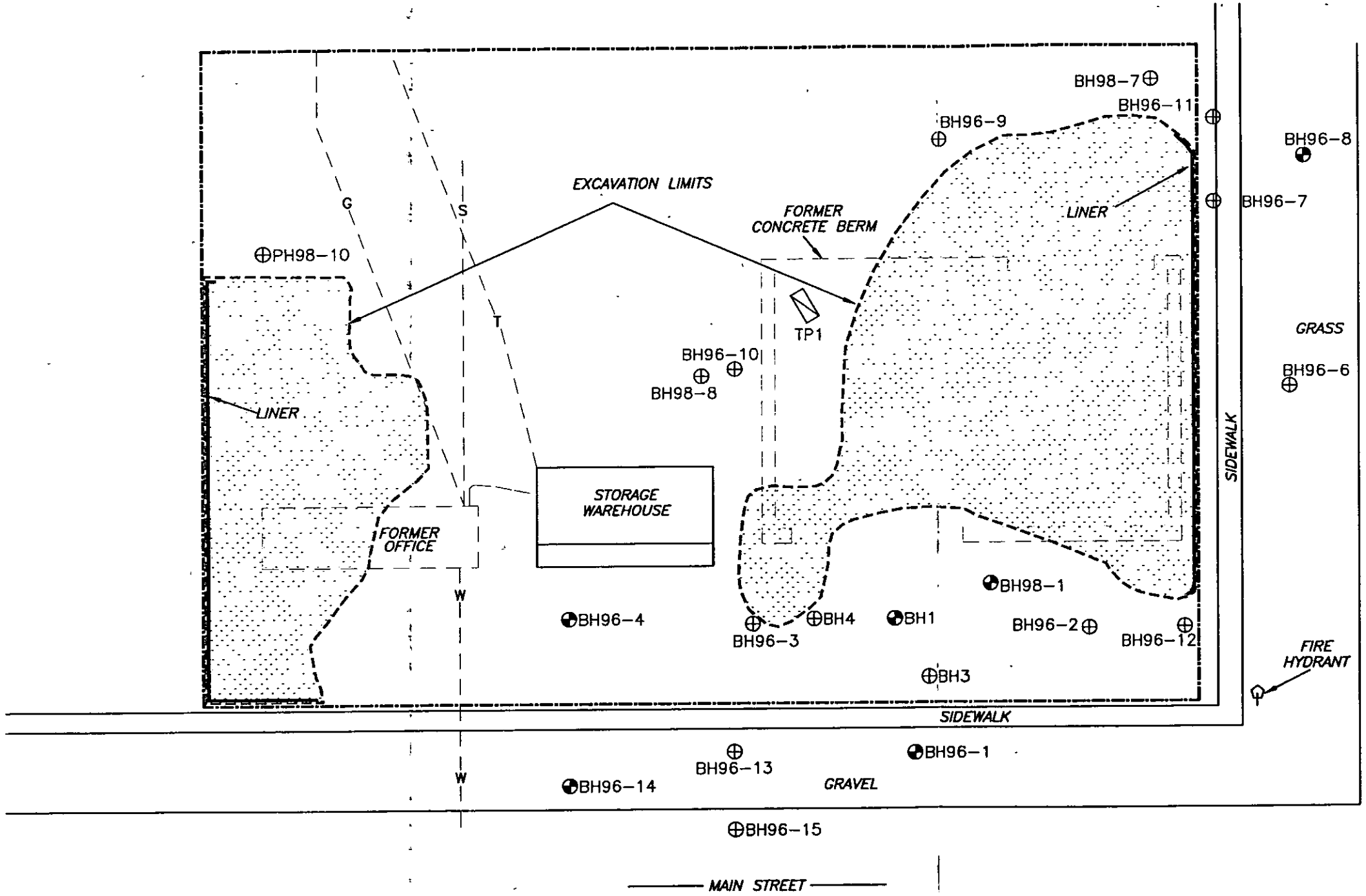
CANADIAN TURBO (1993) INC.
BARONS TURBO BULK STATION #2520
235 MAIN STREET
BARONS, ALBERTA

SITE PLAN

THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.

SCALE	DATE	FILE NAME	
1:250	08/11/99	31-93A9.DWG	
MADE	CHKD	JOB NO.	FIG
TMS	BM	H0031-093	3



N

LEGEND

- PROPERTY LINE (APPROXIMATE)
- EXCAVATION LIMITS
- —W— WATER LINE (UNDERGROUND)
- —S— SEWER LINE (UNDERGROUND)
- —G— GAS LINE (UNDERGROUND)
- —T— TELEPHONE LINE (UNDERGROUND)
- ⊕ BOREHOLE LOCATION
- ◒ BOREHOLE COMPLETED AS A MONITORING WELL
- ▨ TEST PIT LOCATION
- | FORMER STRUCTURES

SCALE 1:250 (APPROX.)

0 5 10 15 m

REV.	DESCRIPTION	DATE	MADE	CHKD
5				
4				
3				
2				
1				

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235 MAIN STREET
BARONS, ALBERTA

EXCAVATION LIMITS

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SCALE	DATE	FILE NAME	
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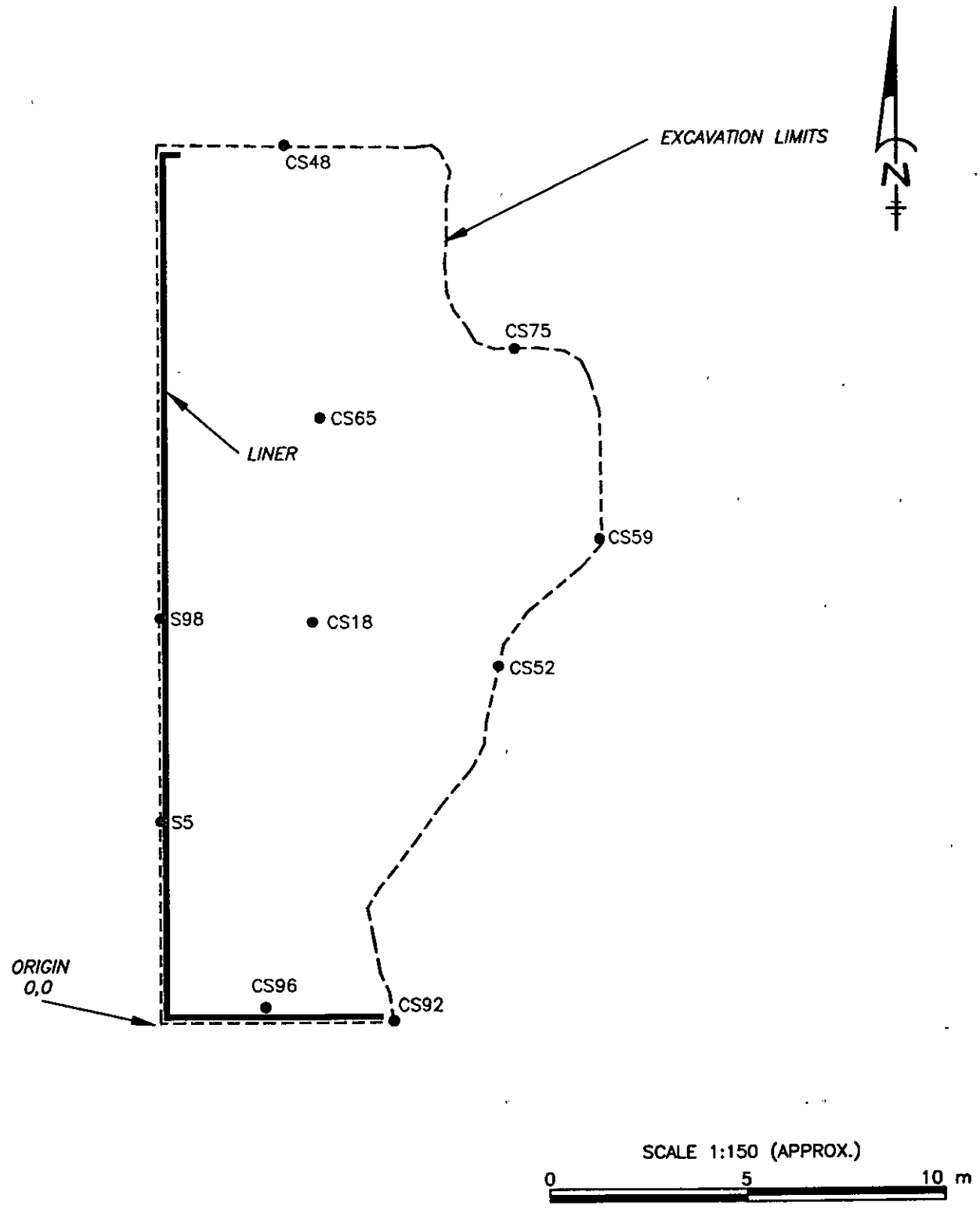
MADE	CHKD	JOB NO.	FIG
TMS	ND	H0031-093	4



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BARONS, ALBERTA

LOCATIONS OF CONFIRMATORY SAMPLES – WEST EXCAVATION

SCALE	DATE	FILE NAME	MADE	CHKD	JOB NO.	FIG
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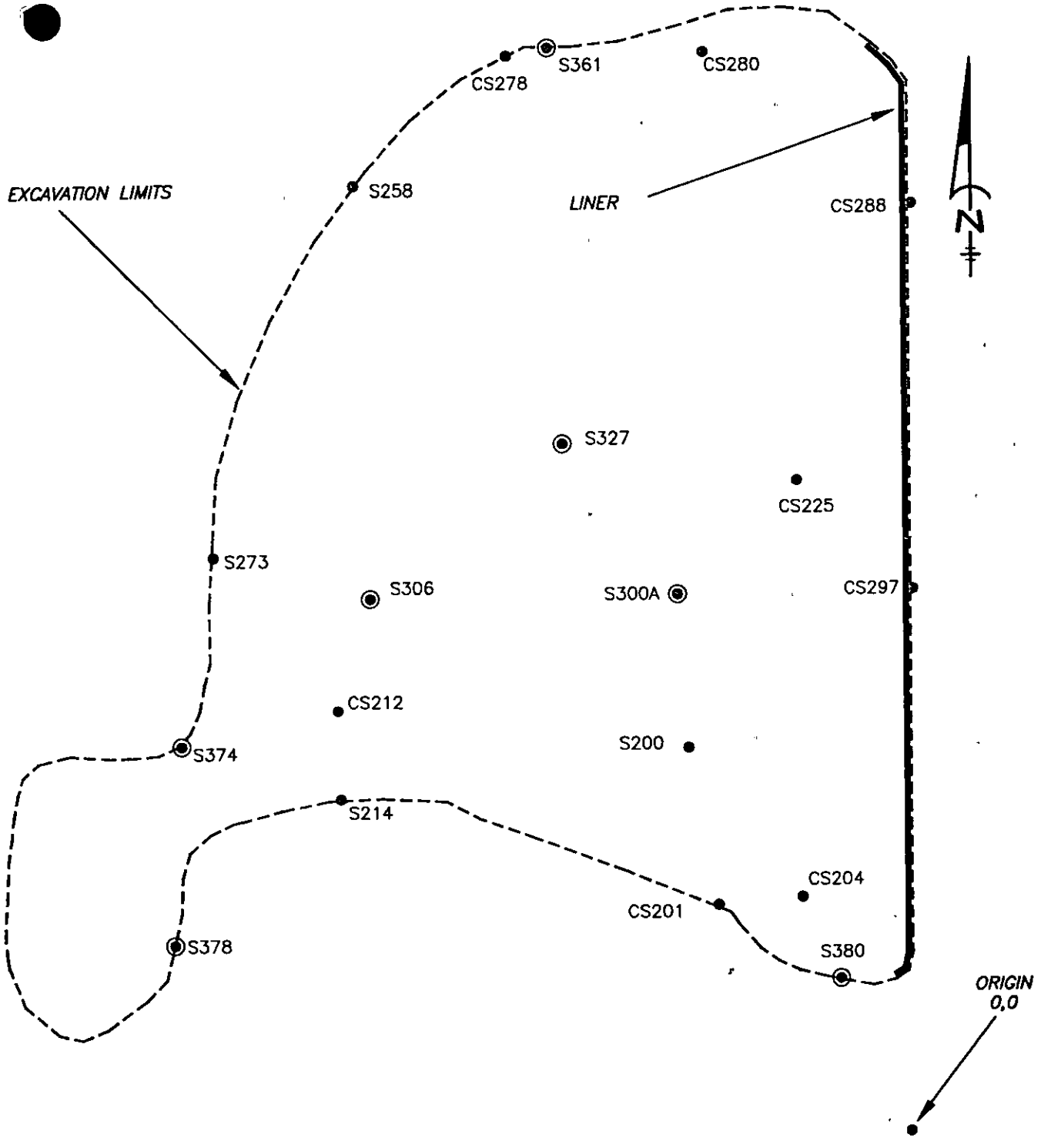

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235 MAIN STREET
BARONS, ALBERTA

LOCATIONS OF CONFIRMATORY SAMPLES – EAST EXCAVATION

SCALE	DATE	FILE NAME	MADE	CHKD	JOB NO.	FIG
1:150	11/15/99	31-93A11.DWG	TMS	BM	H0031-093	6

APPENDIX A

METHODOLOGY

METHODOLOGY

SOIL SAMPLING AND FIELD SCREENING

All samples were field screened for the presence of volatile vapours using a fixed headspace technique with a Gastech 1238 or Tracetechtor Explosimeter. The technique involves half filling a 375 ml jar with soil and sealing it for about 15 minutes prior to analysing the headspace. The explosimeter recorded the quantity of volatile vapours in %LEL (lower explosive limit: 1.4% by volume for gasoline) or ppm TOV (parts per million total organic vapour). The test is dependent on temperature, soil type and equipment calibration, but independent of field personnel. Soil samples were retained for laboratory analysis by immediately sealing them in laboratory prepared 125 ml glass jars, which were labelled and stored in an insulated cooler and packed in ice. Confirmatory soil samples were subsequently transported to Enviro-Test Laboratories of Edmonton, Alberta, for confirmatory laboratory analyses.

SITE SURVEY

The excavation was set up on a (X,Y) coordinate grid system in order to facilitate volume calculations and sample locations for reporting purposes The coordinates given for the sample locations are relative to the southwest corner of the property and the southeast corner of the property for the west and east excavations, respectively (indicated on Figures 5 and 6).

LABORATORY ANALYSIS

Soil samples were submitted to Enviro-Test Laboratories for select analysis of various hydrocarbon compounds. The analyses included:

- BTEX (benzene, toluene, ethylbenzene, xylene) - specific light-end hydrocarbons typically found as gasoline constituents, analysed with GC/FID.
- TVH (total volatile hydrocarbons) - reflects light end hydrocarbon components found in gasoline and diesel, normally in the range C_5 to C_{10}.
- TEH (total extractable hydrocarbons) - reflects heavier end hydrocarbon compounds of gasoline and diesel fuels, normally in the range of C_{11} to C_{30}, and quantified against diesel.
- TPH (total petroleum hydrocarbons) - combination of TVH and TEH analyses reflecting all chained and aromatic hydrocarbon compounds.

APPENDIX B

SUMMARY OF FIELD TEST RESULTS

WEST EXCAVATION
COMBUSTIBLE HYDROCARBON VAPOUR LEVELS FROM CONFIRMATORY SAMPLES

Sample No.	Co-ordinates		Depth (m)	Location	Combustible Hydrocarbon Vapour Level (ppmv)
	x	y			
S5	0	5	3 0	west wall	>10000
CS6	0	3	3 0	west wall	3000
CS7	0	5	2 0	west wall	1000
CS8	0	3	3 8	west wall	6400
CS10	0	4	4 5	west wall	4200
CS13	2	5	5 5	base	38
CS14	4	5	5 0	base	200
CS17	4 5	8	5 0	base	160
CS18	4	10	5 0	base	420
CS19	4 5	13	5 0	base	140
CS34	5	5	5 0	base	70
CS35	7	6	4 0	east wall	260
CS36	7	6	3 8	east wall	48
CS37	8	7	4 0	east wall	84
CS38	8	7	5 0	base	64
CS39	8	7	3 2	east wall	44
CS44	0	19	2 5	west wall	1000
CS47	3	22	4 0	base	14
CS48	3	22	3 0	north wall	38
CS49	3	22	2 0	north wall	32
CS50	8	8 5	4 5	base	70
CS51	5 5	9	4 5	base	170
CS52	8	9	4 0	east wall	260
CS53	8	9	3 0	east wall	59
CS54	8	12	4 5	base	460
CS57	6	12	4 5	base	340
CS59	11	12	4 0	east wall	500
CS60	11	12	3 0	east wall	200
CS61	3	12	4 8	base	200
CS62	10	14	4 0	base	48
CS63	10	14	3 0	east wall	47
CS64	11	14	2.0	east wall	42
CS65	4	15	4.5	base	520
CS66	7	15	4 5	base	260
CS67	5	21	4 0	north wall	34
CS68	5	21	3 0	north wall	34
CS69	5	21	2 0	north wall	20
CS70	7	20	4 0	east wall	26
CS71	7	20	3 0	east wall	28
CS72	7	20	2 0	east wall	35
CS73	9	17	4 0	north wall	40
CS74	9	17	3 0	north wall	45
CS75	9	17	2.0	north wall	48
CS76	2	19	4 2	base	66
CS77	6	21	4 0	base	31
CS78	9	17	4 2	base	28
CS79	7	18	4 0	base	30
CS80	3	3	5 0	base	47
CS85	5	3	4 0	east wall	40
CS86	5	3	3 0	east wall	30
CS91	6	0	5 0	base	45
CS92	6	0	4 0	south wall	60
CS93	6	0	3 0	south wall	39
CS94	6	0	2 0	south wall	30
CS95	6	0	1 0	south wall	32
CS96	0	0	5 0	base	95
CS97	0	1	3.5	west wall	2100
S98	0	10	3 0	west wall	6000

WEST EXCAVATION CONTINUED COMBUSTIBLE HYDROCARBON VAPOUR LEVELS FROM CONFIRMATORY SAMPLES					
Sample No.	Co-ordinates		Depth (m)	Location	Combustible Hydrocarbon Vapour Level (ppmv)
	x	y			
CS99	0	15	4 0	west wall	5000
CS100	0	5	5 0	base	240
CS104	0	17	3 5	west wall	2000
CS105	0	20	4 5	base	200
CS106	0	22	4 5	base	50
CS107	0	22	4 0	north wall	100
CS108	0	22	3 0	north wall	66
CS109	0	22	2 0	north wall	48
CS110	0	22	1 0	north wall	50
CS111	0	12	5 0	base	380
CS112	0	8	5 2	base	58
CS113	0	16	5 2	base	60

Note
- ppmv - parts per million by volume
- m bgs – metres below ground surface

EAST EXCAVATION - JULY 1999
COMBUSTIBLE HYDROCARBON VAPOUR LEVELS FROM CONFIRMATORY SAMPLES

Sample No.	Co-ordinates		Depth (m)	Location	Combustible Hydrocarbon Vapour Level (ppmv)
	x	y			
S200	6	10	3 0	base	160
S201	5	6	2 5	south wall	520
S202	5	6	2 0	south wall	30
S203	5	6	1 0	south wall	40
S204	3	6	2 0	south wall	860
S205	3	6	3 0	base	28
S206	7	7	3 0	base	44
S207	7	6	2 0	south wall	55
S208	7	5	1 0	south wall	27
S209	10	7	2 5	base	30
S210	10	7	2 0	south wall	30
S211	10	7	1 0	south wall	34
S212	15	9	3 0	base	760
S213	15	9	2 0	south wall	40
S214	15	9	1 0	south wall	52
S215	17	11	2 5	base	38
S216	17	11	2 0	south wall	39
S217	17	11	1 0	south wall	45
S218	19	12	2 5	base	38
S219	19	12	2 0	south wall	50
S220	19	12	1 0	south wall	41
S221	3	11	3.0	base	240
S222	6	11	3 0	base	260
S223	3	14	3 2	base	260
S224	6	14	3 2	base	300
S225	3	17	3 5	base	500
S226	5	17	3 5	base	500
S227	3	19	3 5	base	400
S228	3	21	3 5	base	180
S229	3	25	3 5	base	52
S230	3	27	3.0	base	90
S231	3	27	2 0	north wall	57
S232	3	27	1 0	west wall	44
S233	6	26	3 0	base	52
S238	11	11	3 0	base	440
S239	9	12	3 0	base	260
S241	12	13	3 0	base	360
S242	11	20	3.0	base	88
S243	6	17	3 0	base	400
S244	10	18	3 0	base	310
S246	11	15	3 0	base	46
S247	7	20	3 0	base	160
S248	7	24	3 0	base	42
S250	5	27	3 0	base	80
S251	8	27	3 0	base	180
S252	8	22	3 0	base	50
S253	11	21	3 0	base	50
S257	14	25	3.0	base	46
S258	14	25	2.5	north wall	860
S259	14	25	1 0	north wall	48
S260	14	23	3.0	base	52
S261	15	23	2 0	west wall	50
S262	15	23	1.0	west wall	49
S263	15	20	3 0	base	45
S264	17	20	2 0	west wall	48
S265	17	20	1.0	west wall	46
S267	14	16	3 2	base	80

EAST EXCAVATION – JULY 1999 CONTINUED COMBUSTIBLE HYDROCARBON VAPOUR LEVELS FROM CONFIRMATORY SAMPLES					
Sample No.	Co-ordinates		Depth (m)	Location	Combustible Hydrocarbon Vapour Level (ppmv)
	X	Y			
S268	17	17	3 0	base	50
S269	17	17	2 0	west wall	48
S270	17	17	1 0	west wall	60
S272	18	15	3 0	base	38
S273	18	15	2.0	west wall	62
S274	18	15	1 0	west wall	40
S275	13	18	3 2	base	54
S276	12	23	3 0	base	48
S277	10	28	3 0	base	29
S278	10	28	2 0	north wall	46
S279	10	28	1 0	north wall	36
S280	6	28	3 0	base	30
S281	6	28	2 0	north wall	39
S282	6	28	1 0	north wall	34
S283	15	13	3 5	base	36
S284	0	27	3 5	base	40
S285	0	27	2 0	east wall	500
S286	0	27	1 0	east wall	51
S287	0	24	3 5	base	64
S288	0	24	2 8	east wall	1000
S289	0	21	3 5	base	35
S290	0	21	2 8	east wall	300
S291	0	21	2 5	east wall	300
S292	3	24	3 5	base	30
S293	0	18	3 5	base	22
S294	0	18	2 5	east wall	580
S295	0	18	1 0	east wall	55
S296	0	14	3 5	base	50
S297	0	14	2 8	east wall	900
S298	0	10	3 5	base	42
S299	0	10	2.5	east wall	460
S300	0	7	3 0	base	32
S301	0	7	2 5	east wall	200

