Preliminary Site Investigation Stages 1 & 2

at
3267 – 3373 Norland Ave

Burnaby, BC

Prepared for:
Christie Adams Distributors Ltd.

by:
Soilcon Laboratories Ltd.
February 1999

soilcon
LABORATORIES LTD.

Civic Address	3267 – 3373 Norland Avenue, Burnaby, BC
Latitude	49^0 15' 13.86"
Longitude	122^0 58' 27.49"
Legal Description	Parcel A, District Lot 75, Group 1, NWD, Plan 73092
Parcel Identifiers	011-226-188, 005-407-249

March 5th 1999

Mack Christie
Christie Adams Distributors
3267 Norland Avenue
Burnaby, British Columbia
V6E 2R4

Dear: Mr. Christie:

Re: Preliminary Site Investigation, Stages 1 and 2, at 3267 – 3373 Norland Avenue, Burnaby, BC.

In January 1999, Soilcon Laboratories Ltd. was requested by Mr. Mack Christie, of Christie Adams Distributors, to perform a Preliminary Site Investigation at the commercial fuel facility located at 3267 – 3373 Norland Avenue, Burnaby, British Columbia. The purpose of the investigation was to determine the quality of soil and groundwater across the subject site.

A PSI is comprised of two stages: a first stage which includes a review of historical records and past activities at the site and surrounding properties, and a second stage comprising the sampling of relevant media (soil and groundwater) at the site.

As the property is an operating commercial cardlock facility, the potential contaminants of concern are the petroleum hydrocarbons associated with the general operation of the site. A total of six boreholes were drilled at the site for the purposes of sampling the site's soil and groundwater. Five of the six boreholes were developed as groundwater monitoring wells. A total of eighteen soil samples and five groundwater samples were tested for petroleum hydrocarbons of concern by Soilcon Laboratories Ltd. Of the eighteen soil samples tested, only one exceeded the provincial standards applicable to the site. Of the five water samples analyzed, all tested below the provincial standards applicable to the site.

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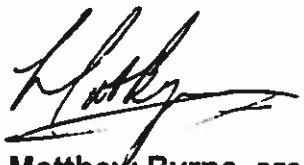
As per section 63 of the Contaminated Sites Regulation (BC Reg. 375/96), I declare that this report has been prepared in accordance with the applicable provincial Waste Management Act, and the provincial Contaminated Sites Regulation. I further declare that I have a demonstrable experience in remediation of the type of contamination at the site and that I am familiar with the remediation carried out at the site, as per the qualifications provided in Appendix I of this report.

Please phone with any questions or comments.

Yours truly,



Matthew Byrne, BES
Project Manager

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1. INTRODUCTION

In January 1999, Mr. Mack Christie of Christie Adams Distributors requested that Soilcon Laboratories Ltd. conduct a Preliminary Site Investigation at the subject property in Burnaby, BC. The subject property encompasses the civic addresses of 3267 – 3373 Norland Avenue, Burnaby, BC. The legal description of the property is:

> PARCEL A, DISTRICT LOT 75, GROUP 1, NEW WESTMINSTER DISTRICT, PLAN 73092

A PSI is comprised of two stages: a first stage which includes a review of historical records and past activities at the site and surrounding properties, and a second stage comprising the sampling of relevant media (soil and groundwater) at the site. The first stage determines the potential for contamination caused by onsite and offsite activities. The second stage determines the general location and degree, if any, of contamination at the site.

Stage 1 of the PSI is presented in Section 2 of this report. Stage 2 of the PSI is presented in Section 3. Conclusions and recommendations are presented in Sections 4 and 5, respectively. References are provided in Section 6. The author's qualifications are provided in Appendix I.

Figure 1 is a site location map. Figure 2 is a map of surrounding property use. Figure 3 is a schematic map of the site showing groundwater flow direction and borehole locations.

2. STAGE I - PRELIMINARY SITE INVESTIGATION

2.1 Records Review

The records review portion of the PSI includes review of public directories for historical property usage, a historical land title search, government inquiries, review of aerial photographs, review of company records, review of any previous PSI reports, and review of surficial soil maps.

2.1.1 Public Directories

A search of historical local property uses was conducted at the Vancouver Public Library, using the Vancouver City Directories (1960 through 1997). Table 1 lists the occupants of the subject site and surrounding properties from 1960 through 1997. Occupants of the subject site are bolded.

According to directories the subject site has been operating as a wholesale distributor of petroleum products since 1972. The site was listed as vacant prior to that time. Surrounding properties were historically occupied by construction companies from 1968 through the mid 1980's. The expansion of the present commercial fuel facility and oil distribution centre was completed in approximately 1987.

The potential contaminants of concern (PCOC) at the site and surrounding properties as indicated by directory listings, are petroleum hydrocarbons associated with the general operations of the subject site(s). Construction companies have historically occupied the properties immediately to the south of 3267 Norland Ave, these would not likely have presented a significant source of contamination to the site or surrounding areas. The property north of the site has been occupied by a wholesale distributor and also does not present a significant contaminant source.

Table 1: Directory Listings – Subject & Surrounding Properties

Addresses Norland Avenue	Occupant	Year
3202	Burnaby Municipal Animal Shelter	1997
3215	Barton of Canada	1997
3267	Christie Adams Distributors Ltd, Skunky's Discount Auto Parts	1997
3350	Maintenance Service Centre school district	1997
3373	Christie Adams Distributors, oil distributors & jobbers	1997
3375	Vector Engineering Services Ltd.	1997
3377	Williams Computer Service	1997
3379	BC Ministry of Transport & Highways	1997
3202	Burnaby Municipal Animal Shelter	1995
3215	Barton of Canada	1995
3267	Christie Adams Distributors Ltd, Skunky's Discount Auto Parts	1995
3350	Maintenance Service Centre school district	1995
3373	Christie Adams Distributors, oil distributors & jobbers	1995
3375	Vector Engineering Services Ltd.	1995
3377	Williams Computer Service	1995
3379	BC Ministry of Transport & Highways	1995
3202	Burnaby Municipal Animal Shelter	1990
3215	Barton of Canada	1990
3267	Christie Adams Distributors Ltd, Skunky's Discount Auto Parts	1990
3350	Maintenance Service Centre school district	1990
3373	Christie Adams Distributors, oil distributors & jobbers	1990
3375	Vector Engineering Services Ltd.	1990
3377	Williams Computer Service	1990
3379	BC Ministry of Transport & Highways	1990
3202	Burnaby Municipal Animal Shelter	1984
3215	Eland Distributors	1984
3367	Adams John F & Sons Ltd. Auto Parts & Wholesale Distributors, Skunky's Discount Auto Parts	1984
3375	Arthon Construction Ltd., Vector Engineering	1984
3379	Ministry of Transport & Highways	1984
3202	Burnaby Municipal Animal Shelter	1978
3215	Eland Distributors	1978
3367	John Adams & Sons Ltd. Auto Parts & Wholesale Distributors, Skunky's Discount Auto Parts	1978
3375	Arthon Construction Ltd., Vector Engineering	1978
3379	Winvan Paving Ltd.	1978
3215	No Listing	1972
3367	John Adams & Sons Ltd. Auto Parts & Wholesale Distributors, Skunky's Discount Auto Parts	1972
3375	Arthon Construction Ltd., Vector Engineering, Burnaby Parks & Recreation	1972
3215	Residence	1968
3267	Vacant	1968
3375	Arthon Construction & Engineering, Vector Installations, Service & Heating, Tarus Imports	1968

2.1.2 Title Searches

A title search for the subject property was completed at the New Westminster Land Title office. Information from the search is presented in Table 2, a copy of the title search is provided in Appendix B.

Table 2: Title Search, Subject Property

Title No.	From Title No.	Registered Owner	Date of Registration	Date Cancelled
Z209453E	Z209446E Z209447E	Como Estates Ltd., Incorporation No. 308,068	November 13, 1986	current

2.1.3 Government Inquiries

Soilcon Laboratories Ltd. sent a site information request regarding possible environmental problems at the subject property to the Regional Environmental Protection Officer of the BC Ministry of Environment, Lands and Parks. The search conducted by the Ministry will report any of the following listings for the subject site:

- Waste Management Permits
- Waste Management Letters of Approval
- Waste Management Applications
- Pollution Abatement and Prevention Orders
- Convictions under the Waste Management Act, or,
- Site Investigation file listings

A response to the information request has not yet been received. A copy of the information request document is provided in Appendix C. Once the information has been received from BC Environment, it will be forwarded for your review.

2.1.4 Fire Insurance Maps

No Fire Insurance Maps were available for the subject site or surrounding areas.

2.1.5 Aerial Photographs

Aerial photographs were obtained from the University of British Columbia, Department of Geography. Dates available were 1994, 1979, 1974, 1963, 1954, and 1949. Air photographs generally correspond with the property uses indicated by the Vancouver Directories. The most significant environmental concern in the area appears to be the subject site. The following paragraphs provide a brief description of each photograph. A photocopy of the 1979 aerial photograph is provided in Appendix D.

1949 – The subject and surrounding properties have not yet been developed.

1954 –The area near the subject site is occupied by one residence. All surrounding properties are vacant.

1963 – The subject site remains vacant with residential properties to the south and east. It appears that some light industry is occupying the areas north of the site. The construction of Highway 1 is ongoing as indicated in the photo.

1974 – The subject site appears in this photo. The configuration is one pump island, currently the middle pump island. The property to the south is separated from the subject site. There is what appears to be light industrial activity at all surrounding properties.

1979 – The subject site still maintains only one pump island. To the east are vacant properties with one occupant (animal shelter). To the north is light industry while the south remains separate from the subject property.

1994 – The site appears as it does today. Christie Adams occupies both the property at 3267 Norland as well as the property south. A warehouse (light industry) is located to the north with more light industry to the east. Highway 1 is located to the west.

2.1.6 Review Of Company Records

No company records were reviewed for the subject site.

2.1.7 Previous PSI Reports

No previous PSI reports were available for the subject property, however, an investigative drilling program was completed at the site in 1995. Although no investigation reports were available, Soilcon was informed that approximately 15 boreholes were advanced across the site as part of the drilling program. The site also contained 7 groundwater monitoring wells prior to the completion of Soilcon's preliminary site investigation. According to Mr. Mack Christie, owner of the property, the boreholes were drilled by O'Connor Associates Environmental Consultants during 1995. Mr. Christie informed Soilcon that no report was available as the drilling program was conducted for potential purchaser of the site.

2.1.8 Previous Remedial Work

In August of 1993, Soilcon Laboratories Ltd. supervised the removal of four steel underground storage tanks from the subject site. The tank removal project was completed at the site's northeast tank basin. The tanks were replaced with two, double-walled fibreglass USTs. During removal of the steel tanks, an enhanced bio-remediation program was carried out on the sand backfill that had surrounded the tanks. Approximately 100 m^3 of visibly stained and odorous sandy soil was removed from the tank basin excavation. This soil was mixed with the following amendments in order to enhance the microbial breakdown of petroleum hydrocarbons in the soil,

- 300 kg 32-4-4 fertilizer
- 125 kg dolomite lime
- 20 m^3 manure

Soil samples collected from the backfill sand prior to the remediation program tested slightly below the then commercial standards applicable to the site. The remediating soil was mixed with an excavator once a day for four days, at which time the soil was re-sampled. Testing at this time indicated that contaminant concentrations in the soil were reduced to below the residential standards of that time. Upon completion of the remediation program, the soil was used as fill material near the southern portion of the site. No soil from the tank upgrade program was removed from the site.

A second remediation program was completed at the site in January 1999. As a result of a drainage trench program completed at the site in December 1998, it was observed that a layer of asphalt, at a depth of 1.2 m below grade, was located between the site's middle tank basin and northern tank basin. During excavation of the drainage trench, this asphalt layer was observed to have a moderate hydrocarbon odour. Due to ongoing environmental investigations at

the site it was decided to excavate and remove the asphalt layer in order to improve the site's environmental quality. On January 13 – 15, 1999, Matthew Byrne of Soilcon Laboratories Ltd. supervised the excavation and removal of the asphalt layer. The excavation was completed with a backhoe. The removed asphalt was relocated to the southern portion of the site. Approximately 200 m of asphalt mixed with soil was excavated and relocated onsite. During excavation, soil samples were collected from the walls and base of the excavation. Sample results are presented in section 4.

2.1.9 Review Of Soils and Surficial Geology Maps

The site was not surveyed as part of the Langley-Vancouver Map Area Soil Survey (Luttmerding 1980) due to the non-agricultural land use at the time.

Review of Geological Survey of Canada Surficial Geology Map No. 1484A, New Westminster, indicates that the site is located in an area of bog, swamp and shallow lake deposites. The area contains fill, (determined through drilling), covering upland peat up to 8 m or more thick (confirmed through drilling).

2.2 Site Visit

A site visit required for the PSI, took place prior to the investigative drilling program. The inspection was completed with the aid of a checklist. Photographs of the site are shown in Appendix H.

2.2.1 General

2.2.1.1 Methodology

The Site Visit was conducted by Matthew Byrne of Soilcon Laboratories Ltd. Observations were made with the aid of a checklist.

2.2.1.2 Timing

Conducted after review of records.

2.2.1.3 Limitations

Inspection of surface soil quality was limited by pavement or structures over the majority of the site. Only the southern portion of the site had not been paved.

2.2.1.4 Property Use

Visual inspection of the property indicates that the site is used for the commercial distribution of petroleum products associated with a commercial cardlock and auto supply store.

2.2.1.5 Hazardous Materials

Hazardous materials associated with petroleum products are stored at the site. The site also operates commercial facilities for the sale of propane and natural gas. No indication of hazardous material storage or handling was noted at adjoining properties.

2.2.1.6 Unidentified Substances

None.

2.2.1.7 Storage Tanks

The site contains both underground and aboveground storage tanks containing petroleum products. Figure 3 is a site schematic diagram showing the location of storage tanks at the site.

2.2.1.8 Storage Containers

The northwestern portion of the site is used for the storage and handling of bulk oil petroleum products.

2.2.1.9 Odours

A slight petroleum odour is evident due to the high volume of petroleum fueling that occurs at the site.

2.2.1.10 Potable Water Supply

GVRD water authority.

2.2.1.11 Special Attention Items

PCBs (polycholrinated bi-phenols), ACMs (asbestos containing materials), Lead piping, UFFI (urea foam formaldehyde insulation) are potentially present due to the age of the onsite building(s) (pre-1972). These issues should be addressed upon demolition; if discovered, a qualified consultant should be contacted.

2.2.2 Interior Observations

2.2.2.1 General

There are no obvious signs of contamination determined by interior observations.

2.2.2.2 Heating and Cooling

Both buildings are heated by natural gas furnaces.

2.2.2.3 Stains

There is no staining which causes significant concern of contamination.

2.2.2.4 Drains and Sumps

Neither building has interior drains or sumps.

2.2.3 Exterior Observations

2.2.3.1 General

No exterior signs of contamination were evident through visual inspection.

2.2.3.2 Observation of Adjoining Properties

No visible signs of contamination were noted at adjoining properties.

2.2.3.3 Topographic, Geologic, and Hydrogeologic Conditions

Local topography slopes toward the east. Geology is not visible, although local geology is known and discussed in Section 2.1.9. Hydrogeology is discussed in section 3.2.5.

2.2.3.4 General Description of Structures

The footprints of site buildings are shown in Figure 3. The southwestern building is a two story building used for offices. The northwestern building is used for the auto parts store and for petroleum product storage and distribution.

2.2.3.5 Wells

There are no wells on site other than the groundwater monitoring wells installed as part of environmental investigations carried out at the property.

2.2.3.6 Sewage Disposal

Provided by City of Burnaby.

2.2.3.7 Pits and Lagoons

None.

2.2.3.8 Stained Materials

Staining across the fueling and parking areas due to vehicle traffic. Oil staining at the northwestern portion of the site due to oil storage and handling.

2.2.3.9 Stressed Vegetation

None.

2.2.3.10 Fill

The entire site has been filled prior to development of the property. Geologic conditions are discussed in section 2.1.9.

2.2.3.11 Wastewater, Watercourses, Ditches, or Standing Water

There is no wastewater or open sewage discharge from the site. There are no watercourses, ditches, or standing water on or adjoining the site.

2.2.3.12 Roads, Parking Facilities, and Rights of Way

Surrounding roads are identified on the site plan, Figure 2.

2.3 Interviews

Due to the substantial amount of information available from the historical investigations as well as the immediate progression to Stage 2 of the PSI, i.e. to subsurface investigation, interviews were not undertaken.

2.4 Potential Contaminants of Concern

The *Potential Contaminants of Concern* associated with the subject site are those associated with the general operation of a commercial fuelling facility, i.e. petroleum hydrocarbons associated with fuel storage, fuel pumps and piping, fuel oil tanks, used and new oil tanks. Gasoline contains monocyclic aromatic hydrocarbons determined in BTEX analysis (benzene, toluene, ethylbenzene, and xylenes). Diesel is comprised of heavier petroleum hydrocarbons largely determined by the light extractable petroleum hydrocarbon (LEPH) analyses. Motor oil is comprised of even heavier petroleum hydrocarbons determined by the heavy extractable petroleum hydrocarbon (HEPH) analyses.

2.5 Stage 1 Conclusions

According to directories, the subject site has been operating as a wholesale distributor of petroleum products since 1972. The site was listed as vacant prior that time. Surrounding properties were historically occupied by construction companies from 1968 through the mid 1980's. The expansion of the present commercial fuel facility and oil distribution centre was completed in approximately 1987.

Potential contaminants of concern at the site are those associated with the general operations of a wholesale distributor of petroleum products. Soil and groundwater samples collected during environmental investigations should be tested for components of BTEX, naphthalene, volatile petroleum hydrocarbons, light extractable petroleum hydrocarbons, and heavy extractable petroleum hydrocarbons.

3. STAGE II PSI

Stage II of the Preliminary Site Investigation consists of a drilling investigation, installation of monitoring wells, soil and groundwater analyses for contaminants of concern, and interpretation of groundwater flow direction. Presented first, in Section 3.1, is a discussion of regulations, contaminant pathways and standards applicable to the site.

3.1 Applicable Standards

The Contaminated Sites Regulation (CSR) BC Reg. 375/96 came into force on April 1, 1997. Under the CSR there are two types of numerical standard for soil contaminants. Where there is sufficient data, "matrix" standards have been enacted. These are based on the presence of pathways along which a contaminant can travel from soil to a receptor. The derivation of matrix standard is described in the Contaminated Sites Soil Taskgroup (CSST) Policy decision Summary (CSST January 1996) and the Workshop on the Development and Implementation of Soil Quality Standards for Contaminated Sites (MacDonald October 1995). There are eight basic pathways covered by the CSR. Two have a human receptor:

1. Intake of contaminated soil
2. Groundwater used for drinking water

There are six for transport of non-human organisms:

3. Toxicity to soil invertebrates and plants
4. Livestock ingesting soil and fodder
5. Major microbial functional impairment
6. Groundwater flow to surface water used by aquatic life
7. Groundwater used for livestock watering
8. Groundwater used for irrigation watering

Under section 11 (2) of the regulation a site is not a contaminated site if the soil, surface and groundwater do not exceed the applicable site-specific numerical criteria. The "Intake of contaminated soil" and "Toxicity to soil invertebrates and plants" pathways apply to all sites. The following is a discussion of the other pathways applicable to this site.

The current zoning of the site is commercial. The intended future use of the site is commercial therefore the commercial standards from the CSR are applicable to the site. The site is, and will be, serviced by GVRD water. According to City of Burnaby Engineering Dept, there are no drinking water wells in Burnaby

therefore, the "Groundwater used for drinking water" pathway is not applicable to the site.

The subject site is located approximately 600 m from Still Creek which is located north and east of the site. The direction of groundwater flow is towards the east therefore the "Groundwater flow to surface water used by aquatic life" pathway is applicable to the site.

There is no livestock currently on or planned for the site so the "Livestock ingesting soil and fodder" pathway does not apply to this site. The majority of the site is paved or covered by structures and no substantial vegetated areas are planned as part of the site. Therefore, the "Major microbial functional impairment" pathway does not apply to the site.

No livestock are or will be watered using surface or groundwater from the site so the "Groundwater used for livestock watering" pathway does not apply to the site. The groundwater on the site is not used for irrigation. Therefore the "Groundwater used for irrigation watering" pathway does not apply to the site. Table 3 summarizes the applicable pathways for the site. The standards presented with tabulated results of analysis, in Sections 3.3 and 3.4, are based on these pathways.

Table 3: Applicable Pathways

Pathway	
Intake of contaminated soil	Yes
Groundwater used for drinking water	No
Toxicity to soil invertebrates and plants	Yes
Livestock ingesting soil and fodder	No
Major microbial functional impairment	No
Groundwater flow to surface water used by aquatic life	Yes
Groundwater used for livestock watering	No
Groundwater used for irrigation watering	No

3.2 Methods

3.2.1 January 1999 Asphalt Excavation

As a result of a drainage trench program completed at the site in December 1998, it was observed that a layer of asphalt at a depth of 1.2 m below grade, was located between the site's middle tank basin and northern tank basin. During excavation of the drainage trench, this asphalt layer was observed to have a moderate hydrocarbon odour. Due to ongoing environmental investigations at the site it was decided to excavate and remove the asphalt layer in order to improve the site's environmental quality.

On January 13 – 15 1999, Matthew Byrne of Soilcon Laboratories Ltd. supervised the excavation and removal of approximately 200 m of asphalt from between the subject property's middle and northern tank basin. The excavation was completed with a backhoe and the removed asphalt was relocated to the southern portion of the site. Approximately 200 m of asphalt mixed with soil was excavated and relocated onsite.

During excavation, a total of 9 soil samples were collected from the walls, base, and removed material from the excavation. Sampling methodology is presented in Appendix F. Sample results are presented in section 4. Figure 4 shows the location of the asphalt excavation and sampling locations.

3.2.2 January 1999 Drilling

On January 22 1999, Matthew Byrne, of Soilcon Laboratories Ltd., supervised the drilling of six boreholes at the subject site for the purpose of investigating soil and groundwater quality.

The drilling was completed by Layne Christensen Environmental Drilling Services, using a truck-mounted auger. The specific drilling locations chosen were based on site coverage combined with already existing groundwater monitoring wells. Soil samples were taken from between auger flights at depths most likely to show contamination, such as near surface, at the end of hole, near the water table surface, and at significant soil layer boundaries. The augers were decontaminated between holes. Five of the six boreholes drilled were developed into groundwater monitoring wells.

The following is a brief description of the development of each borehole. Figure 3 shows the location of these boreholes.

BH 1
BH 1 was drilled near the northeast corner of the site's southern tank basin. The location of BH 1 addresses possible contaminant migration from the southern tank basin. No petroleum odour or staining was noted during drilling. BH 1 was drilled to a depth of 6.0 m and developed into a monitoring well screened from 1.5 m to 4.5 m.

BH 2
BH 2 was drilled at the site's southern driveway entrance. The location of BH 2 addresses possible offsite contaminant migration from the southern tank basin. No petroleum odour or staining was noted during drilling. BH 2 was drilled to a depth of 6.0 m and developed into a groundwater monitoring well screened from 1.5 m to 6.0 m.

BH 3
BH 3 was drilled near the southwestern corner of the site's southern tank basin. The location of BH 3 addresses possible offsite contaminant migration from the southern tank basin. No petroleum odour or staining was noted during drilling. BH 2 drilled to a depth of 6.0 m and developed into a groundwater monitoring well screened from 1.5 m to 6.0 m.

BH 4
BH 4 was drilled at the southern area of the subject site. This area is not paved and is currently used for parking. The intended future use of this area is for continued parking. The location of BH 4 addresses possible contamination from fill material used at this area of the site. No petroleum odour or staining was noted during drilling. BH 4 was drilled to a depth of 6.0 m and was not developed into a groundwater monitoring well.

BH 5
BH 5 was drilled within the oil storage area of the site located at the northwestern portion of the property. The location of BH 5 address possible soil and or groundwater contamination originating from the storage and handling of bulk oil products. BH 5 is specifically located between the aboveground propane tank and the above ground oil tank nest. Petroleum staining and a moderate oily petroleum odour were noted within the first 1. 5 m of BH 5. No odour or staining was noted below 1.5 m. BH 5 was drilled to a depth of 4.5 m and developed into a groundwater monitoring well screened from 1.5 m to 4.5 m.

BH 6

BH 6 was drilled near the northwestern corner of the site's northern tank basin. The location of BH 6 addresses possible contaminant migration from the oil storage area as well as possible migration from the northern tank basin. No petroleum odour or staining was noted during drilling. BH 6 was drilled to a depth of 6.0 m and developed into a groundwater monitoring well screened from 1.5 m to 6.0 m.

Additional boreholes were not drilled at locations east of the site's middle and northern tank basins due to the presence of boreholes drilled during the 1995 investigation program at the site. It was planned to address these specific areas by the collection of groundwater samples from BH A and BH B. Figure 3 is a site schematic diagram showing the location of groundwater monitoring wells installed during the January drilling program at the site.

3.2.3 Soil Sampling

Samples chosen for laboratory analyses came from depths where contamination would most likely exist, as judged by field experience, i.e. near surface, at the groundwater table, and at the end of hole. Soil samples were collected in clean, new 250-mL glass jars. Soil samples were refrigerated during transportation and storage. Samples were taken in accordance with *Guideline #1 Contaminated Sites, Site Characterization and Confirmation Testing* (MoELP 1996).

A total of thirty-four soil samples were collected during the project. Eighteen of these samples were analyzed for benzene, toluene, ethylbenzene, xylenes (BTEX), naphthalene, volatile petroleum hydrocarbons (VPH), light extractable petroleum hydrocarbons (LEPH), and heavy extractable petroleum hydrocarbons (HEPH) by Soilcon Laboratories Ltd. Two additional samples were analyzed for metals by Cavendish Laboratory Ltd. Soil sampling methods and analytical laboratory methods are given in Appendix F. Laboratory methods used are in accordance with the *British Columbia Environmental Laboratory Manual* (BCMOE, with revisions 1996). Results of soil analysis are presented in Section 3.3.

3.2.4 Groundwater Sampling

On February 24th 1999, groundwater samples were collected from each of the five groundwater monitoring wells installed at the site during the January drilling program. An additional two water samples were collected from two monitoring wells installed at the site in 1995. As indicated on Figure 3, groundwater samples collected from BH's A & B address possible contaminant migration towards the east of the site's middle and northern tank basins respectively.

Dedicated "Waterra" water samplers were installed in all wells. The use of dedicated sampling equipment eliminates cross contamination between monitoring wells. Each groundwater well was purged by removing two well-volumes of water.

Groundwater samples for BTEX, naphthalene, and VPH were taken from the wells in new, completely filled, amber, 40 ml, glass septum vials. Groundwater samples for extractable hydrocarbons were taken from the wells in new, 1000 mL amber glass bottles. Groundwater samples were refrigerated during transportation and storage.

Groundwater samples were analyzed for benzene, toluene, ethylbenzene, xylenes (BTEX), naphthalene, volatile petroleum hydrocarbons (VPH), light extractable petroleum hydrocarbons (LEPH), and heavy extractable petroleum hydrocarbons (HEPH) by Soilcon Laboratories Ltd. Groundwater sampling methods and analytical laboratory methods are given in Appendix F. Laboratory methods used are in accordance with the *British Columbia Environmental Laboratory Manual* (BCMOE, with revisions 1996).

3.2.5 Groundwater Flow Direction

The direction of groundwater flow was inferred from the hydraulic gradient across the site. On February 24th 1999, a vertical survey of monitoring well piezometers, was performed by Soilcon Laboratories, using a standard surveyor's level and rod. Depth to groundwater was also measured in each well using a water level probe. Water level and surveying data are provided in Appendix A and presented graphically in Figure 3. Water level and surveying data are combined to obtain water table elevations relative to an arbitrary benchmark.

3.3 Results

3.3.1 Petroleum Hydrocarbons

Due to their toxicity and persistence, the monocyclic aromatic hydrocarbons benzene, toluene, ethylbenzene and xylenes (BTEX) are of particular concern on sites where gasoline has been handled. Light extractable petroleum hydrocarbons (LEPH) analyses include hydrocarbons from C^{11} to C^{19} which include most of the diesel fraction. Heavy extractable petroleum hydrocarbons (HEPH) analyses include hydrocarbons from C^{20} to C^{32} which includes the heavier diesel fraction and as well as heavier compounds such as motor oil.

Table 4 presents the hydrocarbon analysis results for the 9 soil samples tested as part of the asphalt removal excavation conducted at the site in January 1999.

Located at the bottom of the tables are the corresponding standards from two sources; *Contaminated Sites Regulation* (375/96), and the *Special Waste Regulation* (BC Reg. 63/88 am. 52/95). Results exceeding the commercial criteria are shown in bold and are shaded. Laboratory methods are described in Appendix F. Copies of the original laboratory results from Soilcon Laboratories Ltd. are given in Appendix G.

Table 4: Soil Hydrocarbons: January 1999 Asphalt Excavation

mg/kg

Location	#	Depth (m)	Yg	Benzene	Toluene	Ethyl Benzene	Xylenes	Naphthalene	VPH	LEPH	HEPH
Base	1	1.5	14%	0.34	0.05	<0.05	0.24	<0.05	<10	<40	<40
Removed Fill	2	0.6	19%	0.06	<0.05	<0.05	0.30	0.21	<10	232	118
Southern Base	3	1.8	12%	0.26	0.92	0.25	2.05	0.07	<10	<40	<40
West Wall	4	1.5	10%	1.89	0.55	4.63	3.60	7.70	61	1037	2487
Imported Fill	5	--	7%	0.04	<0.05	<0.05	0.12	<0.05	<10	<40	782
Removed Asphalt	6	1.2	7%	**42.55**	**63.93**	**242.45**	**812.19**	**77.18**	**3676**	**11616**	**6995**
East Wall	7	1.0	22%	0.30	<0.05	0.48	4.28	0.15	<10	<40	<40
North Wall	8	1.0	21%	0.33	0.48	3.87	9.16	6.98	69	419	<40
South Wall	9	1.0	16%	0.18	<0.05	0.60	4.40	11.46	82	1879	<40
Removed Fill	2D	0.6	19%	0.06	<0.05	<0.05	0.71	0.16	<10	208	122
Commercial/Industrial Standard				**8**	**30**	**50**	**50**	**50**	**200**	**2000**	**5000**
Special Waste[2]				**100**	**300**	**500**	**500**	**500**	**NS**	**NS**	**NS**

[1] Contaminated Sites Reg. (375/96). [2] B.C. Reg. (63/88). < less than specified detection limits.
(NS) no applicable standard.
Yg: moisture content

Results from Table 4 indicate that all the samples collected from the removed asphalt has tested well above the applicable commercial standards. The removed soil mixed with asphalt is currently stored at the southern portion of the property, covered with a polyethylene liner. Table 4 indicates that remaining samples from the walls and base of the excavation, as well as the removed fill soil located above the asphalt layer, has tested below applicable standards.

Table 5 presents hydrocarbon analysis results for the eighteen soil samples tested for as part of the January 1999 drilling program.

Table 5: Soil Hydrocarbons: January 1999 Drilling

mg/kg

Location	#	Depth (m)	Yg	Benzene	Toluene	Ethyl Benzene	Xylenes	Naphthalene	VPH	LEPH	HEPH
BH 1	1	0.75	16%	<0.04	<0.05	<0.05	2.20	<0.05	<10	<40	<40
BH 1	2	3.6	647%	0.11	<0.05	0.11	0.35	0.08	13	<40	<40
BH 1	3	6.0	492%	0.09	<0.05	0.11	0.32	0.06	11	<40	<40
BH 2	4	0.8	33%	0.81	0.31	0.09	0.17	<0.05	<10	<40	<40
BH 2	5	3.3	309%	0.09	<0.05	0.07	0.23	<0.05	<10	<40	<40
BH 2	6	6.0	479%	0.08	<0.05	0.08	0.31	<0.05	11	<40	<40
BH 3	7	0.75	25%	<0.04	<0.05	<0.05	<0.10	<0.05	<10	<40	<40
BH 3	8	3.0	526%	0.08	<0.05	0.09	0.34	<0.05	12	<40	<40
BH 3	9	6.0	304%	0.05	<0.05	0.06	0.22	<0.05	<10	<40	<40
BH 4	10	1.0	18%	<0.04	<0.05	<0.05	<0.10	<0.05	<10	<40	<40
BH 4	11	2.2	25%	<0.04	<0.05	<0.05	<0.10	<0.05	<10	<40	<40
BH 4	12	5.0	16%	<0.04	<0.05	<0.05	<0.10	<0.05	<10	<40	<40
BH 5	13	0.5	20%	0.30	<0.05	<0.05	0.35	4.15	<10	835	10620
BH 5	14	2.6	211%	0.11	<0.05	<0.05	0.28	0.05	<10	<40	273
BH 5	15	4.5	735%	0.17	<0.05	<0.05	0.57	0.09	18	<40	<40
BH 6	16	0.3	14%	<0.04	<0.05	<0.05	0.12	5.59	<10	672	473
BH 6	17	3.0	504%	0.12	<0.05	<0.05	0.37	0.10	14	<40	<40
BH 6	18	6.0	368%	0.09	<0.05	0.07	0.24	0.08	<10	<40	<40
BH 1	2D	3.6	647%	0.11	<0.05	0.13	0.38	<0.05	16	<40	<40
BH 4	12D	5.0	16%	<0.04	<0.05	<0.05	<0.10	<0.05	<10	<40	<40
Commercial/Industrial Standard				**8**	**30**	**50**	**50**	**50**	**200**	**2000**	**5000**
Special Waste[2]				**100**	**300**	**500**	**500**	**500**	**NS**	**NS**	**NS**

[1] Contaminated Sites Reg. (375/96). [2] B.C. Reg. (63/88). < less than specified detection limits.
(NS) no applicable standard.
Yg: moisture content

Of the eighteen soil samples tested for petroleum hydrocarbons of concern, only one sample collected from BH5 at 0.5 m, tested above the commercial standard for HEPH. All remaining soil samples tested below the applicable commercial soil standards applicable to the site.

3.3.2 Soil Metals

Two of the thirty-four soil samples collected during the drilling program were analyzed for total metals by Cavendish Laboratory Ltd.

Table 6 presents the results of soil metals analysis. Also presented are the current, as of 1998, commercial standards from the CSR (BC Reg. 375/96). Exceedences of the commercial standard are bolded and shaded.

Table 6: Soil Metals

(mg/kg)

Component	Units	Standards Commercial	BH1 @ 1.5 m	BH6 @ 5.0 m
			pH = 5.8	pH = 6.5
(Ag) Silver	Ppm	40	<.1	<.1
(Al) Aluminum	%	Ns	1.84	.62
(As)* Arsenic	Ppm	150	7	11
(B) Boron	Ppm	Ns	19	33
(Ba) Barium	Ppm	2000	175	52
(Be) Beryllium	Ppm	8	.4	.3
(Bi) Bismuth	Ppm	Ns	<3	<3
(Ca) Calcium	%	Ns	.31	.81
(Cd)* Cadmium	ppm	1.5	.2	<.2
(Co) Cobalt	ppm	300	9	3
(Cr)* Chromium	ppm	60	21	10
(Cu)* Copper	ppm	200	44	41
(Fe) Iron	%	Ns	2.47	.99
(Hg) Mercury	ppm	10	<.01	<.01
(K) Potassium	%	Ns	.09	.03
(La) Lanthanum	ppm	Ns	4	3
(Mg) Magnesium	%	Ns	.51	.20
(Mn) Manganese	ppm	Ns	356	133
(Mo) Molybdenum	ppm	40	3	7
(Na) Sodium	%	Ns	.03	.03
(Ni) Nickel	ppm	500	24	22
(P) Phosphorous	ppm	Ns	639	233
(Pb)* Lead	ppm	250	14	7
(S) Sulphur	%	Ns	n/a	n/a
(Sb) Antimony	ppm	40	<2	<2
(Se) Selenium	ppm	10	<1	<1
(Si) Silicon	%	Ns	.05	.04
(Sn) Tin	ppm	300	<5	<5
(Sr) Strontium	ppm	Ns	57	50
(Ti) Titanium	%	Ns	.11	.03
(V) Vanadium	ppm	Ns	56	31
(W) Tungsten	ppm	Ns	<2	<2
(Zn)* Zinc	ppm	150	132	41

[1] Contaminated Sites Reg. (375/96).
*numerical standard changes with land use and pH
Ns: no applicable standard.

Results from Table 6 indicate that both samples analyzed for total metals tested below applicable standards for metals of concern.

3.4 Groundwater Results

3.4.1 Petroleum Hydrocarbons

A total of seven groundwater samples were analyzed for petroleum hydrocarbons of concern. Five water samples were collected from monitoring wells installed during the January 1999 drilling program. Two water samples were collected from monitoring wells previously drilled at the site in 1995.

Table 7 presents the hydrocarbon analysis results for the seven groundwater samples tested. Located at the bottom of the table are the corresponding criteria given from two sources: *Contaminated Sites Regulation* (375/96); and the *Special Waste Regulation* (BC Reg. 63/88 am. 52/95). Results exceeding the applicable aquatic life standards are shown in bold and are shaded. Laboratory methods are described in Appendix F. Copies of the original laboratory results from Soilcon Laboratories Ltd. are given in Appendix G.

Table 7: Water Hydrocarbon Laboratory Results

(mg/l)

Location	Date Sampled	Benzene	Toluene	Ethyl benzene	Xylenes	Naphthalene	VPH	LEPH	HEPH
99-BH 1	02.24.99	**1.4015**	0.0970	0.0114	0.0420	<0.0050	<1.0	0.7	<1.0
99-BH 2	02.24.99	<0.0005	<0.0005	<0.0005	<0.0010	<0.0005	<0.1	0.6	<1.0
99-BH 3	02.24.99	<0.0005	<0.0005	<0.0005	<0.0010	<0.0005	<0.1	<0.5	<1.0
99-BH 5	02.24.99	0.1089	0.0770	0.0477	0.1112	**0.0139**	<1.0	0.5	<1.0
99-BH 6	02.24.99	<0.0005	0.0015	<0.0005	<0.0010	<0.0005	<0.1	<0.5	<1.0
95 BHA	02.24.99	**1.5523**	1.4021	**0.2478**	1.9702	**0.0525**	2.8	13.5	3.2
95 BHB	02.24.99	**0.5408**	0.0689	0.1107	0.2369	**0.0141**	<1.0	0.7	<1.0
Aquatic Life Standard[1]		**3**	**3**	**7**	**NS**	**0.01**	**NS**	**NS**	**NS**
Special Waste Leachate Standard[2]		**0.50**	**2.40**	**0.24**	**30.0**	**30.0**	**NS**	**NS**	**NS**

[1]Contaminated Sites Reg. (375/96).

[2]Special Waste Regulation BC Reg. (63/88).

< less than specified detection limits.

NS No standard

Results from Table 7 show the following exceedences of the standards applicable to the site. Borehole 99-BH1 exceeded the applicable special waste standard for concentrations of benzene. Borehole 99-BH5 exceeded the applicable aquatic life standard for concentrations of naphthalene. Borehole 95-BHA exceeded the special waste standards for concentrations of benzene, ethylbenzene, and the aquatic life standard for naphthalene. Borehole 95-BHB exceeded the special waste standard for concentrations of benzene and the aquatic life standard for concentrations of naphthalene.

4. CONCLUSIONS

4.1 Potential Contaminants of Concern (PCOC)

The *Potential Contaminants of Concern* associated with the subject site are those primarily associated with the general operation of a commercial fueling facility and bulk oil distribution centre. PCOC are petroleum hydrocarbons associated with fuel and oil storage, fuel pumps and piping, fuel oil tanks, used oil tanks, and retail bulk oil storage. Gasoline contains monocyclic aromatic hydrocarbons determined in BTEX analysis (benzene, toluene, ethylbenzene, and xylenes). Diesel is comprised of heavier petroleum hydrocarbons largely covered by the light extractable petroleum hydrocarbons (LEPH) analyses. Heavy petroleum products such as motor oil are comprised of even heavier petroleum hydrocarbons covered by the heavy extractable petroleum hydrocarbons (HEPH) analyses.

4.2 Soil

In January 1999, prior to the initiation of the PSI at the site, a minor asphalt excavation was completed between the site's middle and northern tank basins. Analytical results for the material removed from the excavation indicated that the removed asphalt/soil has tested well above the commercial standards applicable to the site. The asphalt/soil is currently stored beneath a polyethylene liner at the southern portion of the site. All remaining soil samples collected from the excavation in January 1999 tested below the commercial standards applicable to the site.

As part of the PSI drilling program carried out at the site in January 1999, a total of eighteen soil samples were analyzed for PCOC. All but one sample analyzed tested below the applicable commercial standards applicable to the site. One soil sample, collected from the fill material in BH 5, has tested above the commercial standards for concentrations of HEPH. Due to exceedences for only HEPH and the oily odour and staining noted during drilling of BH 5, it is concluded that the exceedence has likely been caused by the ongoing storage and handling of bulk oil in the northwestern portion of the site.

Two samples collected during the drilling program were analyzed for total metals of concern. Both samples tested below the commercial standards applicable to the site.

4.3 Groundwater

A total of 7 water samples were collected from the site and analyzed for petroleum hydrocarbons of concern. Five samples were collected from the wells installed during the January 1999 drilling program, and two samples were collected from the wells installed during the 1995 drilling program.

The water sample collected from BH 99-1 exceeded the special waste standard for concentrations of benzene. Based on the location of BH 99-1 and the direction of groundwater flow at the site, the likely source of the exceedences is contaminant migration from the site's southern tank basin. BH 99-5 tested slightly over the applicable aquatic life standard for concentrations of naphthalene. Groundwater exceedences at this area of the site are likely caused by the contaminated soil identified during the drilling and soil sampling program.

Borehole 95-BHA exceeded the special waste standards for concentrations of benzene, ethylbenzene, and the aquatic life standard for naphthalene. Borehole 95-BHB exceeded the special waste standard for concentrations of benzene and the aquatic life standard for concentrations of naphthalene. Exceedences at these areas of the site are likely caused by contaminant migration from the site's middle and northern tank basins.

5. RECOMMENDATIONS

Results from groundwater analysis indicate a potential for offsite migration of contaminants from the subject site. In order to insure contaminants are not migrating offsite, it is recommended that three groundwater monitoring wells be installed along Norland Ave, down gradient of existing wells at the site.

As approximately 200 m^3 of asphalt/soil was removed from between the site's middle and northern tank basin, it is likely that groundwater contaminant concentrations at this area of the site will decrease.

While exceedences of soil and groundwater standards at the northwestern portion of the site were detected, the groundwater flow pattern, and uncontaminated soil and groundwater samples collected from BH 99-6, indicates that migration of contaminants from this area is not significant. Regular monitoring of all groundwater wells at the site will insure that migration of existing contamination does not occur.

REFERENCES

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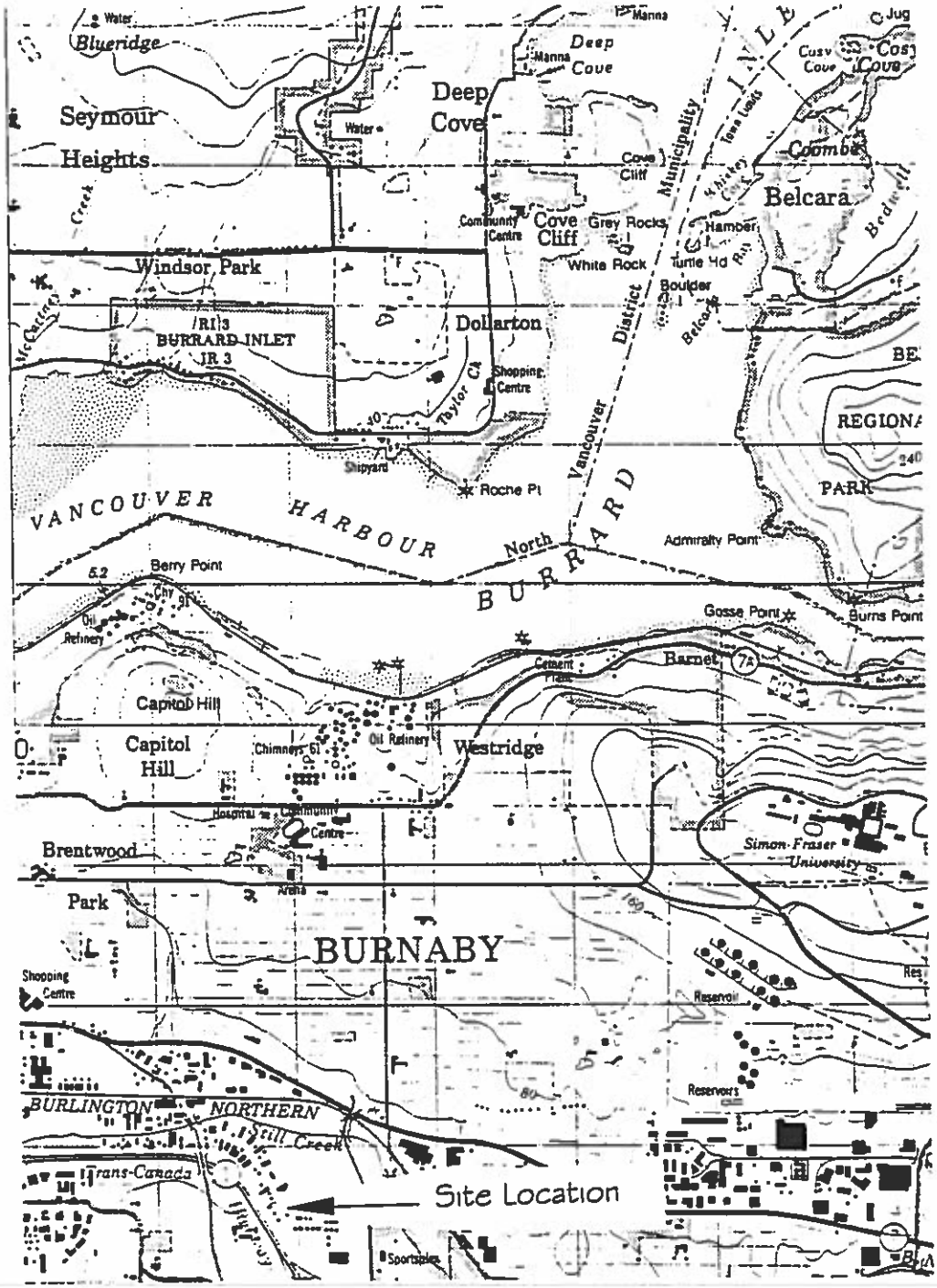
Ministry of Environment and Parks, 1988. Special Waste Legislation Guide. Waste Management Branch. Province of British Columbia, Victoria.

Ministry of Environment, 1988. Waste Management Act, Special Waste Legislation. BC Reg.63/88 am. 52/95. Victoria, BC.

United States Environmental Protection Agency (U.S.E.P.A.), 1992. Test Methods for Evaluating Solid Waste. Four volumes. Updated quarterly. U.S. Printing office, Washington, D.C. No SW-846.



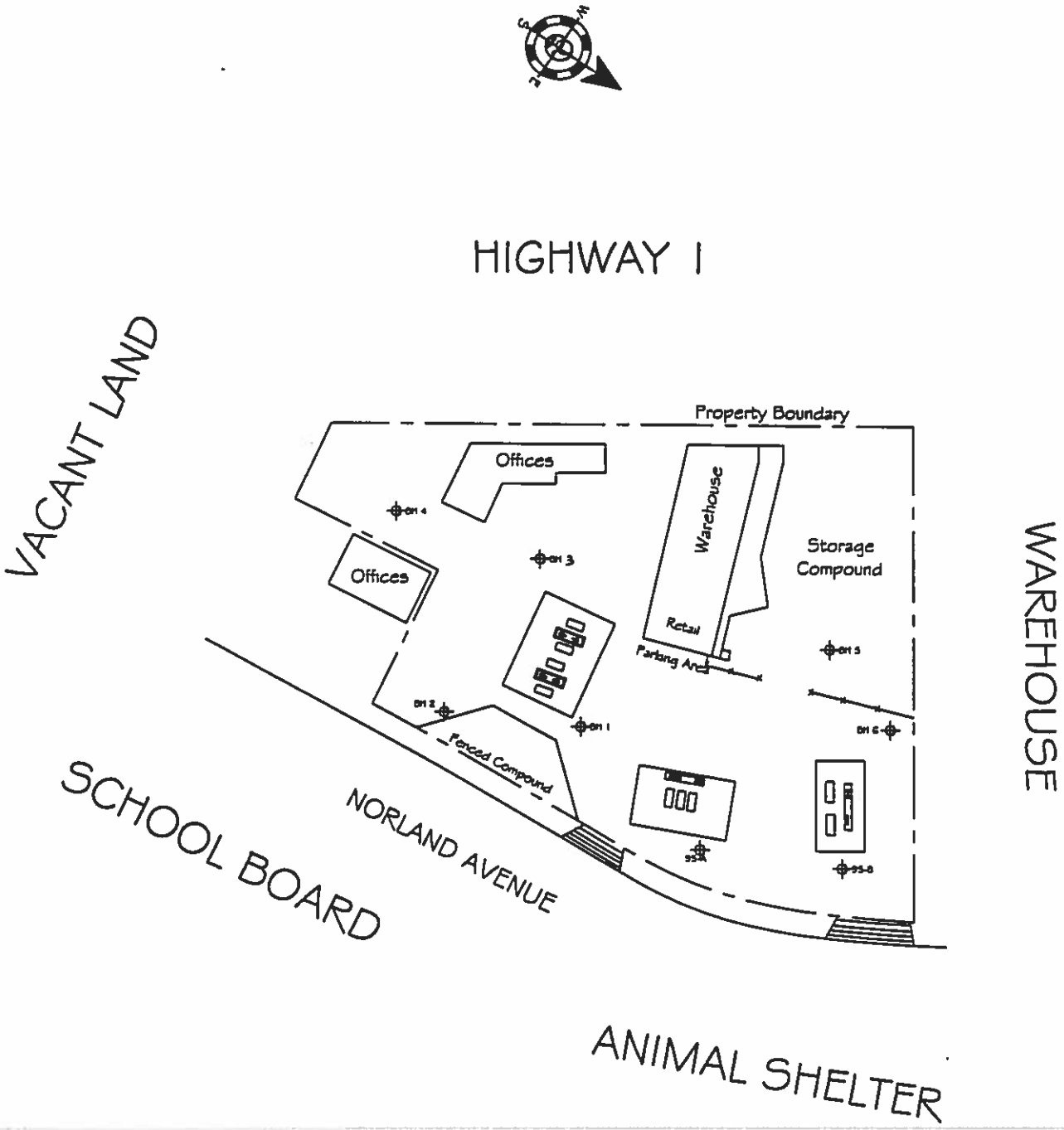
Scale: 1 : 50,000

SOILCON LABORATORIES LTD.