Note
- ppmv - parts per million by volume
- m bgs – metres below ground surface

EAST EXCAVATION - OCTOBER 1999

COMBUSTIBLE HYDROCARBON VAPOUR LEVELS FROM CONFIRMATORY SAMPLES

Sample No.	Co-ordinates		Depth (m)	Location	Combustible Hydrocarbon Vapour Level (ppmv)
	x	y			
S275A	2	6	3 2	base	34
S276A	2	5	2.0	south wall	180
S277A	2	5	1 0	south wall	41
S278A	6	6	3 2	base	60
S279A	6	6	2 0	south wall	60
S280A	6	6	1 0	south wall	30
S281A	9	7	3.2	base	50
S282A	9	7	2.0	south wall	56
S283A	9	7	1 0	south wall	64
S284A	13	9	3 2	base	50
S285A	13	9	2 0	south wall	82
S286A	13	9	1 0	south wall	62
S287A	16	9	3 2	base	66
S288A	16	9	2 0	south wall	74
S289A	16	9	1 0	south wall	42
S290A	19	10	3 2	base	65
B293A	-	-	-	biopile	20
B294A	-	-	-	biopile	62
B295A	-	-	-	biopile	92
B296A	-	-	-	biopile	32
S297A	2	11	3 5	base	34
S298A	2	14	3 5	base	45
S299A	6	11	3 5	base	49
S300A	6	14	3 5	base	400
S301A	8	11	3 2	base	68
S302A	8	14	3.2	base	210
S303	10	11	3.2	base	48
S304	10	14	3 2	base	81
S305	14	11	3 5	base	85
S306	14	14	3.5	base	400
S307	18	12	3.5	base	60
S308	18	14	3 5	base	64
S309	18	12	2 0	west wall	73
S310	18	14	1 0	west wall	100
S311	18	12	2.0	west wall	46
S312	18	14	1 0	west wall	68
B313	-	-	-	biopile	62
B314	-	-	-	biopile	180
B315	-	-	-	biopile	18
B316	-	-	-	biopile	88
B317	-	-	-	biopile	200
B318	-	-	-	biopile	46
B319	-	-	-	biopile	82
B320	-	-	-	biopile	64
B321	-	-	-	biopile	60
B322	-	-	-	biopile	84
S323	3	18	3.5	base	44
S324	3	22	3 5	base	66
S325	6	18	3 5	base	68
S326	6	22	3.5	base	60
S327	9	18	3.5	base	180
S328	9	22	3 5	base	56
S329	12	18	3 5	base	58
S330	12	22	3 5	base	59
S331	14	18	3 5	base	50
S332	14	22	3.5	base	59
S333	16	18	3 5	base	50

EAST EXCAVATION – OCTOBER 1999 CONTINUED COMBUSTIBLE HYDROCARBON VAPOUR LEVELS FROM CONFIRMATORY SAMPLES					
Sample No.	Co-ordinates		Depth (m)	Location	Combustible Hydrocarbon Vapour Level (ppmv)
	X	Y			
S334	16	22	3 5	base	12
S335	18	18	2 0	west wall	60
S336	18	18	1 0	west wall	62
S337	16	22	2 0	west wall	60
S338	16	22	1 0	west wall	55
B339	-	-	-	biopile	38
B340	-	-	-	biopile	74
B341	-	-	-	biopile	160
B342	-	-	-	biopile	45
B343	-	-	-	biopile	78
B344	-	-	-	biopile	68
B345	-	-	-	biopile	200
B346	-	-	-	biopile	100
B347	-	-	-	biopile	45
B348	-	-	-	biopile	35
B349	-	-	-	biopile	30
B350	-	-	-	biopile	25
S351	3	25	3 5	base	28
S352	3	28	3 5	base	46
S353	6	25	3 5	base	38
S354	6	28	3 5	base	40
S355	3	29	2 0	north wall	46
S356	3	30	1 0	north wall	37
S357	6	29	2 0	north wall	42
S358	6	30	1 0	north wall	40
S359	9	25	3 5	base	44
S360	9	27	3 5	base	40
S361	9	28	2 0	north wall	48
S362	9	28	1 0	north wall	45
S363	12	25	3 5	base	41
S364	14	25	2 0	west wall	34
S365	14	25	1 0	west wall	40
S366	20	8	2 8	base	40
S367	19	8	2 5	south wall	20
B369	-	-	-	biopile	500
B370	-	-	-	biopile	100
B371	-	-	-	biopile	96
B372	-	-	-	biopile	50
S373	19	10	1 8	north wall	65
S374	19	10	2 8	north wall	200
S375	21	4	3 5	base	92
S378	19	4	3 0	south wall	200
S379	24	9	3.0	west wall	80
S380	2	4	2.2	south wall	90
S381	2	4	3 0	south wall	73
S382	2	4	1 8	south wall	50
S383	24	4	3 0	west wall	78

Note:

- ppmv - parts per million by volume
- m bgs – metres below ground surface

APPENDIX C

ANALYTICAL CHEMISTRY RESULTS

ETL EnviroTest

A DIVISION OF ETL CHEMSPEC ANALYTICAL LIMITED

nonton (Main)
16 - 67 Avenue
onton, AB
0P5
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. (780) 437-2311

nonton (Downtown)
Flr., 10158 - 103 Street
onton, AB
0X6
ne: (780) 413-5265
(780) 424-4602

gary
2, 1313 - 44th Ave. N.E.
ary, AB
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Logan Avenue
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Barton Street
der Bay, ON
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e: (807) 623-6463
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ıda Wide Phone:
0-668-9878

ern Canada Fax:
0-286-7319

CHEMICAL ANALYSIS REPORT

SEACOR ENVIRONMENTAL ENG
405 525 11 AVE SW
CALGARY AB T2R 0C9

DATE: July 16, 1999

ATTN: NIKOLE IMMEL

Lab Work Order #:	E907713	**Sampled By:**	NI
Project Reference:	H0031-093	**Date Received:**	07/15/99
Project P.O.#:	BARONS TURBO		

Comments:
Emergency Service.

APPROVED BY:

Ron Minks
Project Manager

ACCREDITATIONS: **STANDARDS COUNCIL OF CANADA (SCC), IN COOPERATION WITH THE CANADIAN ASSOCIATION FOR ENVIRONMENTAL ANALYTICAL LABORATORIES (CAEAL):** FOR SPECIFIC TESTS AS REGISTERED BY THE COUNCIL (EDMONTON, CALGARY)
AMERICAN INDUSTRIAL HYGIENE ASSOCIATION (AIHA): FOR INDUSTRIAL HYGIENE ANALYSIS (EDMONTON)
AGRICULTURE CANADA: UNDER THE CANADIAN FERTILIZER QUALITY ASSURANCE PROGRAM (SASKATOON)

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

LAB ID	SAMPLE ID	TEST DESCRIPTION	RESULT	D.L.	UNITS	EXTRACTED	ANALYZED	BY
E907713-01	FP3							
Sample Type:SOIL								
Collected:07/15/99								
		Flash Point	> 75		Degrees C	07/16/99	07/16/99	RLB
E907713-02	FP4							
Sample Type:SOIL								
Collected 07/15/99								
		Flash Point	> 75		Degrees C	07/16/99	07/16/99	RLB
E907713-03	CS18							
Sample Type:SOIL								
Collected:07/15/99								
WEST EXCAVATION BASE		BTEX and TVH in Soil						
		BTEX and TVH in Soil						
		Benzene	0 22	0 01	ug/g	07/15/99	07/16/99	RLB
		Toluene	0 60	0.01	ug/g	07/15/99	07/16/99	RLB
		Ethylbenzene	< 0 01	0 01	ug/g	07/15/99	07/16/99	RLB
		Xylenes	0.09	0.01	ug/g	07/15/99	07/16/99	RLB
		Total Volatiles	1 2	0 5	ug/g	07/15/99	07/16/99	RLB
		% Moisture	13 1	0.1	%	07/15/99	07/16/99	JSH

N D. - NOT DETECTED, LESS THAN THE DETECTION LIMIT

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NOT INCLUDING APPENDICES

Appendix A Test Methodologies

BTEX and TVH in Soil

PREPARATION METHOD: Methanol extraction with headspace analysis.

INSTRUMENTAL METHOD: GC/PID for BTEX.
GC/FID for TVH - summation of hydrocarbons from C5 to C10 carbon range and is calculated against a BTEX standard.
NOTE: Results based upon dry weight.

METHOD REFERENCE: Modified SW-846 USEPA Method 5021 and 8015/8020.

BTEX QC SUMMARY: Accuracy Precision
100% +/- 20%
NOTE: Accuracy is expressed as the average % recovery and Precision as the relative standard deviation (RSD) of fortifications made using certified standards (BTEX).

TVH QC SUMMARY: Accuracy Precision
96% +/- 24%
NOTE: Accuracy is expressed as the average % recovery and Precision as the relative standard deviation (RSD) of fortifications made using certified standards (BTEX).

Flash Point

Instrumental Method: Closed cup Pensky-Martens
Method Reference: ASTM D-93

% Moisture

PREPARATION METHOD: Sample is oven-dried at 105 C

INSTRUMENTAL METHOD. Gravimetric analysis

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a Wide Phone:
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n Canada Fax:
-286-7319

CHEMICAL ANALYSIS REPORT

SEACOR ENVIRONMENTAL ENG
405 525 11 AVE SW
CALGARY AB T2R 0C9

DATE: August 27, 1999

ATTN: NIKOLE IMMEL

Lab Work Order #:	E907A02 REVISION	**Sampled By:**	NI
Project Reference:	H0031-093	**Date Received:**	07/21/99
Project P.O.#:	BARONS TURBO		

Comments:
Emergency Service.

APPROVED BY:

Ron Minks
Project Manager

ACCREDITATIONS: STANDARDS COUNCIL OF CANADA (SCC), IN COOPERATION WITH THE CANADIAN ASSOCIATION FOR ENVIRONMENTAL ANALYTICAL LABORATORIES (CAEAL): FOR SPECIFIC TESTS AS REGISTERED BY THE COUNCIL (EDMONTON, CALGARY)
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AGRICULTURE CANADA: UNDER THE CANADIAN FERTILIZER QUALITY ASSURANCE PROGRAM (SASKATOON)

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

LAB ID / SAMPLE ID	TEST DESCRIPTION	RESULT	D.L.	UNITS	EXTRACTED	ANALYZED	BY
E907A02-01 W1 Sample Type:WATER Collected:07/19/99							
WEST EXCAVATION	BTEX in Water						
	BTEX in Water						
	Benzene	< 0 5	0.5	ug/L	07/22/99	07/22/99	JWM
	Toluene	0.6	0.5	ug/L	07/22/99	07/22/99	JWM
	Ethylbenzene	< 0.5	0 5	ug/L	07/22/99	07/22/99	JWM
	Xylenes	8 8	0 5	ug/L	07/22/99	07/22/99	JWM
E907A02-02 FP-EAST Sample Type:SOIL Collected:07/19/99							
	Flash Point	>75		Degrees C		07/21/99	TAR
E907A02-03 BF1 Sample Type:SOIL Collected:07/19/99							
BACKFILL WEST EXCAVATION	BTEX in Soil						
	BTEX in Soil						
	Benzene	< 0.01	0.01	ug/g	07/21/99	07/21/99	RLB
	Toluene	< 0.01	0 01	ug/g	07/21/99	07/21/99	RLB
	Ethylbenzene	< 0.01	0.01	ug/g	07/21/99	07/21/99	RLB
	Xylenes	< 0.01	0.01	ug/g	07/21/99	07/21/99	RLB
	% Moisture	15 8	0 1	%	07/21/99	07/21/99	JSH
E907A02-04 CS48 Sample Type:SOIL Collected 07/19/99							
WEST	BTEX in Soil						
	BTEX in Soil						
	Benzene	< 0.01	0.01	ug/g	07/21/99	07/21/99	RLB
	Toluene	< 0.01	0.01	ug/g	07/21/99	07/21/99	RLB
	Ethylbenzene	< 0.01	0.01	ug/g	07/21/99	07/21/99	RLB
	Xylenes	< 0.01	0 01	ug/g	07/21/99	07/21/99	RLB
	% Moisture	26.1	0.1	%	07/21/99	07/21/99	JSH
E907A02-06 CS75 Sample Type:SOIL Collected:07/19/99							
WEST	BTEX and TVH in Soil						
	BTEX and TVH in Soil						
	Benzene	< 0.01	0.01	ug/g	07/29/99	07/30/99	RLB
	Toluene	< 0.01	0.01	ug/g	07/29/99	07/30/99	RLB
	Ethylbenzene	< 0.01	0 01	ug/g	07/29/99	07/30/99	RLB
	Xylenes	0.04	0 01	ug/g	07/29/99	07/30/99	RLB
	Total Volatiles	< 0 5	0.5	ug/g	07/29/99	07/30/99	RLB
	% Moisture	15.4	0.1	%	07/27/99	07/28/99	TAR
E907A02-07 CS65 Sample Type:SOIL Collected:07/19/99							
WEST	BTEX in Soil						
	BTEX in Soil						
	Benzene	0.61	0.01	ug/g	07/21/99	07/21/99	RLB
	Toluene	0 29	0.01	ug/g	07/21/99	07/21/99	RLB
	Ethylbenzene	0.25	0.01	ug/g	07/21/99	07/21/99	RLB
	Xylenes	2.0	0.01	ug/g	07/21/99	07/21/99	RLB
	% Moisture	15.1	0.1	%	07/21/99	07/21/99	JSH
	Lead in Soil						
	Lead, Soil (Total)	12	5	mg/kg		08/12/99	SWW
	TVH and TEH in Soil						
	% Moisture	15.1	0.1	%	07/21/99	07/22/99	TAR
	Total Extractables (Soil)	6	5	ug/g	07/27/99	07/27/99	INV
	TVH (C5-C10) in Soil	6.7	0.5	ug/g	07/21/99	07/21/99	RLB

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

LAB ID	SAMPLE ID	TEST DESCRIPTION	RESULT	D.L.	UNITS	EXTRACTED	ANALYZED	BY
E907A02-08	CS59							
Sample Type:SOIL								
Collected:07/19/99								
		BTEX in Soil						
		BTEX in Soil						
		Benzene	0.02	0.01	ug/g	07/21/99	07/21/99	RLB
WEST		Toluene	< 0.01	0.01	ug/g	07/21/99	07/21/99	RLB
		Ethylbenzene	< 0.01	0.01	ug/g	07/21/99	07/21/99	RLB
		Xylenes	0.01	0.01	ug/g	07/21/99	07/21/99	RLB
		% Moisture	16.7	0.1	%	07/21/99	07/21/99	JSH
		Lead in Soil						
		Lead, Soil (Total)	11	5	mg/kg		08/12/99	SWW
		TVH and TEH in Soil						
		% Moisture	16.7	0.1	%	07/21/99	07/22/99	TAR
		Total Extractables (Soil)	< 5	5	ug/g	07/27/99	07/27/99	INV
		TVH (C5-C10) in Soil	2.3	0.5	ug/g	07/21/99	07/21/99	RLB
E907A02-09	CS52							
Sample Type:SOIL								
Collected:07/19/99								
WEST		**BTEX in Soil**						
		BTEX in Soil						
		Benzene	0.16	0.01	ug/g	07/21/99	07/21/99	RLB
		Toluene	1.9	0.01	ug/g	07/21/99	07/21/99	RLB
		Ethylbenzene	0.39	0.01	ug/g	07/21/99	07/21/99	RLB
		Xylenes	3.0	0.01	ug/g	07/21/99	07/21/99	RLB
		% Moisture	15.0	0.1	%	07/21/99	07/21/99	JSH

N.D. - NOT DETECTED, LESS THAN THE DETECTION LIMIT

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Appendix A Test Methodologies

BTEX in Soil

PREPARATION METHOD: Methanol extraction with headspace analysis.

INSTRUMENTAL METHOD: GC/PID
NOTE: Results reported on dry weight basis.

METHOD REFERENCE: Modified SW-846 USEPA Method 5021 and 8020.

QC SUMMARY: Accuracy Precision
100% +/- 20%
NOTE: Accuracy is expressed as the average % recovery and Precision as the relative standard deviation (RSD) of fortifications made using certified standards (BTEX).

BTEX in Water

PREPARATION METHOD: Purge and trap extraction.

INSTRUMENTAL METHOD: GC/PID

METHOD REFERENCE: Modified SW-846 USEPA Method 5030 and 8020.

QC SUMMARY: Accuracy Precision
100% +/- 10%
NOTE: Accuracy is expressed as the average % recovery and Precision as the relative standard deviation (RSD) of fortifications made using certified standards (BTEX).

BTEX and TVH in Soil

PREPARATION METHOD: Methanol extraction with headspace analysis.

INSTRUMENTAL METHOD: GC/PID for BTEX.
GC/FID for TVH - summation of hydrocarbons from C5 to C10 carbon range and is calculated against a BTEX standard.
NOTE: Results based upon dry weight.

METHOD REFERENCE: Modified SW-846 USEPA Method 5021 and 8015/8020.

BTEX QC SUMMARY. Accuracy Precision
100% +/- 20%
NOTE: Accuracy is expressed as the average % recovery and Precision as the relative standard deviation (RSD) of fortifications made using certified standards (BTEX).

TVH QC SUMMARY: Accuracy Precision
96% +/- 24%
NOTE: Accuracy is expressed as the average % recovery and Precision as the relative standard deviation (RSD) of fortifications made using certified standards (BTEX).

Flash Point

Instrumental Method: Closed cup Pensky-Martens
Method Reference: ASTM D-93

% Moisture

PREPARATION METHOD: Sample is oven-dried at 105 C

INSTRUMENTAL METHOD: Gravimetric analysis

Lead, Soil (Total)

Preparation Method: Modified EPA 3050 digestion with Aqua Regia.
Instrumental Method: Flame Atomic Absorption Spectrometry
Method Reference: U.S.E.P.A.- SW846, No.3050m/7420

Total Extractables (Soil)

PREPARATION METHOD: Shake and sonication extraction with organic solvent

INSTRUMENTAL METHOD: GC/FID - summation of hydrocarbons from C11 to C30 carbon range (excluding benzene, toluene, ethylbenzene, and xylenes) and calculated against diesel standard.

Appendix A Test Methodologies

NOTE. Results based upon dry weight.

METHOD REFERENCE: Modified SW-846 USEPA Method 3550/3580 and 8000

QC SUMMARY:

Accuracy	Precision
107%	+/- 17%

NOTE: Accuracy is expressed as the average % recovery and Precision as the relative standard deviation (RSD) of fortifications made using in-house standards (TEH).

TVH (C5-C10) in Soil

PREPARATION METHOD: Methanol extraction with headspace analysis.

INSTRUMENTAL METHOD: GC/FID for TVH - summation of hydrocarbons from C5 to C10 carbon range and is calculated against a BTEX standard.
NOTE: Results based upon dry weight.

METHOD REFERENCE: Modified SW-846 USEPA Method 5021 and 8015.

TVH QC SUMMARY:

Accuracy	Precision
96%	+/- 24%

NOTE: Accuracy is expressed as the average % recovery and Precision as the relative standard deviation (RSD) of fortifications made using certified standards (BTEX)

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CHEMICAL ANALYSIS REPORT

SEACOR ENVIRONMENTAL ENG
405 525 11 AVE SW
CALGARY AB T2R 0C9

DATE: July 28, 1999

ATTN: BILL MACDONALD

Lab Work Order #:	E907C74	**Sampled By:**	NI
Project Reference:	H00031-093	**Date Received:**	07/26/99
Project P.O.#:	TURBO		

Comments:
Emergency Service FOR FRAC 8 ONLY

APPROVED BY:

Ron Minks
Project Manager

ACCREDITATIONS: STANDARDS COUNCIL OF CANADA (SCC), IN COOPERATION WITH THE CANADIAN ASSOCIATION FOR ENVIRONMENTAL ANALYTICAL LABORATORIES (CAEAL): FOR SPECIFIC TESTS AS REGISTERED BY THE COUNCIL (EDMONTON, CALGARY)
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AGRICULTURE CANADA: UNDER THE CANADIAN FERTILIZER QUALITY ASSURANCE PROGRAM (SASKATOON)

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

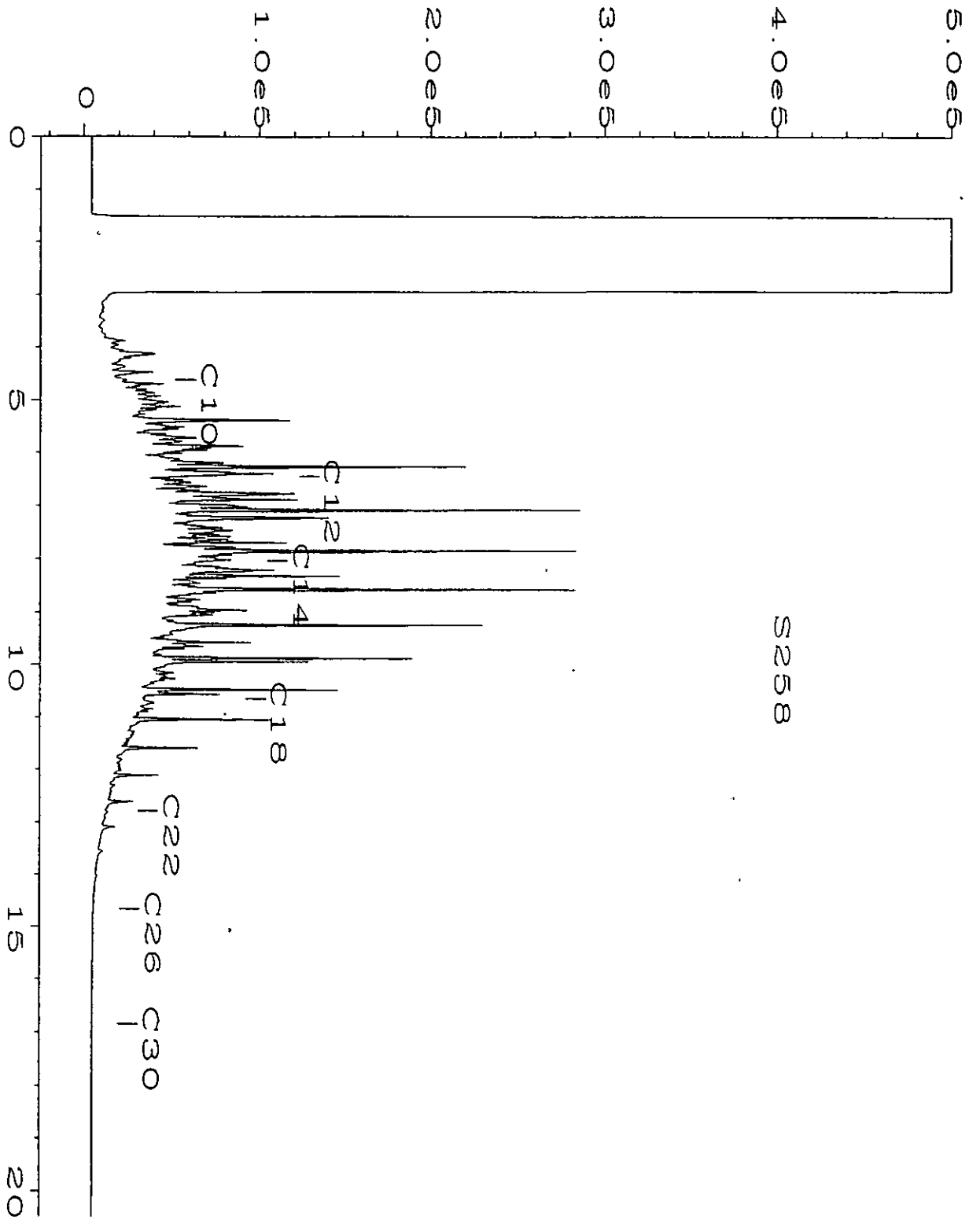
LAB ID / SAMPLE ID / TEST DESCRIPTION	RESULT	D L.	UNITS	EXTRACTED	ANALYZED	BY
E907C74-01 S5 Sample Type:SOIL Collected:07/23/99						
OFF-SITE WEST						
BTEX and TVH in Soil						
BTEX and TVH in Soil						
Benzene	9 2	0.01	ug/g	07/27/99	07/28/99	JWM
Toluene	220	0.01	ug/g	07/27/99	07/28/99	JWM
Ethylbenzene	190	0 01	ug/g	07/27/99	07/28/99	JWM
Xylenes	880	0 01	ug/g	07/27/99	07/28/99	JWM
Total Volatiles	6800	0 5	ug/g	07/27/99	07/28/99	JWM
% Moisture	21.3	0.1	%	07/27/99	07/27/99	TAR
E907C74-03 S98 Sample Type:SOIL Collected:07/23/99						
OFF-SITE WEST						
BTEX and TVH in Soil						
BTEX and TVH in Soil						
Benzene	13	0.01	ug/g	07/27/99	07/27/99	JWM
Toluene	< 0.01	0 01	ug/g	07/27/99	07/27/99	JWM
Ethylbenzene	31	0 01	ug/g	07/27/99	07/27/99	JWM
Xylenes	73	0 01	ug/g	07/27/99	07/27/99	JWM
Total Volatiles	2200	0 5	ug/g	07/27/99	07/27/99	JWM
% Moisture	23 6	0.1	%	07/27/99	07/27/99	TAR
E907C74-05 S96 Sample Type:SOIL Collected 07/23/99						
WEST EXCAVATION BASE						
BTEX and TVH in Soil						
BTEX and TVH in Soil						
Benzene	0.33	0.01	ug/g	07/27/99	07/27/99	JMW
Toluene	< 0.01	0.01	ug/g	07/27/99	07/27/99	JMW
Ethylbenzene	< 0.01	0.01	ug/g	07/27/99	07/27/99	JMW
Xylenes	< 0.01	0.01	ug/g	07/27/99	07/27/99	JMW
Total Volatiles	0.6	0 5	ug/g	07/27/99	07/27/99	JMW
% Moisture	17.7	0.1	%	07/27/99	07/27/99	TAR
E907C74-06 S92 Sample Type:SOIL Collected:07/23/99						
WEST EXCAVATION SOUTH WALL						
BTEX and TVH in Soil						
BTEX and TVH in Soil						
Benzene	< 0.01	0.01	ug/g	07/27/99	07/27/99	JWM
Toluene	< 0.01	0 01	ug/g	07/27/99	07/27/99	JWM
Ethylbenzene	< 0.01	0.01	ug/g	07/27/99	07/27/99	JWM
Xylenes	0.05	0 01	ug/g	07/27/99	07/27/99	JWM
Total Volatiles	5.9	0.5	ug/g	07/27/99	07/27/99	JWM
% Moisture	12 7	0.1	%	07/27/99	07/27/99	TAR
E907C74-07 GW (WEST) Sample Type:GROUNDWATER Collected:07/23/99						
BTEX in Water						
BTEX in Water						
Benzene	21	0 5	ug/L	07/27/99	07/27/99	JWM
Toluene	12	0.5	ug/L	07/27/99	07/27/99	JWM
Ethylbenzene	< 0.5	0.5	ug/L	07/27/99	07/27/99	JWM
Xylenes	100	0.5	ug/L	07/27/99	07/27/99	JWM
E907C74-08 S258 Sample Type:SOIL Collected:07/23/99						
EAST EXCAVATION NORTH WALL						
BTEX, TVH and TEH in Soil						
BTEX and TVH in Soil						
Benzene	< 0.1	0.1	ug/g	07/26/99	07/27/99	JWM
Toluene	0.1	0.1	ug/g	07/26/99	07/27/99	JWM
Ethylbenzene	1.9	0.1	ug/g	07/26/99	07/27/99	JWM
Xylenes	11	0.1	ug/g	07/26/99	07/27/99	JWM
Total Volatiles	500	5	ug/g	07/26/99	07/27/99	JWM
% Moisture	28.0	0.1	%	07/26/99	07/27/99	TAR
Total Extractables (Soil)	2000	5	ug/g	07/26/99	07/26/99	INV