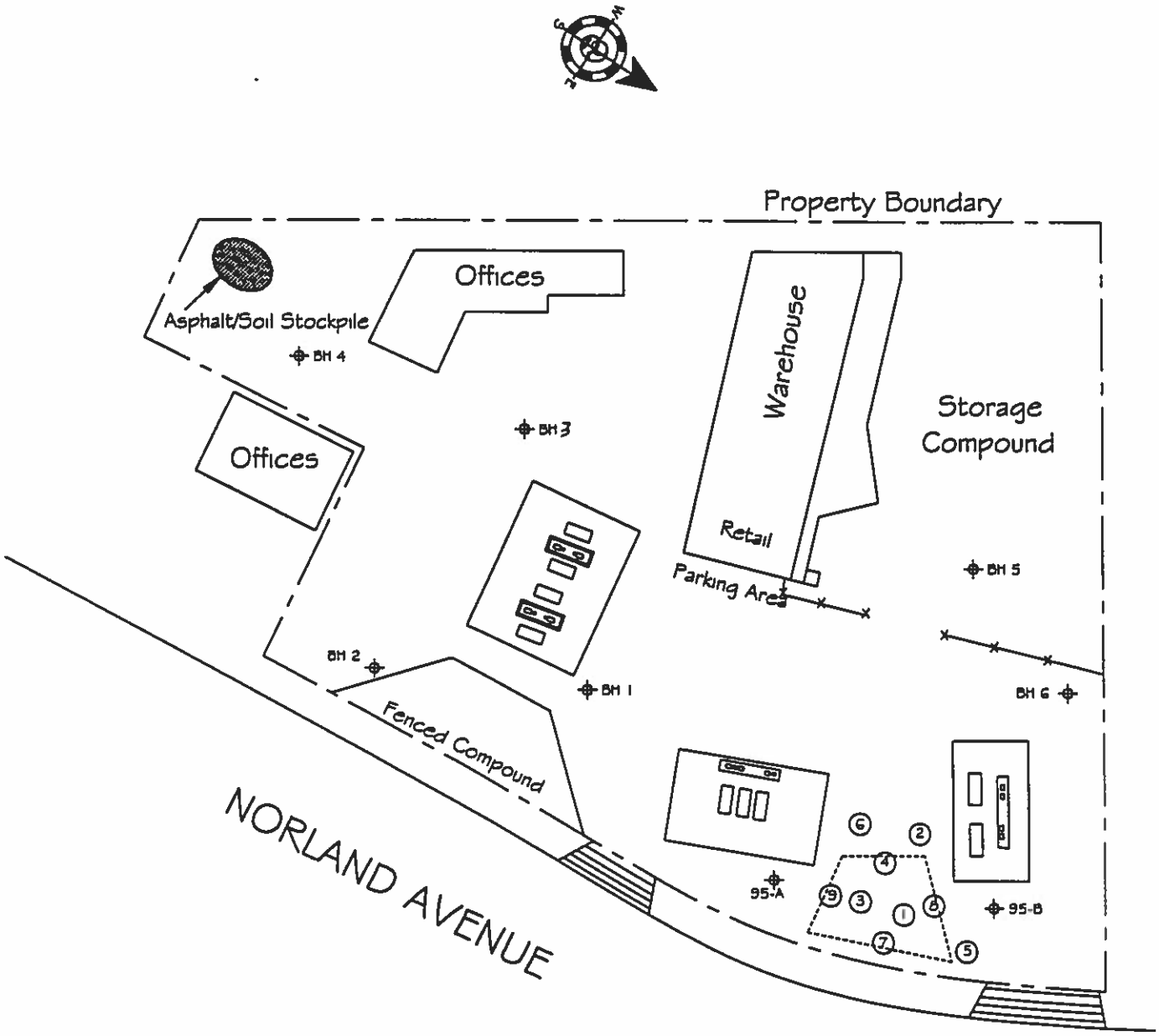
Fig. 1 : Site Location Map

Location: Christie Adams Distributors
3267-3373 Norland Ave, Burnaby, BC

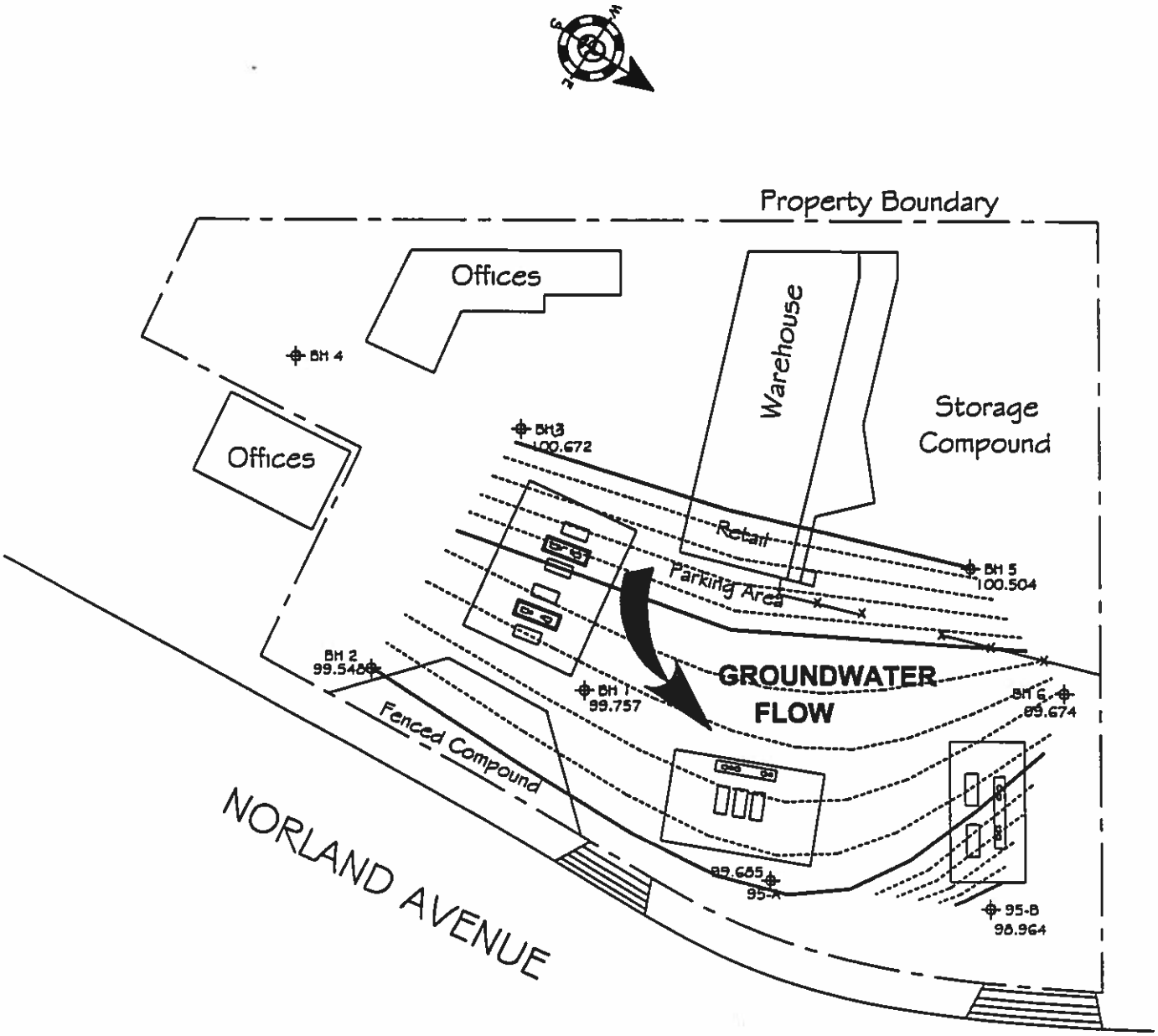
Drawn by:	Date:	Job No.
MB	Feb 1999	S1 - 013



SOILCON LABORATORIES LTD.		
Figure 2: Surrounding Land Use		
Location: Christie Adams 3267 - 3373 Norland Ave. Bby., BC.		
Drawn by:	Date:	Scale
MB	Jan 1999	NTS



SOILCON LABORATORIES LTD.		
Figure 4: Asphalt Excavation		
Location: Christie Adams 3267 - 3373 Norland Ave. Bby., BC.		
Drawn by:	Date:	Scale
MB	Jan 1999	NTS



SOILCON LABORATORIES LTD.		
Figure 3: Groundwater Flow		
Location: Christie Adams 3267 - 3373 Norland Ave. Bby., BC.		
Drawn by:	Date:	Scale
MB	Jan 1999	NTS

Appendix A: Water Level & Survey Data

Site: Christie Adams Cardlock

Job Number: S1-013

Date: 24-Feb-99

Soilcon Representative: Duncan/Matt

SOILCON

Vertical Survey

Well Number	BS	HI	IFS	FS	ELEV
BM	1.845	101.845			100.000
BH 1			2.088		99.757
95-A			2.160		99.685
95-B			2.881		98.964
TP 1				2.360	99.485
	2.240	101.725			
BH 6			2.051		99.674
BH 5			1.221		100.504
TP 2				1.506	100.219
	1.742	101.961			
BH 3			1.289		100.672
BH 2			2.413		99.548
BM				1.955	100.006

SOILCON

Water Table Elevations

Date: 24-Feb-99

Soilcon Representative: Duncan/Matt

Borehole Number	BH Elevation at grade	Depth to Product (m)	Depth to Water (m)	Water Elevation
BH 1	99.757	NR	0.691	99.066
BH 2	99.548	NR	0.681	98.867
BH 3	100.672	NR	0.000	100.672
BH 5	100.504	NR	0.000	100.504
BH 6	99.674	NR	0.450	99.224
MW 2	98.964	NR	0.364	98.600
MW 5	99.685	NR	0.671	99.014

Appendix B: Property Title

TITLE NO: Z209453E
FROM TITLE NO: Z209446E
Z209447E

APPLICATION FOR REGISTRATION RECEIVED ON: 13 NOVEMBER, 1986
ENTERED: 21 NOVEMBER, 1986

REGISTERED OWNER IN FEE SIMPLE:
COMO ESTATES LTD. (INCORPORATION NO. 308,068)
1260 - 1176 WEST GEORGIA STREET,
VANCOUVER, B.C.
V6E 4A2

TAXATION AUTHORITY:
CITY OF BURNABY

DESCRIPTION OF LAND:
PARCEL IDENTIFIER: 005-407-249
PARCEL A DISTRICT LOT 75 GROUP 1 NEW WESTMINSTER DISTRICT
REFERENCE PLAN 73092

LEGAL NOTATIONS: NONE

CHARGES, LIENS AND INTERESTS:
NATURE OF CHARGE
CHARGE NUMBER DATE TIME

MORTGAGE
AB130669 1988-07-07 14:54
REGISTERED OWNER OF CHARGE
THE TORONTO-DOMINION BANK
AB130669

ASSIGNMENT OF RENTS
AB130670 1988-07-07 14:54
REGISTERED OWNER OF CHARGE
THE TORONTO-DOMINION BANK
AB130670

"CAUTION - CHARGES MAY NOT APPEAR IN ORDER OF PRIORITY. SEE SECTION 28, L.T.A."

DUPLICATE INDEFEASIBLE TITLE: NONE OUTSTANDING

TRANSFERS: NONE

PENDING APPLICATIONS: NONE

*** CURRENT INFORMATION ONLY - NO CANCELLED INFORMATION SHOWN ***

Appendix C: MoE Site Specific Information Request

BRITISH COLUMBIA

SITE-SPECIFIC INFORMATION REQUEST APPLICATION FORM

Complete this form to request a ministry office to search its site assessment and remediation records (other than those on the computer-based Site Registry) for information on the site indicated below. A Site Registry Search Request Application form is to be used to request the ministry to search the Site Registry for information.

The searches are limited to information received since 1989. The existence or absence of information provides no assurance that a site is or is not contaminated. Regional and Victoria Headquarters ministry offices may possess different information.

APPLICATION FORM: Have you conducted a search through BC Online ☐ Yes ☒ No

Date: February 22, 1999	Applicant's File: S1 – 013	BCE File (if known):	SITE ID (if known):

From: Soilcon Laboratories Ltd.

Contact: Matthew Byrne

Telephone: (604) 278 – 5535

Fax: (604) 278 – 0517

Site Civic Address(s)

3267 – 3373 Norland Avenue, Burnaby, BC.

3379 Norland Ave, Burnaby, BC

Site Legal Description Parcel Identifier Numbers (PIDs)/Crown Land Descriptor Numbers (PINs):

3267 – 3373 : Parcel A, District Lot 75, Plan 73092

PID # **011-226-188** PIN # _____

Please provide any of: 1) a large scale map or a site plan showing the site's location; 2) present and former site land uses; and 3) present and former site owners'/occupiers' names. If a registered company name is not applicable, the full name of the individual person(s) should be provided.

Map or a site plan provided? Yes X No

Map or plan reference number: #

Present and Former Site Land Uses (if known): **3267 – 3373 Norland – presently and formerly a commercial petroleum cardlock facility. 3379 – unknown**

Present and Former Site Owners'/Occupiers' Names (if known):

3367 – 3373 Norland – Christie Adams Distributors Ltd. (past & present)

3379 - Presently a ministry of Transport & Highways building.

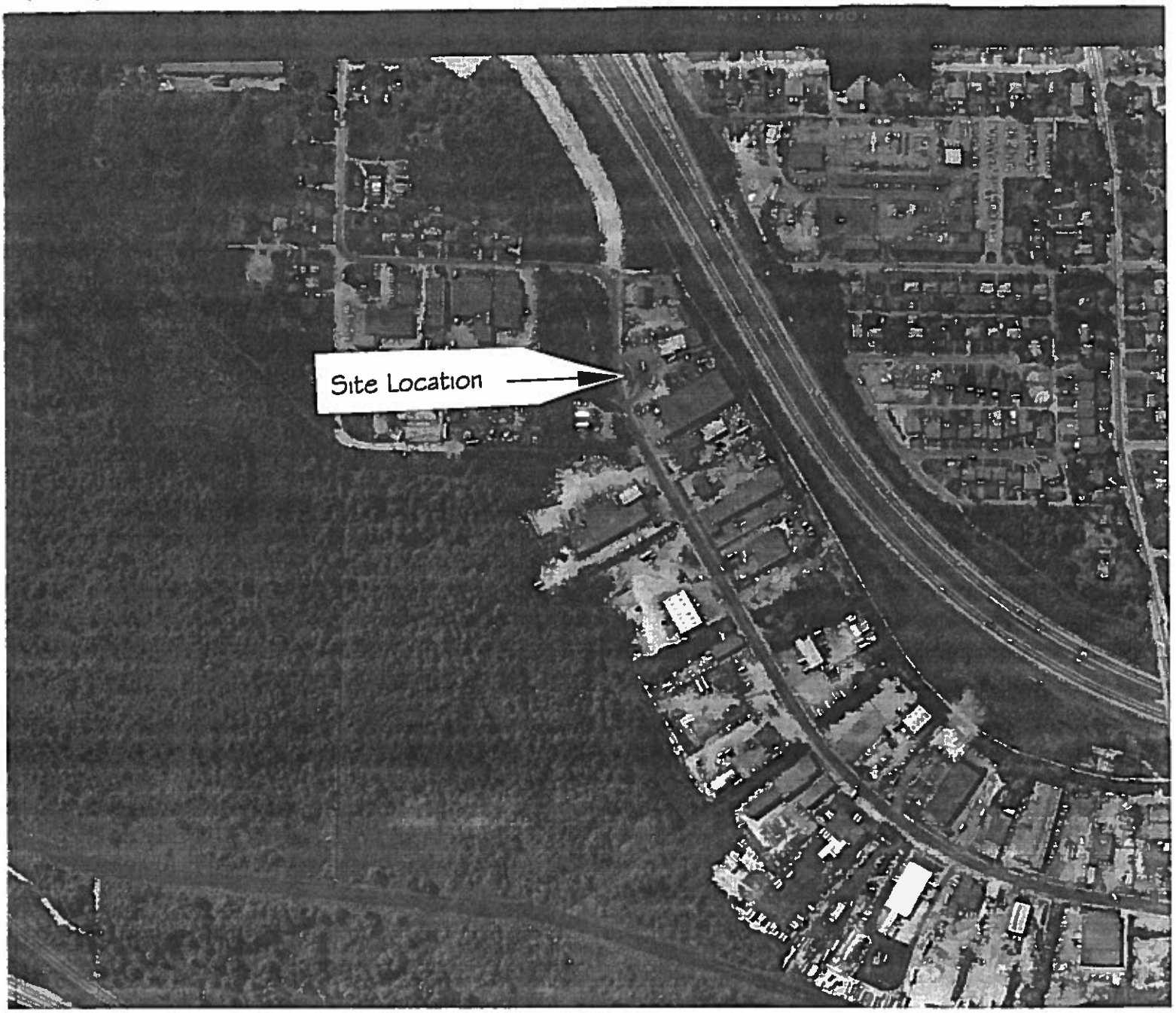
You may also request, for no additional fee, searches for information relating to the indicated site for:

- ☒ *Waste Management Act* pollution abatement and pollution prevention orders
- ☒ *Waste Management Act* applications, permits and approvals
- ☒ *Waste Management Act* convictions
- ☒ Special waste registrations
- ☒ Spills

If a person requests information about a single site the fee is $100 per site plus $80/hour for time over one hour to review and prepare information. For multiple sites the fee is $300 plus $80/hour for time over three hours to review and prepare information. The photocopying fee is $0.25 per page. Enclose a cheque for the applicable fee (plus GST) made payable to Minister of Finance and Corporate Relations. You may be invoiced and required to pay any outstanding fees. Please note that the fee is per request. If you require searches by different ministry offices, these would constitute separate requests, and separate fees would be charged.

Receipt number (for official use only): *Received by:*

Appendix D: Aerial Photograph (1979)



SOILCON LABORATORIES LTD.

1979 Aerial Photograph

Location: Christie Adams
3267 - 3373 Norland Ave. Bby., BC.

Drawn by:	Date:	Scale
na	1979	NTS

Appendix E: Bore Hole Logs

SOILCON LABORATORIES LTD.

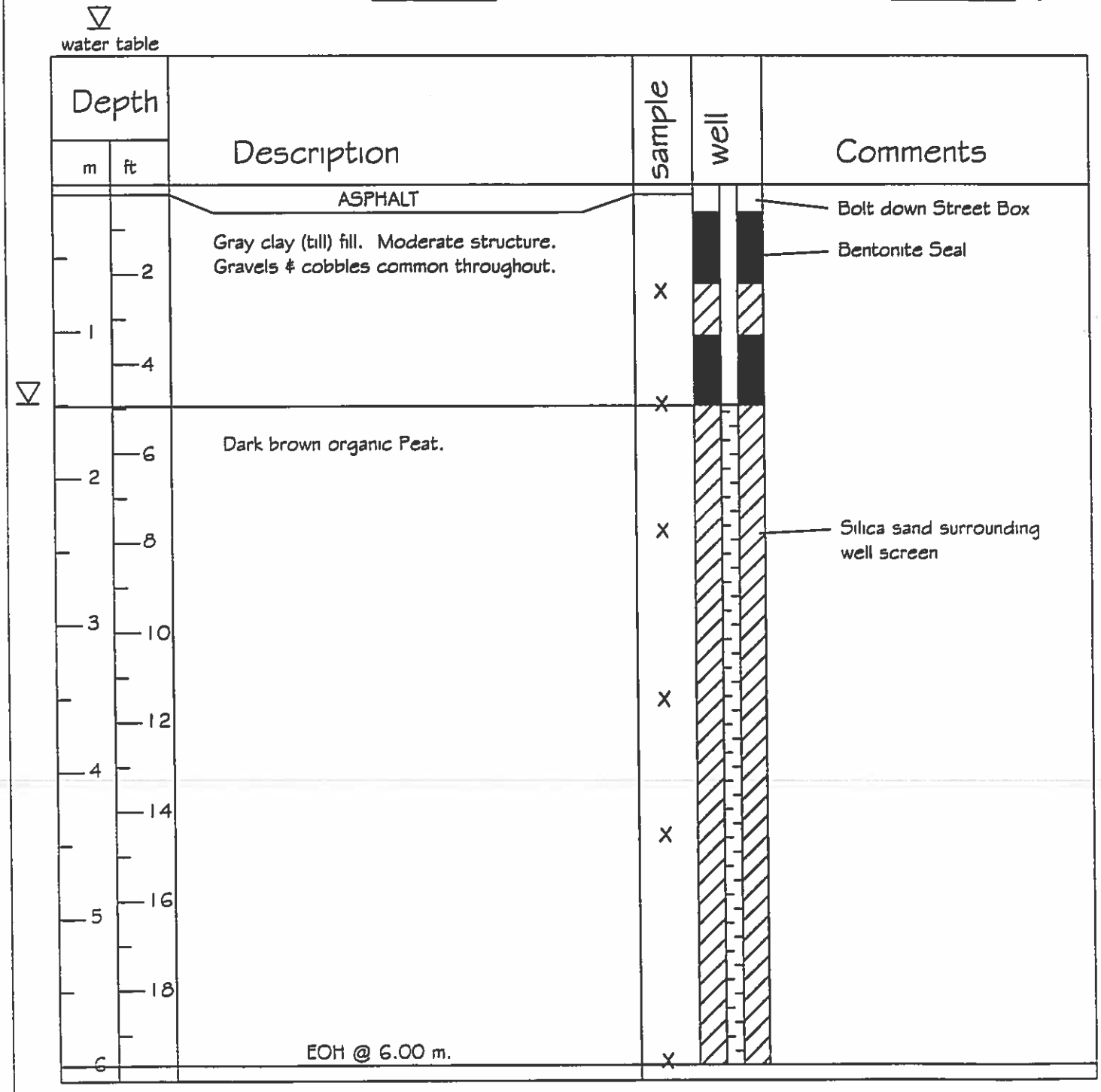
BOREHOLE LOG

JOB NO: 51 - 013
LOCATION: Christie Adams

BH 99-BH 1
DATE: January 22, 1999

SOILCON REP: MB
CONTRACTOR: Layne

DRILL RIG: Solid Stem Auger



grab sample [X] split spoon [SS]

SOILCON LABORATORIES LTD.

BOREHOLE LOG

JOB NO: 51 - 013
LOCATION: Christie Adams

BH 99-BH 2
DATE: January 22, 1999

SOILCON REP: MB
CONTRACTOR: Layne

DRILL RIG: Solid Stem Auger

▽ water table

Depth m	Depth ft	Description	sample	well	Comments
		ASPHALT			Bolt down Street Box
		Gray clay (till) fill. Moderate structure. Gravels & cobbles common throughout.			Bentonite Seal
1	2		X		
	4	Dark brown organic Peat.			
2	6		X		Silica sand surrounding well screen
	8				
3	10		X		
	12				
4	14		X		
5	16		X		
	18				
6		EOH @ 6.00 m.	X		

grab sample [X] split spoon [SS]

SOILCON LABORATORIES LTD.

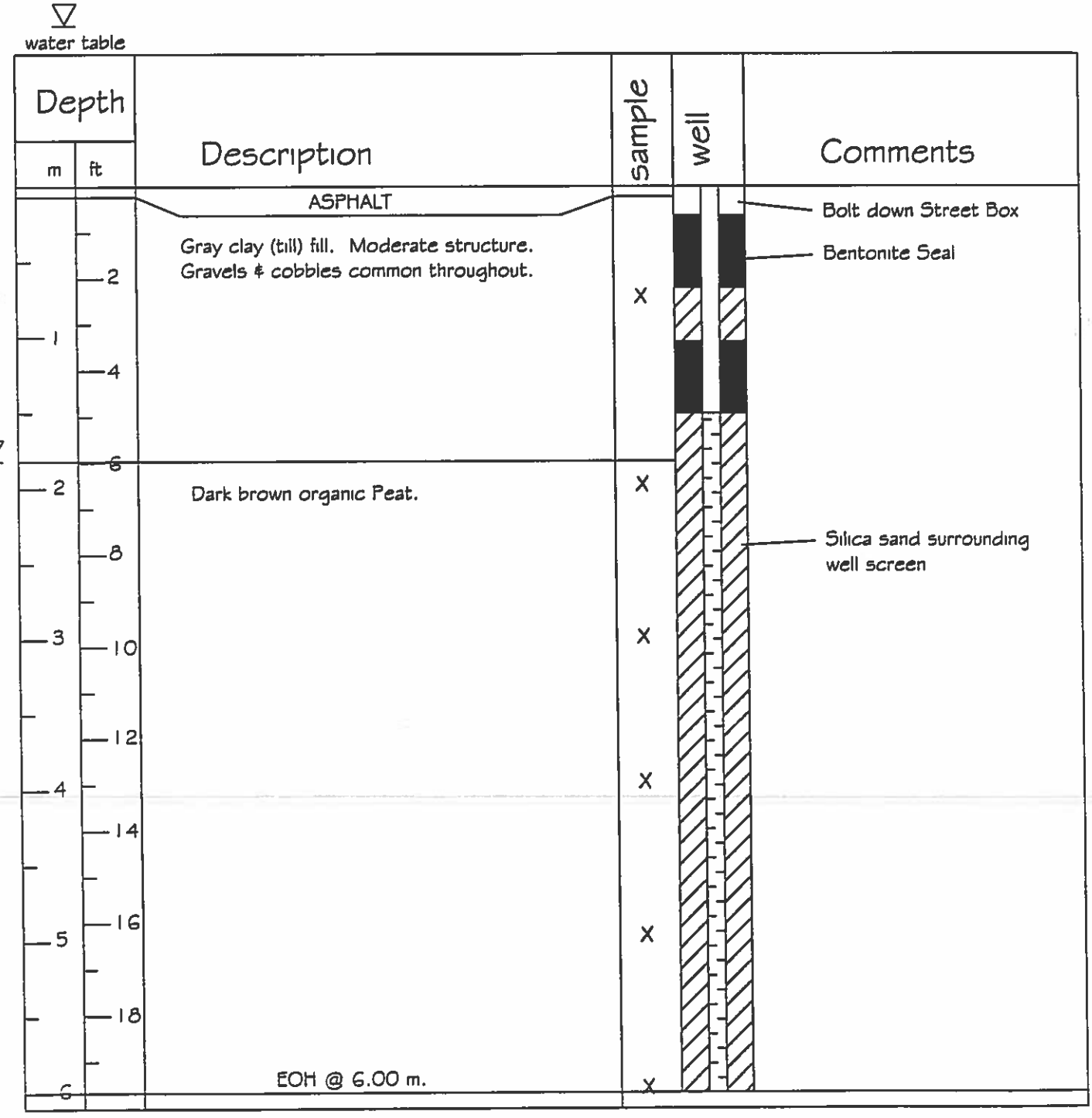
BOREHOLE LOG

JOB NO: S1 - 013
LOCATION: Christie Adams

BH 99-BH 3
DATE: January 22, 1999

SOILCON REP: MB
CONTRACTOR: Layne

DRILL RIG: Solid Stem Auger



SOILCON LABORATORIES LTD.

BOREHOLE LOG

JOB NO: 51 - 013
LOCATION: Christie Adams

BH 99-BH 4
DATE: January 22, 1999

SOILCON REP: MB
CONTRACTOR: Layne

DRILL RIG: Solid Stem Auger

▽ water table

Depth m	Depth ft	Description	sample	well	Comments
1	2	Brown clay, sandy fill. Loose structure. Gravels common throughout.	X		No monitoring well.
2	6	Light brown gravelly sandy clay. Moderate structure. Cobbles throughout.	X		
3	10		X		
4	12				
5	16		X		
6	18	EOH @ 6.00 m.			

grab sample [X] split spoon [SS]

SOILCON LABORATORIES LTD.

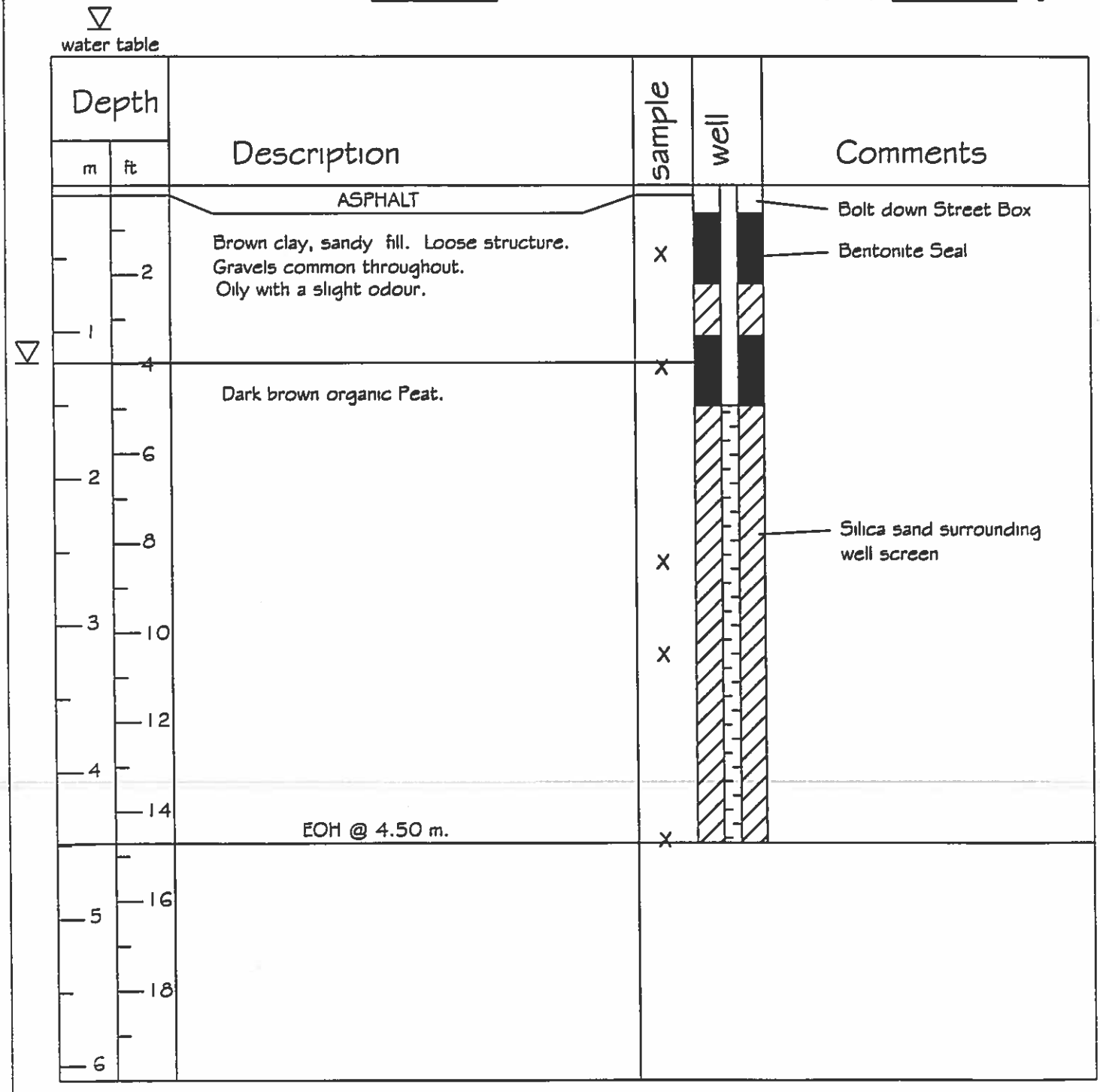
BOREHOLE LOG

JOB NO: 51 - 013
LOCATION: Christie Adams

BH 99-BH 5
DATE: January 22, 1999

SOILCON REP: MB
CONTRACTOR: Layne

DRILL RIG: Solid Stem Auger



grab sample [X] split spoon [SS]

SOILCON LABORATORIES LTD.

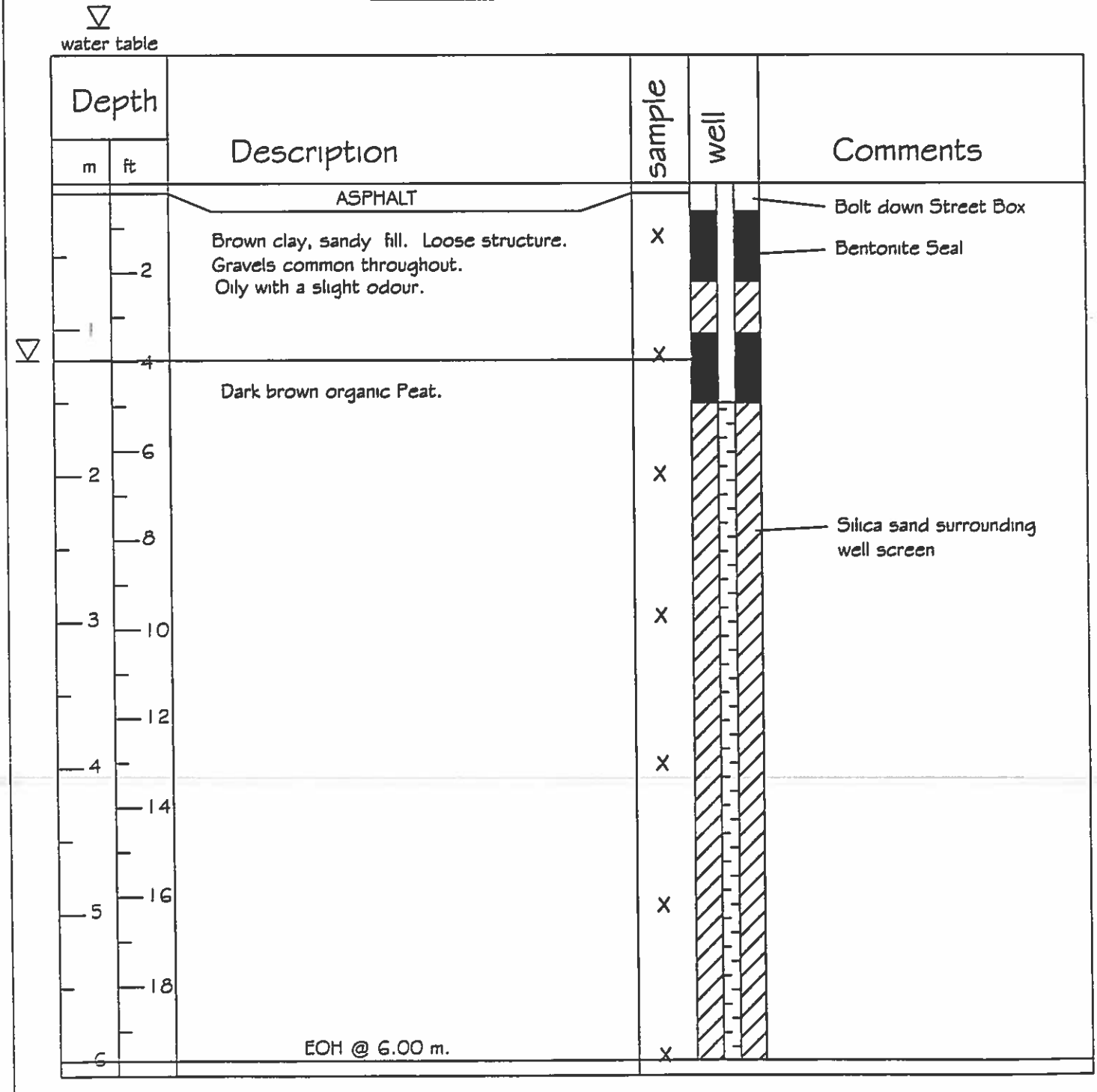
BOREHOLE LOG

JOB NO: S1 - 013
LOCATION: Christie Adams

BH 99-BH 6
DATE: January 22, 1999

SOILCON REP: MB
CONTRACTOR: Layne

DRILL RIG: Solid Stem Auger



grab sample [X] split spoon [SS]

Appendix F: Laboratory Methods

1 Appendix F Laboratory Methods

1.1 Sampling

All soil samples are taken in new, 250 mL glass jars. Water samples for BTEX and naphthalene are collected in new, 40 mL, amber septa vials. Water samples for extractable petroleum hydrocarbons are collected in new, 1 L amber glass bottles. The jars and vials are completely filled and immediately cooled with ice packs prior to refrigeration. Chain-of-custody sheets accompany each consignment of samples. Method blanks, standards and duplicates are run with each sample set. Duplicates are maintained within 20% of the mean reading. External correlations are run on a regular basis by the Canadian Association for Environmental Analytical Laboratories (CAEAL).

1.2 BTEX and Naphthalene

SOIL

Soil samples are analyzed for benzene, toluene, ethylbenzene, xylenes (BTEX), and naphthalene by Soilcon Laboratories in accordance with EPA methods 5030A/8020A (EPA 1992). An SRI chromatograph equipped with a 30-m capillary column that conforms to EPA specifications is used. The chromatograph is calibrated with six concentrations of spiked water samples for each compound. BTEX and naphthalene are analyzed with a photo ionization detector (PID). Samples are extracted with a ratio of 10 mL methanol to 10 g wet soil. The methanol extract is then injected using a standard EPA purge and trap apparatus. A subsample is analyzed to determine gravimetric moisture content so that chromatograph readings can be adjusted to a dry-weight basis. This method meets the criteria in the *British Columbia Environmental Laboratory Manual* (BCMOELP 1996).

WATER

Water samples are analyzed for benzene, toluene, ethyl benzene, xylenes (BTEX), and naphthalene by Soilcon Laboratories in accordance with EPA methods 5030A/8020A (EPA 1992). Water samples are injected into a gas chromatograph using a standard EPA purge and trap apparatus. An SRI chromatograph equipped with a 30 m capillary column that conforms to EPA specifications is used. BTEX and naphthalene are analyzed with a photo ionization detector (PID). The chromatograph is calibrated with six concentrations of water samples spiked with five compounds (benzene, toluene,

ethyl benzene and meta and para-xylene). This method meets the criteria in the *British Columbia Environmental Laboratory Manual* (BCMOELP 1996).

1.3 VPH

SOIL

All soil samples are analyzed for volatile petroleum hydrocarbons (VPH) by Soilcon Laboratories in accordance with EPA methods 5030A/8015A (EPA 1992). An SRI chromatograph equipped with a 30 m capillary column that conforms to EPA specifications is used. The chromatograph is calibrated water samples spiked with six concentrations of toluene. Samples are extracted with a 10 mL methanol:10 g wet soil ratio. A subsample is analyzed to determine gravimetric moisture content so that chromatograph readings can be adjusted to a dry-weight basis. The methanol extract is injected using a standard EPA purge and trap apparatus, and VPH is analyzed with a flame ionization detector (FID). All peaks between C_6 (hexane) and C_{10} (decane) are integrated using the toluene calibration. This method meets the criteria in the *British Columbia Environmental Laboratory Manual* (BCMOELP 1996).

WATER

Water samples are analyzed for volatile petroleum hydrocarbons (VPH) by Soilcon Laboratories in accordance with EPA methods 5030A/8015A (EPA 1992). Water samples are injected into a gas chromatograph using a standard EPA purge and trap apparatus. An SRI chromatograph equipped with a 30 m capillary column that conforms to EPA specifications is used. VPH is analyzed with a flame ionization detector (FID). The chromatograph is calibrated with water samples spiked with six concentrations of toluene. All peaks between C_6 (hexane) and C_{10} (decane) are integrated using the toluene calibration. This method meets the criteria in the *British Columbia Environmental Laboratory Manual* (BCMOELP 1996).

1.4 LEPH and HEPH

SOIL

Soil samples are analyzed for extractable hydrocarbons (LEPH and HEPH) by Soilcon Laboratories in accordance with EPA methods 5030A/8015A (EPA 1992). Soils are extracted with a 1:1 solution of hexane and acetone. Twenty mL of the hexane/acetone solution are added to 10 g of soil and the mixture is shaken for one hour on an orbital shaker. Following solvent exchange to the hexane, the extract is then filtered through silica gel, which acts as an adsorbent for most functional groups with ionic characteristics, including alkaloids, sugar esters, glycosides, dyes, alkali metal cations, lipids, glycerides, steroids, terpenoids, and plasticizers. The extract is automatically injected into a HP 5890 A series II gas chromatograph equipped with a 15 m capillary column. LEPH and HEPH are analyzed with flame ionization detection (FID). LEPH and HEPH are calibrated using six standard solutions of C_{20} (eicosane) in hexane. For LEPH, all peaks between C_{10} (decane) and C_{19} (nonadecane) are integrated and quantified. For HEPH, all peaks between C_{19} (nonadecane) and C_{32} (dotriacontane) are integrated and quantified. This method meets the criteria in the *British Columbia Environmental Laboratory Manual* (BCMOELP 1996).

WATER

Water samples are analyzed for light and heavy extractable petroleum hydrocarbons (LEPH and HEPH) by Soilcon Laboratories Ltd. in accordance with EPA methods 3510/8015A (EPA 1992). Water samples are extracted by pouring 1000 mL of sample and 50 mL of hexane into a 2000 mL container, which is placed in a rotary "TCLP" mixer for 10 minutes. This mixture is transferred to a 2000 mL separatory funnel, the water is drawn off, and the hexane is retained and transferred to a new, clean glass container. The extraction process is repeated two more times with the water that is drawn off. The retained hexane solutions are combined and then concentrated in a Kuderna-Danish (K-D) Apparatus. The concentrated extract is automatically injected on-column to a HP 5890 A series II gas chromatograph equipped with a 15-m capillary column.

LEPH and HEPH are analyzed with flame ionization detection (FID). The FID is calibrated using six concentrations of C_{20} (eicosane) which is used to quantify both LEPH and HEPH. For LEPH, all peaks between C_{10} and C_{19} are integrated and quantified. For HEPH, all peaks between C_{19} and C_{32} are integrated and quantified. This method meets the criteria in the BC Environmental Laboratory Manual (BCMOELP 1996).

References:

British Columbia Ministry of Environment, Lands and Parks. Revised February 1996. BC Environmental Laboratory Manual. British Columbia Ministry of Environment, Victoria, BC.

[EPA] United States Environmental Protection Agency (1986). November Test Methods for Evaluating Solid Waste, Physical/Chemical Methods. (SW-846) 3rd Edition. 2 volumes (November 1986).

Appendix G: Original Laboratory Results

Lab name: Soilcon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Components: FEBVPH99.cpt
Integration: Peak sens=95.0 Base sens= 6.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
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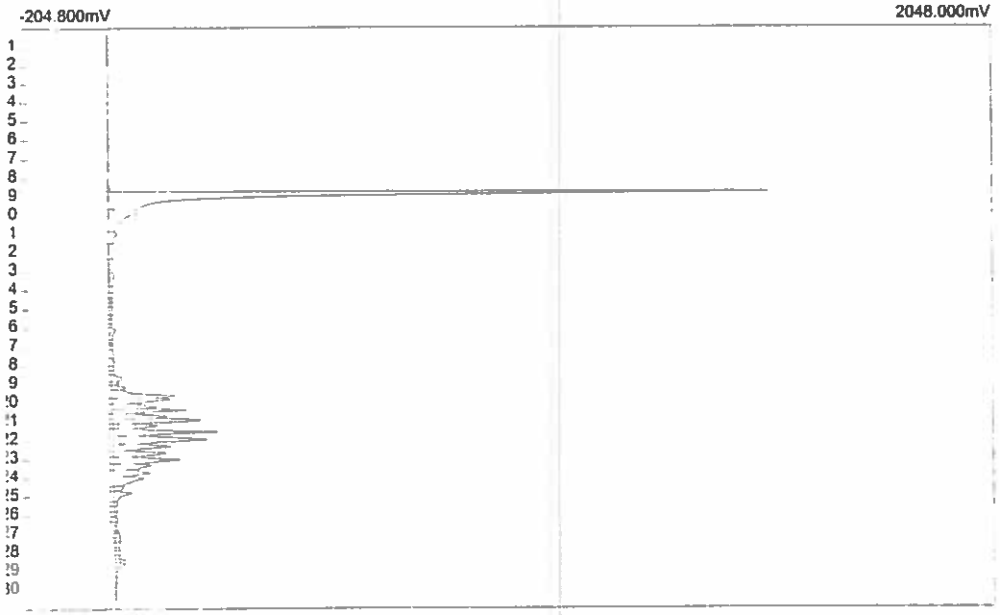

lumber	Retention	Area	External	Units	Component
1	11.683	1992.213	2255.46	ppb	VPH
1		1992.213	2255.46		

Lab name: Soilcon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
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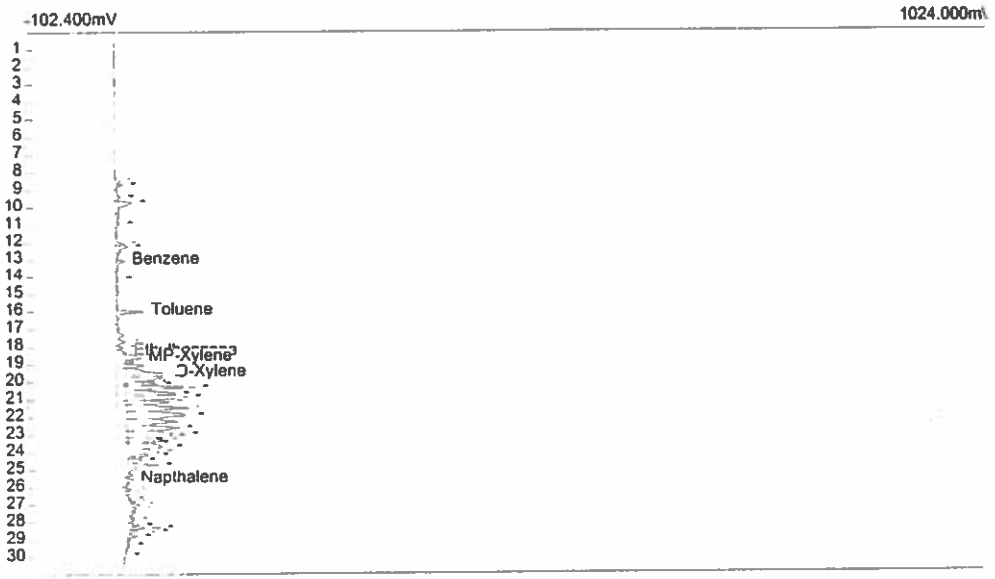

Number	Retention	Area	External	Units	Component
1	13.108	69.972	18.55	ppb	Benzene
2	16.041	278.805	4.25	ppb	Toluene
3	18.350	16.178	7.40	ppb	Ethylbenzene
4	18.675	223.142	72.03	ppb	MP-Xylene
5	19.558	788.682	1824.66	ppb	O-Xylene
6	25.575	54.334	20.99	ppb	Napthalene
6		1431.114	1947.88		

Lab name: Silicon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Components: FEBVPH99.cpt
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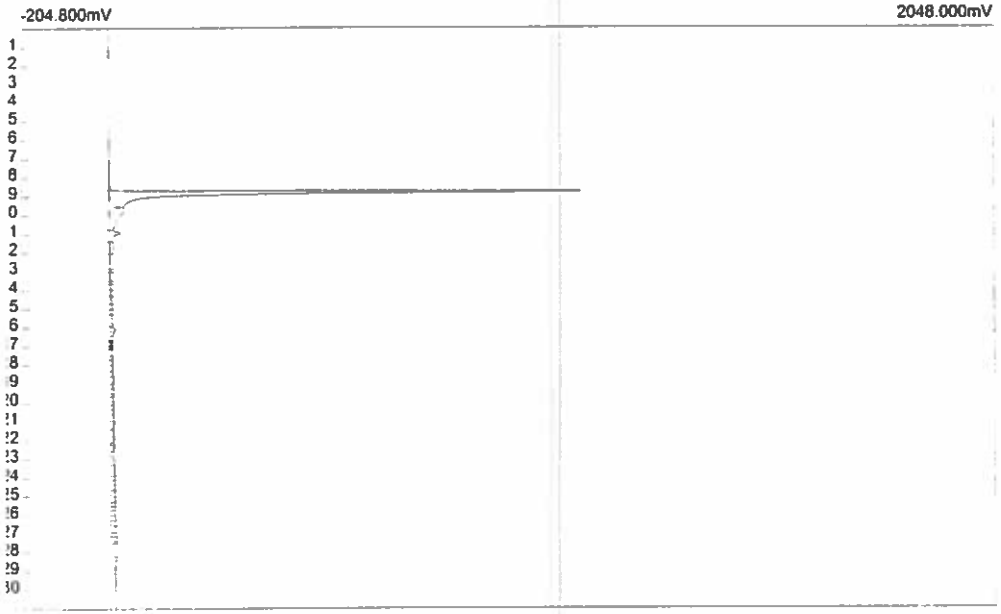
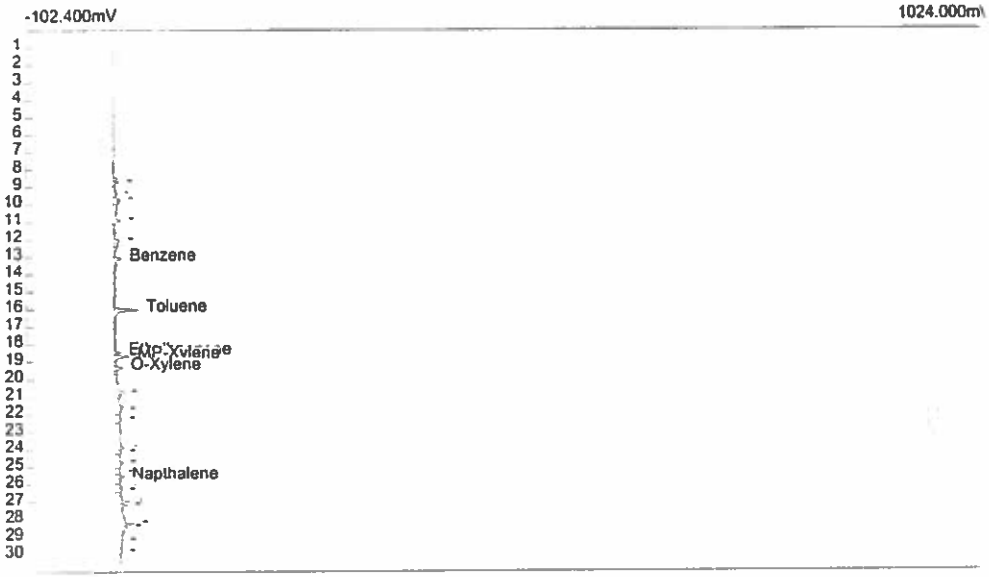


lumber	Retention	Area	External	Units	Component
1	11.666	1586.399	1796.02	ppb	VPH
1		1586.399	1796.02		

Lab name: Silicon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Integration: Peak sens=95.0 Base sens=60.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
Data file: s#2.CHR (c:\datawinpeak\jobs1999\99-030A\)



Number	Retention	Area	External	Units	Component
1	13.100	54.191	14.37	ppb	Benzene
2	16.016	249.435	3.80	ppb	Toluene
3	18.458	32.013	14.64	ppb	Ethylbenzene
4	18.675	106.561	34.40	ppb	MP-Xylene
5	19.316	49.372	12.78	ppb	O-Xylene
6	25.566	26.269	10.15	ppb	Napthalene
6		517.841	90.14		

Lab name: Silicon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Components: FEBVPH99.cpt
Integration: Peak sens=95.0 Base sens= 6.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
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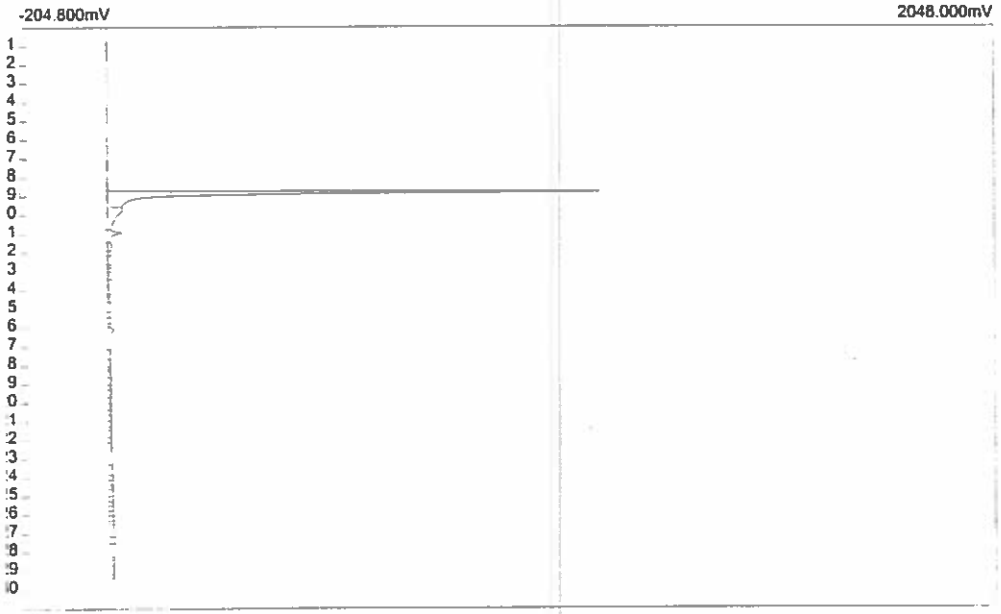
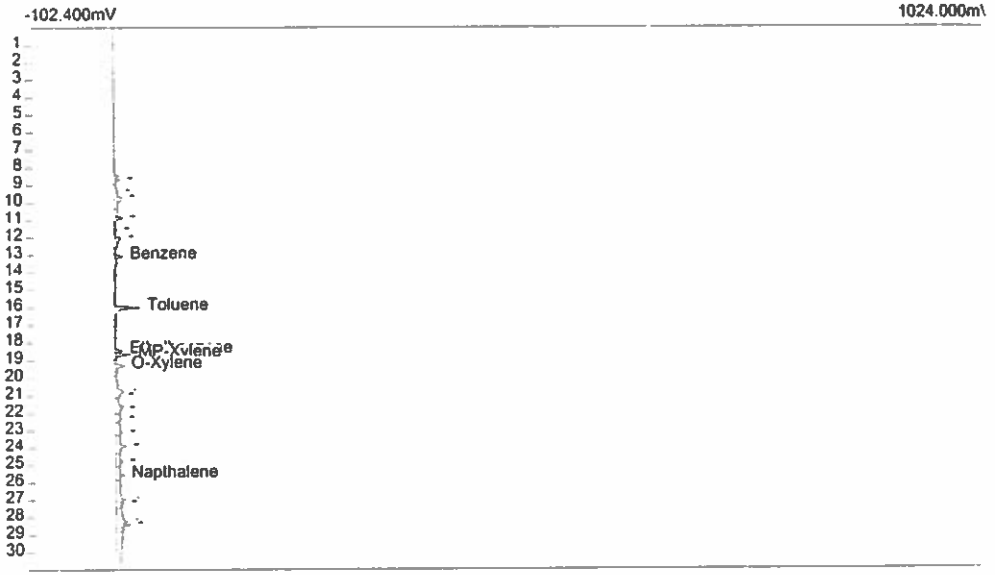