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

LAB ID / SAMPLE ID	TEST DESCRIPTION	RESULT	D.L.	UNITS	EXTRACTED	ANALYZED	BY
E907C74-09 S214 Sample Type:SOIL Collected 07/23/99							
EAST EXCAVATION SOUTH WALL	BTEX, TVH and TEH in Soil						
	BTEX and TVH in Soil						
	Benzene	< 0 01	0.01	ug/g	07/27/99	07/27/99	JMW
	Toluene	< 0.01	0 01	ug/g	07/27/99	07/27/99	JMW
	Ethylbenzene	< 0.01	0.01	ug/g	07/27/99	07/27/99	JMW
	Xylenes	< 0 01	0.01	ug/g	07/27/99	07/27/99	JMW
	Total Volatiles	< 0.5	0 5	ug/g	07/27/99	07/27/99	JMW
	% Moisture	11.8	0.1	%	07/27/99	07/27/99	TAR
	Total Extractables (Soil)	1500	5	ug/g	07/27/99	07/27/99	INV
E907C74-10 S273 Sample Type:SOIL Collected:07/23/99							
EAST EXCAVATION WEST WALL	BTEX, TVH and TEH in Soil						
	BTEX and TVH in Soil						
	Benzene	< 0 01	0 01	ug/g	07/27/99	07/27/99	JWM
	Toluene	< 0.01	0 01	ug/g	07/27/99	07/27/99	JWM
	Ethylbenzene	< 0.01	0 01	ug/g	07/27/99	07/27/99	JWM
	Xylenes	< 0.01	0 01	ug/g	07/27/99	07/27/99	JWM
	Total Volatiles	< 0 5	0 5	ug/g	07/27/99	07/27/99	JWM
	% Moisture	15 1	0 1	%	07/27/99	07/27/99	TAR
	Total Extractables (Soil)	< 5	5	ug/g	07/27/99	07/27/99	INV
E907C74-11 S200 Sample Type:SOIL Collected:07/23/99							
EAST EXCAVATION BASE	**BTEX, TVH and TEH in Soil**						
	BTEX and TVH in Soil						
	Benzene	< 0.01	0.01	ug/g	07/27/99	07/27/99	JWM
	Toluene	< 0.01	0 01	ug/g	07/27/99	07/27/99	JWM
	Ethylbenzene	0.25	0.01	ug/g	07/27/99	07/27/99	JWM
	Xylenes	0.67	0.01	ug/g	07/27/99	07/27/99	JWM
	Total Volatiles	18	0.5	ug/g	07/27/99	07/27/99	JWM
	% Moisture	27.9	0.1	%	07/27/99	07/27/99	TAR
	Total Extractables (Soil)	370	5	ug/g	07/27/99	07/27/99	INV
E907C74-12 BF2 Sample Type:SOIL Collected:07/23/99							
BACKFILL WEST EXCAVATION	**BTEX and TVH in Soil**						
	BTEX and TVH in Soil						
	Benzene	< 0.01	0.01	ug/g	07/27/99	07/27/99	JMW
	Toluene	< 0.01	0.01	ug/g	07/27/99	07/27/99	JMW
	Ethylbenzene	< 0.01	0 01	ug/g	07/27/99	07/27/99	JMW
	Xylenes	< 0.01	0.01	ug/g	07/27/99	07/27/99	JMW
	Total Volatiles	< 0.5	0.5	ug/g	07/27/99	07/27/99	JMW
	% Moisture	13.6	0.1	%	07/27/99	07/27/99	TAR

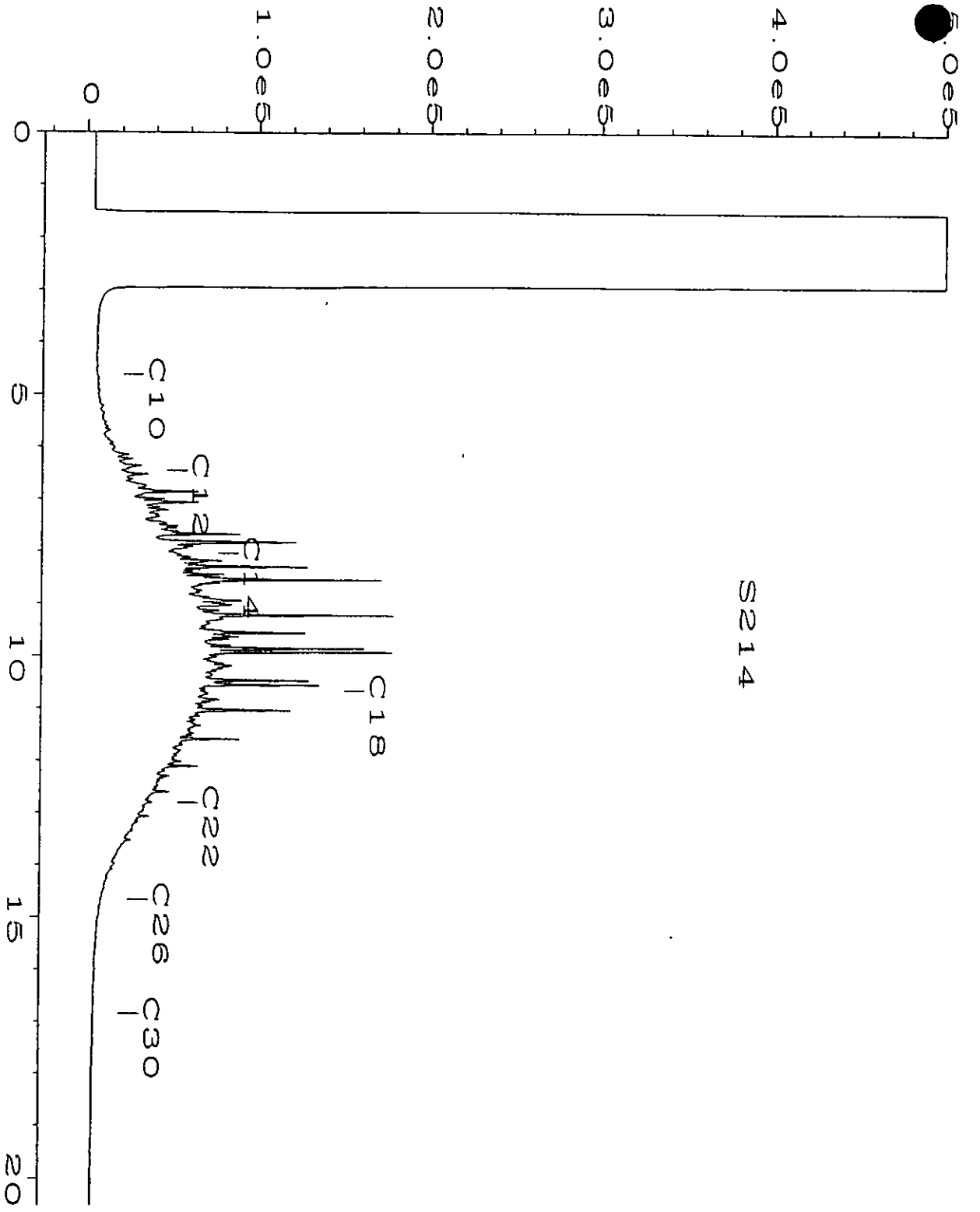
N.D - NOT DETECTED, LESS THAN THE DETECTION LIMIT

THIS IS THE FINAL PAGE OF THE REPORT
NOT INCLUDING APPENDICES



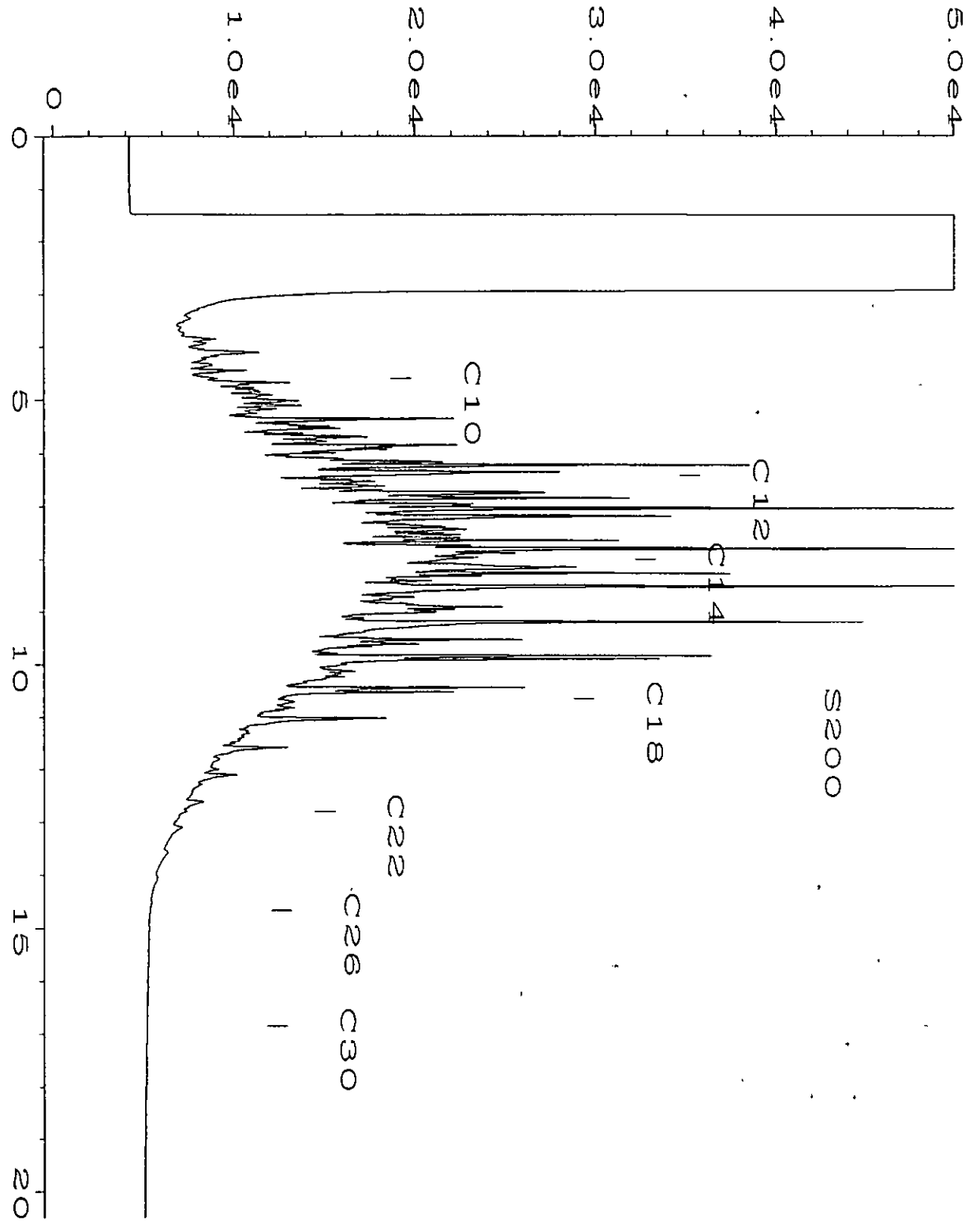
Data File Name : C:\HPCHEM\1\DATA\TEH0722\094F0101.D
Operator : IGOR VOLOSCHIK
Instrument : HP-1
Sample Name : E907C74-08
Run Time Bar Code:
Acquired on : 26 Jul 99 04:31 PM
Report Created on: 30 Jul 99 01:55 PM

Page Number : 1
Vial Number : 94
Injection Number : 1
Sequence Line : 1
Instrument Method: TEH0604.MTH
Analysis Method : TEH0604.MTH



Data File Name : C:\HPCHEM\1\DATA\TEH0727\025F0101.D
Operator : IGOR VOLOSCHIK
Instrument : HP-1
Sample Name : E907C74-09
Run Time Bar Code:
Acquired on : 27 Jul 99 07:11 PM
Report Created on: 30 Jul 99 01:58 PM

Page Number : 1
Vial Number : 25
Injection Number : 1
Sequence Line : 1
Instrument Method: TEH0604.MTH
Analysis Method : TEH0604.MTH



Data File Name : C:\HPCHEM\1\DATA\TEH0727\024F0101.D
Operator : IGOR VOLOSCHIK
Instrument : HP-1
Sample Name : E907C74-11
Run Time Bar Code:
Acquired on : 27 Jul 99 06:45 PM
Report Created on: 30 Jul 99 01:57 PM

Page Number : 1
Vial Number : 24
Injection Number : 1
Sequence Line : 1
Instrument Method: TEH0604.MTH
Analysis Method : TEH0604.MTH

Appendix A Test Methodologies

BTEX in Water

PREPARATION METHOD: Purge and trap extraction.

INSTRUMENTAL METHOD: GC/PID

METHOD REFERENCE: Modified SW-846 USEPA Method 5030 and 8020.

QC SUMMARY

Accuracy	Precision
100%	+/- 10%

NOTE: Accuracy is expressed as the average % recovery and Precision as the relative standard deviation (RSD) of fortifications made using certified standards (BTEX).

BTEX and TVH in Soil

PREPARATION METHOD: Methanol extraction with headspace analysis.

INSTRUMENTAL METHOD: GC/PID for BTEX.
GC/FID for TVH - summation of hydrocarbons from C5 to C10 carbon range and is calculated against a BTEX standard.
NOTE: Results based upon dry weight.

METHOD REFERENCE. Modified SW-846 USEPA Method 5021 and 8015/8020.

BTEX QC SUMMARY

Accuracy	Precision
100%	+/- 20%

NOTE: Accuracy is expressed as the average % recovery and Precision as the relative standard deviation (RSD) of fortifications made using certified standards (BTEX).

TVH QC SUMMARY:

Accuracy	Precision
96%	+/- 24%

NOTE: Accuracy is expressed as the average % recovery and Precision as the relative standard deviation (RSD) of fortifications made using certified standards (BTEX).

% Moisture

PREPARATION METHOD: Sample is oven-dried at 105 C

INSTRUMENTAL METHOD: Gravimetric analysis

Total Extractables (Soil)

PREPARATION METHOD: Shake and sonication extraction with organic solvent

INSTRUMENTAL METHOD: GC/FID - summation of hydrocarbons from C11 to C30 carbon range (excluding benzene, toluene, ethylbenzene, and xylenes) and calculated against diesel standard.
NOTE: Results based upon dry weight.

METHOD REFERENCE: Modified SW-846 USEPA Method 3550/3580 and 8000

QC SUMMARY:

Accuracy	Precision
107%	+/- 17%

NOTE: Accuracy is expressed as the average % recovery and Precision as the relative standard deviation (RSD) of fortifications made using in-house standards (TEH)

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nton, AB
.X6
e: (780) 413-5265
(780) 424-4602

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1313 - 44th Ave. N.E.
y, AB
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e: (403) 291-9897
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(780) 513-2191

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Barton Street
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(807) 623-6463
(807) 623-7598

a Wide Phone:
-668-9878

m Canada Fax:
-286-7319

CHEMICAL ANALYSIS REPORT

SEACOR ENVIRONMENTAL ENG
405 525 11 AVE SW
CALGARY AB T2R 0C9

DATE: July 23, 1999

ATTN: NIKOLE IMMEL

Lab Work Order #:	E907B37	**Sampled By:**	NI
Project Reference:	H0031-093	**Date Received:**	07/22/99
Project P.O.#:	TURBO BARONS BULK SERVICE		

Comments:
Emergency Service.

APPROVED BY:

Ron Minks
Project Manager

ACCREDITATIONS: STANDARDS COUNCIL OF CANADA (SCC), IN COOPERATION WITH THE CANADIAN ASSOCIATION FOR ENVIRONMENTAL ANALYTICAL LABORATORIES (CAEAL): FOR SPECIFIC TESTS AS REGISTERED BY THE COUNCIL (EDMONTON, CALGARY)
AMERICAN INDUSTRIAL HYGIENE ASSOCIATION (AIHA): FOR INDUSTRIAL HYGIENE ANALYSIS (EDMONTON)
AGRICULTURE CANADA: UNDER THE CANADIAN FERTILIZER QUALITY ASSURANCE PROGRAM (SASKATOON)

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

LAB ID / SAMPLE ID	TEST DESCRIPTION	RESULT	D.L.	UNITS	EXTRACTED	ANALYZED	BY
E907B37-01 CS201 Sample Type:SOIL Collected:07/21/99							
EAST EXCAVATION SOUTH WALL	BTEX, TVH and TEH in Soil						
	BTEX and TVH in Soil						
	Benzene	< 0.01	0.01	ug/g	07/22/99	07/22/99	RLB
	Toluene	< 0.01	0.01	ug/g	07/22/99	07/22/99	RLB
	Ethylbenzene	0.12	0.01	ug/g	07/22/99	07/22/99	RLB
	Xylenes	0.41	0.01	ug/g	07/22/99	07/22/99	RLB
	Total Volatiles	12	0.5	ug/g	07/22/99	07/22/99	RLB
	% Moisture	26.4	0.1	%	07/22/99	07/22/99	JSH
	Total Extractables (Soil)	1100.	5	ug/g	07/22/99	07/22/99	INV
E907B37-02 CS204 Sample Type:SOIL Collected:07/21/99							
EAST EXCAVATION SOUTH WALL	BTEX, TVH and TEH in Soil						
	BTEX and TVH in Soil						
	Benzene	< 0.01	0.01	ug/g	07/22/99	07/22/99	RLB
	Toluene	< 0.01	0.01	ug/g	07/22/99	07/22/99	RLB
	Ethylbenzene	0.31	0.01	ug/g	07/22/99	07/22/99	RLB
	Xylenes	0.60	0.01	ug/g	07/22/99	07/22/99	RLB
	Total Volatiles	17	0.5	ug/g	07/22/99	07/22/99	RLB
	% Moisture	24.1	0.1	%	07/22/99	07/22/99	JSH
	Total Extractables (Soil)	1800	5	ug/g	07/22/99	07/22/99	INV
E907B37-03 CS212 Sample Type:SOIL Collected:07/21/99							
EAST EXCAVATION BASE	BTEX, TVH and TEH in Soil						
	BTEX and TVH in Soil						
	Benzene	< 0.01	0.01	ug/g	07/22/99	07/22/99	RLB
	Toluene	< 0.01	0.01	ug/g	07/22/99	07/22/99	RLB
	Ethylbenzene	0.07	0.01	ug/g	07/22/99	07/22/99	RLB
	Xylenes	0.17	0.01	ug/g	07/22/99	07/22/99	RLB
	Total Volatiles	9.1	0.5	ug/g	07/22/99	07/22/99	RLB
	% Moisture	16.1	0.1	%	07/22/99	07/22/99	JSH
	Total Extractables (Soil)	1000	5	ug/g	07/22/99	07/22/99	INV
E907B37-04 CS225 Sample Type:SOIL Collected:07/21/99							
EAST EXCAVATION BASE	BTEX, TVH and TEH in Soil						
	BTEX and TVH in Soil						
	Benzene	< 0.01	0.01	ug/g	07/22/99	07/22/99	RLB
	Toluene	< 0.01	0.01	ug/g	07/22/99	07/22/99	RLB
	Ethylbenzene	0.15	0.01	ug/g	07/22/99	07/22/99	RLB
	Xylenes	0.33	0.01	ug/g	07/22/99	07/22/99	RLB
	Total Volatiles	10	0.5	ug/g	07/22/99	07/22/99	RLB
	% Moisture	19.0	0.1	%	07/22/99	07/22/99	JSH
	Total Extractables (Soil)	800	5	ug/g	07/22/99	07/22/99	INV
E907B37-05 CS236 Sample Type:SOIL Collected:07/22/99							
INTO BIOCELL	BTEX, TVH and TEH in Soil						
	BTEX and TVH in Soil						
	Benzene	< 0.01	0.01	ug/g	07/22/99	07/22/99	RLB
	Toluene	< 0.01	0.01	ug/g	07/22/99	07/22/99	RLB
	Ethylbenzene	1.4	0.01	ug/g	07/22/99	07/22/99	RLB
	Xylenes	4.1	0.01	ug/g	07/22/99	07/22/99	RLB
	Total Volatiles	150	0.5	ug/g	07/22/99	07/22/99	RLB
	% Moisture	22.3	0.1	%	07/22/99	07/22/99	JSH
	Total Extractables (Soil)	4100	5	ug/g	07/22/99	07/22/99	INV