Number	Retention	Area	External	Units	Component
1	11.633	1674.861	1896.17	ppb	VPH
1		1674.861	1896.17		

Lab name: Silicon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Integration: Peak sens=95.0 Base sens=60.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
Data file: s#3.CHR (c:\datawinpeak\jobs1999\99-030A\)



Number	Retention	Area	External	Units	Component
1	13.075	56.375	14.95	ppb	Benzene
2	16.016	263.089	4.01	ppb	Toluene
3	18.458	39.480	18.06	ppb	Ethylbenzene
4	18.675	112.562	36.33	ppb	MP-Xylene
5	19.316	68.549	17.75	ppb	O-Xylene
6	25.566	26.739	10.33	ppb	Napthalene
6		566.794	101.42		

Lab name: Silicon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Components: FEBVPH99.cpt
Integration: Peak sens=95.0 Base sens= 6.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
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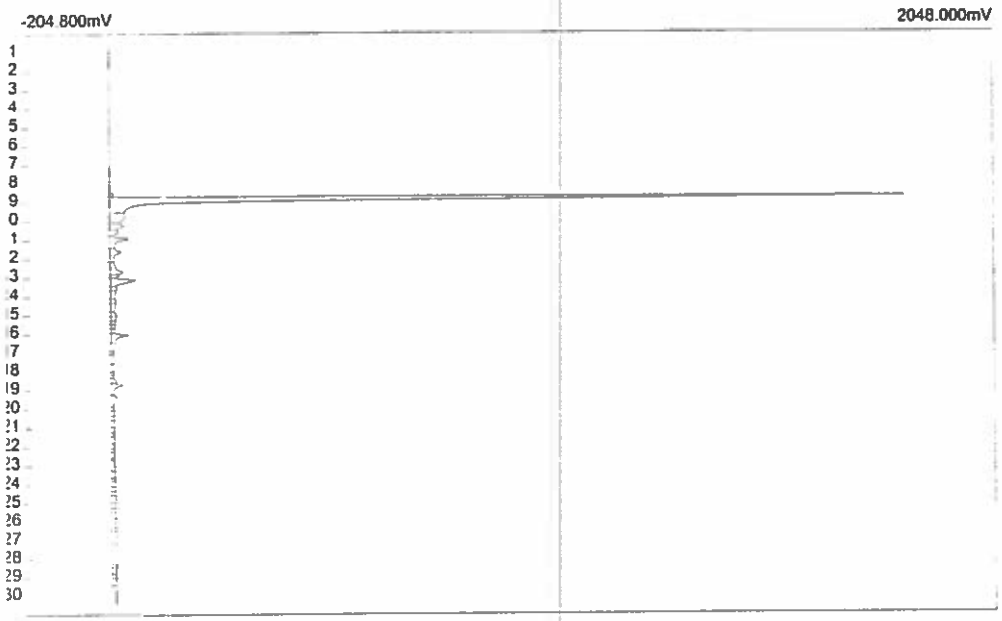
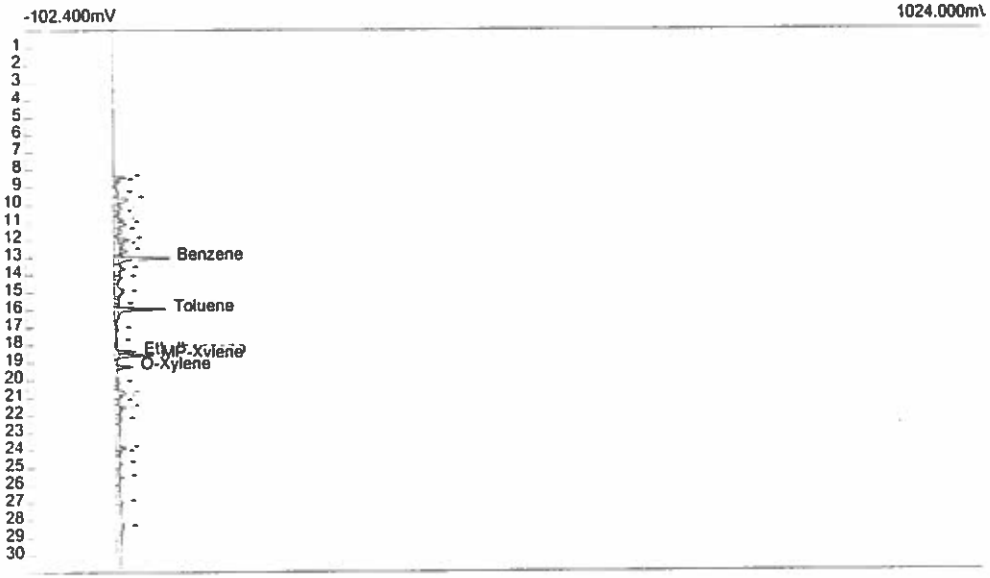


Number	Retention	Area	External	Units	Component
1	11.641	4178.214	4730.31	ppb	VPH
1		4178.214	4730.31		

Lab name: Silicon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Integration: Peak sens=95.0 Base sens=60.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
Data file: s#4.CHR (c:\datawinpeak\jobs1999\99-030A\)



Number	Retention	Area	External	Units	Component
1	13.050	546.840	609.47	ppb	Benzene
2	15.975	462.526	234.55	ppb	Toluene
3	18.416	126.972	65.27	ppb	Ethylbenzene
4	18.633	274.147	88.49	ppb	MP-Xylene
5	19.275	140.602	36.40	ppb	O-Xylene
5		1551.088	1034.18		

Lab name: Silicon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Components: FEBVPH99.cpt
Integration: Peak sens=95.0 Base sens= 6.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
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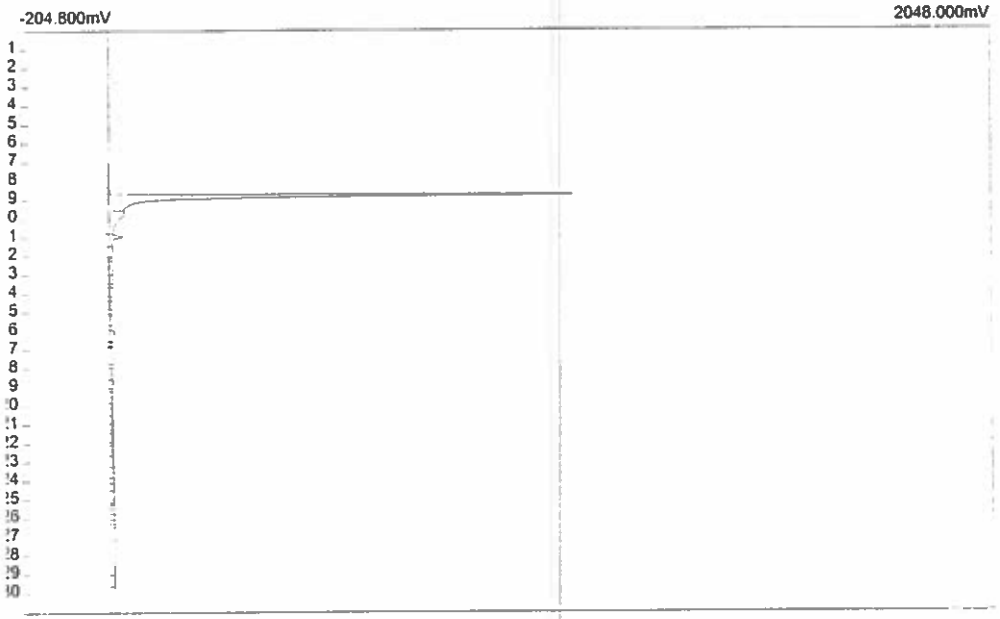

lumber	Retention	Area	External	Units	Component
1	11.650	1688.389	1911.49	ppb	VPH
1		1688.389	1911.49		

Lab name: Silicon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Integration: Peak sens=95.0 Base sens=60.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
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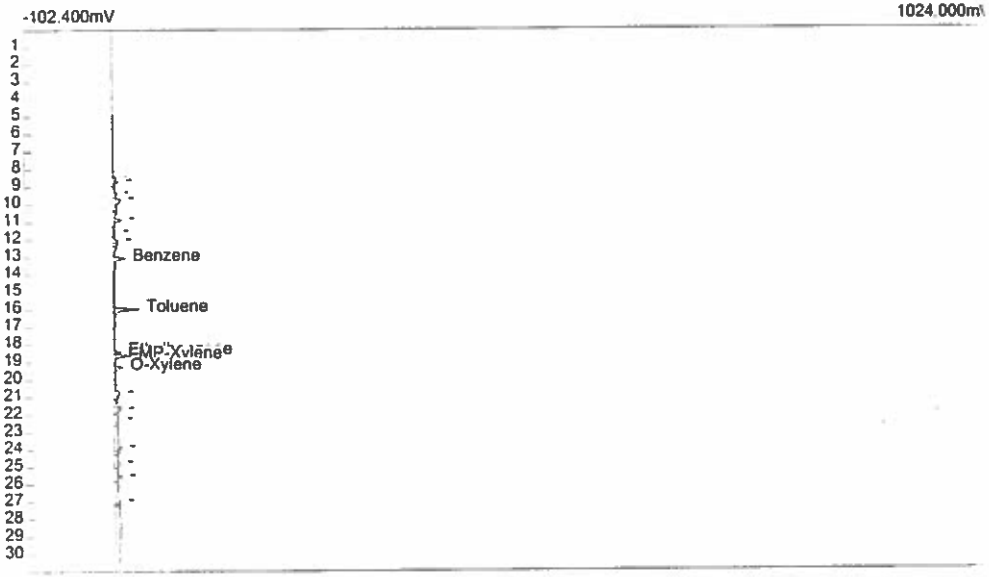

Number	Retention	Area	External	Units	Component
1	13.075	86.727	23.00	ppb	Benzene
2	15.983	256.460	3.91	ppb	Toluene
3	18.433	35.904	16.42	ppb	Ethylbenzene
4	18.641	118.506	38.25	ppb	MP-Xylene
5	19.283	68.198	17.66	ppb	O-Xylene
5		565.794	99.23		

Lab name: Silicon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Components: FEBVPH99.cpt
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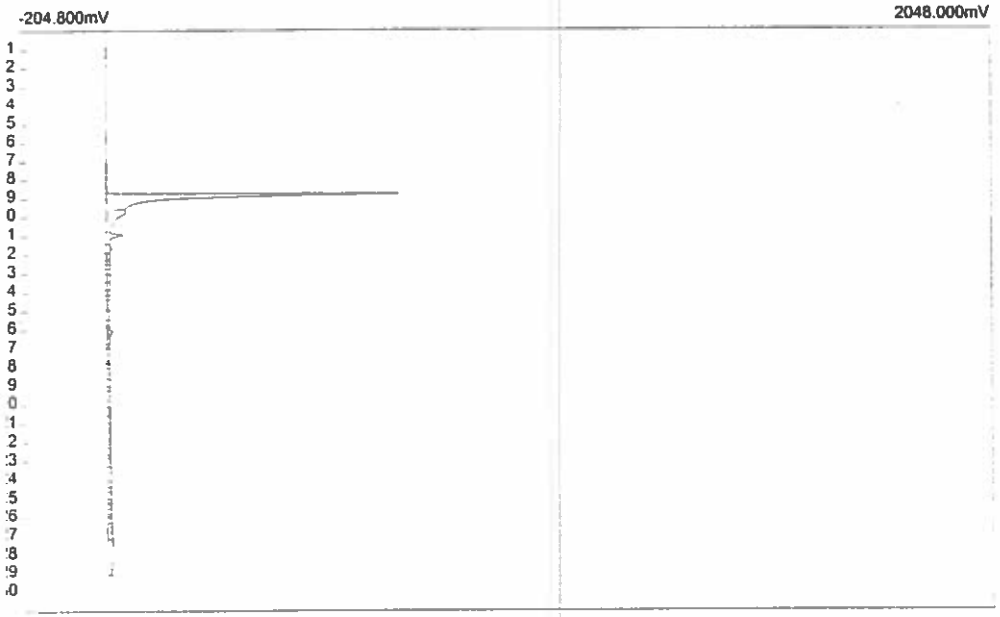

Number	Retention	Area	External	Units	Component
1	11.650	1784.882	2020.73	ppb	VPH
1		1784.882	2020.73		

Lab name: Silicon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Integration: Peak sens=95.0 Base sens=60.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
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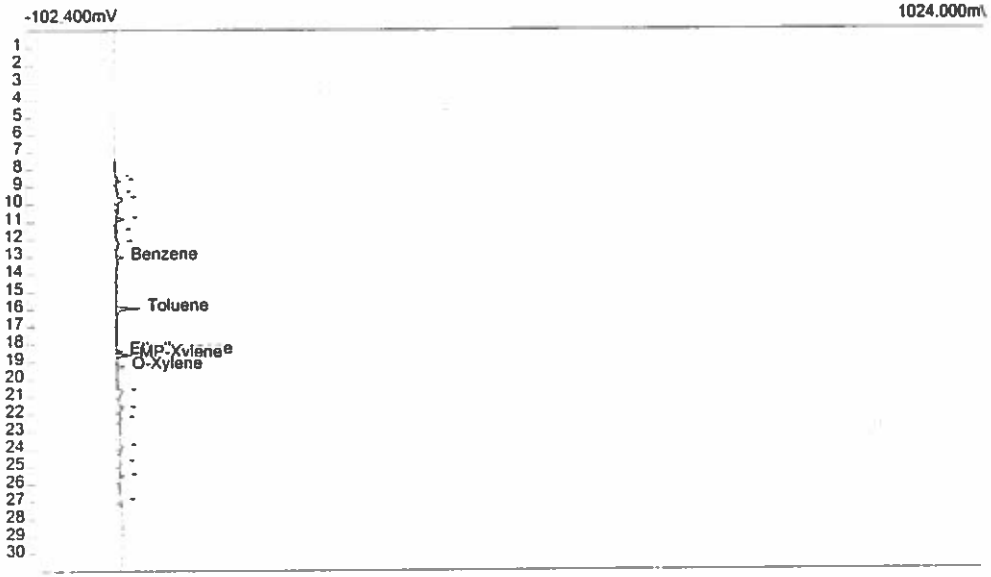

Number	Retention	Area	External	Units	Component
1	13.058	54.446	14.44	ppb	Benzene
2	15.975	248.366	3.78	ppb	Toluene
3	18.416	31.742	14.52	ppb	Ethylbenzene
4	18.625	113.662	36.69	ppb	MP-Xylene
5	19.275	65.290	16.90	ppb	O-Xylene
5		513.505	86.33		

Lab name: Silicon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Components: FEBVPH99.cpt
Integration: Peak sens=95.0 Base sens= 6.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
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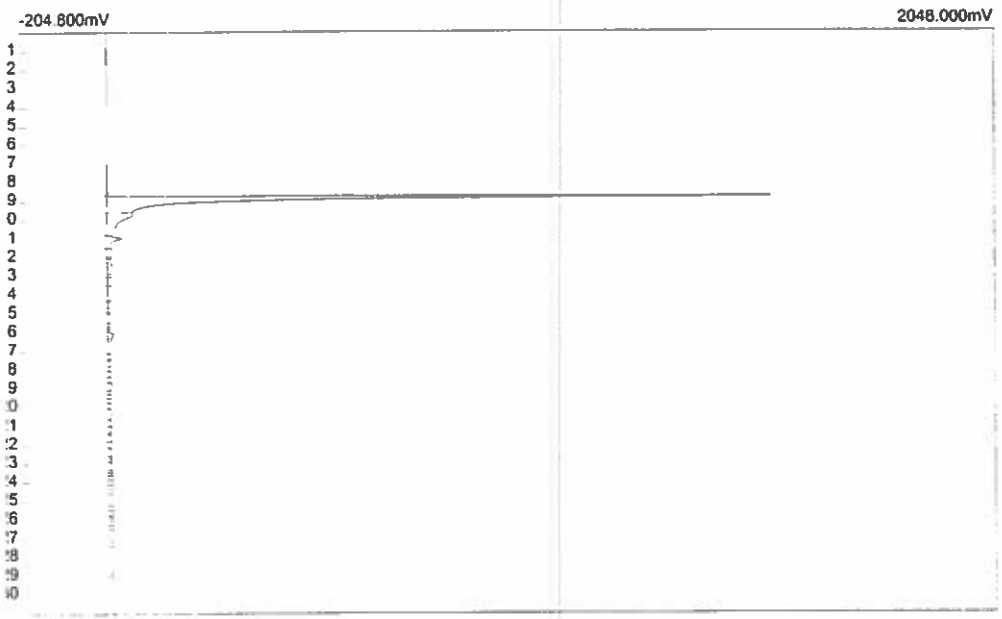

Number	Retention	Area	External	Units	Component
1	11.633	2212.497	2504.85	ppb	VPH
1		2212.497	2504.85		

Lab name: Silicon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Integration: Peak sens=95.0 Base sens=60.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
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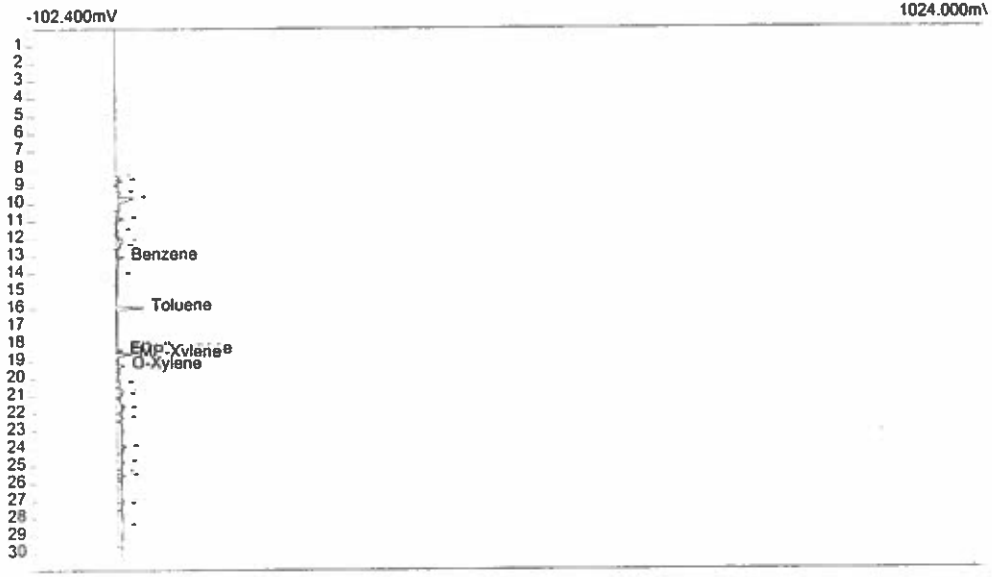

Number	Retention	Area	External	Units	Component
1	13.058	57.311	15.20	ppb	Benzene
2	15.966	287.658	4.38	ppb	Toluene
3	18.416	29.171	13.34	ppb	Ethylbenzene
4	18.625	105.913	34.19	ppb	MP-Xylene
5	19.275	47.974	12.42	ppb	O-Xylene
5		528.027	79.53		

Lab name: Silicon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Components: FEBVPH99.cpt
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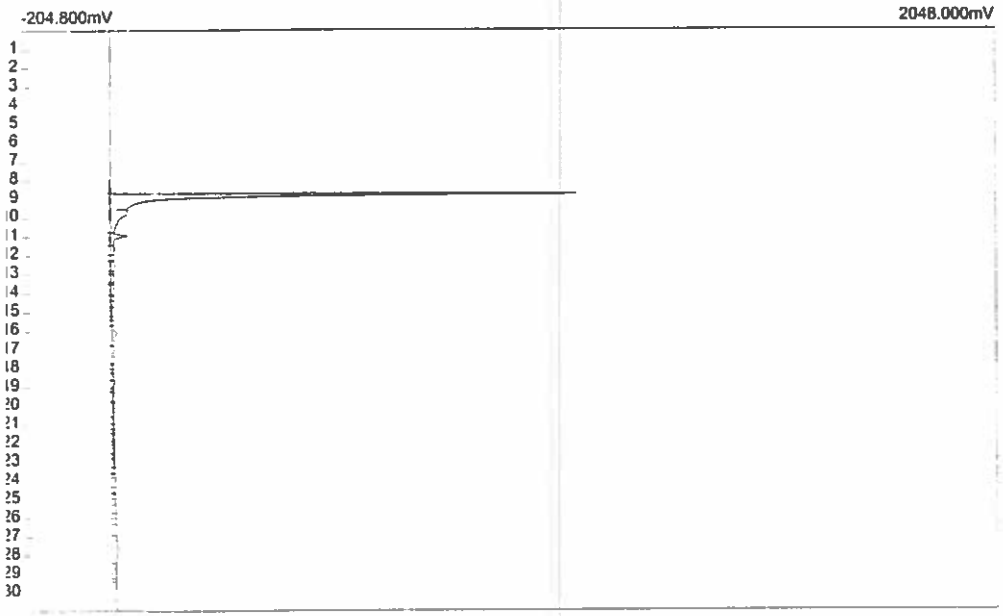
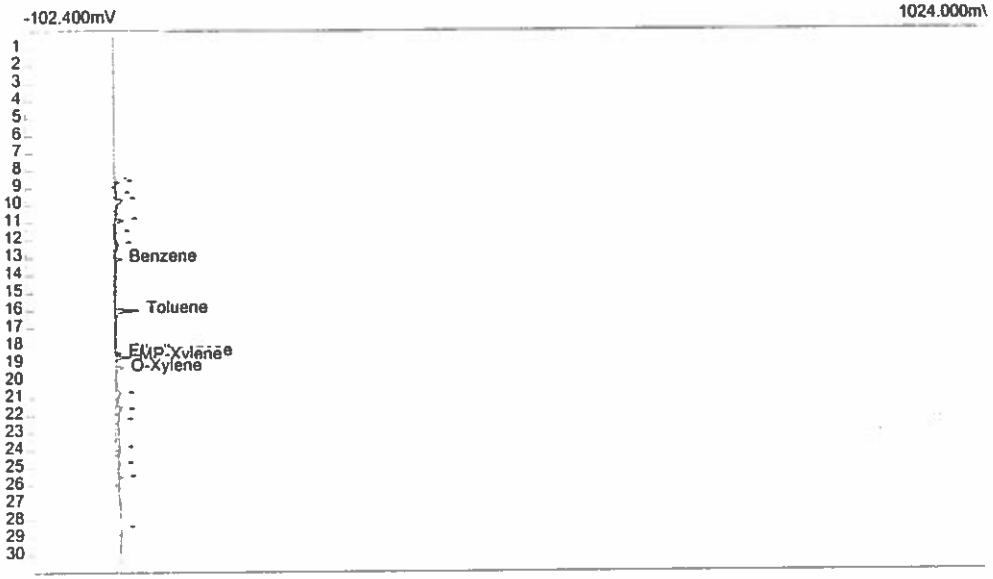


Number	Retention	Area	External	Units	Component
1	11.650	1827.708	2069.22	ppb	VPH
1		1827.708	2069.22		

Lab name: Silicon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Integration: Peak sens=95.0 Base sens=60.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
Data file: s#8.CHR (c:\datawinpeak\jobs1999\99-030A\)



Number	Retention	Area	External	Units	Component
1	13.091	50.565	13.41	ppb	Benzene
2	16.000	243.841	3.71	ppb	Toluene
3	18.433	32.304	14.77	ppb	Ethylbenzene
4	18.641	114.945	37.10	ppb	MP-Xylene
5	19.283	66.535	17.23	ppb	O-Xylene
5		508.191	86.22		

Lab name: Silicon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Components: FEBVPH99.cpt
Integration: Peak sens=95.0 Base sens= 6.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
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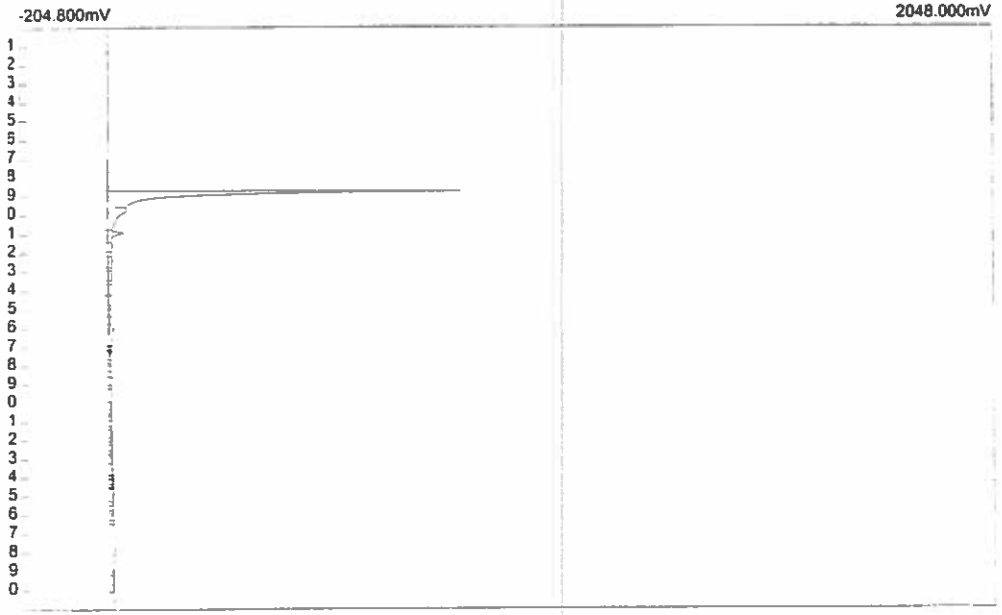

umber	Retention	Area	External	Units	Component
1	11.633	1940.736	2197.18	ppb	VPH
1		1940.736	2197.18		