N.D. - NOT DETECTED, LESS THAN THE DETECTION LIMIT

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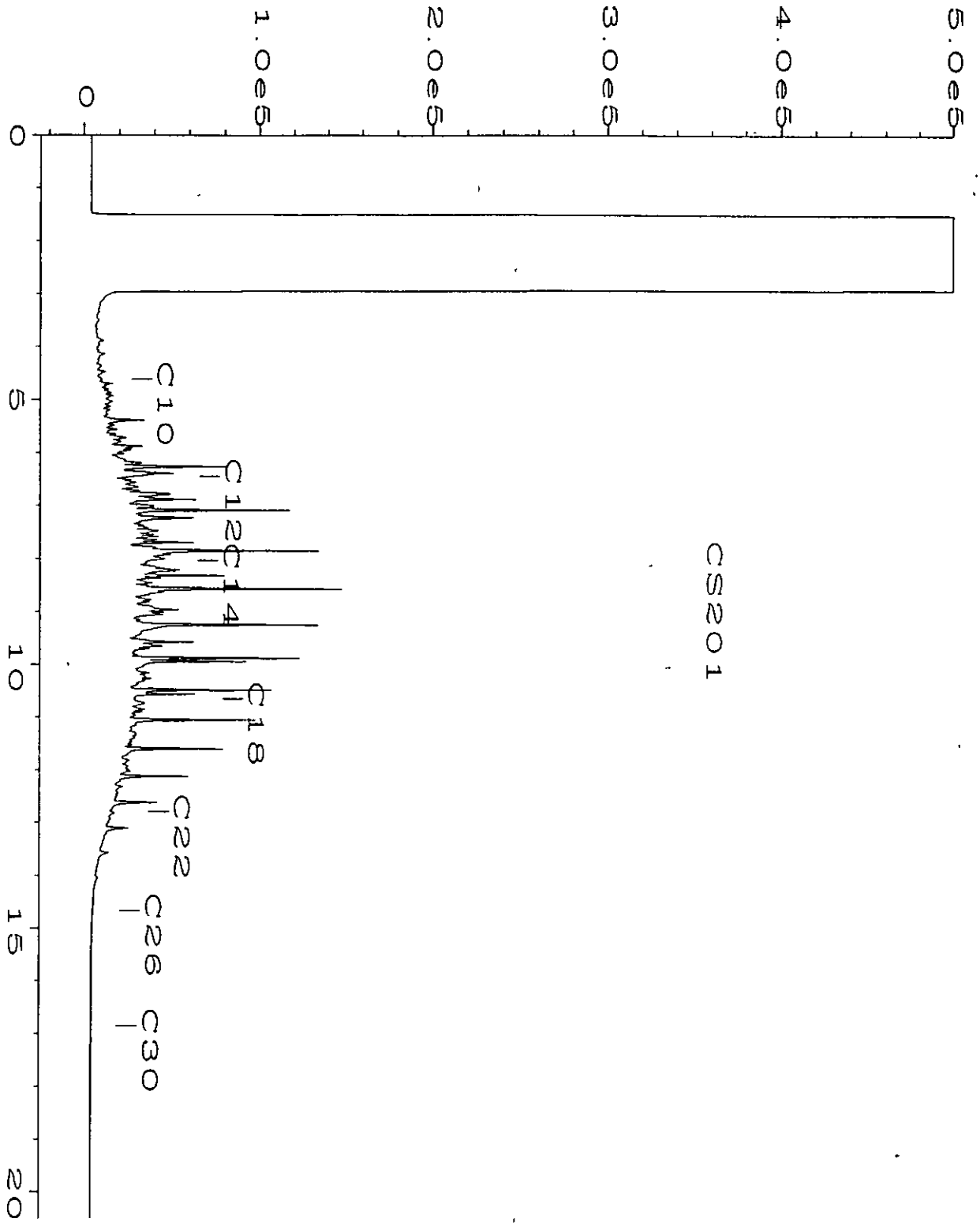

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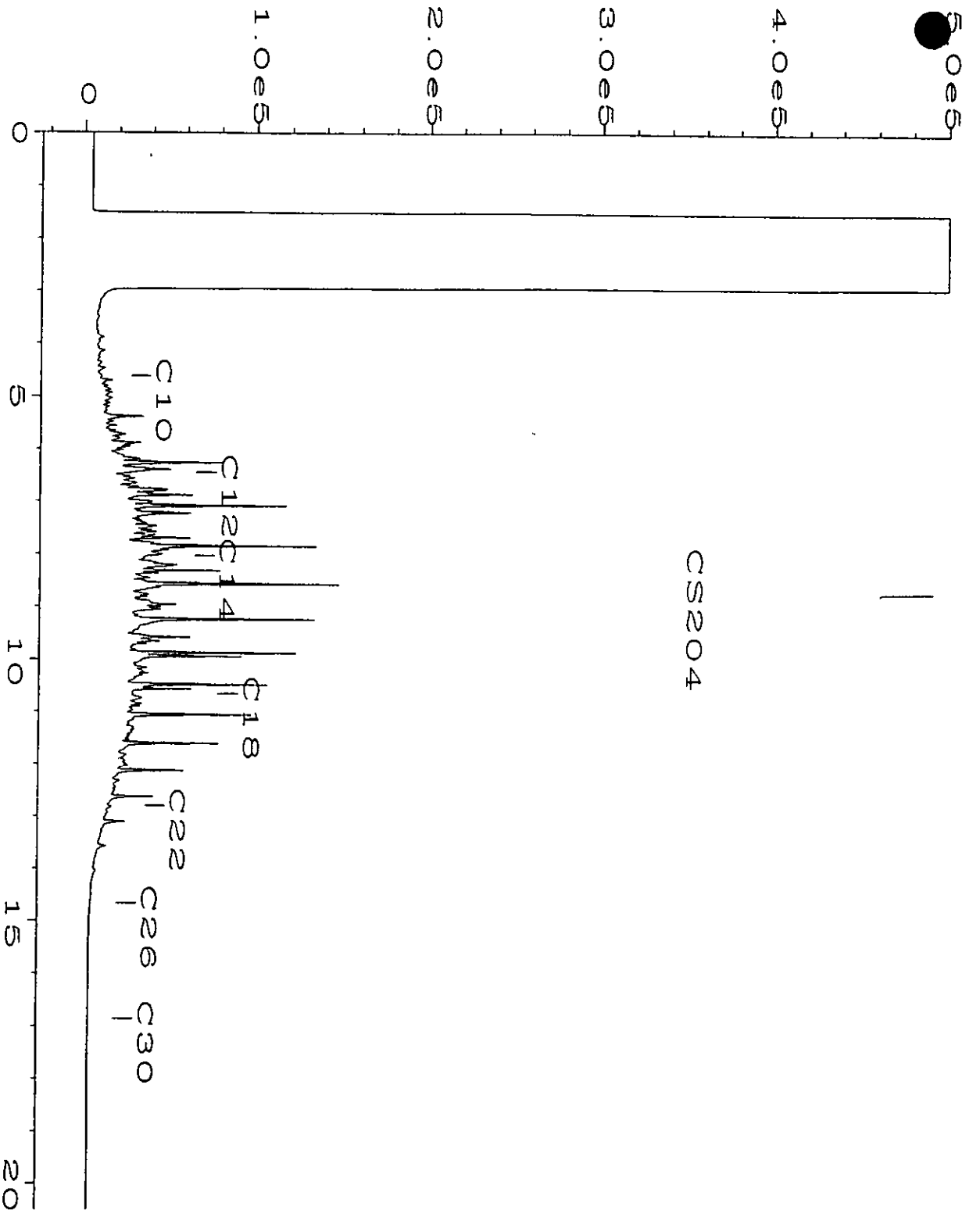
Instrument : HP-1
Sample Name : E907B37-01
Run Time Bar Code:
Acquired on : 23 Jul 99 08:51 AM
Report Created on: 30 Jul 99 01:05 PM

Page Number : 1
Vial Number : 43
Injection Number : 1
Sequence Line : 1
Instrument Method: TEH0604.MTH
Analysis Method : TEH0604.MTH



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Instrument : HP-1
Sample Name : E907B37-01
Run Time Bar Code:
Acquired on : 23 Jul 99 08:51 AM
Report Created on: 30 Jul 99 01:06 PM

Page Number : 1
Vial Number : 43
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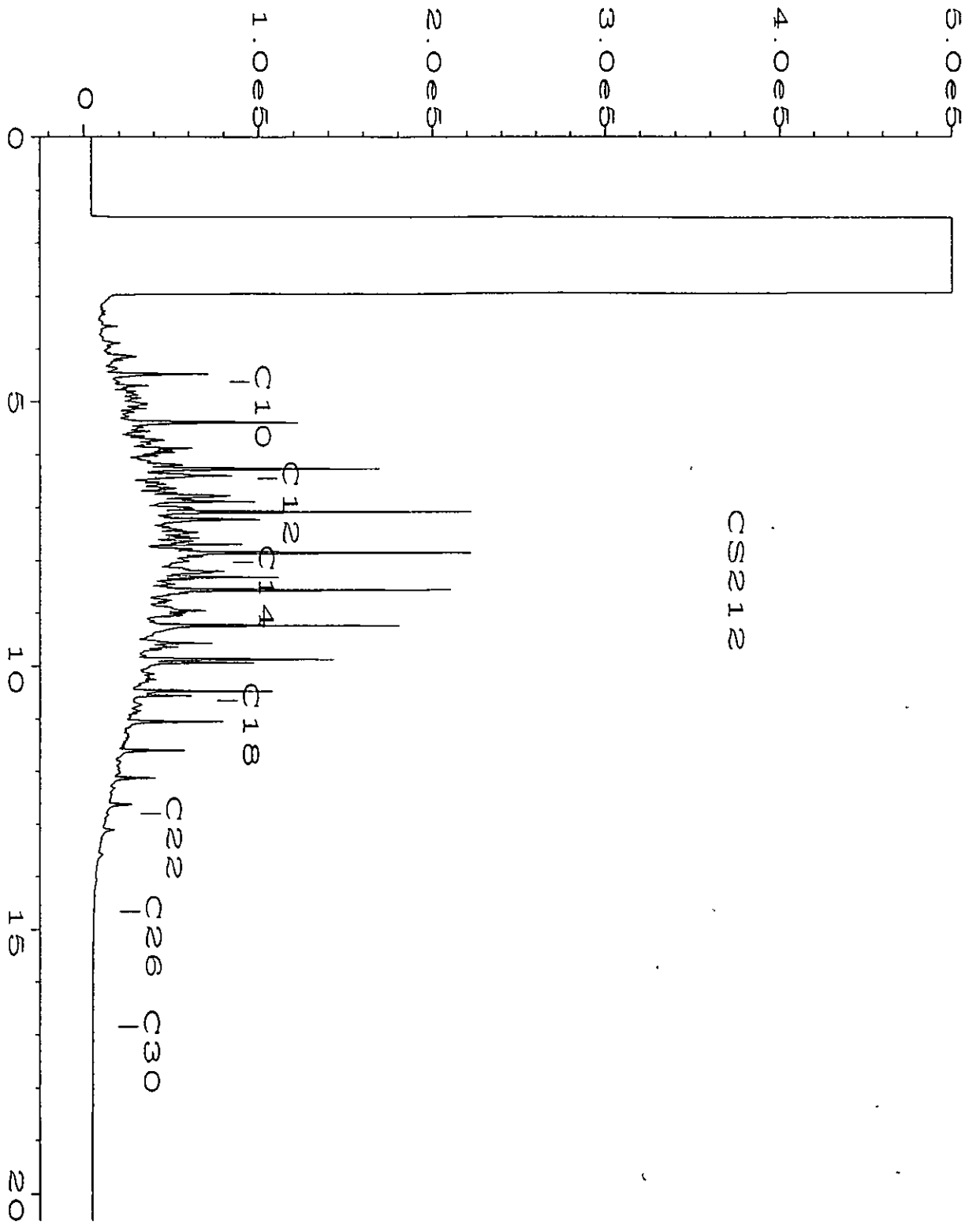
Instrument Method: TEH0604.MTH
Analysis Method : TEH0604.MTH



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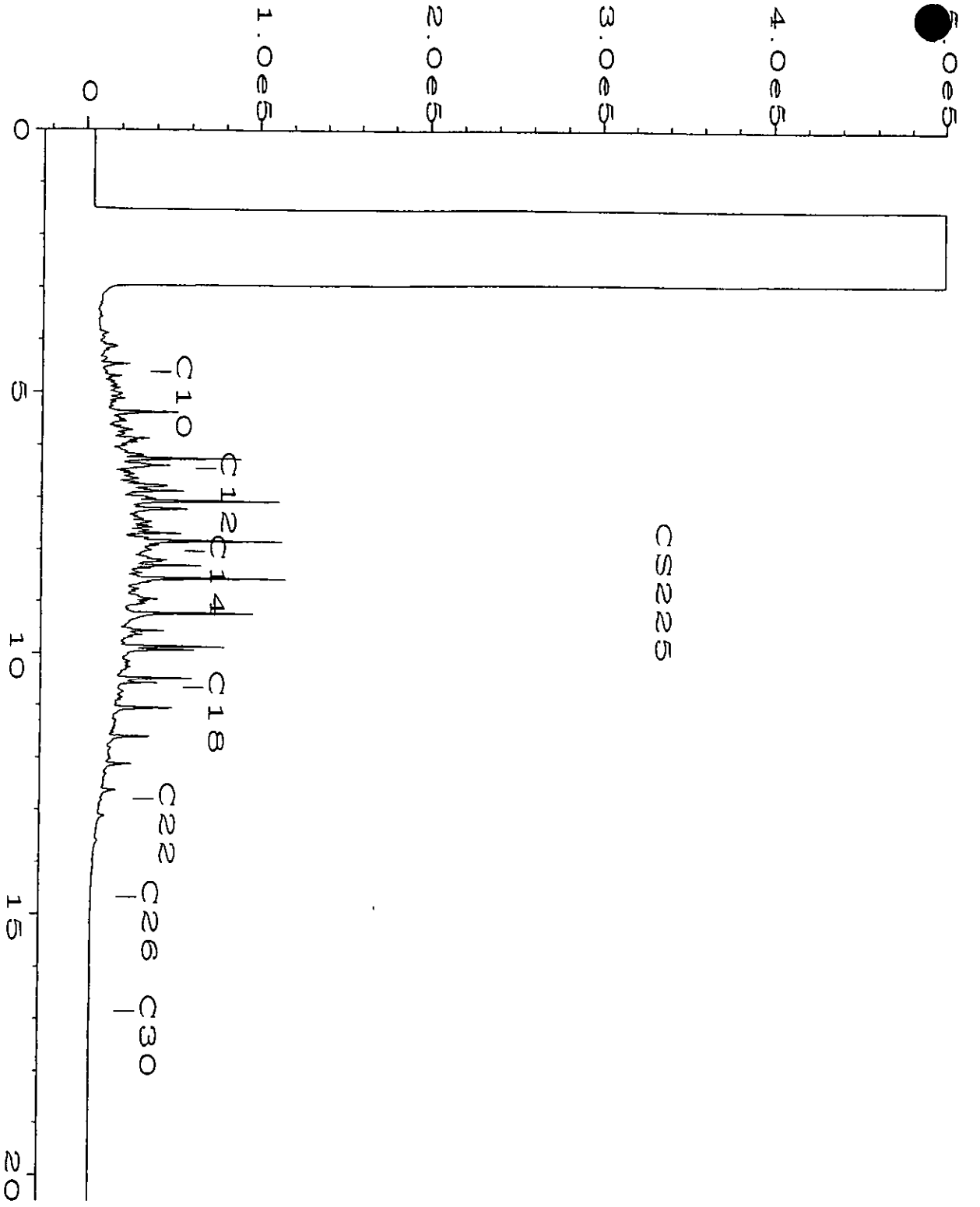
Instrument	: HP-1	Vial Number	: 45
Sample Name	: E907B37-03	Injection Number	: 1
:un Time Bar Code:		Sequence Line	: 1
Acquired on	: 23 Jul 99 09:42 AM	Instrument Method	: TEH0604.MTH
Report Created on	: 30 Jul 99 01:07 PM	Analysis Method	: TEH0604.MTH



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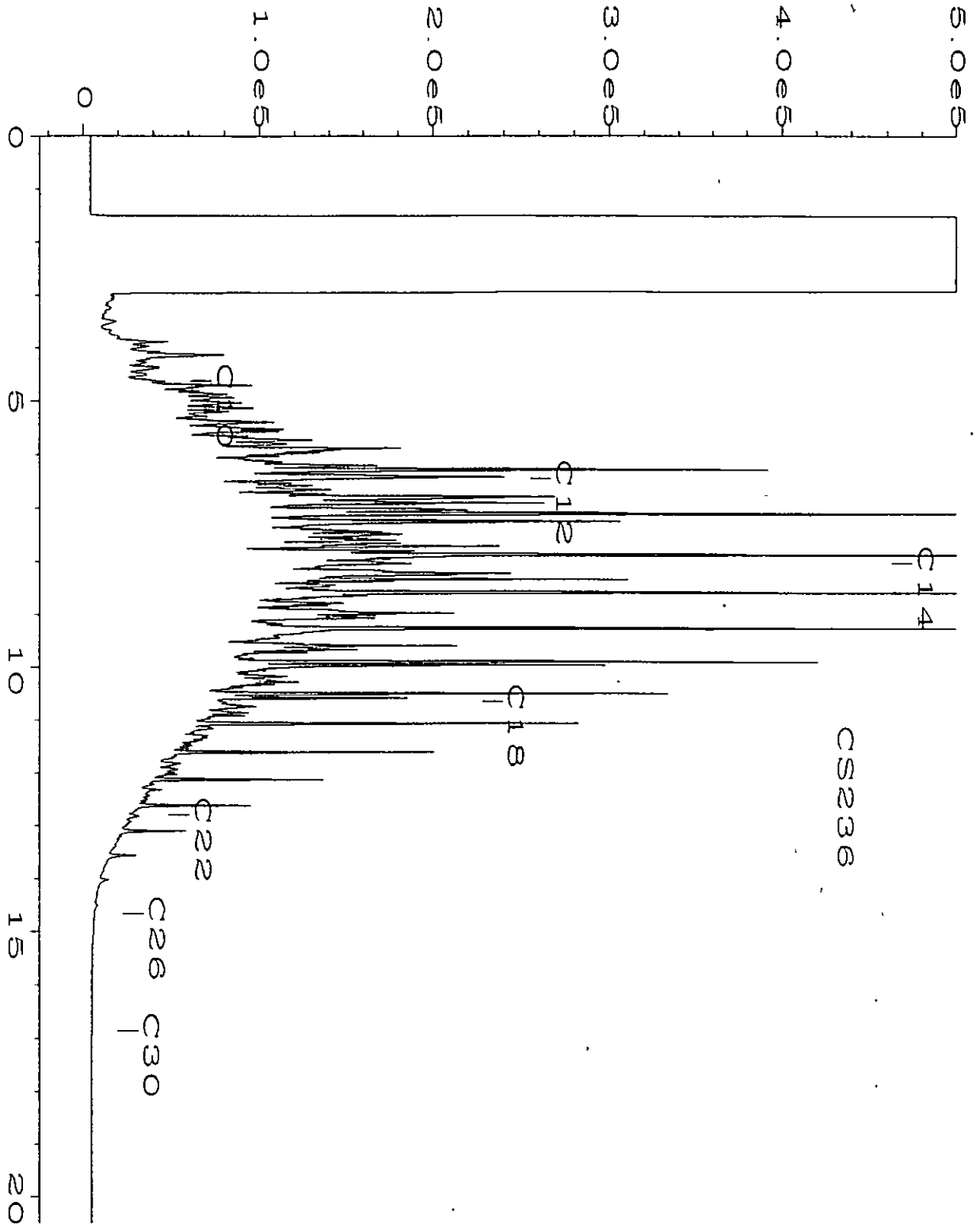
Operator : IGOR VOLOSCHIK
Instrument : HP-1
Sample Name : E907B37-04
Run Time Bar Code:
Acquired on : 23 Jul 99 10:08 AM
Report Created on: 30 Jul 99 01:07 PM

Page Number : 1
Vial Number : 46
Injection Number : 1
Sequence Line : 1
Instrument Method: TEH0604.MTH
Analysis Method : TEH0604.MTH



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Operator : IGOR VOLOSCHIK
Instrument : HP-1
Sample Name : E907B37-05
Run Time Bar Code:
Acquired on : 23 Jul 99 10:34 AM
Report Created on: 30 Jul 99 01:08 PM

Page Number : 1
Vial Number : 47
Injection Number : 1
Sequence Line : 1
Instrument Method: TEH0604.MTH
Analysis Method : TEH0604.MTH

Appendix A Test Methodologies

BTEX and TVH in Soil

PREPARATION METHOD: Methanol extraction with headspace analysis

INSTRUMENTAL METHOD: GC/PID for BTEX.
GC/FID for TVH - summation of hydrocarbons from C5 to C10 carbon range and is calculated against a BTEX standard.
NOTE Results based upon dry weight.

METHOD REFERENCE. Modified SW-846 USEPA Method 5021 and 8015/8020.

BTEX QC SUMMARY: Accuracy Precision
100% +/- 20%
NOTE: Accuracy is expressed as the average % recovery and Precision as the relative standard deviation (RSD) of fortifications made using certified standards (BTEX).

TVH QC SUMMARY: Accuracy Precision
96% +/- 24%
NOTE. Accuracy is expressed as the average % recovery and Precision as the relative standard deviation (RSD) of fortifications made using certified standards (BTEX).

% Moisture

PREPARATION METHOD: Sample is oven-dried at 105 C

INSTRUMENTAL METHOD: Gravimetric analysis

Total Extractables (Soil)

PREPARATION METHOD Shake and sonication extraction with organic solvent

INSTRUMENTAL METHOD: GC/FID - summation of hydrocarbons from C11 to C30 carbon range (excluding benzene, toluene, ethylbenzene, and xylenes) and calculated against diesel standard.
NOTE: Results based upon dry weight.

METHOD REFERENCE: Modified SW-846 USEPA Method 3550/3580 and 8000

QC SUMMARY: Accuracy Precision
107% +/- 17%
NOTE: Accuracy is expressed as the average % recovery and Precision as the relative standard deviation (RSD) of fortifications made using in-house standards (TEH).

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CHEMICAL ANALYSIS REPORT

SEACOR ENVIRONMENTAL ENG
405 525 11 AVE SW
CALGARY AB T2R 0C9

DATE: August 4, 1999

ATTN: NIKOLE IMMEL

Lab Work Order #:	E907D78	Sampled By:	NI
Project Reference:	H0031-093 BARONS TURBO	Date Received:	07/27/99
Project P.O.#:	BARONS TURBO		

Comments:

APPROVED BY:

Ron Minks
Project Manager

ACCREDITATIONS: STANDARDS COUNCIL OF CANADA (SCC), IN COOPERATION WITH THE CANADIAN ASSOCIATION FOR ENVIRONMENTAL ANALYTICAL LABORATORIES (CAEAL): FOR SPECIFIC TESTS AS REGISTERED BY THE COUNCIL (EDMONTON, CALGARY)
AMERICAN INDUSTRIAL HYGIENE ASSOCIATION (AIHA): FOR INDUSTRIAL HYGIENE ANALYSIS (EDMONTON)
AGRICULTURE CANADA: UNDER THE CANADIAN FERTILIZER QUALITY ASSURANCE PROGRAM (SASKATOON)

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

LAB ID / SAMPLE ID	TEST DESCRIPTION	RESULT	D.L.	UNITS	EXTRACTED	ANALYZED	BY
E907D78-01 CS278 Sample Type:SOIL Collected:07/27/99							
EAST EXCAVATION NORTH WALL	**BTEX, TVH and TEH in Soil** **BTEX and TVH in Soil**						
	Benzene	< 0.01	0.01	ug/g	07/30/99	07/31/99	RLB
	Toluene	< 0.01	0 01	ug/g	07/30/99	07/31/99	RLB
	Ethylbenzene	< 0.01	0.01	ug/g	07/30/99	07/31/99	RLB
	Xylenes	< 0.01	0.01	ug/g	07/30/99	07/31/99	RLB
	Total Volatiles	< 0.5	0.5	ug/g	07/30/99	07/31/99	RLB
	% Moisture	26.9	0.1	%	07/29/99	07/30/99	TAR
	Total Extractables (Soil)	< 5	5	ug/g	07/29/99	07/29/99	INV
E907D78-02 CS280 Sample Type:SOIL Collected.07/27/99							
EAST EXCAVATION BASE	**BTEX, TVH and TEH in Soil** **BTEX and TVH in Soil**						
	Benzene	< 0.01	0 01	ug/g	07/30/99	07/31/99	RLB
	Toluene	< 0 01	0.01	ug/g	07/30/99	07/31/99	RLB
	Ethylbenzene	< 0 01	0.01	ug/g	07/30/99	07/31/99	RLB
	Xylenes	< 0.01	0 01	ug/g	07/30/99	07/31/99	RLB
	Total Volatiles	< 0.5	0.5	ug/g	07/30/99	07/31/99	RLB
	% Moisture	16.6	0.1	%	07/29/99	07/30/99	TAR
	Total Extractables (Soil)	< 5	5	ug/g	07/29/99	07/29/99	INV
E907D78-03 CS288 Sample Type:SOIL Collected 07/27/99							
OFF-SITE EAST EAST EXCAVATION	**BTEX, TVH and TEH in Soil** **BTEX and TVH in Soil**						
	Benzene	< 0.01	0.01	ug/g	07/30/99	07/31/99	RLB
	Toluene	< 0.01	0.01	ug/g	07/30/99	07/31/99	RLB
	Ethylbenzene	1.3	0.01	ug/g	07/30/99	07/31/99	RLB
	Xylenes	4 8	0 01	ug/g	07/30/99	07/31/99	RLB
	Total Volatiles	150	0.5	ug/g	07/30/99	07/31/99	RLB
	% Moisture	26.2	0.1	%	07/29/99	07/30/99	TAR
	Total Extractables (Soil)	4100	5	ug/g	07/29/99	07/29/99	INV
E907D78-04 CS297 Sample Type:SOIL Collected 07/27/99							
OFF-SITE EAST EAST EXCAVATION	**BTEX, TVH and TEH in Soil** **BTEX and TVH in Soil**						
	Benzene	< 0.01	0 01	ug/g	07/30/99	07/31/99	RLB
	Toluene	< 0.01	0.01	ug/g	07/30/99	07/31/99	RLB
	Ethylbenzene	0.95	0.01	ug/g	07/30/99	07/31/99	RLB
	Xylenes	4 4	0.01	ug/g	07/30/99	07/31/99	RLB
	Total Volatiles	140	0.5	ug/g	07/30/99	07/31/99	RLB
	% Moisture	24.9	0 1	%	07/29/99	07/30/99	TAR
	Total Extractables (Soil)	3200	5	ug/g	07/29/99	07/29/99	INV

N D. - NOT DETECTED, LESS THAN THE DETECTION LIMIT

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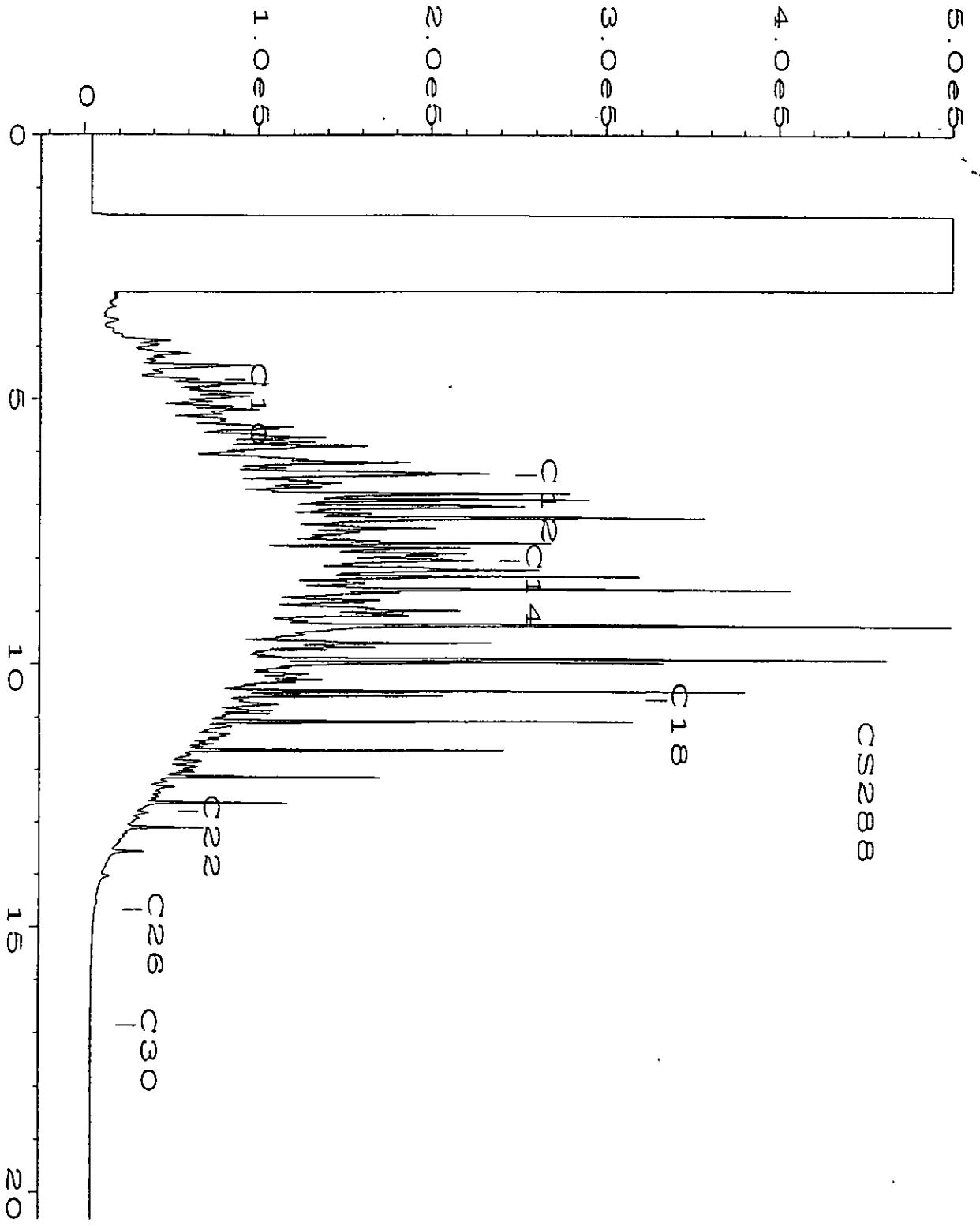

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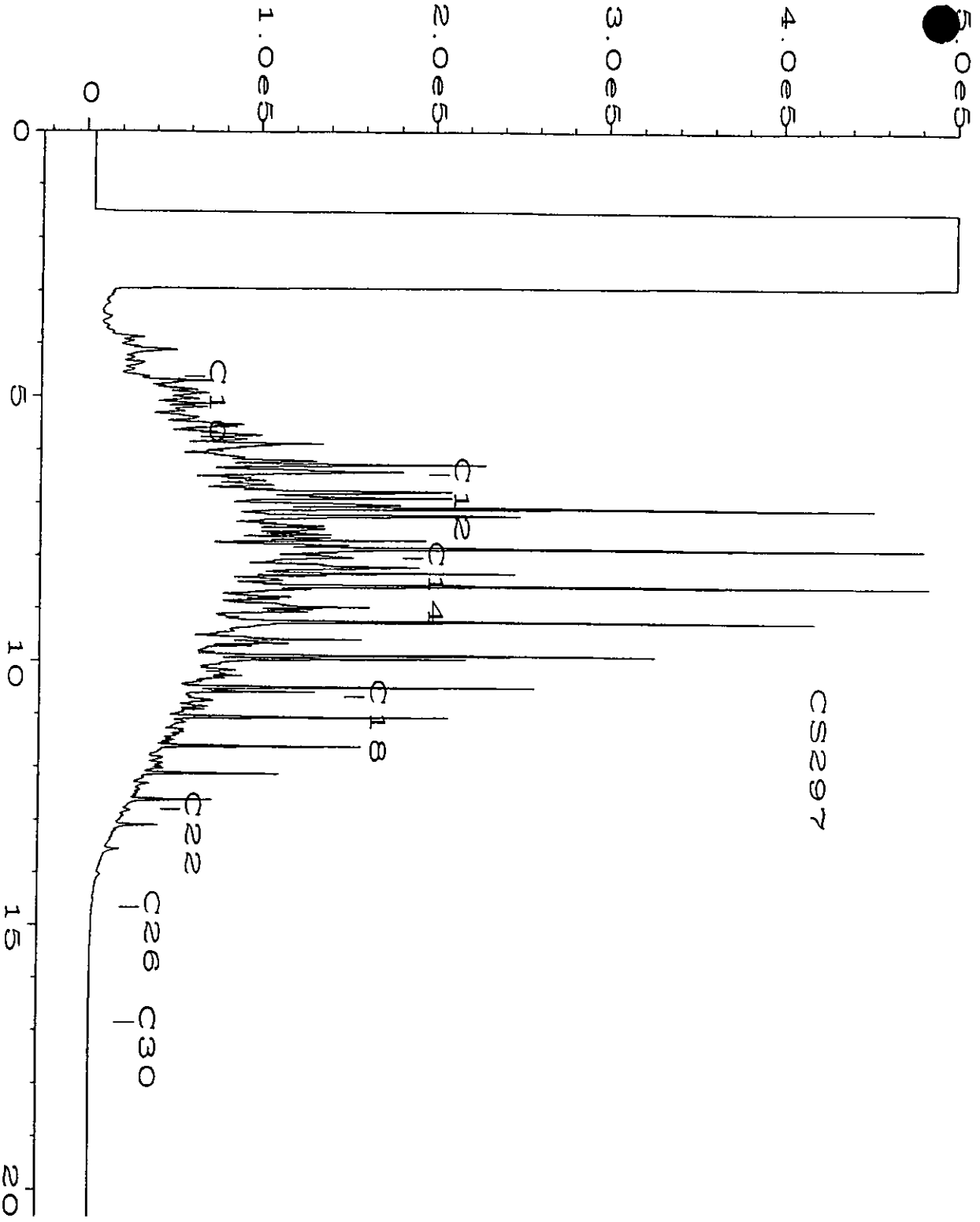
Operator : IGOR VOLOSCHIK
Instrument : HP-1
Sample Name : E907D78-03
Run Time Bar Code:
Acquired on : 29 Jul 99 08:19 PM
Report Created on: 05 Aug 99 03:32 PM

Page Number : 1
Vial Number : 17
Injection Number : 1
Sequence Line : 1
Instrument Method: TEH0604.MTH
Analysis Method : TEH0604.MTH



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Operator : IGOR VOLOSCHIK
Instrument : HP-1
Sample Name : E907D78-04
Run Time Bar Code:
Acquired on : 29 Jul 99 08:45 PM
Report Created on: 05 Aug 99 03:32 PM

Page Number : 1
Vial Number : 18
Injection Number : 1
Sequence Line : 1
Instrument Method: TEH0604.MTH
Analysis Method : TEH0604.MTH

Appendix A Test Methodologies

BTEX and TVH in Soil — Laboratory Code: BTX2S2

PREPARATION METHOD: Methanol extraction with headspace analysis.

INSTRUMENTAL METHOD: GC/PID for BTEX.
GC/FID for TVH - summation of hydrocarbons from C5 to C10 carbon range and is calculated against a BTEX standard.
NOTE: Results based upon dry weight.

METHOD REFERENCE: Modified SW-846 USEPA Method 5021 and 8015/8020.

BTEX QC SUMMARY:

Accuracy	Precision
100%	+/- 20%

NOTE: Accuracy is expressed as the average % recovery and Precision as the relative standard deviation (RSD) of fortifications made using certified standards (BTEX).

TVH QC SUMMARY:

Accuracy	Precision
96%	+/- 24%

NOTE: Accuracy is expressed as the average % recovery and Precision as the relative standard deviation (RSD) of fortifications made using certified standards (BTEX).

% Moisture — Laboratory Code: MOI2S2

PREPARATION METHOD: Sample is oven-dried at 105 C

INSTRUMENTAL METHOD: Gravimetric analysis

Total Extractables (Soil) — Laboratory Code: TEH1S2

PREPARATION METHOD: Shake and sonication extraction with organic solvent

INSTRUMENTAL METHOD: GC/FID - summation of hydrocarbons from C11 to C30 carbon range (excluding benzene, toluene, ethylbenzene, and xylenes) and calculated against diesel standard.
NOTE: Results based upon dry weight.

METHOD REFERENCE: Modified SW-846 USEPA Method 3550/3580 and 8000

QC SUMMARY:

Accuracy	Precision
107%	+/- 17%

NOTE: Accuracy is expressed as the average % recovery and Precision as the relative standard deviation (RSD) of fortifications made using in-house standards (TEH).

Key To Sub-Contracted Laboratory Identification:

Laboratory	Test Code # *	Laboratory	Test Code# *
ETL - Edmonton	1,S	Core Laboratories	C
ETL - Calgary	2	HydroQual	H
ETL -Saskatoon	3	SRC	R
ETL - Thunder Bay	7	Biochem	B
ETL - Winnipeg	8	Bioquest	Q
ETL - Grande Prairie	9	WSH Laboratories	W
ETL - Mobile Services	L	Maxxam	M
Bodycote	E	Alpha Laboratories	A
Norwest Laboratories	N		

* The Test code #/Letter is the last character on the test code.
For Example: NMA1W3 designates that the test was performed in the ETL Saskatoon laboratory.
THIS IS THE LAST PAGE OF THE METHODOLOGY APPENDIX.

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e: (403) 291-9897
(403) 291-0298

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- 111 Street
e Prairie, AB
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(780) 513-2191

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toon, SK
E3
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(306) 668-8383
-667-7645

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ogan Avenue
peg, MB
L5
e: (204) 945-3705
(204) 945-0763

der Bay
Barton Street
er Bay, ON
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e: (807) 623-6463
(807) 623-7598

da Wide Phone:
)-668-9878

em Canada Fax:
)-286-7319

CHEMICAL ANALYSIS REPORT

SEACOR ENVIRONMENTAL ENG
405 525 11 AVE SW
CALGARY AB T2R 0C9

DATE: October 14, 1999

ATTN: NIKOLE IMMEL

Lab Work Order #:	E910465	**Sampled By:**	NI
Project Reference:	HOO31-093 BARONS TURBO	**Date Received:**	10/07/99
Project P.O.#:	NOT SUBMITTED		

Comments:

APPROVED BY:

Ron Minks
Project Manager

ACCREDITATIONS: **STANDARDS COUNCIL OF CANADA (SCC), IN COOPERATION WITH THE CANADIAN ASSOCIATION FOR ENVIRONMENTAL ANALYTICAL LABORATORIES (CAEAL): FOR SPECIFIC TESTS AS REGISTERED BY THE COUNCIL (EDMONTON, CALGARY)**
AMERICAN INDUSTRIAL HYGIENE ASSOCIATION (AIHA): FOR INDUSTRIAL HYGIENE ANALYSIS (EDMONTON)
AGRICULTURE CANADA: UNDER THE CANADIAN FERTILIZER QUALITY ASSURANCE PROGRAM (SASKATOON)

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

LAB ID	SAMPLE ID	TEST DESCRIPTION	RESULT	D.L.	UNITS	EXTRACTED	ANALYZED	BY
E910465-01	BH96-8							
Sample Type:WATER								
Collected:10/06/99								
		BTEX in Water						
		BTEX in Water						
		Benzene	< 0.5	0 5	ug/L	10/08/99	10/08/99	INV
		Toluene	< 0 5	0 5	ug/L	10/08/99	10/08/99	INV
		Ethylbenzene	< 0 5	0 5	ug/L	10/08/99	10/08/99	INV
		Xylenes	< 0 5	0.5	ug/L	10/08/99	10/08/99	INV
E910465-02	BH98-14							
Sample Type:WATER								
Collected:10/06/99								
		BTEX in Water						
		BTEX in Water						
		Benzene	< 0.5	0.5	ug/L	10/08/99	10/08/99	INV
		Toluene	< 0.5	0.5	ug/L	10/08/99	10/08/99	INV
		Ethylbenzene	< 0.5	0 5	ug/L	10/08/99	10/08/99	INV
		Xylenes	< 0.5	0.5	ug/L	10/08/99	10/08/99	INV

N D. - NOT DETECTED, LESS THAN THE DETECTION LIMIT

THIS IS THE FINAL PAGE OF THE REPORT

Appendix A Test Methodologies

BTEX in Water

PREPARATION METHOD: Purge and trap extraction.

INSTRUMENTAL METHOD: GC/PID

METHOD REFERENCE: Modified SW-846 USEPA Method 5030 and 8020.

QC SUMMARY:

Accuracy	Precision
100%	+/- 10%

NOTE: Accuracy is expressed as the average % recovery and Precision as the relative standard deviation (RSD) of fortifications made using certified standards (BTEX).

Appendix B: Quality Control Report

Date: October 20, 1999 ETL lab number: E910465

Client : Seacor Environmental

Sample \ Batch ID E910465

			Blank		Duplicate		Matrix Spike	
Test	**Analyte**	**Analysis Date**	**Result**	**Limit**	**RPD (%)**	**Limit (%)**	**Recovery (%)**	**Limits (%)**
BTEX in water	average	10/8/99	<0.5	0.5 ppb	n/a*	23%	92%	67-119%

* duplicate RPD not available, duplicate ran on sample below detection limits.

Explanation of Terms:

Limit(s): Represent 95% tolerance limits

RPD: Relative % Difference

QA\QC:

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(807) 623-7598

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ern Canada Fax:
)-286-7319

CHEMICAL ANALYSIS REPORT

SEACOR ENVIRONMENTAL ENG
405 525 11 AVE SW
CALGARY AB T2R 0C9

DATE: October 25, 1999

ATTN: NIKOLE IMMEL

Lab Work Order #:	E910466 REVISION	**Sampled By:**	NI
Project Reference:	HO031-093 BARONS TURBO	**Date Received:**	10/07/99
Project P.O.#:	HO031-093 BARONS TURBO		

Comments:

Priority Service.
Revised TEH results for fractions -07 and -09.

APPROVED BY:

Ron Minks
Project Manager

ACCREDITATIONS: **STANDARDS COUNCIL OF CANADA (SCC), IN COOPERATION WITH THE CANADIAN ASSOCIATION FOR ENVIRONMENTAL ANALYTICAL LABORATORIES (CAEAL):** FOR SPECIFIC TESTS AS REGISTERED BY THE COUNCIL (EDMONTON, CALGARY)
AMERICAN INDUSTRIAL HYGIENE ASSOCIATION (AIHA): FOR INDUSTRIAL HYGIENE ANALYSIS (EDMONTON)
AGRICULTURE CANADA: UNDER THE CANADIAN FERTILIZER QUALITY ASSURANCE PROGRAM (SASKATOON)