Lab name: Silicon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Integration: Peak sens=95.0 Base sens=60.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
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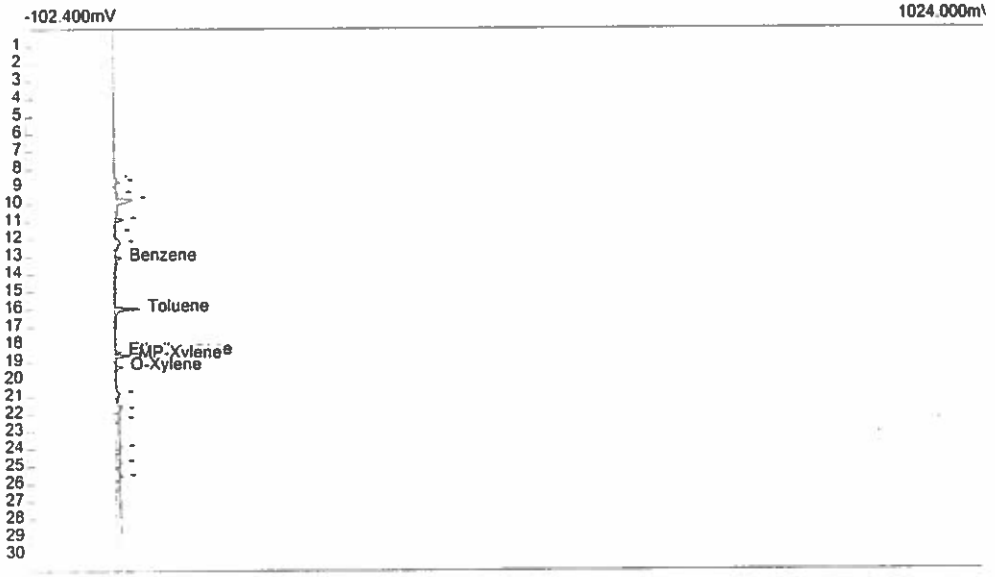

Number	Retention	Area	External	Units	Component
1	13.058	48.849	12.95	ppb	Benzene
2	15.966	256.478	3.91	ppb	Toluene
3	18.408	32.152	14.70	ppb	Ethylbenzene
4	18.616	113.165	36.53	ppb	MP-Xylene
5	19.258	67.579	17.50	ppb	O-Xylene
5		518.223	85.59		

Lab name: Silicon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Components: FEBVPH99.cpt
Integration: Peak sens=95.0 Base sens= 6.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
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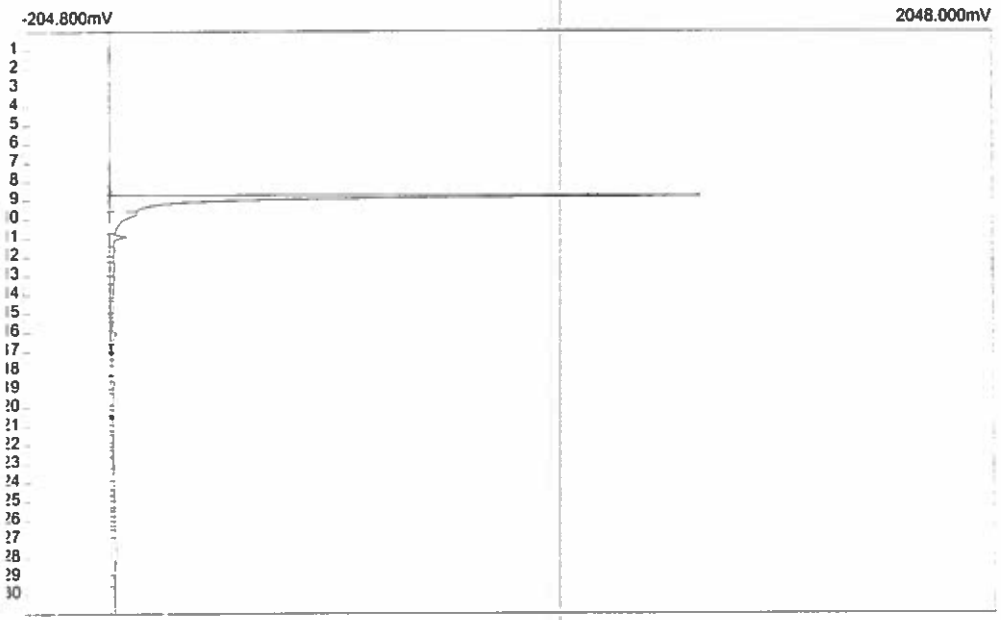
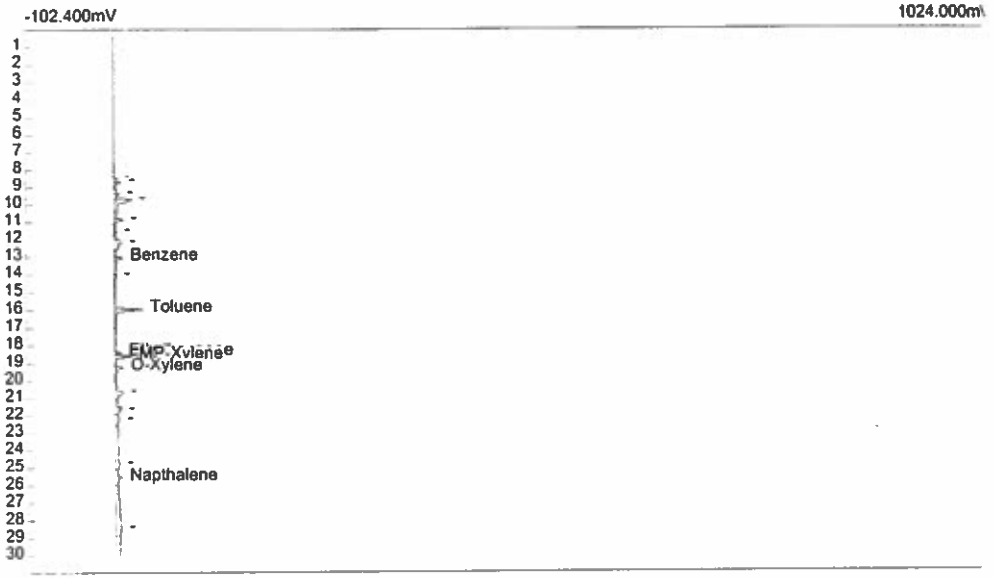


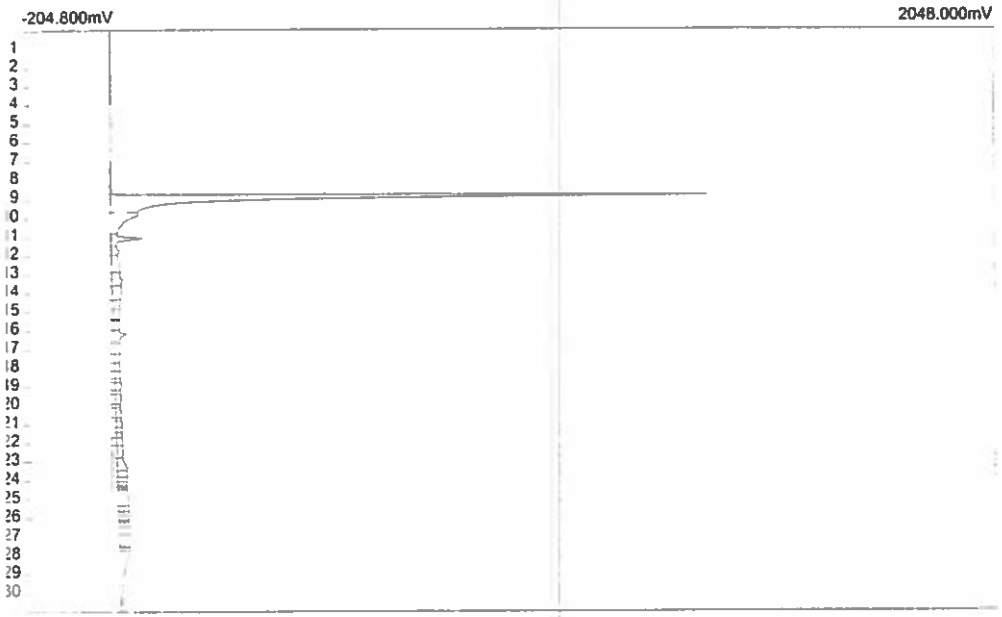
Number	Retention	Area	External	Units	Component
1	11.633	2240.597	2536.66	ppb	VPH
1		2240.597	2536.66		

Lab name: Silicon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Integration: Peak sens=95.0 Base sens=60.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
Data file: s#10 CHR (c:\datawinpeak\jobs1999\99-030A\)



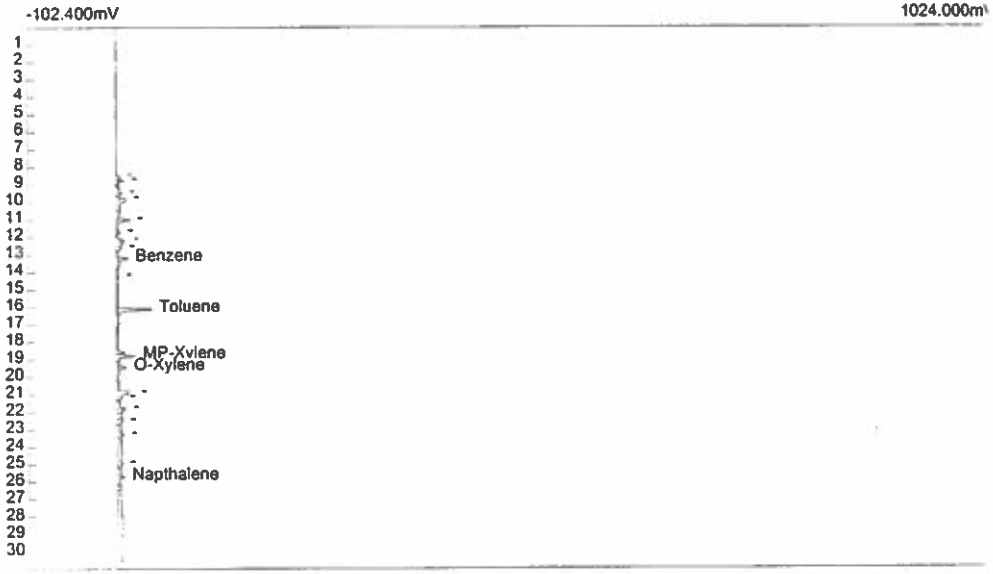
Number	Retention	Area	External	Units	Component
1	13.050	60.095	15.93	ppb	Benzene
2	15.968	285.478	4.35	ppb	Toluene
3	18.408	33.328	15.24	ppb	Ethylbenzene
4	18.616	116.508	37.61	ppb	MP-Xylene
5	19.266	69.585	18.02	ppb	O-Xylene
6	25.558	23.264	8.99	ppb	Napthalene
6		588.258	100.14		

Lab name: Soilcon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Components: FEBVPH99.cpt
Integration: Peak sens=95.0 Base sens= 6.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
Data file: fs#11.CHR (c:\datawinpeak\jobs1999\99-030A\)



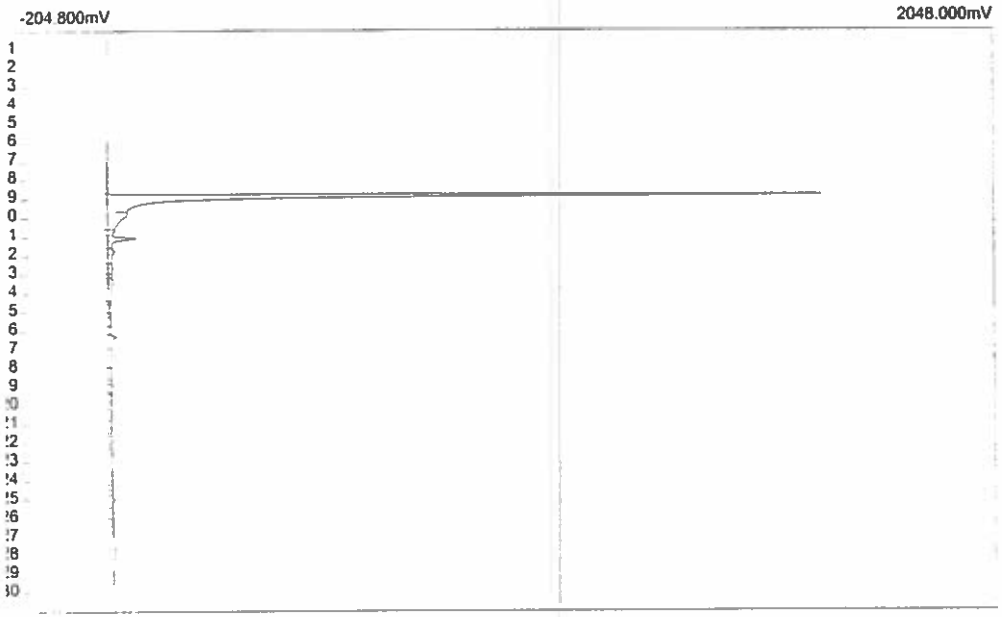
Number	Retention	Area	External	Units	Component
1	11.775	4921.424	5571.72	ppb	VPH
1		4921.424	5571.72		

Lab name: Soilcon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Integration: Peak sens=95.0 Base sens=60.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
Data file: s#11.CHR (c:\datawinpeak\jobs1999\99-030A\)



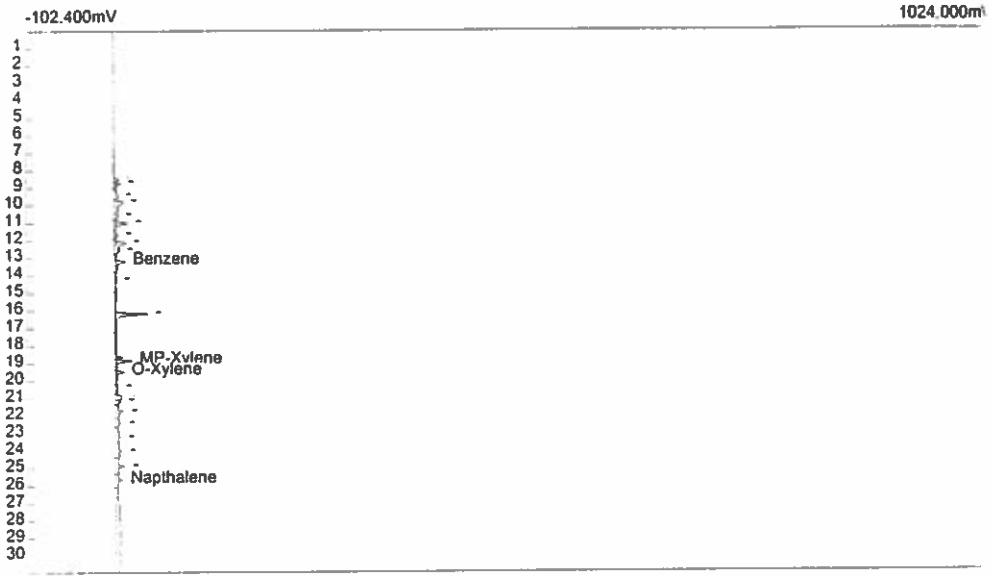
Number	Retention	Area	External	Units	Component
1	13.208	89.692	23.78	ppb	Benzene
2	16.125	349.867	35.51	ppb	Toluene
4	18.791	130.125	42.00	ppb	MP-Xylene
5	19.450	75.794	19.62	ppb	O-Xylene
6	25.708	28.044	10.84	ppb	Napthalene
5		673.521	131.75		

Lab name: Silicon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Components: FEBVPH99.cpt
Integration: Peak sens=95.0 Base sens= 6.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
Data file: fs#12.CHR (c:\datawinpeak\jobs1999\99-030A\)



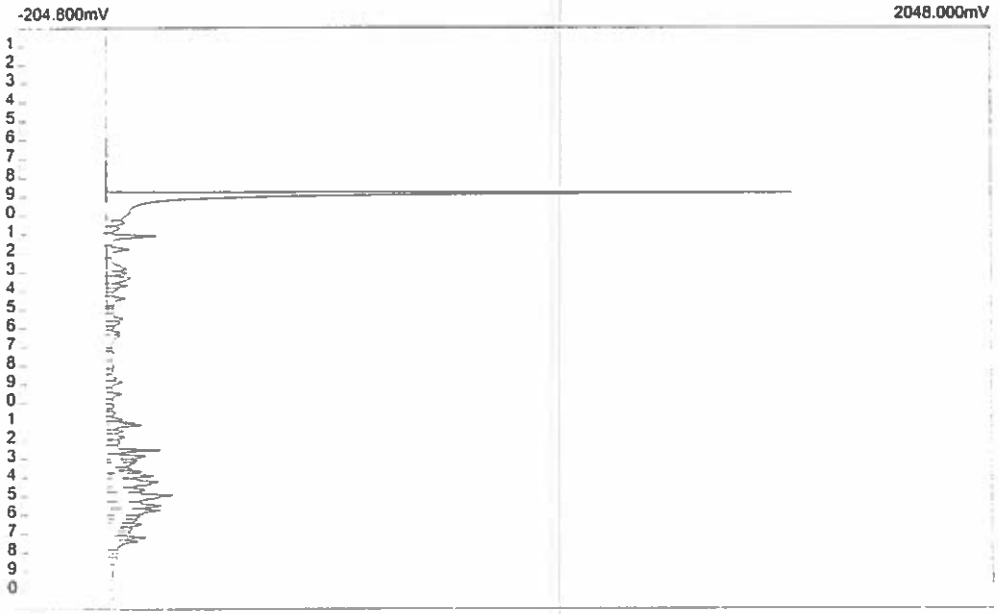
lumber	Retention	Area	External	Units	Component
1	11.775	1940.217	2196.59	ppb	VPH
1		1940.217	2196.59		

Lab name: Silicon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Integration: Peak sens=95.0 Base sens=60.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
Data file: s#12.CHR (c:\datawinpeak\jobs1999\99-030A\)



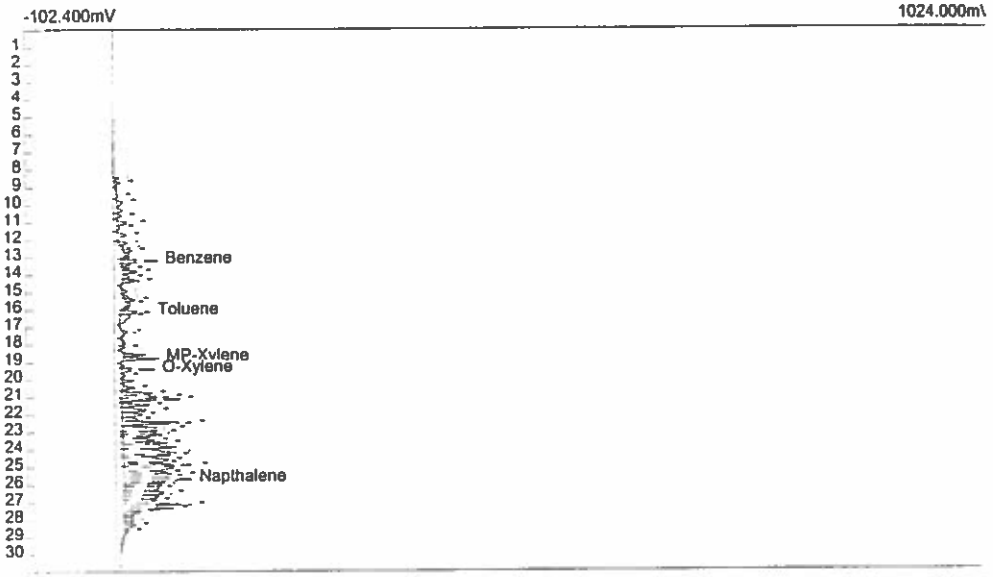
Number	Retention	Area	External	Units	Component
1	13.225	83.824	22.23	ppb	Benzene
4	18.866	121.666	39.27	ppb	MP-Xylene
5	19.500	71.214	18.44	ppb	O-Xylene
6	25.691	28.623	11.06	ppb	Napthalene
4		305.327	91.00		

Lab Name: Silicon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Components: FEBVPH99.cpt
Integration: Peak sens=95.0 Base sens= 6.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
Data file: fs#13.CHR (c:\datawinpeak\jobs1999\99-030A\)



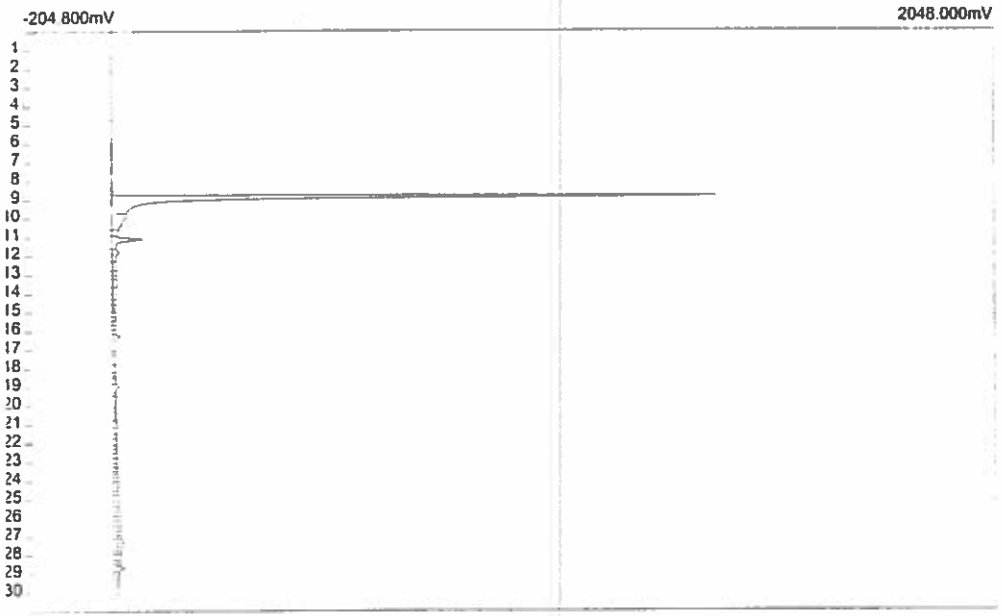
umber	Retention	Area	External	Units	Component
1	11.808	7013.940	7940.74	ppb	VPH
1		7013.940	7940.74		

Lab Name: Silicon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Integration: Peak sens=95.0 Base sens=60.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
Data file: s#13.CHR (c:\datawinpeak\jobs1999\99-030A\)



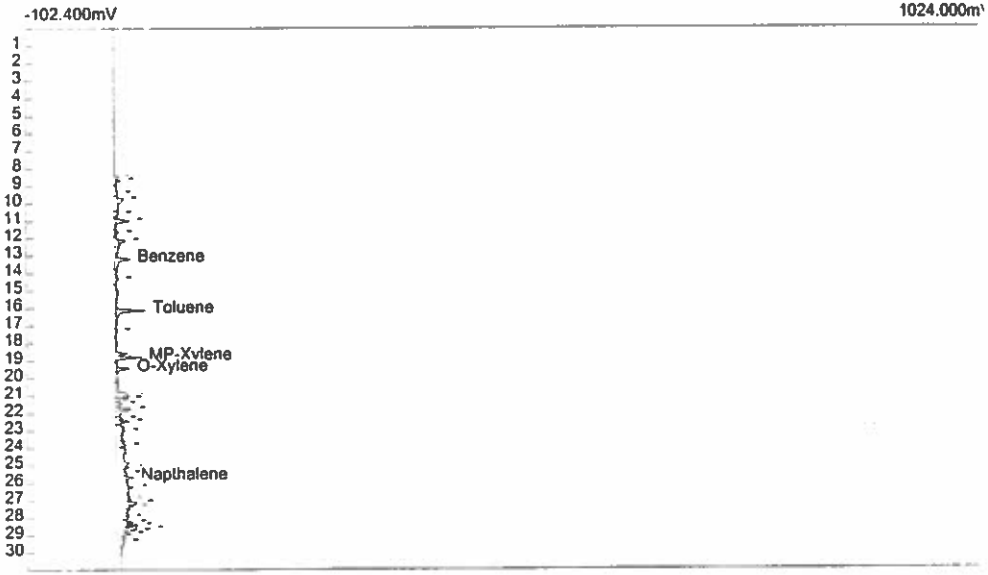
Number	Retention	Area	External	Units	Component
1	13.225	338.556	251.89	ppb	Benzene
2	16.141	270.082	4.11	ppb	Toluene
4	18.816	269.070	86.85	ppb	MP-Xylene
5	19.458	256.858	203.01	ppb	O-Xylene
6	25.708	811.535	3461.00	ppb	Napthalene
5		1946.101	4008.86		

Lab name: Silicon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Components: FEBVPH99.cpt
Integration: Peak sens=95.0 Base sens= 6.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
Data file: fs#14.CHR (c:\datawinpeak\jobs1999\99-030A\)