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

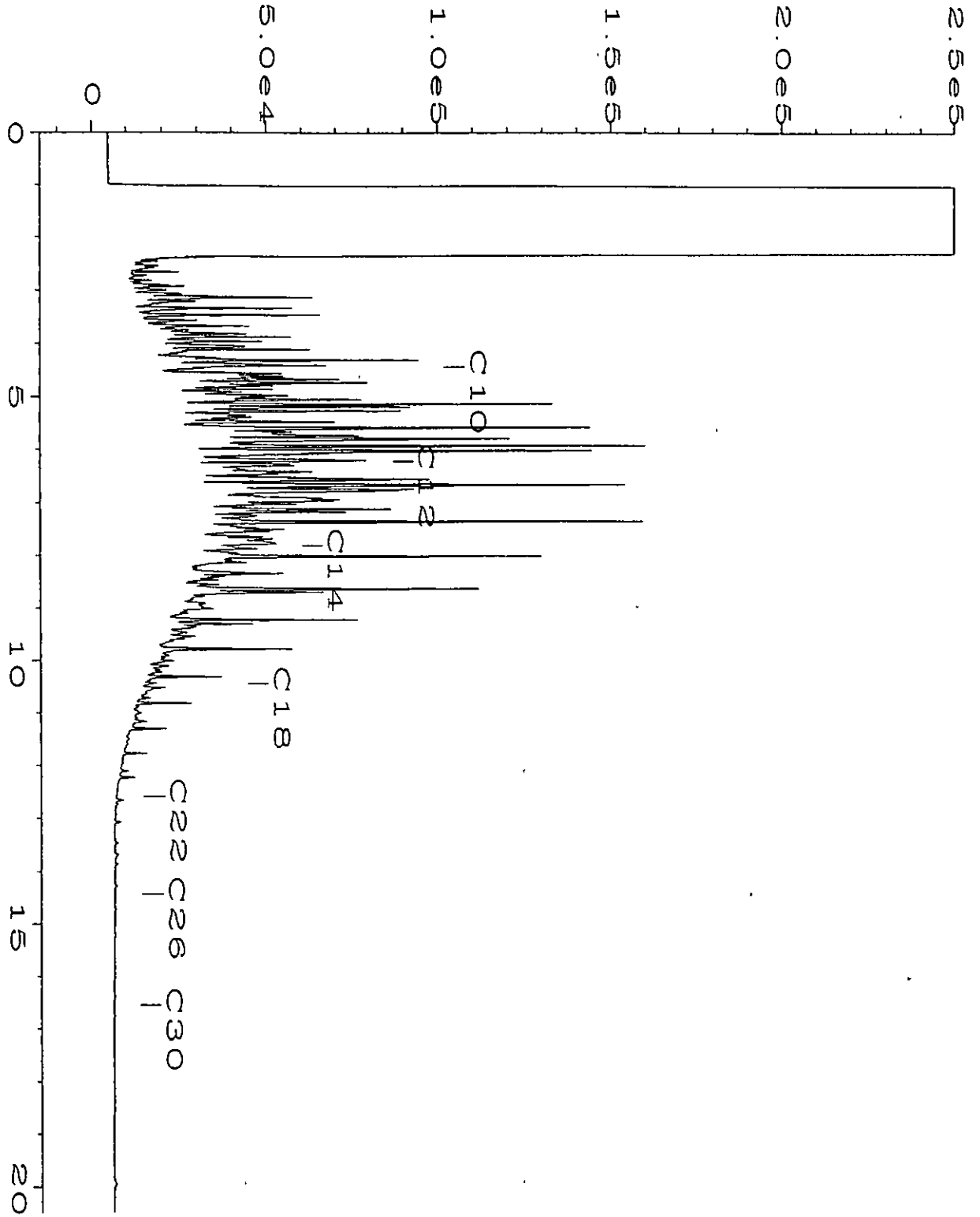
LAB ID	SAMPLE ID	TEST DESCRIPTION	RESULT	D.L.	UNITS	EXTRACTED	ANALYZED	BY
E910466-01	B317							
Sample Type:SOIL								
Collected:10/05/99								
		BTEX, TVH and TEH in Soil						
		BTEX and TVH in Soil						
		Benzene	0 02	0 01	ug/g	10/21/99	10/22/99	RLB
		Toluene	< 0 01	0 01	ug/g	10/21/99	10/22/99	RLB
		Ethylbenzene	0 21	0 01	ug/g	10/21/99	10/22/99	RLB
		Xylenes	2 8	0 01	ug/g	10/21/99	10/22/99	RLB
		Total Volatiles	53	0.5	ug/g	10/21/99	10/22/99	RLB
		% Moisture	21 5	0.1	%	10/20/99	10/21/99	NJN
		Total Extractables (Soil)	1200	5	ug/g	10/22/99	10/22/99	RLB
E910466-02	B345							
Sample Type:SOIL								
Collected:10/05/99								
		BTEX, TVH and TEH in Soil						
		BTEX and TVH in Soil						
		Benzene	< 0 01	0.01	ug/g	10/20/99	10/21/99	RLB
		Toluene	< 0 01	0.01	ug/g	10/20/99	10/21/99	RLB
		Ethylbenzene	0 10	0.01	ug/g	10/20/99	10/21/99	RLB
		Xylenes	0 42	0 01	ug/g	10/20/99	10/21/99	RLB
		Total Volatiles	16	0.5	ug/g	10/20/99	10/21/99	RLB
		% Moisture	23 1	0 1	%	10/20/99	10/21/99	NJN
		Total Extractables (Soil)	460	5	ug/g	10/22/99	10/22/99	RLB
E910466-03	B341							
Sample Type:SOIL								
Collected:10/05/99								
		BTEX, TVH and TEH in Soil						
		BTEX and TVH in Soil						
		Benzene	< 0 01	0 01	ug/g	10/22/99	10/21/99	RLB
		Toluene	< 0 01	0 01	ug/g	10/22/99	10/21/99	RLB
		Ethylbenzene	0.17	0 01	ug/g	10/22/99	10/21/99	RLB
		Xylenes	1 0	0 01	ug/g	10/22/99	10/21/99	RLB
		Total Volatiles	41	0.5	ug/g	10/22/99	10/21/99	RLB
		% Moisture	17 1	0 1	%	10/20/99	10/21/99	NJN
		Total Extractables (Soil)	1300	5	ug/g	10/22/99	10/22/99	RLB
E910466-04	B370							
Sample Type:SOIL								
Collected:10/05/99								
		BTEX, TVH and TEH in Soil						
		BTEX and TVH in Soil						
		Benzene	< 0.01	0.01	ug/g	10/20/99	10/21/99	RLB
		Toluene	< 0 01	0.01	ug/g	10/20/99	10/21/99	RLB
		Ethylbenzene	0 17	0.01	ug/g	10/20/99	10/21/99	RLB
		Xylenes	0.77	0.01	ug/g	10/20/99	10/21/99	RLB
		Total Volatiles	33	0.5	ug/g	10/20/99	10/21/99	RLB
		% Moisture	19.9	0 1	%	10/20/99	10/21/99	NJN
		Total Extractables (Soil)	490	5	ug/g	10/22/99	10/22/99	RLB
E910466-05	B295							
Sample Type:SOIL								
Collected:10/05/99								
		BTEX, TVH and TEH in Soil						
		BTEX and TVH in Soil						
		Benzene	< 0.01	0.01	ug/g	10/20/99	10/21/99	RLB
		Toluene	< 0 01	0 01	ug/g	10/20/99	10/21/99	RLB
		Ethylbenzene	0 13	0 01	ug/g	10/20/99	10/21/99	RLB
		Xylenes	0.47	0.01	ug/g	10/20/99	10/21/99	RLB
		Total Volatiles	9.9	0.5	ug/g	10/20/99	10/21/99	RLB
		% Moisture	17 0	0.1	%	10/20/99	10/21/99	NJN
		Total Extractables (Soil)	240	5	ug/g	10/22/99	10/22/99	RLB
E910466-06	S306							
Sample Type:SOIL								
Collected:10/05/99								
		BTEX, TVH and TEH in Soil						
		BTEX and TVH in Soil						
		Benzene	< 0.01	0.01	ug/g	10/20/99	10/21/99	RLB
		Toluene	< 0.01	0 01	ug/g	10/20/99	10/21/99	RLB

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

LAB ID / SAMPLE ID / TEST DESCRIPTION	RESULT	D.L.	UNITS	EXTRACTED	ANALYZED	BY
E910466-06 S306 Sample Type:SOIL Collected:10/05/99						
EAST						
BTEX, TVH and TEH in Soil						
Ethylbenzene	< 0 01	0.01	ug/g	10/20/99	10/21/99	RLB
Xylenes	0.10	0.01	ug/g	10/20/99	10/21/99	RLB
Total Volatiles	5 4	0 5	ug/g	10/20/99	10/21/99	RLB
% Moisture	17 6	0.1	%	10/20/99	10/21/99	NJN
Total Extractables (Soil)	58	5	ug/g	10/21/99	10/22/99	RLB
E910466-07 S300 Sample Type:SOIL Collected.10/05/99						
BTEX, TVH and TEH in Soil						
BTEX and TVH in Soil						
Benzene	< 0 01	0 01	ug/g	10/20/99	10/21/99	RLB
Toluene	< 0 01	0.01	ug/g	10/20/99	10/21/99	RLB
Ethylbenzene	0 02	0 01	ug/g	10/20/99	10/21/99	RLB
Xylenes	0 46	0 01	ug/g	10/20/99	10/21/99	RLB
Total Volatiles	12	0 5	ug/g	10/20/99	10/21/99	RLB
% Moisture	22.8	0 1	%	10/20/99	10/21/99	NJN
Total Extractables (Soil)	370	5	ug/g	10/21/99	10/22/99	RLB
E910466-08 S327 Sample Type:SOIL Collected.10/05/99						
BTEX, TVH and TEH in Soil						
BTEX and TVH in Soil						
Benzene	< 0.01	0 01	ug/g	10/20/99	10/21/99	RLB
Toluene	< 0.01	0.01	ug/g	10/20/99	10/21/99	RLB
Ethylbenzene	< 0.01	0 01	ug/g	10/20/99	10/21/99	RLB
Xylenes	< 0.01	0.01	ug/g	10/20/99	10/21/99	RLB
Total Volatiles	1.1	0.5	ug/g	10/20/99	10/21/99	RLB
% Moisture	23 6	0 1	%	10/20/99	10/21/99	NJN
Total Extractables (Soil)	< 5	5	ug/g	10/21/99	10/22/99	RLB
E910466-09 S276 Sample Type:SOIL Collected·10/05/99						
EXCAVATED AND DISPOSED AT LRL.						
BTEX, TVH and TEH in Soil						
BTEX and TVH in Soil						
Benzene	< 0 01	0 01	ug/g	10/20/99	10/21/99	RLB
Toluene	< 0 01	0.01	ug/g	10/20/99	10/21/99	RLB
Ethylbenzene	1.7	0 01	ug/g	10/20/99	10/21/99	RLB
Xylenes	9.6	0.01	ug/g	10/20/99	10/21/99	RLB
Total Volatiles	240	0.5	ug/g	10/20/99	10/21/99	RLB
% Moisture	22.9	0.1	%	10/20/99	10/21/99	NJN
Total Extractables (Soil)	7800	5	ug/g	10/21/99	10/22/99	RLB
E910466-11 S361 Sample Type:SOIL Collected:10/06/99						
BTEX, TVH and TEH in Soil						
BTEX and TVH in Soil						
Benzene	< 0 01	0.01	ug/g	10/20/99	10/21/99	RLB
Toluene	< 0.01	0.01	ug/g	10/20/99	10/21/99	RLB
Ethylbenzene	< 0.01	0.01	ug/g	10/20/99	10/21/99	RLB
Xylenes	< 0.01	0.01	ug/g	10/20/99	10/21/99	RLB
Total Volatiles	1.2	0.5	ug/g	10/20/99	10/21/99	RLB
% Moisture	24.3	0.1	%	10/20/99	10/21/99	NJN
Total Extractables (Soil)	< 5	5	ug/g	10/21/99	10/22/99	RLB

N.D. - NOT DETECTED, LESS THAN THE DETECTION LIMIT

THIS IS THE FINAL PAGE OF THE REPORT
NOT INCLUDING APPENDICES



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Operator : MOHAMAD
Instrument : HP-1
Sample Name : E910466-01
Run Time Bar Code:
Acquired on : 28 Oct 99 10:55 PM
Report Created on: 29 Oct 99 11:15 AM

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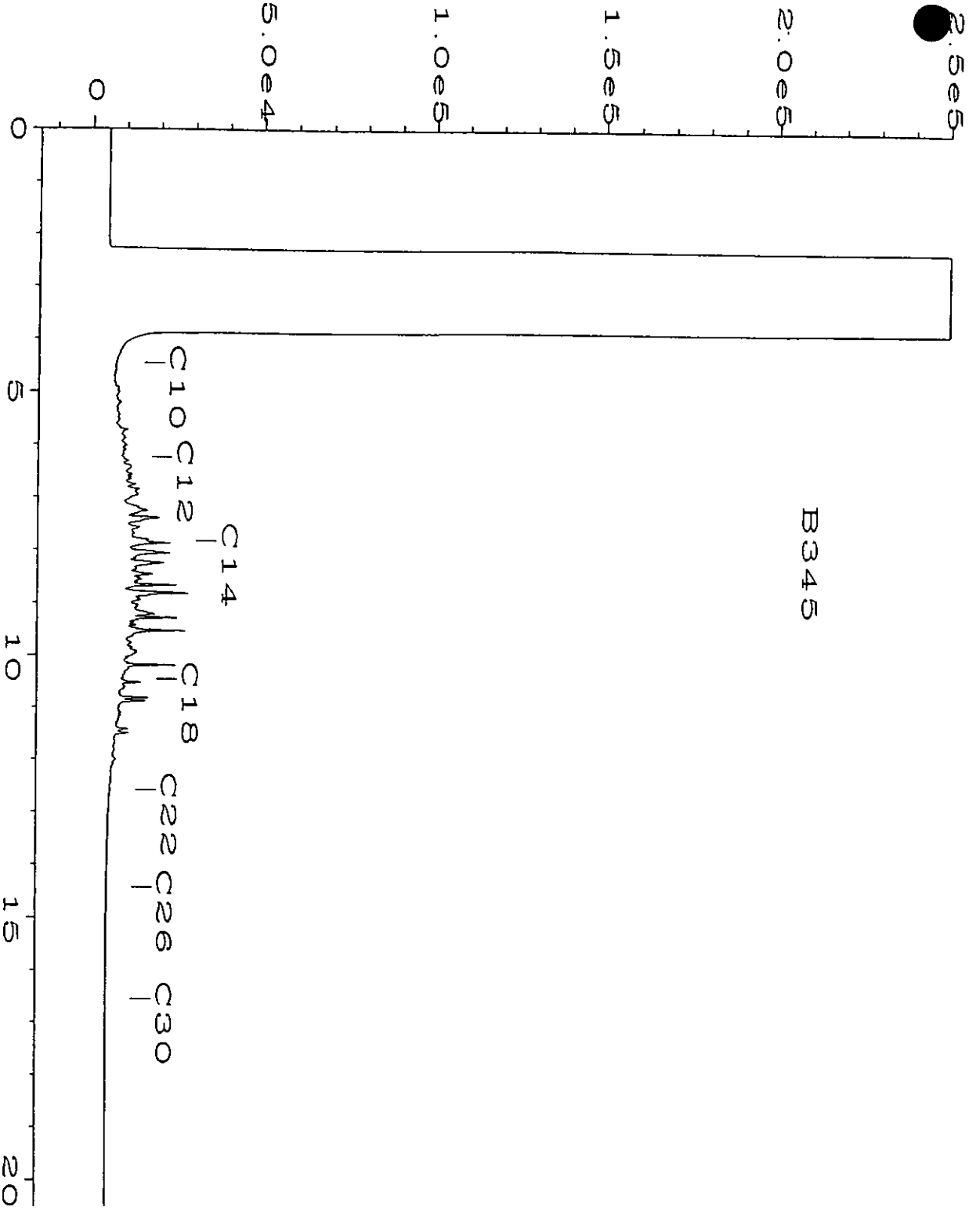
Vial Number : 72
Injection Number : 1
Sequence Line : 1
Instrument Method: TEH1027.MTH
Analysis Method : LABEL.MTH



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Operator : MOHAMAD HASAN
Instrument : HP-1
Sample Name : E910466-02
Run Time Bar Code:
Acquired on : 21 Oct 99 05:46 PM
Report Created on: 28 Oct 99 02:55 PM

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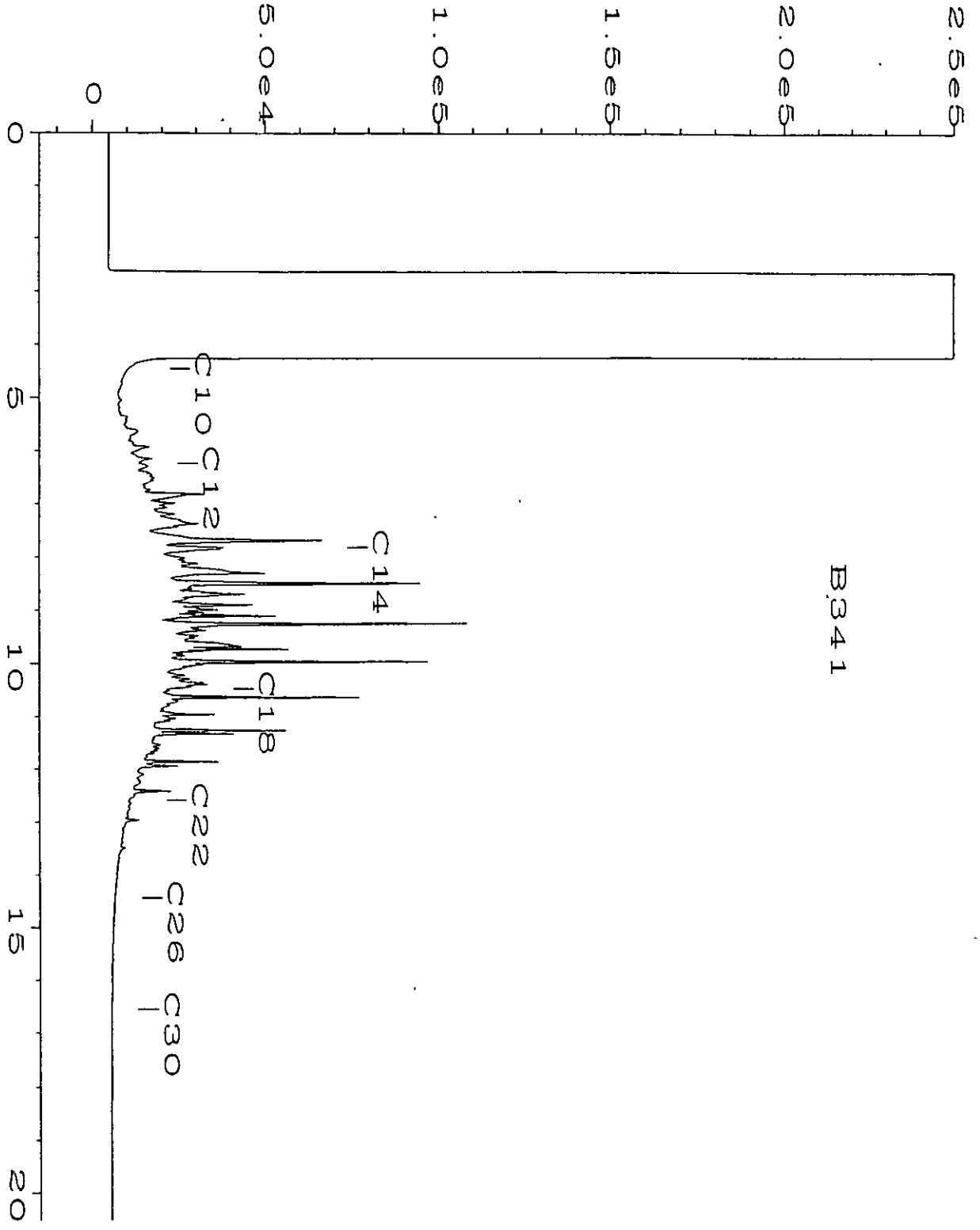
Vial Number : 87
Injection Number : 1
Sequence Line : 1
Instrument Method: TEH0604.MTH
Analysis Method : LABEL.MTH



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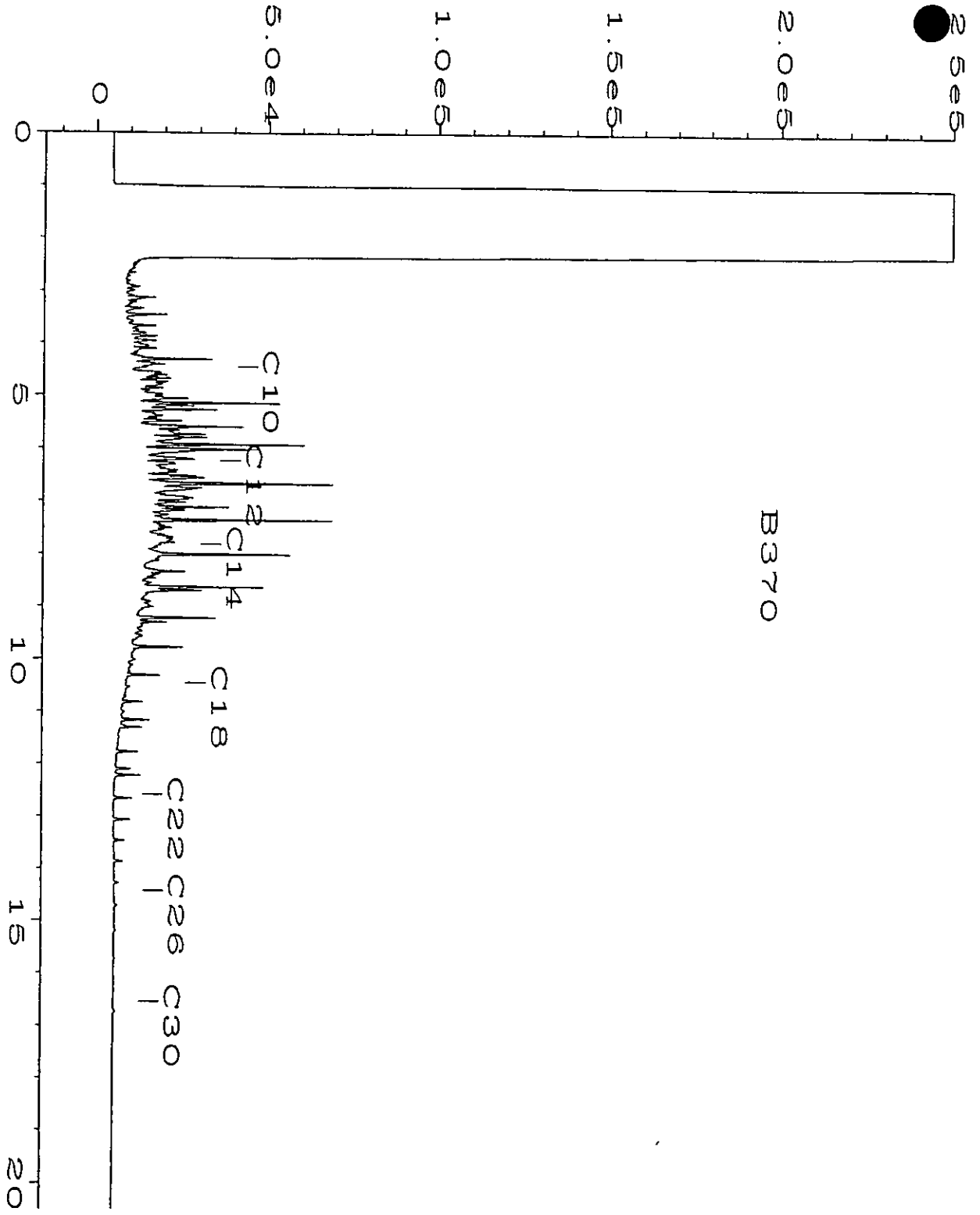
Operator : MOHAMAD HASAN
Instrument : HP-1
Sample Name : E910466-03
Run Time Bar Code:
Acquired on : 21 Oct 99 06:12 PM
Report Created on: 28 Oct 99 02:55 PM

Page Number : 1
Vial Number : 88
Injection Number : 1
Sequence Line : 1
Instrument Method: TEH0604.MTH
Analysis Method : LABEL.MTH



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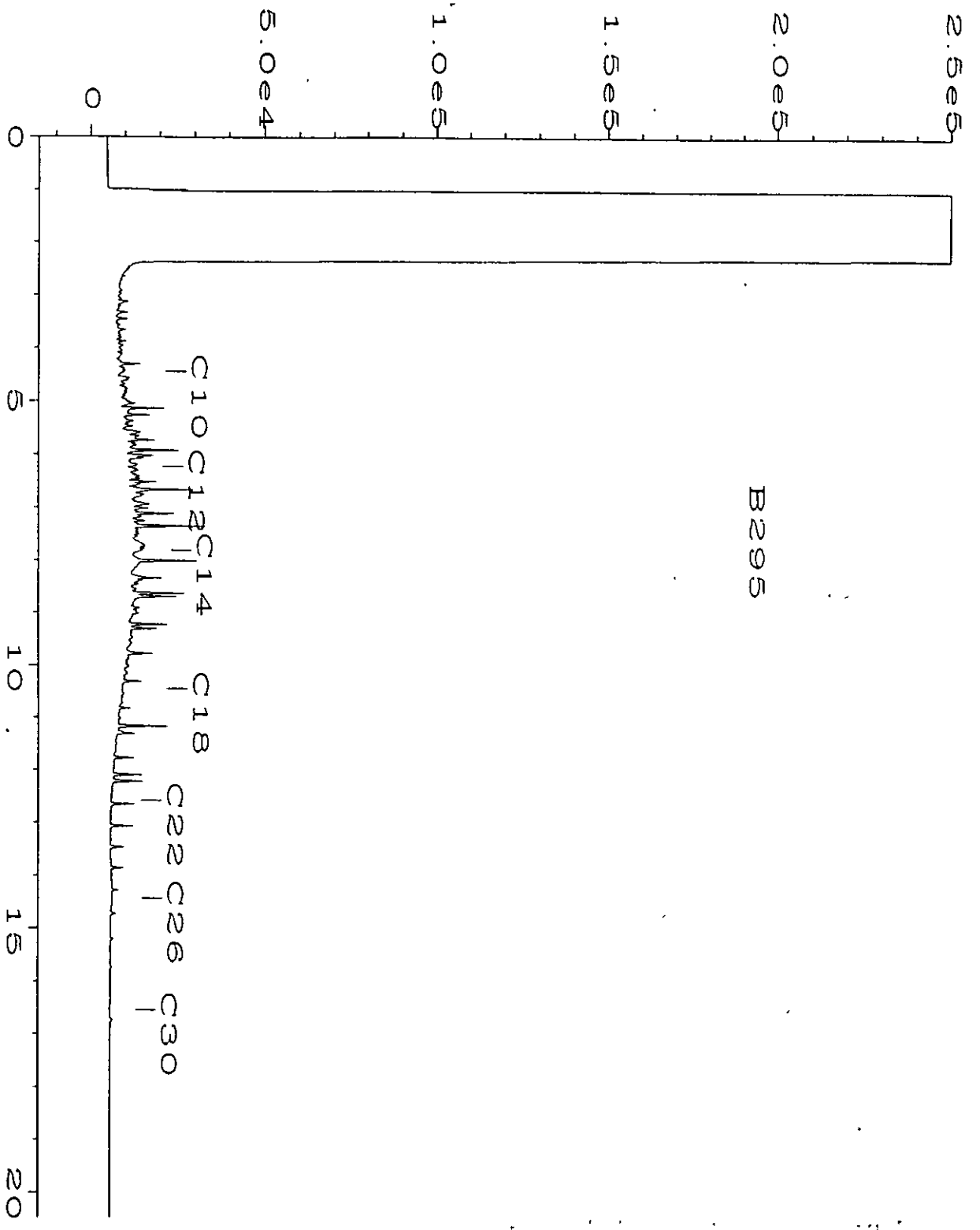
Operator : MOHAMAD
Instrument : HP-1
Sample Name : E910466-04
Run Time Bar Code:
Acquired on : 28 Oct 99 10:29 PM
Report Created on: 29 Oct 99 11:16 AM