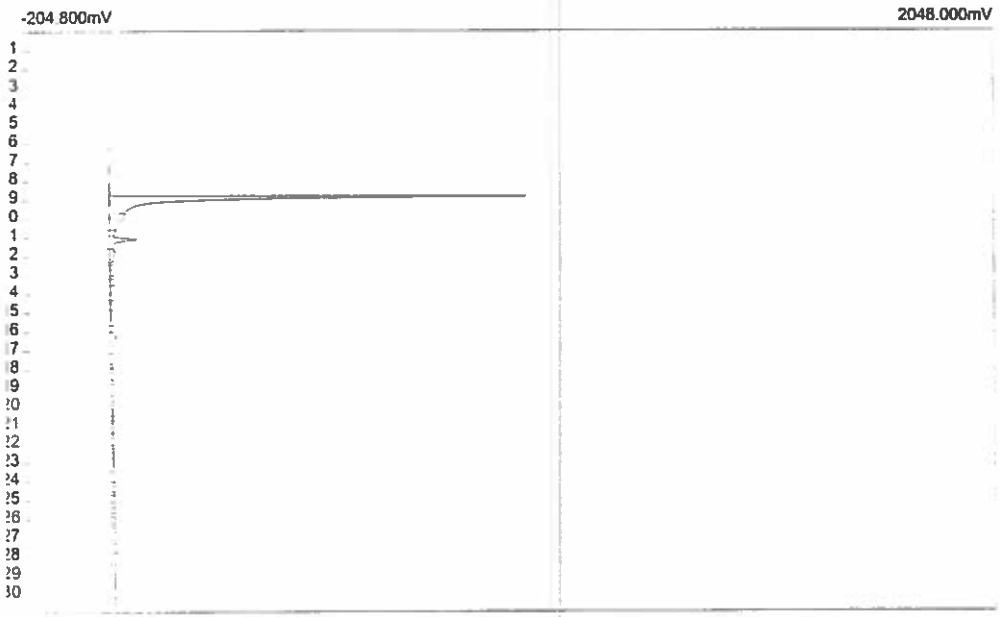
Number	Retention	Area	External	Units	Component
1	11.783	2189.525	2478.84	ppb	VPH
1		2189.525	2478.84		

Lab name: Silicon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Integration: Peak sens=95.0 Base sens=60.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
Data file: s#14.CHR (c:\datawinpeak\jobs1999\99-030A\)



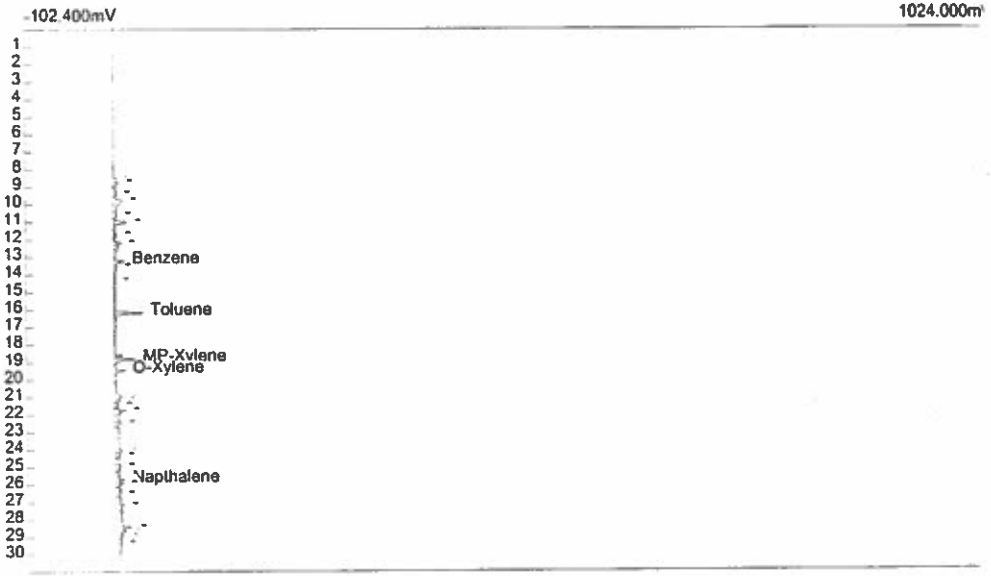
Number	Retention	Area	External	Units	Component
1	13.233	135.305	35.88	ppb	Benzene
2	16.158	305.492	4.65	ppb	Toluene
4	18.833	183.363	59.19	ppb	MP-Xylene
5	19.475	112.945	29.24	ppb	O-Xylene
6	25.700	42.549	16.44	ppb	Napthalene
5		779.654	145.40		

Lab Name: Soilcon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Components: FEBVPH99.cpt
Integration: Peak sens=95.0 Base sens= 6.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
Data file: fs#15.CHR (c:\datawinpeak\jobs1999\99-030A\)



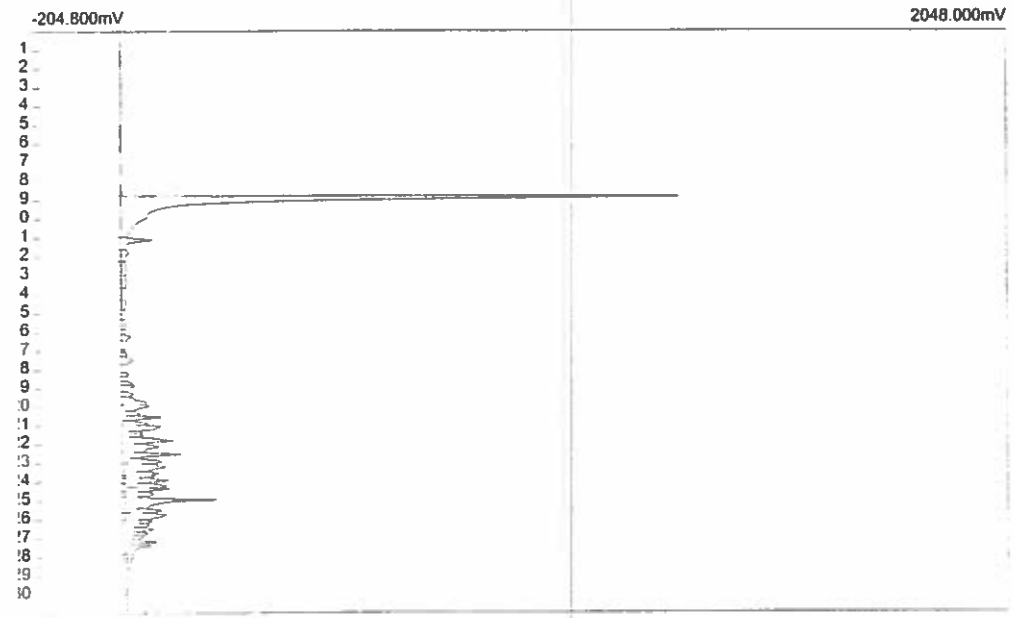
Number	Retention	Area	External	Units	Component
1	11.791	1947.501	2204.84	ppb	VPH
1		1947.501	2204.84		

Lab Name: Soilcon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Integration: Peak sens=95.0 Base sens=60.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
Data file: s#15.CHR (c:\datawinpeak\jobs1999\99-030A\)



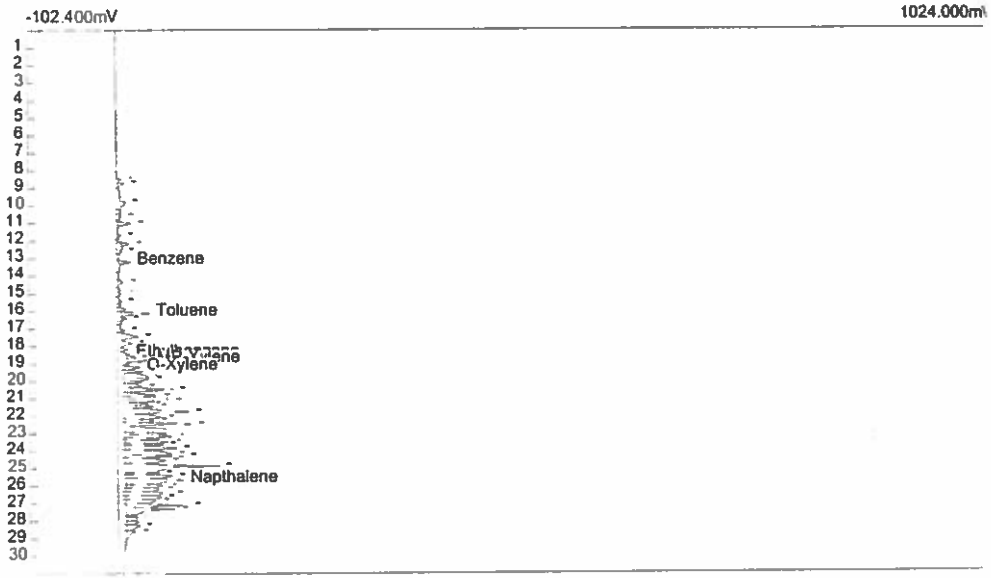
Number	Retention	Area	External	Units	Component
1	13.250	76.158	20.19	ppb	Benzene
2	16.175	282.577	4.30	ppb	Toluene
4	18.816	144.586	46.67	ppb	MP-Xylene
5	19.458	84.019	21.75	ppb	O-Xylene
6	25.708	28.937	11.18	ppb	Napthalene
5		616.277	104.10		

Lab name: Soilcon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Components: FEBVPH99.cpt
Integration: Peak sens=95.0 Base sens= 6.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
Data file: fs#16.CHR (c:\datawinpeak\jobs1999\99-030A\)



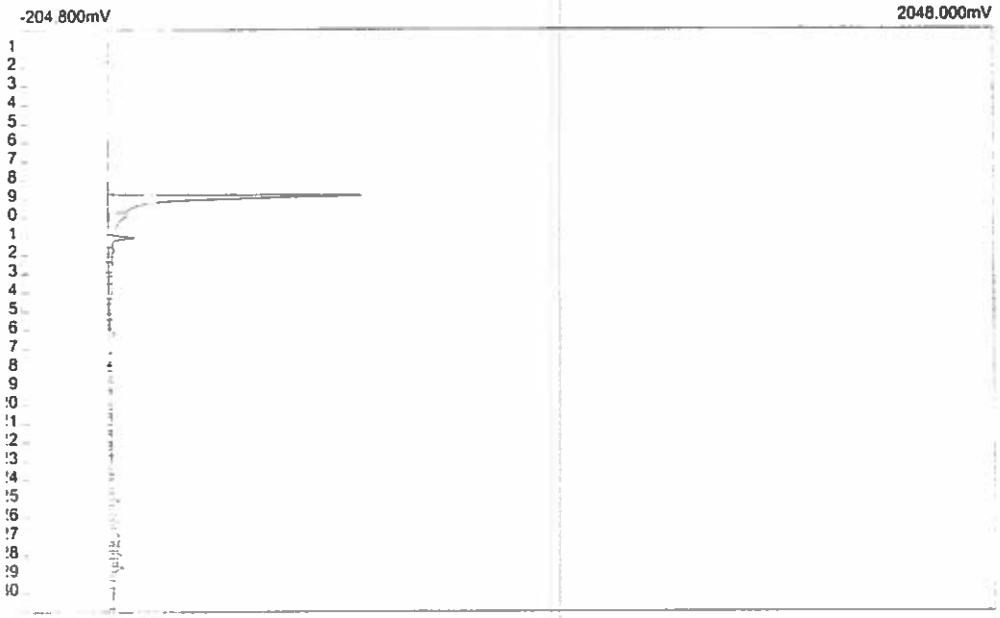
lumber	Retention	Area	External	Units	Component
1	11.783	2783.007	3150.74	ppb	VPH
1		2783.007	3150.74		

Lab name: Soilcon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Integration: Peak sens=95.0 Base sens=60.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
Data file: s#16.CHR (c:\datawinpeak\jobs1999\99-030A\)



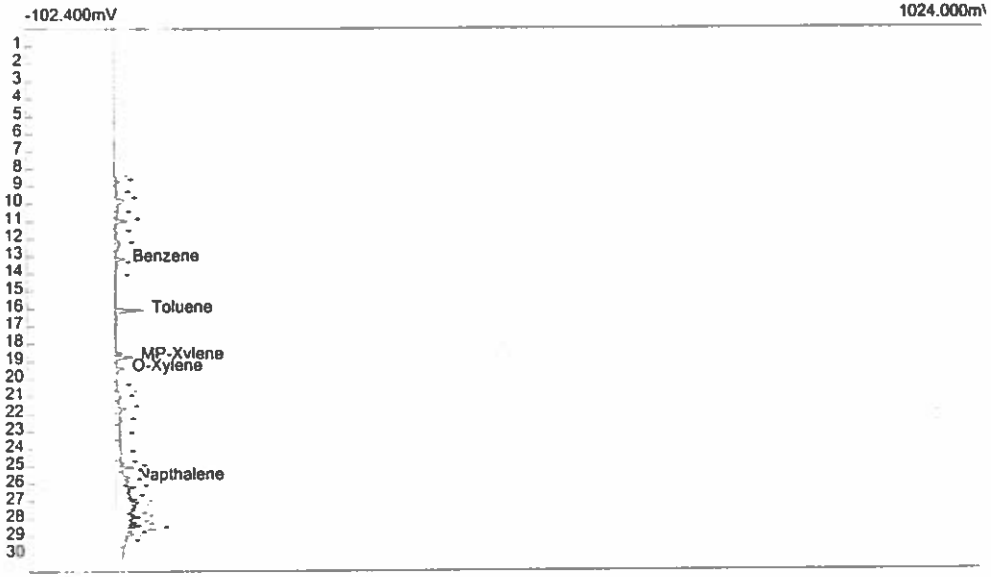
Number	Retention	Area	External	Units	Component
1	13.216	106.652	28.28	ppb	Benzene
2	16.141	238.807	3.64	ppb	Toluene
3	18.458	20.776	9.50	ppb	Ethylbenzene
4	18.800	196.055	63.28	ppb	MP-Xylene
5	19.225	166.361	43.07	ppb	O-Xylene
6	25.683	1070.286	4914.95	ppb	Napthalene
6		1798.937	5062.72		

Lab name: Silicon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Components: FEBVPH99.cpt
Integration: Peak sens=95.0 Base sens= 6.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
Data file: fs#17.CHR (c:\datawinpeak\jobs1999\99-030A\)



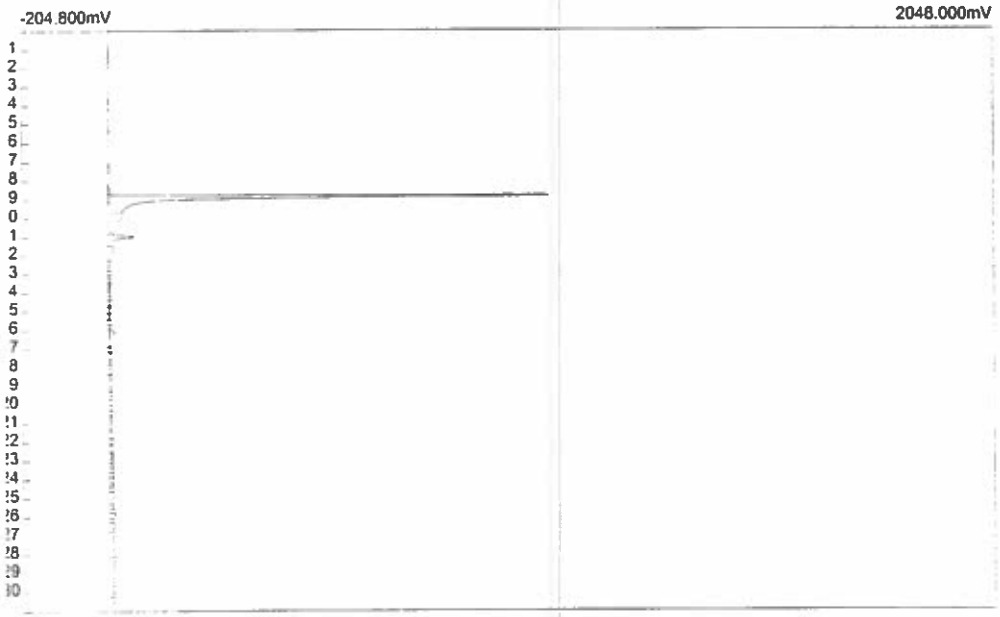
lumber	Retention	Area	External	Units	Component
1	11.750	2130.809	2412.37	ppb	VPH
1		2130.809	2412.37		

Lab name: Silicon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Integration: Peak sens=95.0 Base sens=60.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
Data file: s#17.CHR (c:\datawinpeak\jobs1999\99-030A\)



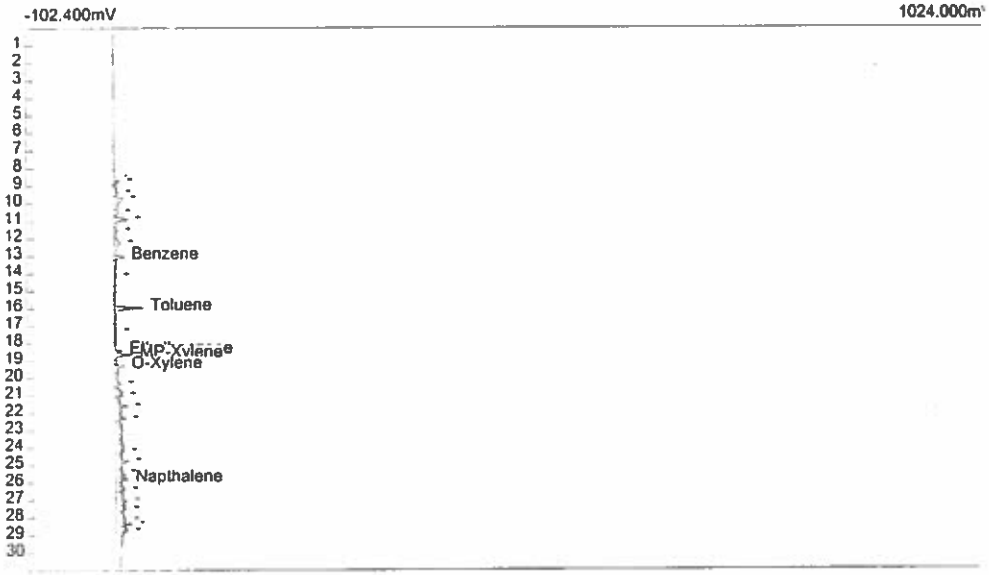
Number	Retention	Area	External	Units	Component
1	13.183	71.798	19.04	ppb	Benzene
2	16.091	289.478	4.41	ppb	Toluene
4	18.766	127.040	41.01	ppb	MP-Xylene
5	19.416	75.111	19.45	ppb	O-Xylene
6	25.641	40.855	15.79	ppb	Napthalene
5		604.282	99.69		

Lab name: Silicon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Components: FEBVPH99.cpt
Integration: Peak sens=95.0 Base sens= 6.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
Data file: fs#18.CHR (c:\datawinpeak\jobs1999\99-030A\)



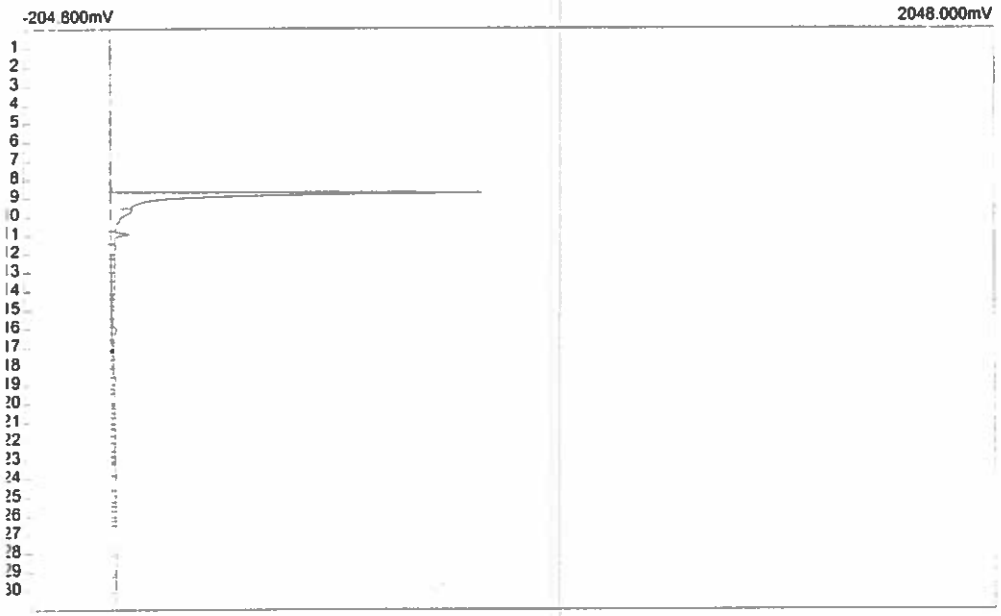
lumber	Retention	Area	External	Units	Component
1	11.633	1654.158	1872.73	ppb	VPH
1		1654.158	1872.73		

Lab name: Silicon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Integration: Peak sens=95.0 Base sens=60.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
Data file: s#18.CHR (c:\datawinpeak\jobs1999\99-030A\)



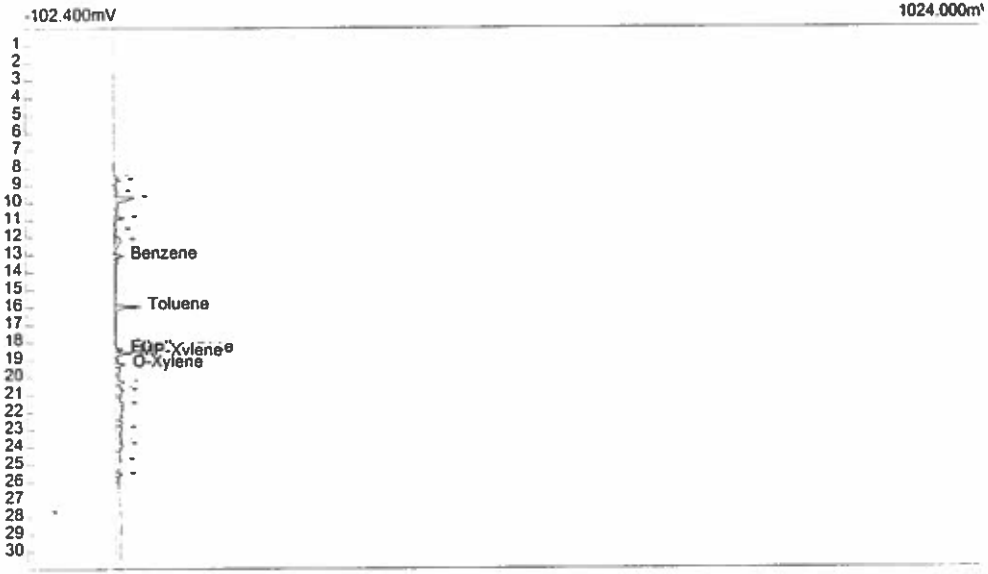
Number	Retention	Area	External	Units	Component
1	13.050	72.350	19.18	ppb	Benzene
2	15.991	289.249	4.41	ppb	Toluene
3	18.458	34.234	15.66	ppb	Ethylbenzene
4	18.666	116.871	38.37	ppb	MP-Xylene
5	19.316	51.571	13.35	ppb	O-Xylene
6	25.808	45.519	17.59	ppb	Napthalene
6		611.793	108.56		

Lab name: Silicon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Components: FEBVPH99.cpt
Integration: Peak sens=95.0 Base sens= 6.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
Data file: fs#2D.CHR (c:\datawinpeak\jobs1999\99-030A\)



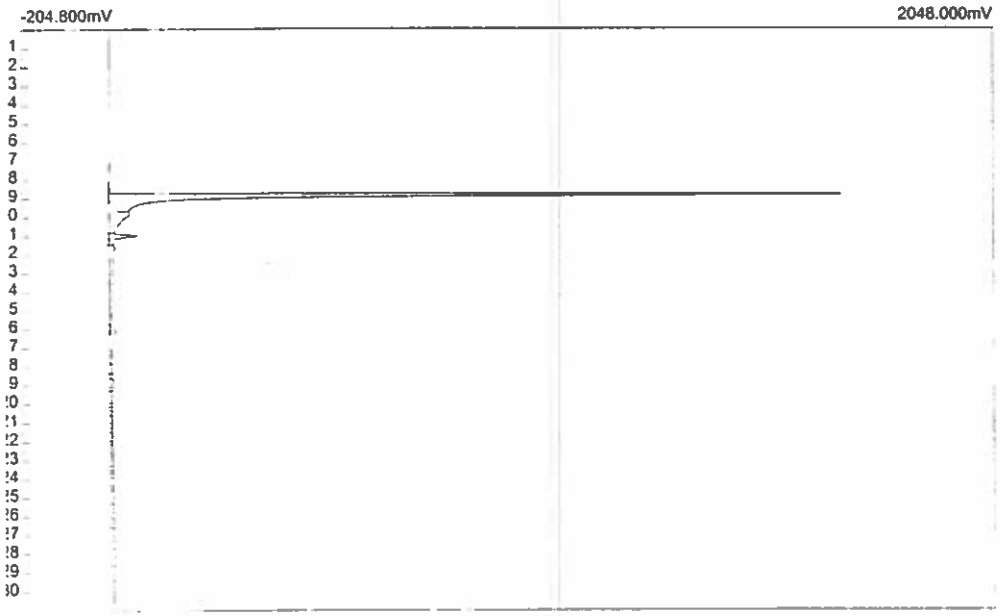
Number	Retention	Area	External	Units	Component
1	11.641	1956.173	2214.65	ppb	VPH
1		1956.173	2214.65		

Lab name: Silicon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Integration: Peak sens=95.0 Base sens=60.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
Data file: s#2D.CHR (c:\datawinpeak\jobs1999\99-030A\)