Page Number : 1
Vial Number : 71
Injection Number : 1
Sequence Line : 1
Instrument Method: TEH1027.MTH
Analysis Method : LABEL.MTH



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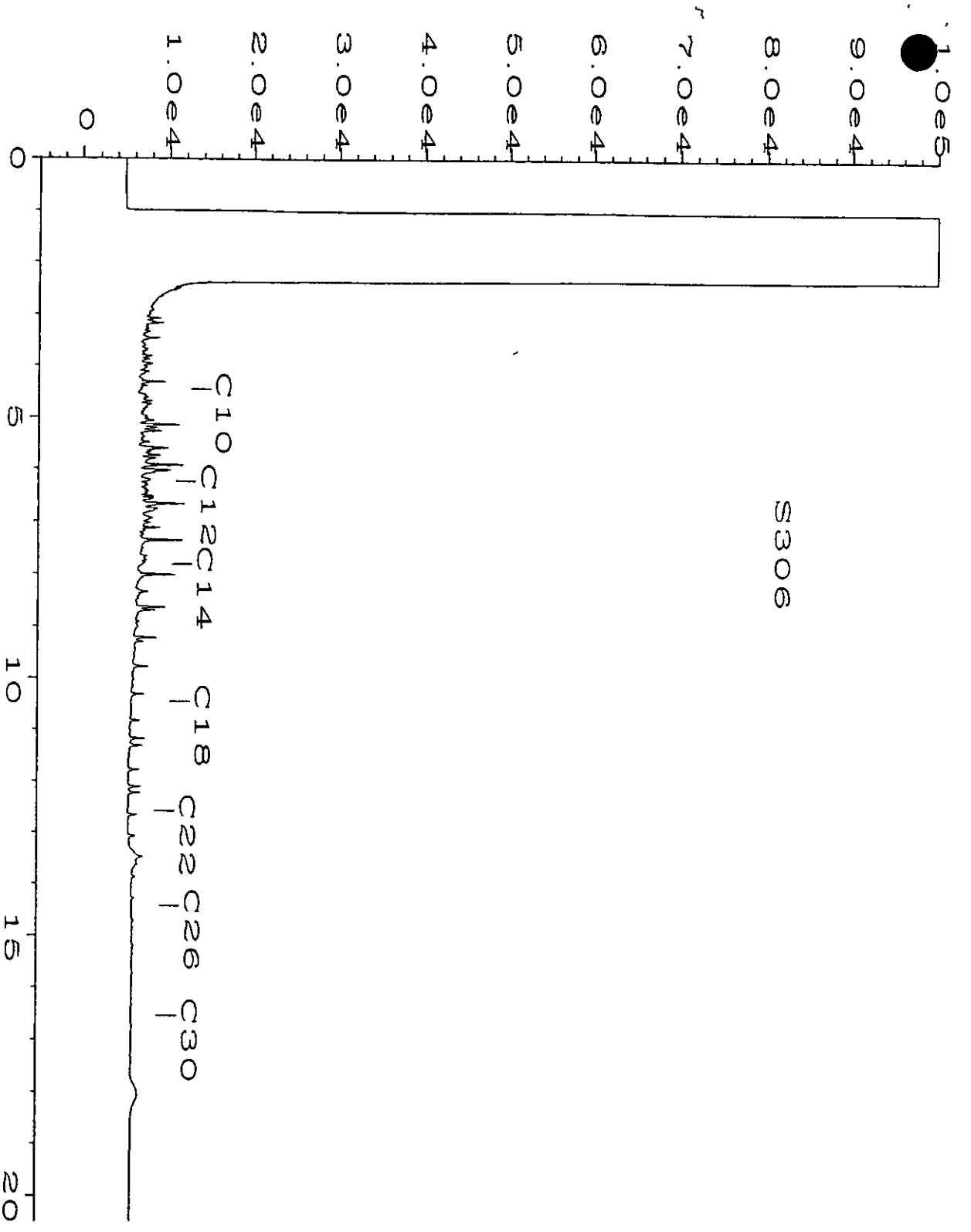
Operator : MOHAMAD
Instrument : HP-1
Sample Name : E910466-05
Run Time Bar Code:
Acquired on : 29 Oct 99 00:38 AM
Report Created on: 29 Oct 99 11:16 AM

Page Number : 1
Vial Number : 76
Injection Number : 1
Sequence Line : 1
Instrument Method: TEH1027.MTH
Analysis Method : LABEL.MTH



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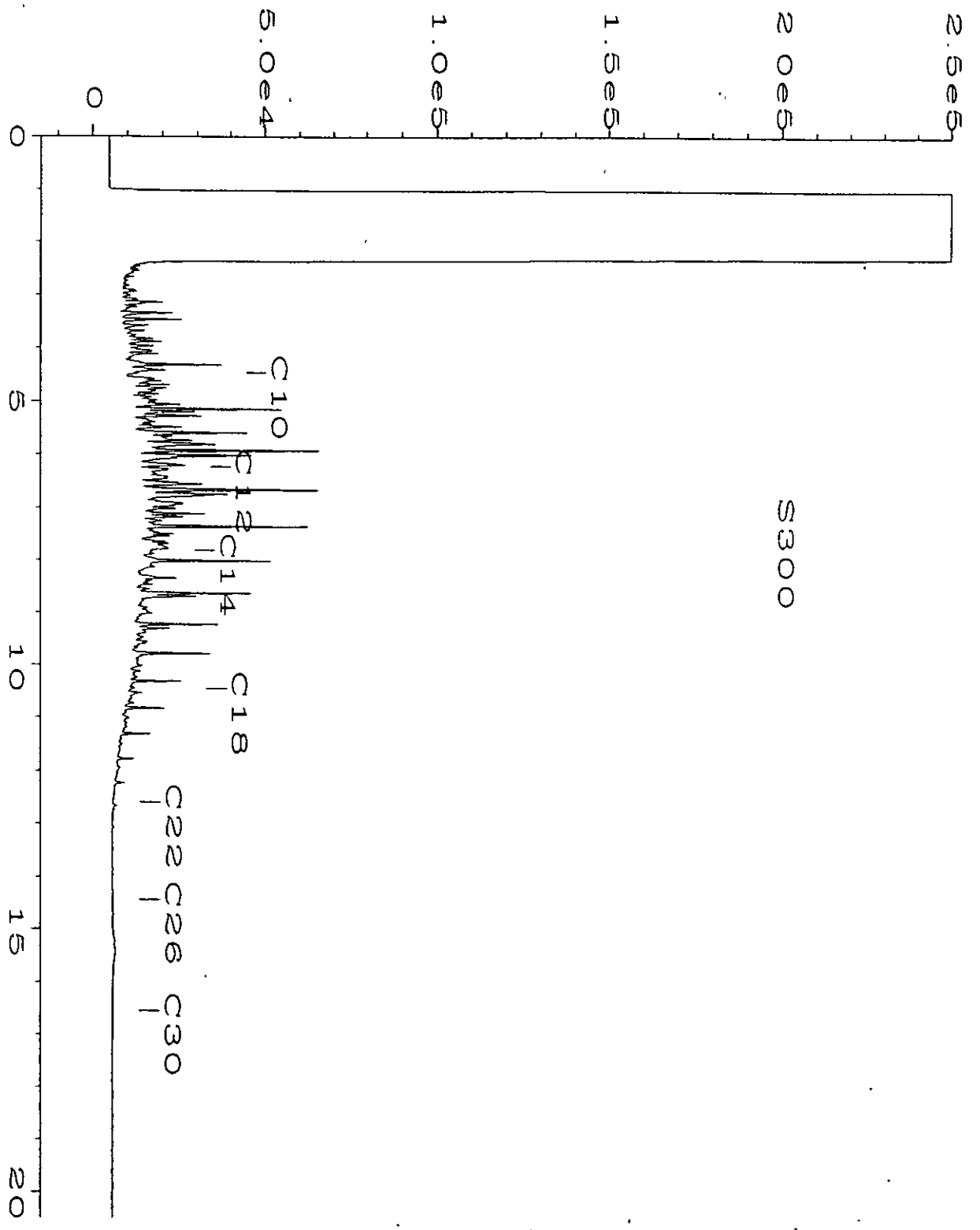
Operator : MOHAMAD
Instrument : HP-1
Sample Name : E910466-06
Run Time Bar Code:
Acquired on : 28 Oct 99 11:47 PM
Report Created on: 29 Oct 99 11:18 AM

Page Number : 1
Vial Number : 74
Injection Number : 1
Sequence Line : 1
Instrument Method: TEH1027.MTH
Analysis Method : LABEL.MTH



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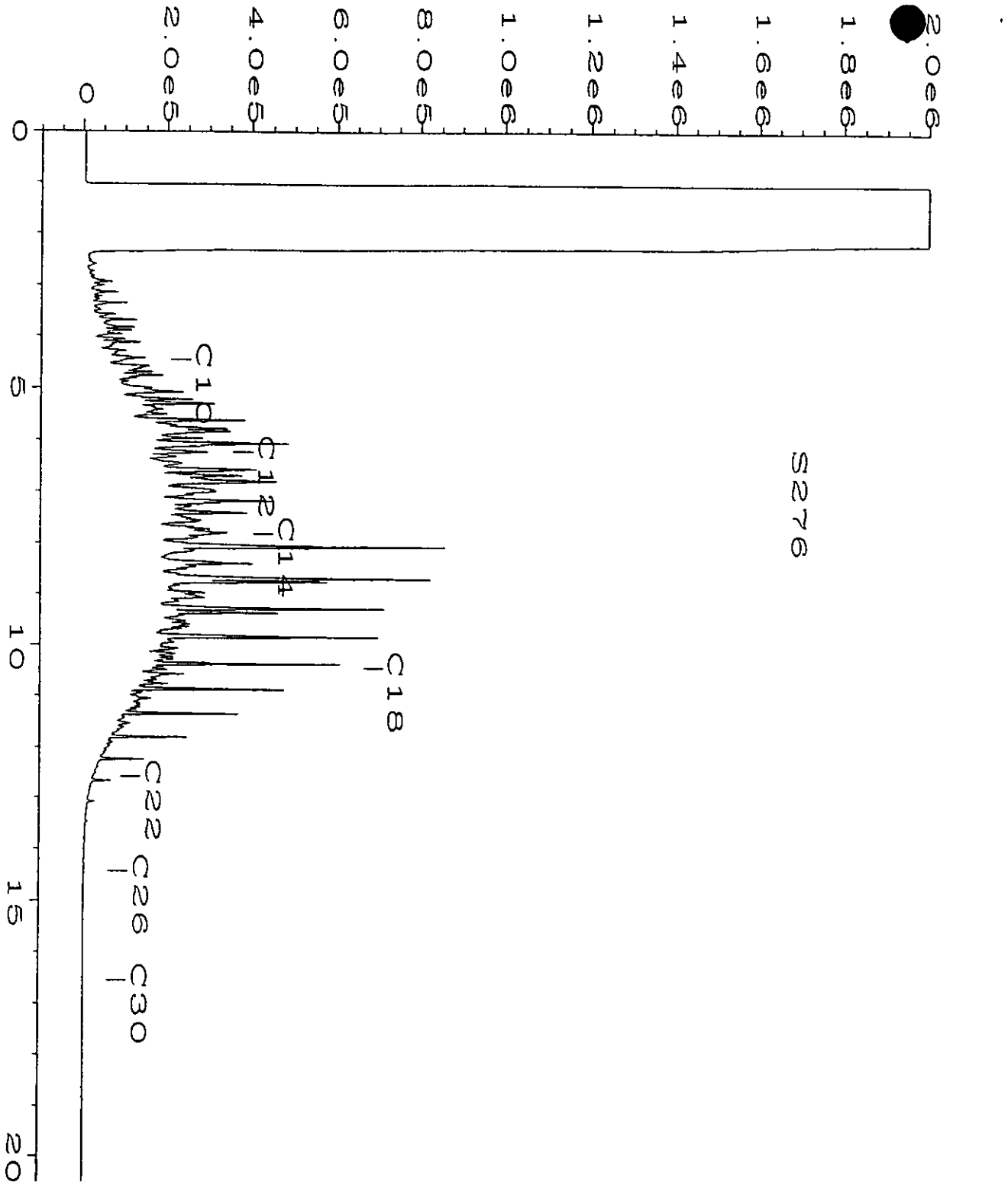
Operator : MOHAMAD
Instrument : HP-1
Sample Name : E910466-07
Run Time Bar Code:
Acquired on : 29 Oct 99 00:13 AM
Report Created on: 29 Oct 99 11:18 AM

Page Number : 1
Vial Number : 75
Injection Number : 1
Sequence Line : 1
Instrument Method: TEH1027.MTH
Analysis Method : LABEL.MTH



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Operator : MOHAMAD
Instrument : HP-1
Sample Name : E910466-09
Run Time Bar Code:
Acquired on : 28 Oct 99 11:21 PM
Report Created on: 29 Oct 99 11:21 AM

Page Number : 1
Vial Number : 73
Injection Number : 1
Sequence Line : 1
Instrument Method: TEH1027.MTH
Analysis Method : LABEL.MTH

Appendix A Test Methodologies

BTEX and TVH in Soil

PREPARATION METHOD: Methanol extraction with headspace analysis.

INSTRUMENTAL METHOD: GC/PID for BTEX.
GC/FID for TVH - summation of hydrocarbons from C5 to C10 carbon range and is calculated against a BTEX standard.
NOTE: Results based upon dry weight.

METHOD REFERENCE: Modified SW-846 USEPA Method 5021 and 8015/8020.

BTEX QC SUMMARY: Accuracy Precision
100% +/- 20%
NOTE: Accuracy is expressed as the average % recovery and Precision as the relative standard deviation (RSD) of fortifications made using certified standards (BTEX).

TVH QC SUMMARY: Accuracy Precision
96% +/- 24%
NOTE: Accuracy is expressed as the average % recovery and Precision as the relative standard deviation (RSD) of fortifications made using certified standards (BTEX).

% Moisture

PREPARATION METHOD: Sample is oven-dried at 105 C

INSTRUMENTAL METHOD: Gravimetric analysis

Total Extractables (Soil)

PREPARATION METHOD Shake and sonication extraction with organic solvent

INSTRUMENTAL METHOD GC/FID - summation of hydrocarbons from C11 to C30 carbon range (excluding benzene, toluene, ethylbenzene, and xylenes) and calculated against diesel standard.
NOTE: Results based upon dry weight.

METHOD REFERENCE: Modified SW-846 USEPA Method 3550/3580 and 8000

QC SUMMARY: Accuracy Precision
107% +/- 17%
NOTE: Accuracy is expressed as the average % recovery and Precision as the relative standard deviation (RSD) of fortifications made using in-house standards (TEH).

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ary, AB
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(403) 291-0298

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de Prairie, AB
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atoon, SK
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e: (306) 668-8370
(306) 668-8383
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ipeg, MB
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(204) 945-0763

ıder Bay
Barton Street
ler Bay, ON
N3
ne: (807) 623-6463
(807) 623-7598

da Wide Phone:
0-668-9878

ern Canada Fax:
0-286-7319

CHEMICAL ANALYSIS REPORT

SEACOR ENVIRONMENTAL ENG
405 525 11 AVE SW
CALGARY AB T2R 0C9

DATE: October 28, 1999

ATTN: NIKOLE IMMEL

Lab Work Order #:	E910G11	**Sampled By:**	NI
Project Reference:	H0031-093	**Date Received:**	10/27/99
Project P.O.#:	NOT SUBMITTED		

Comments:
Emergency Service.

APPROVED BY:

Ron Minks
Project Manager

ACCREDITATIONS: **STANDARDS COUNCIL OF CANADA (SCC), IN COOPERATION WITH THE CANADIAN ASSOCIATION FOR ENVIRONMENTAL ANALYTICAL LABORATORIES (CAEAL): FOR SPECIFIC TESTS AS REGISTERED BY THE COUNCIL (EDMONTON, CALGARY, SASKATOON, WINNIPEG, THUNDER BAY)**
AMERICAN INDUSTRIAL HYGIENE ASSOCIATION (AIHA) FOR INDUSTRIAL HYGIENE ANALYSIS (EDMONTON, W
STANDARDS COUNCIL OF CANADA IN COOPERATION WITH THE CANADIAN FOOD INSPECTION AGENCY (CFIA FOR FERTILIZER AND FEED TESTING (SASKATOON)

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

LAB ID	SAMPLE ID	TEST DESCRIPTION	RESULT	D.L.	UNITS	EXTRACTED	ANALYZED	BY
E910G11-01	S374							
Sample Type:SOIL								
Collected: 10/26/99								
		BTEX, TVH and TEH in Soil						
		BTEX and TVH in Soil						
		Benzene	0.24	0.01	ug/g	10/27/99	10/28/99	RLB
		Toluene	< 0.01	0.01	ug/g	10/27/99	10/28/99	RLB
		Ethylbenzene	< 0.01	0.01	ug/g	10/27/99	10/28/99	RLB
		Xylenes	0.01	0.01	ug/g	10/27/99	10/28/99	RLB
		Total Volatiles	6.8	0.5	ug/g	10/27/99	10/28/99	RLB
		% Moisture	22.5	0.1	%	10/27/99	10/28/99	NJN
		Total Extractables (Soil)	< 5	5	ug/g	10/27/99	10/28/99	RLB
E910G11-02	S378							
Sample Type:SOIL								
Collected: 10/26/99								
		BTEX, TVH and TEH in Soil						
		BTEX and TVH in Soil						
		Benzene	< 0.01	0.01	ug/g	10/27/99	10/28/99	RLB
		Toluene	< 0.01	0.01	ug/g	10/27/99	10/28/99	RLB
		Ethylbenzene	0.37	0.01	ug/g	10/27/99	10/28/99	RLB
		Xylenes	1.8	0.01	ug/g	10/27/99	10/28/99	RLB
		Total Volatiles	33	0.5	ug/g	10/27/99	10/28/99	RLB
		% Moisture	19.3	0.1	%	10/27/99	10/28/99	NJN
		Total Extractables (Soil)	700	5	ug/g	10/27/99	10/28/99	RLB
E910G11-03	S380							
Sample Type:SOIL								
Collected: 10/26/99								
		BTEX, TVH and TEH in Soil						
		BTEX and TVH in Soil						
		Benzene	< 0.01	0.01	ug/g	10/27/99	10/28/99	RLB
		Toluene	< 0.01	0.01	ug/g	10/27/99	10/28/99	RLB
		Ethylbenzene	< 0.01	0.01	ug/g	10/27/99	10/28/99	RLB
		Xylenes	< 0.01	0.01	ug/g	10/27/99	10/28/99	RLB
		Total Volatiles	< 0.5	0.5	ug/g	10/27/99	10/28/99	RLB
		% Moisture	24.4	0.1	%	10/27/99	10/28/99	NJN
		Total Extractables (Soil)	< 5	5	ug/g	10/27/99	10/28/99	RLB

N D. - NOT DETECTED, LESS THAN THE DETECTION LIMIT

THIS IS THE FINAL PAGE OF THE REPORT
NOT INCLUDING APPENDICES

Appendix A Test Methodologies

BTEX and TVH in Soil

PREPARATION METHOD: Methanol extraction with headspace analysis.

INSTRUMENTAL METHOD: GC/PID for BTEX.
GC/FID for TVH - summation of hydrocarbons from C5 to C10 carbon range and is calculated against a BTEX standard.
NOTE: Results based upon dry weight.

METHOD REFERENCE: Modified SW-846 USEPA Method 5021 and 8015/8020.

BTEX QC SUMMARY:

Accuracy	Precision
100%	+/- 20%

NOTE: Accuracy is expressed as the average % recovery and Precision as the relative standard deviation (RSD) of fortifications made using certified standards (BTEX).

TVH QC SUMMARY:

Accuracy	Precision
96%	+/- 24%

NOTE: Accuracy is expressed as the average % recovery and Precision as the relative standard deviation (RSD) of fortifications made using certified standards (BTEX).

% Moisture

PREPARATION METHOD: Sample is oven-dried at 105 C

INSTRUMENTAL METHOD: Gravimetric analysis

Total Extractables (Soil)

PREPARATION METHOD: Shake and sonication extraction with organic solvent

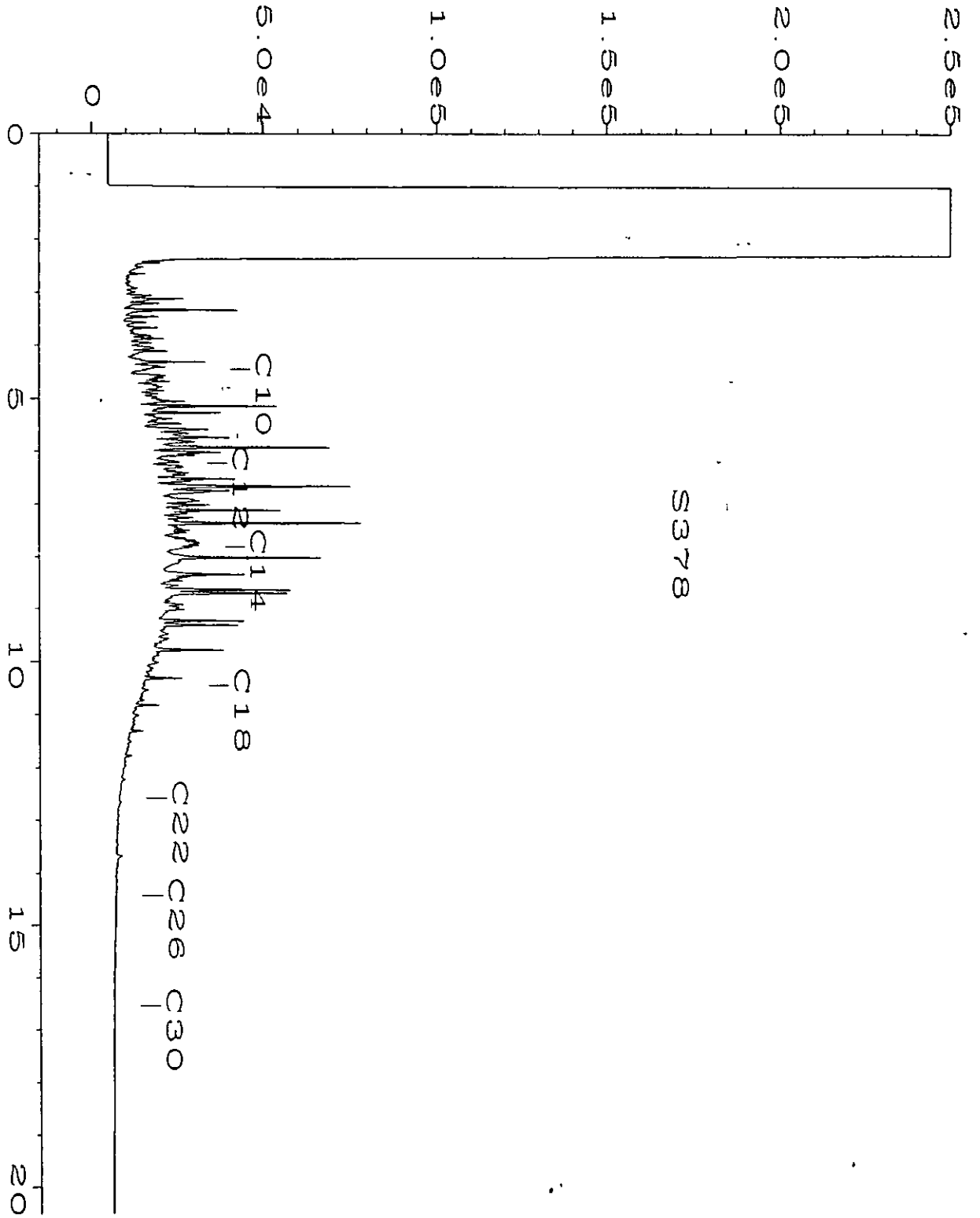
INSTRUMENTAL METHOD: GC/FID - summation of hydrocarbons from C11 to C30 carbon range (excluding benzene, toluene, ethylbenzene, and xylenes) and calculated against diesel standard.
NOTE: Results based upon dry weight.

METHOD REFERENCE: Modified SW-846 USEPA Method 3550/3580 and 8000

QC SUMMARY:

Accuracy	Precision
107%	+/- 17%

NOTE: Accuracy is expressed as the average % recovery and Precision as the relative standard deviation (RSD) of fortifications made using in-house standards (TEH).



Data File Name : C:\HPCHEM\1\DATA\TEH1027\015F0101.D
Operator : MOHAMAD
Instrument : HP-1
Sample Name : E910G11-02
Run Time Bar Code:
Acquired on : 27 Oct 99 10:14 PM
Report Created on: 10 Nov 99 05:30 PM

Page Number : 1
Vial Number : 15
Injection Number : 1
Sequence Line : 1
Instrument Method: TEH0604.MTH
Analysis Method : HISTOGRM.MTH

Appendix B: Quality Control Report

Date: November 8, 1999

ETL lab number: E910G11

Client : Seacor Environmental

Sample \ Batch ID E910G11

			Blank		Duplicate		Matrix Spike	
Test	**Analyte**	**Analysis Date**	**Result**	**Limit**	**RPD (%)**	**Limit (%)**	**Recovery (%)**	**Limits (%)**
BTEX in soil	average	10/28/99	<0.01	0.01ppm	1%	45%	93%	67-136%
TEH in soil	TEH	10/28/99	<5	5ppm	<D.L.*	43%	97%	67-150%

* duplicate ran was less than detection limit, therefore no RPD can be calculated.

Explanation of Terms:

Limit(s): Represent 95% tolerance limits

RPD: Relative % Difference

QA\QC:

ETL EnviroTest

A DIVISION OF ETL CHEMSPEC ANALYTICAL LIMITED

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ne: (204) 945-3705
(204) 945-0763

der Bay
Barton Street
der Bay, ON
N3
.: (807) 623-6463
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da Wide Phone:
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ern Canada Fax:
0-286-7319

CHEMICAL ANALYSIS REPORT

SEACOR ENVIRONMENTAL ENG
405 525 11 AVE SW
CALGARY AB T2R 0C9

DATE: October 27, 1999

ATTN: NIKOLE IMMEL

Lab Work Order #:	E910461(ADDITIONAL)	**Sampled By:**	NI
Project Reference:	H0031-093 BARONS TURBO	**Date Received:**	10/07/99
Project P.O.#:	NOT SUBMITTED		

Comments:

Additional pH analysis requested 10/23/99.
Additional flash point analysis requested on 10/12/99.
NOTE: Sample for flash point analysis previously sub-sampled, thus losses of volatile components will have occurred.

APPROVED BY:

Ron Minks
Project Manager

ACCREDITATIONS: STANDARDS COUNCIL OF CANADA (SCC), IN COOPERATION WITH THE CANADIAN ASSOCIATION FOR ENVIRONMENTAL ANALYTICAL LABORATORIES (CAEAL): FOR SPECIFIC TESTS AS REGISTERED BY THE [illegible] (EDMONTON [illegible] CALGARY)
AMERICAN INDUSTRIAL HYGIENE ASSOCIATION (AIHA): FOR INDUSTRIAL HYGIENE ANALYSIS (EDMONTON)

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

LAB ID	SAMPLE ID	TEST DESCRIPTION	RESULT	D.L.	UNITS	EXTRACTED	ANALYZED	BY
E910461-01	S291							
Sample Type:SOIL								
Collected:10/05/99								
EXCAVATED AND DISPOSED AT L.R.L.		Flash Point	> 75		Degrees C		10/18/99	TAR
		pH in Soil (1:2 soil:H2O)	8.6		pH		10/27/99	WRR
		BTEX, TVH and TEH in Soil						
		BTEX and TVH in Soil						
		Benzene	0.34	0.01	ug/g	10/07/99	10/08/99	RLB
		Toluene	2.1	0.01	ug/g	10/07/99	10/08/99	RLB
		Ethylbenzene	1.6	0.01	ug/g	10/07/99	10/08/99	RLB
		Xylenes	44	0.01	ug/g	10/07/99	10/08/99	RLB
		Total Volatiles	380	0.5	ug/g	10/07/99	10/08/99	RLB
		% Moisture	16.7	0.1	%	10/07/99	10/08/99	RLB
		Total Extractables (Soil)	3800	5	ug/g	10/07/99	10/08/99	MRH
E910461-02	B369							
Sample Type:SOIL								
Collected:10/06/99								
		BTEX, TVH and TEH in Soil						
		BTEX and TVH in Soil						
		Benzene	0.04	0.01	ug/g	10/07/99	10/08/99	RLB
		Toluene	< 0.01	0.01	ug/g	10/07/99	10/08/99	RLB
		Ethylbenzene	0.35	0.01	ug/g	10/07/99	10/08/99	RLB
		Xylenes	1.7	0.01	ug/g	10/07/99	10/08/99	RLB
		Total Volatiles	33	0.5	ug/g	10/07/99	10/08/99	RLB
		% Moisture	16.3	0.1	%	10/07/99	10/08/99	RLB
		Total Extractables (Soil)	350	5	ug/g	10/07/99	10/08/99	MRH

N.D. - NOT DETECTED, LESS THAN THE DETECTION LIMIT

THIS IS THE FINAL PAGE OF THE REPORT
NOT INCLUDING APPENDICES

Appendix B: Quality Control Report

Date: October 27, 1999 ETL lab number: E910461

Client : Seacor Environmental

Sample \ Batch ID E910461

			CCV		Duplicate		Matrix Spike	
Test	**Analyte**	**Analysis Date**	**Result (°C)**	**Limit**	**RPD (%)**	**Limit (%)**	**Recovery (%)**	**Limits (%)**
Flashpoint on soil	FP	10/18/99	51	49-51	n/a*	n/a	n/a	n/a
pH 1:2 extract	pH	10/27/99	6.0	5 7-6.2	0.4%	4%	n/a	n/a

* no duplicate ran with this batch.

Sample \ Batch ID E910461

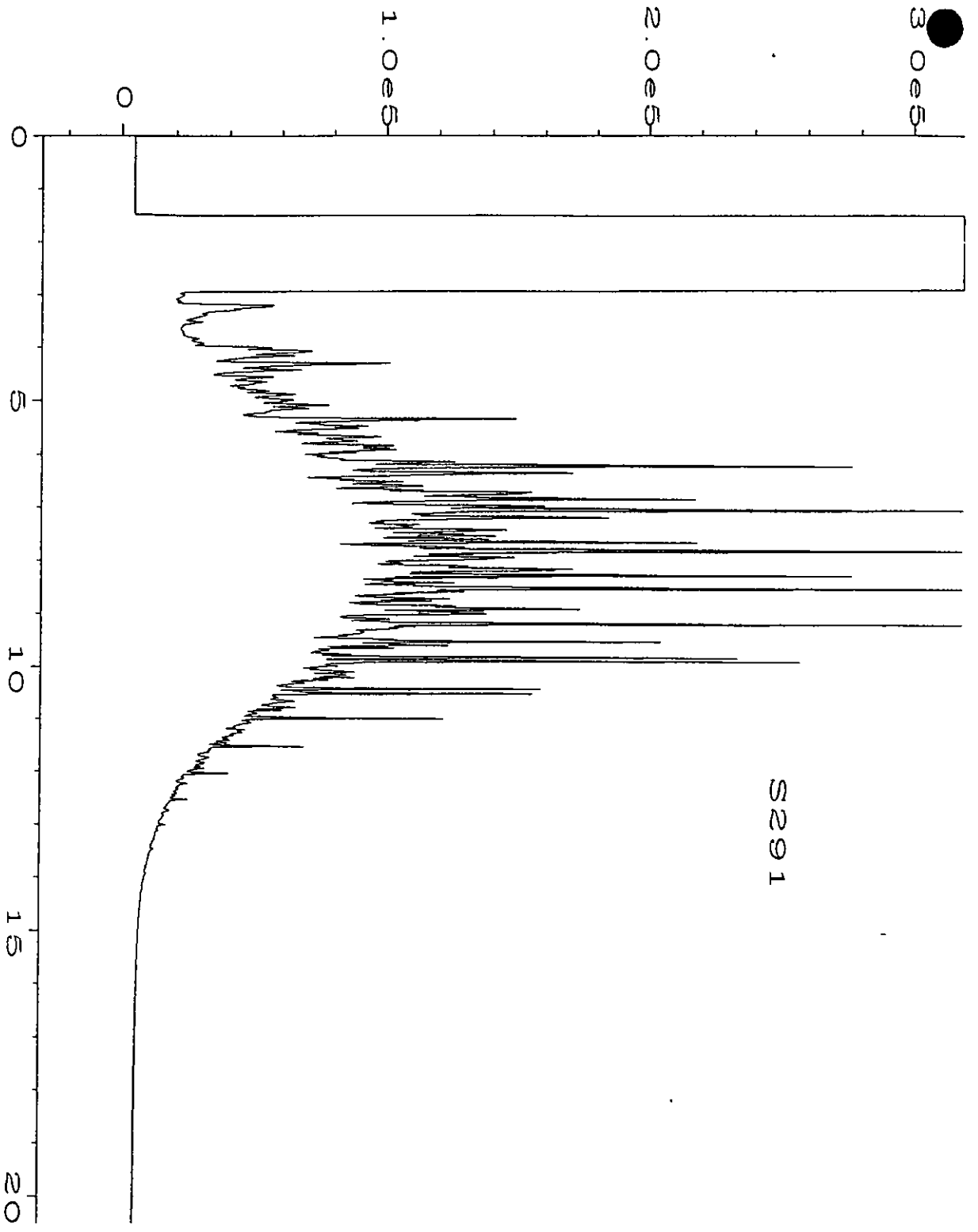
			Blank		Duplicate		Matrix Spike	
Test	**Analyte**	**Analysis Date**	**Result**	**Limit (%)**	**RPD (%)**	**Limit (%)**	**Recovery (%)**	**Limits (%)**
BTEX in soil	average	10/8/99	<0.01ppm	0 01ppm	13%	45%	88%	67-136%
TEH in soil	TEH	10/8/99	<5ppm	5ppm	11%	43%	120%	67-150%

Explanation of Terms:

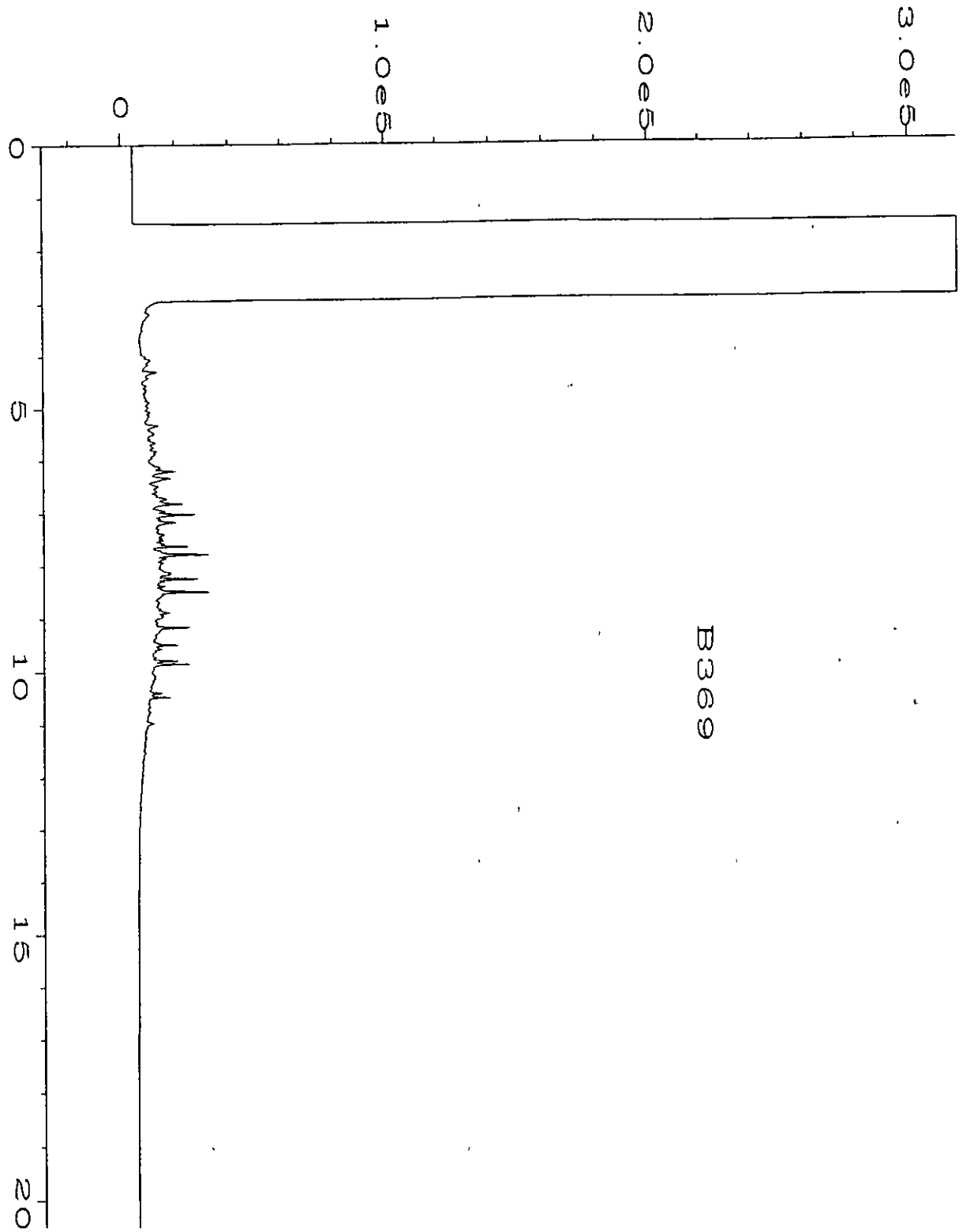
Limit(s): Represent 95% tolerance limits

RPD: Relative % Difference

QA\QC:



Data File Name	: C:\HPCHEM\1\DATA\TEH1004\079F0101.D		
Operator	: MOHAMAD HASAN	Page Number	: 1
Instrument	: HP-1	Vial Number	: 79
Sample Name	: E910461-01	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 1
Acquired on	: 08 Oct 99 04:45 AM	Instrument Method	: TEH0604.MTH
Report Created on	: 08 Nov 99 04:16 PM	Analysis Method	: HIS1106B.MTH
Last Recalib on	: 21 OCT 99 09:26 AM	Sample Amount	: 0
Multiplier	: 1	ISTD Amount	: 1



Data File Name : C:\HPCHEM\1\DATA\TEH1004\078F0101.D
Operator : MOHAMAD HASAN
Instrument : HP-1
Sample Name : E910461-02
Run Time Bar Code:
Acquired on : 08 Oct 99 04:20 AM
Report Created on: 08 Nov 99 04:16 PM
Last Recalib on : 21 OCT 99 09:26 AM
Multiplier : 1

Page Number : 1
Vial Number : 78
Injection Number : 1
Sequence Line : 1
Instrument Method: TEH0604.MTH
Analysis Method : HIS1106B.MTH
Sample Amount : 0
ISTD Amount : 1

Appendix A Test Methodologies

BTEX and TVH in Soil

PREPARATION METHOD: Methanol extraction with headspace analysis

INSTRUMENTAL METHOD: GC/PID for BTEX.
GC/FID for TVH - summation of hydrocarbons from C5 to C10 carbon range and is calculated against a BTEX standard.
NOTE: Results based upon dry weight.

METHOD REFERENCE: Modified SW-846 USEPA Method 5021 and 8015/8020

BTEX QC SUMMARY:

Accuracy	Precision
100%	+/- 20%

NOTE: Accuracy is expressed as the average % recovery and Precision as the relative standard deviation (RSD) of fortifications made using certified standards (BTEX).

TVH QC SUMMARY:

Accuracy	Precision
96%	+/- 24%

NOTE. Accuracy is expressed as the average % recovery and Precision as the relative standard deviation (RSD) of fortifications made using certified standards (BTEX).

Flash Point

Instrumental Method: Closed cup Pensky-Martens
Method Reference: ASTM D-93

% Moisture

PREPARATION METHOD. Sample is oven-dried at 105 C

INSTRUMENTAL METHOD: Gravimetric analysis

pH in Soil (1:2 soil:H2O)

Preparation Method: 1:2 Soil in water
Instrumental Method: pH meter
Method Reference. Carter SCCC 16.3

Total Extractables (Soil)

PREPARATION METHOD: Shake and sonication extraction with organic solvent

INSTRUMENTAL METHOD: GC/FID - summation of hydrocarbons from C11 to C30 carbon range (excluding benzene, toluene, ethylbenzene, and xylenes) and calculated against diesel standard.
NOTE: Results based upon dry weight.

METHOD REFERENCE: Modified SW-846 USEPA Method 3550/3580 and 8000

QC SUMMARY:

Accuracy	Precision
107%	+/- 17%

NOTE: Accuracy is expressed as the average % recovery and Precision as the relative standard deviation (RSD) of fortifications made using in-house standards (TEH).

M&B TECHNICAL TESTING SERVICES LTD.

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CALGARY, ALBERTA
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OFFICE (403) 243-9733
FAX (403) 243-9736

August 11, 1999

Project No. 99-11-009

SEACOR ENVIRONMENTAL
405, 525-11th Avenue S.W.
Calgary, Alberta
T2R 0C9

ATTENTION: MR. BILL MACDONALD

RE: LABORATORY TESTING
SEACOR JOB# H0031-093 BARON'S BULK TURBO

Dear Sir,

Please find the laboratory test results for the above noted project.

CS-49	2.0m	% Passing 75μ	93.6%
CS-235		% Passing 75μ	90.5%

If you have any questions, please do not hesitate to contact this office at your convenience.

Respectfully submitted,

M & B TECHNICAL TESTING SERVICES LTD.

M.J. O'Connor

APPENDIX D

APPLICABLE ENVIRONMENTAL STANDARDS

RELEVANT ENVIRONMENT STANDARDS

PROVINCIAL CRITERIA

The document entitled "Subsurface Remediation Guidelines for Underground Storage Tanks", - Draft, February, 1991, produced by the Alberta Departments of Environment & Labour, Management of Underground Storage Tanks (MUST) Project, has been standard by which the Department of Environment and industry in Alberta has evaluated contaminated sites since its inception in 1991.

Since July 1994, a new guideline has been proposed: "Remediation Guidelines for Petroleum Storage Tanks Sites", Draft July 1994. Produced by Alberta Environmental Protection, it provides a risk management process specific to impacted soil and groundwater originating from existing or former petroleum storage facilities. The document is in draft form only, pending completion of a public review and consultation period. Alberta Environmental Protection has agreed to allow the use of these guidelines provided that should the guidelines change as a result of public review or consultation, the party responsible must upgrade the remediation to meet the criteria contained in the final guideline.

There are three levels of contamination *I, II* and *III* for which allowable concentrations are given in each guideline. The *Levels (I, II, III)* apply to high, moderate and low site sensitivities in relation to potential health risks and environmental effects. The new 1994 RMC guidelines also differentiate between coarse and fine grained soils and for the groundwater found in either of the soils. The new guidelines have allowable concentrations for soils and groundwater at each level and grain size type.

REMEDIATION CRITERIA

Typically, *Level III* threshold criteria applies to facilities with ongoing petroleum storage and handling operations and for those sites located in industrial districts. Commercial and/or light industrial districts are normally assessed against *Level II* threshold criteria, and *Level I* threshold criteria applies to sites in residential districts or other environmentally sensitive areas. Remediation of decommissioned properties depends on final land use, whether commercial/industrial or residential.

It should be noted that LH and TEH analyses are not included in the Alberta MUST evaluation criteria; they are presented herein (Appendix D) for the sole purpose of assessing the relative proportions of gasoline to diesel residues in the subsurface soil and groundwater regime.

1994 RMC STANDARDS - INHALATION PATHWAYS

SOIL						
HYDROCARBON	COARSE GRAINED			FINE GRAINED		
COMPONENT	I	II	III	I	II	III
Benzene	0.04	0 3	1.6	0 2	1 5	55
Toluene	10	60	320	40	340	340
Ethylbenzene	70	400	400	300	400	400
Xylene	25	130	130	110	130	130
TPH	1000	2000	5000	2000	4000	5000
Phenol	ns	ns	ns	ns	ns	ns
Lead	50	200	600	50	200	600
WATER						
HYDROCARBON	COARSE GRAINED			FINE GRAINED		
COMPONENT	I	II	III	I	II	III
Benzene	0.3	1 6	7 5	0.4	4.2	75
Toluene	15	90	430	25	240	430
Ethylbenzene	30	30	30	50	50	50
Xylene	50	50	50	80	80	80
TPH	ns	ns	ns	ns	ns	ns
Phenol	ns	ns	ns	ns	ns	ns
Lead	ns	ns	ns	ns	ns	ns

Notes: • ns - not specified
- all concentrations in parts per million

1994 RMC STANDARDS - INGESTION PATHWAYS

HYDROCARBON COMPONENT	SOIL		WATER
	Coarse Grained	Fine Grained	
Benzene	0.02	0.07	0.005
Toluene	0 36	1.22	0.024
Ethylbenzene	0 10	0.41	0.0024
Xylene	3.5	11.9	0.3
TPH	1000*	2000*	ns
Phenol	ns	ns	ns
Lead	50	50	0.01

Notes: • ns - not specified
- * - recommended only
- all concentrations in parts per million