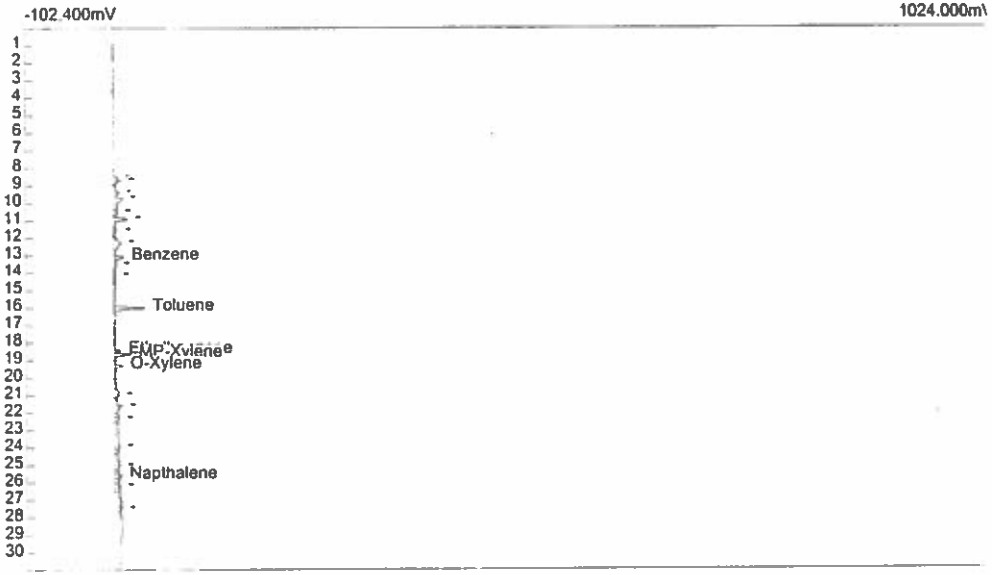
Number	Retention	Area	External	Units	Component
1	13.058	57.450	15.23	ppb	Benzene
2	15.958	261.863	3.99	ppb	Toluene
3	18.408	38.176	17.46	ppb	Ethylbenzene
4	18.616	111.873	36.11	ppb	MP-Xylene
5	19.258	54.739	14.17	ppb	O-Xylene
5		524.101	86.96		

Lab name: Soilcon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Components: FEBVPH99.cpt
Integration: Peak sens=95.0 Base sens= 6.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
Data file: fs#12D.CHR (c:\datawinpeak\jobs1999\99-030A\)



lumber	Retention	Area	External	Units	Component
1	11.666	2108.063	2386.61	ppb	VPH
1		2108.063	2386.61		

Lab name: Soilcon Laboratories
Client: Christie Adams
Client ID: 99-030A
Collected: FEB 3 1999
Temp. prog: tect.tem
Integration: Peak sens=95.0 Base sens=60.0 Min area= 10.00 Standard=100.000 Sample= 1.000 Tangents=on
Data file: s#12D.CHR (c:\datawinpeak\jobs1999\99-030A\)



Number	Retention	Area	External	Units	Component
1	13.108	83.599	22.17	ppb	Benzene
2	16.025	309.766	4.72	ppb	Toluene
3	18.458	35.939	16.44	ppb	Ethylbenzene
4	18.666	120.595	38.93	ppb	MP-Xylene
5	19.316	69.406	17.97	ppb	O-Xylene
6	25.616	22.492	8.69	ppb	Napthalene
6		641.797	108.91		

External Standard Report

Data File Name : C:\HPCHEM\1\DATA\99-030A\SAMP0004.D
Operator : douglas
Instrument : SOILCON 5
Sample Name : 99-030A 2
Run Time Bar Code:
Acquired on : 05 Feb 99 11:17 AM
Report Created on: 08 Feb 99 11:36 AM
Last Recalib on : 03 FEB 99 11:11 AM
Multiplier : 1

Page Number : 1
Vial Number : 4
Injection Number : 1
Sequence Line : 1
Instrument Method: FEB99.MTH
Analysis Method : FEB99.MTH
Sample Amount : 0
ISTD Amount :

Sig. 1 in C:\HPCHEM\1\DATA\99-030A\SAMP0004.D

Ret Time	Area	Type	Width	Ref#	mg\kg	Name
6.536	* not found *			1		C10-C20
12.800	* not found *			1		C20-C32

Not all calibrated peaks were found

External Standard Report

Data File Name : C:\HPCHEM\1\DATA\99-030A\SAMP0003.D
Operator : douglas
Instrument : SOILCON 5
Sample Name : 99-030A 1
Run Time Bar Code:
Acquired on : 05 Feb 99 10:44 AM
Report Created on: 08 Feb 99 11:36 AM
Last Recalib on : 03 FEB 99 11:11 AM
Multiplier : 1

Page Number : 1
Vial Number : 3
Injection Number : 1
Sequence Line : 1
Instrument Method: FEB99.MTH
Analysis Method : FEB99.MTH
Sample Amount : 0
ISTD Amount :

Sig. 1 in C:\HPCHEM\1\DATA\99-030A\SAMP0003.D

Ret Time	Area	Type	Width	Ref#	mg\kg	Name
6.536	* not found *			1		C10-C20
12.800	* not found *			1		C20-C32

Not all calibrated peaks were found

External Standard Report

Data File Name : C:\HPCHEM\1\DATA\99-030A\SAMP0007.D
Operator : douglas
Instrument : SOILCON 5
Sample Name : 99-030A 4
Run Time Bar Code:
Acquired on : 05 Feb 99 12:58 PM
Report Created on: 08 Feb 99 11:36 AM
Last Recalib on : 03 FEB 99 11:11 AM
Multiplier : 1

Page Number : 1
Vial Number : 7
Injection Number : 1
Sequence Line : 1
Instrument Method: FEB99.MTH
Analysis Method : FEB99.MTH
Sample Amount : 0
ISTD Amount :

Sig. 1 in C:\HPCHEM\1\DATA\99-030A\SAMP0007.D

Ret Time	Area	Type	Width	Ref#	mg\kg	Name
6.536	* not found *			1		C10-C20
12.800	* not found *			1		C20-C32

Not all calibrated peaks were found

External Standard Report

Data File Name : C:\HPCHEM\1\DATA\99-030A\SAMP0006.D
Operator : douglas
Instrument : SOILCON 5
Sample Name : 99-030A 3
Run Time Bar Code:
Acquired on : 05 Feb 99 12:24 PM
Report Created on: 08 Feb 99 11:36 AM
Last Recalib on : 03 FEB 99 11:11 AM
Multiplier : 1

Page Number : 1
Vial Number : 6
Injection Number : 1
Sequence Line : 1
Instrument Method: FEB99.MTH
Analysis Method : FEB99.MTH
Sample Amount : 0
ISTD Amount :

Sig. 1 in C:\HPCHEM\1\DATA\99-030A\SAMP0006.D

Ret Time	Area	Type	Width	Ref#	mg\kg	Name
6.536	* not found *			1		C10-C20
12.800	* not found *			1		C20-C32

Not all calibrated peaks were found

External Standard Report

Data File Name : C:\HPCHEM\1\DATA\99-030A\SAMP0009.D
Operator : douglas
Instrument : SOILCON 5
Sample Name : 99-030A 6
Run Time Bar Code:
Acquired on : 05 Feb 99 02:06 PM
Report Created on: 08 Feb 99 11:36 AM
Last Recalib on : 03 FEB 99 11:11 AM
Multiplier : 1

Page Number : 1
Vial Number : 9
Injection Number : 1
Sequence Line : 1
Instrument Method: FEB99.MTH
Analysis Method : FEB99.MTH
Sample Amount : 0
ISTD Amount :

Sig. 1 in C:\HPCHEM\1\DATA\99-030A\SAMP0009.D

Ret Time	Area	Type	Width	Ref#	mg\kg	Name
6.536	* not found *			1		C10-C20
12.800	* not found *			1		C20-C32

Not all calibrated peaks were found

External Standard Report

Data File Name : C:\HPCHEM\1\DATA\99-030A\SAMP0008.D
Operator : douglas
Instrument : SOILCON 5
Sample Name : 99-030A 5
Run Time Bar Code:
Acquired on : 05 Feb 99 01:32 PM
Report Created on: 08 Feb 99 11:36 AM
Last Recalib on : 03 FEB 99 11:11 AM
Multiplier : 1

Page Number : 1
Vial Number : 8
Injection Number : 1
Sequence Line : 1
Instrument Method: FEB99.MTH
Analysis Method : FEB99.MTH
Sample Amount : 0
ISTD Amount :

Sig. 1 in C:\HPCHEM\1\DATA\99-030A\SAMP0008.D

Ret Time	Area	Type	Width	Ref#	mg\kg	Name
6.536	* not found *			1		C10-C20
12.800	* not found *			1		C20-C32

Not all calibrated peaks were found

External Standard Report

Data File Name : C:\HPCHEM\1\DATA\99-030A\SAMP0011.D
Operator : douglas
Instrument : SOILCON 5
Sample Name : 99-030A 8
Run Time Bar Code:
Acquired on : 05 Feb 99 03:12 PM
Report Created on: 08 Feb 99 11:36 AM
Last Recalib on : 03 FEB 99 11:11 AM
Multiplier : 1

Page Number : 1
Vial Number : 11
Injection Number : 1
Sequence Line : 1
Instrument Method: FEB99.MTH
Analysis Method : FEB99.MTH
Sample Amount : 0
ISTD Amount :

Sig. 1 in C:\HPCHEM\1\DATA\99-030A\SAMP0011.D

Ret Time	Area	Type	Width	Ref#	mg\kg	Name
6.536	* not found *			1		C10-C20
12.800	* not found *			1		C20-C32

Not all calibrated peaks were found

External Standard Report

Data File Name : C:\HPCHEM\1\DATA\99-030A\SAMP0010.D
Operator : douglas
Instrument : SOILCON 5
Sample Name : 99-030A 7
Run Time Bar Code:
Acquired on : 05 Feb 99 02:39 PM
Report Created on: 08 Feb 99 11:36 AM
Last Recalib on : 03 FEB 99 11:11 AM
Multiplier : 1

Page Number : 1
Vial Number : 10
Injection Number : 1
Sequence Line : 1
Instrument Method: FEB99.MTH
Analysis Method : FEB99.MTH
Sample Amount : 0
ISTD Amount :

Sig. 1 in C:\HPCHEM\1\DATA\99-030A\SAMP0010.D

Ret Time	Area	Type	Width	Ref#	mg\kg	Name
6.536	* not found *			1		C10-C20
12.800	* not found *			1		C20-C32

Not all calibrated peaks were found

External Standard Report

Data File Name : C:\HPCHEM\1\DATA\99-030A\SAMP0013.D
Operator : douglas
Instrument : SOILCON 5
Sample Name : 99-030A 10
Run Time Bar Code:
Acquired on : 05 Feb 99 04:18 PM
Report Created on: 08 Feb 99 11:36 AM
Last Recalib on : 03 FEB 99 11:11 AM
Multiplier : 1

Page Number : 1
Vial Number : 13
Injection Number : 1
Sequence Line : 1
Instrument Method: FEB99.MTH
Analysis Method : FEB99.MTH
Sample Amount : 0
ISTD Amount :

Sig. 1 in C:\HPCHEM\1\DATA\99-030A\SAMP0013.D

Ret Time	Area	Type	Width	Ref#	mg\kg	Name
6.536	* not found *			1		C10-C20
12.800	* not found *			1		C20-C32

Not all calibrated peaks were found

External Standard Report

Data File Name : C:\HPCHEM\1\DATA\99-030A\SAMP0012.D
Operator : douglas
Instrument : SOILCON 5
Sample Name : 99-030A 9
Run Time Bar Code:
Acquired on : 05 Feb 99 03:45 PM
Report Created on: 08 Feb 99 11:36 AM
Last Recalib on : 03 FEB 99 11:11 AM
Multiplier : 1

Page Number : 1
Vial Number : 12
Injection Number : 1
Sequence Line : 1
Instrument Method: FEB99.MTH
Analysis Method : FEB99.MTH
Sample Amount : 0
ISTD Amount :

Sig. 1 in C:\HPCHEM\1\DATA\99-030A\SAMP0012.D

Ret Time	Area	Type	Width	Ref#	mg\kg	Name
6.536	* not found *			1		C10-C20
12.800	* not found *			1		C20-C32

Not all calibrated peaks were found

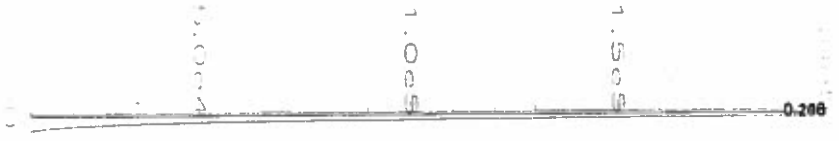
External Standard Report

Data File Name	: C:\HPCHEM\1\DATA\99-030A\SAMP0015.D		
Operator	: douglas	Page Number	: 1
Instrument	: SOILCON 5	Vial Number	: 15
Sample Name	: 99-030A 12	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 1
Acquired on	: 05 Feb 99 05:24 PM	Instrument Method	: FEB99.MTH
Report Created on	: 08 Feb 99 11:36 AM	Analysis Method	: FEB99.MTH
Last Recalib on	: 03 FEB 99 11:11 AM	Sample Amount	: 0
Multiplier	: 1	ISTD Amount	:

Sig. 1 in C:\HPCHEM\1\DATA\99-030A\SAMP0015.D

Ret Time	Area	Type	Width	Ref#	mg\kg	Name
6.536	* not found *			1		C10-C20
12.800	* not found *			1		C20-C32

Not all calibrated peaks were found



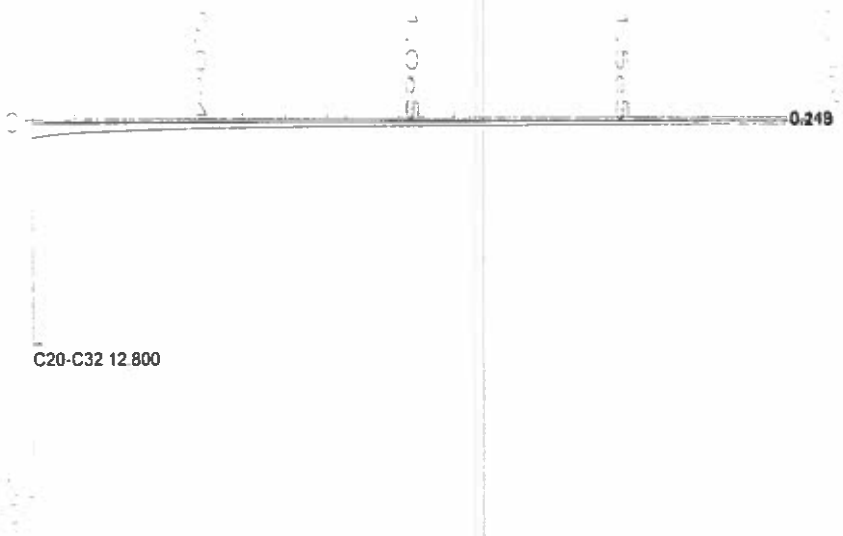
External Standard Report

Data File Name	: C:\HPCHEM\1\DATA\99-030A\SAMP0014.D		
Operator	: douglas	Page Number	: 1
Instrument	: SOILCON 5	Vial Number	: 14
Sample Name	: 99-030A 11	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 1
Acquired on	: 05 Feb 99 04:50 PM	Instrument Method	: FEB99.MTH
Report Created on	: 08 Feb 99 11:36 AM	Analysis Method	: FEB99.MTH
Last Recalib on	: 03 FEB 99 11:11 AM	Sample Amount	: 0
Multiplier	: 1	ISTD Amount	:

Sig. 1 in C:\HPCHEM\1\DATA\99-030A\SAMP0014.D

Ret Time	Area	Type	Width	Ref#	mg\kg	Name
6.536	* not found *			1		C10-C20
12.800	* not found *			1		C20-C32

Not all calibrated peaks were found



External Standard Report

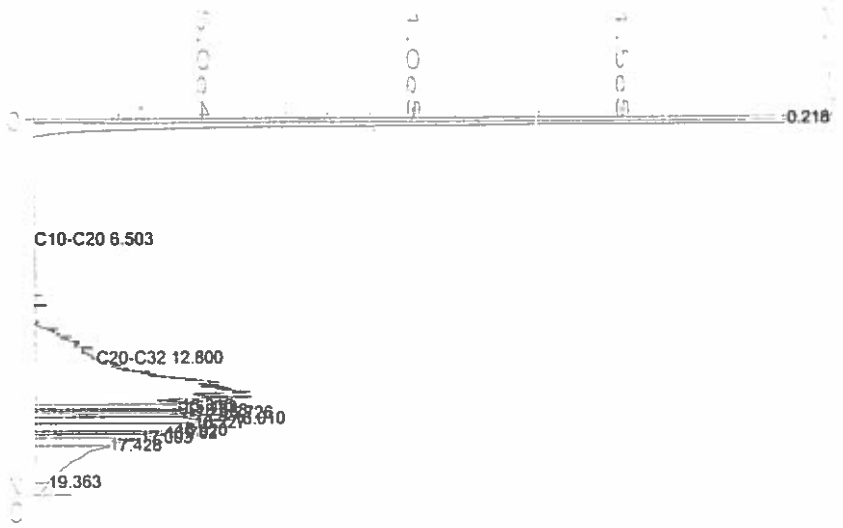
Data File Name : C:\HPCHEM\1\DATA\99-030A\SAMP0018.D
Operator : douglas
Instrument : SOILCON 5
Sample Name : 99-030A 14
Run Time Bar Code:
Acquired on : 05 Feb 99 07:04 PM
Report Created on: 08 Feb 99 11:36 AM
Last Recalib on : 03 FEB 99 11:11 AM
Multiplier : 1

Page Number : 1
Vial Number : 18
Injection Number : 1
Sequence Line : 1
Instrument Method: FEB99.MTH
Analysis Method : FEB99.MTH
Sample Amount : 0
ISTD Amount :

Sig. 1 in C:\HPCHEM\1\DATA\99-030A\SAMP0018.D

Ret Time	Area	Type	Width	Ref#	mg\kg	Name
6.536	* not found *			1		C10-C20
12.800	159290	PH + 0.000	1		87.591	C20-C32

Not all calibrated peaks were found



External Standard Report

Data File Name : C:\HPCHEM\1\DATA\99-030A\SAMP0017.D
Operator : douglas
Instrument : SOILCON 5
Sample Name : 99-030A 13
Run Time Bar Code:
Acquired on : 05 Feb 99 06:31 PM
Report Created on: 08 Feb 99 11:36 AM
Last Recalib on : 03 FEB 99 11:11 AM
Multiplier : 1

Page Number : 1
Vial Number : 17
Injection Number : 1
Sequence Line : 1
Instrument Method: FEB99.MTH
Analysis Method : FEB99.MTH
Sample Amount : 0
ISTD Amount :

Sig. 1 in C:\HPCHEM\1\DATA\99-030A\SAMP0017.D

Ret Time	Area	Type	Width	Ref#	mg\kg	Name
6.503	842870	BHA	1.174	1	700.515	C10-C20
12.800	8298475	HH + 0.000		1	8863.881	C20-C32

C10-C20 6.503

C20-C32 12.800

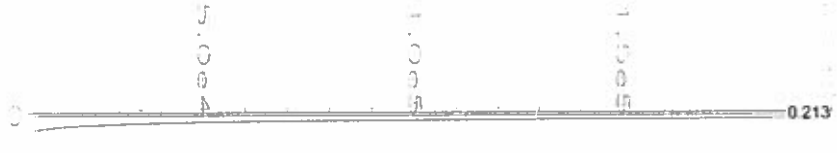
External Standard Report

Data File Name : C:\HPCHEM\1\DATA\99-030A\SAMP0020.D
Operator : douglas
Instrument : SOILCON 5
Sample Name : 99-030A 16
Run Time Bar Code:
Acquired on : 05 Feb 99 08:11 PM
Report Created on: 08 Feb 99 11:37 AM
Last Recalib on : 03 FEB 99 11:11 AM
Multiplier : 1

Page Number : 1
Vial Number : 20
Injection Number : 1
Sequence Line : 1
Instrument Method: FEB99.MTH
Analysis Method : FEB99.MTH
Sample Amount : 0
ISTD Amount :

Sig. 1 in C:\HPCHEM\1\DATA\99-030A\SAMP0020.D

Ret Time	Area	Type	Width	Ref#	mg\kg	Name
6.503	739786	BHA	1.273	1	596.286	C10-C20
12.800	527211	HH +	0.000	1	415.861	C20-C32



External Standard Report

Data File Name : C:\HPCHEM\1\DATA\99-030A\SAMP0019.D
Operator : douglas
Instrument : SOILCON 5
Sample Name : 99-030A 15
Run Time Bar Code:
Acquired on : 05 Feb 99 07:38 PM
Report Created on: 08 Feb 99 11:36 AM
Last Recalib on : 03 FEB 99 11:11 AM
Multiplier : 1

Page Number : 1
Vial Number : 19
Injection Number : 1
Sequence Line : 1
Instrument Method: FEB99.MTH
Analysis Method : FEB99.MTH
Sample Amount : 0
ISTD Amount :

Sig. 1 in C:\HPCHEM\1\DATA\99-030A\SAMP0019.D

Ret Time	Area	Type	Width	Ref#	mg\kg	Name
6.536	* not found *			1		C10-C20
12.800	* not found *			1		C20-C32

Not all calibrated peaks were found

External Standard Report

ata File Name : C:\HPCHEM\1\DATA\99-030A\SAMP0022.D
perator : douglas
nstrument : SOILCON 5
ample Name : 99-030A 18
un Time Bar Code:
cquired on : 05 Feb 99 09:18 PM
eport Created on: 08 Feb 99 11:37 AM
ast Recalib on : 03 FEB 99 11:11 AM
ultiplier : 1

Page Number : 1
Vial Number : 22
Injection Number : 1
Sequence Line : 1
Instrument Method: FEB99.MTH
Analysis Method : FEB99.MTH
Sample Amount : 0
ISTD Amount :

ig. 1 in C:\HPCHEM\1\DATA\99-030A\SAMP0022.D

et Time	Area	Type	Width	Ref#	mg\kg	Name
6.536	* not found *			1		C10-C20
12.800	* not found *			1		C20-C32

ot all calibrated peaks were found

External Standard Report

Data File Name : C:\HPCHEM\1\DATA\99-030A\SAMP0021.D
Operator : douglas
Instrument : SOILCON 5
Sample Name : 99-030A 17
Run Time Bar Code:
Acquired on : 05 Feb 99 08:44 PM
Report Created on: 08 Feb 99 11:37 AM
Last Recalib on : 03 FEB 99 11:11 AM
Multiplier : 1

Page Number : 1
Vial Number : 21
Injection Number : 1
Sequence Line : 1
Instrument Method: FEB99.MTH
Analysis Method : FEB99.MTH
Sample Amount : 0
ISTD Amount :

Sig. 1 in C:\HPCHEM\1\DATA\99-030A\SAMP0021.D

Ret Time	Area	Type	Width	Ref#	mg\kg	Name
6.536	* not found *			1		C10-C20
12.800	* not found *			1		C20-C32

Not all calibrated peaks were found

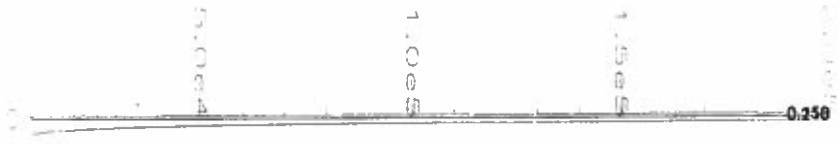
External Standard Report

Data File Name	: C:\HPCHEM\1\DATA\99-030A\SAMP0016.D		
Operator	: douglas	Page Number	: 1
Instrument	: SOILCON 5	Vial Number	: 16
Sample Name	: 99-030A 12D	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 1
Acquired on	: 05 Feb 99 05:57 PM	Instrument Method	: FEB99.MTH
Report Created on	: 08 Feb 99 11:36 AM	Analysis Method	: FEB99.MTH
Last Recalib on	: 03 FEB 99 11:11 AM	Sample Amount	: 0
Multiplier	: 1	ISTD Amount	:

Sig. 1 in C:\HPCHEM\1\DATA\99-030A\SAMP0016.D

Ret Time	Area	Type	Width	Ref#	mg\kg	Name
6.536	* not found *			1		C10-C20
12.800	* not found *			1		C20-C32

Not all calibrated peaks were found



External Standard Report

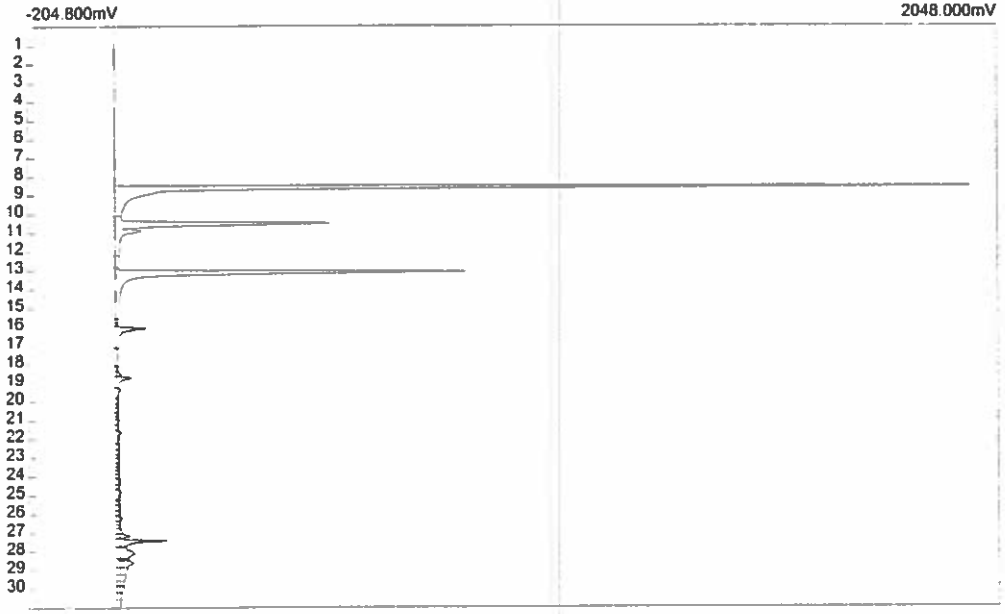
Data File Name	: C:\HPCHEM\1\DATA\99-030A\SAMP0005.D		
Operator	: douglas	Page Number	: 1
Instrument	: SOILCON 5	Vial Number	: 5
Sample Name	: 99-030A 2D	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 1
Acquired on	: 05 Feb 99 11:51 AM	Instrument Method	: FEB99.MTH
Report Created on	: 08 Feb 99 11:36 AM	Analysis Method	: FEB99.MTH
Last Recalib on	: 03 FEB 99 11:11 AM	Sample Amount	: 0
Multiplier	: 1	ISTD Amount	:

Sig. 1 in C:\HPCHEM\1\DATA\99-030A\SAMP0005.D

Ret Time	Area	Type	Width	Ref#	mg\kg	Name
6.536	* not found *			1		C10-C20
12.800	* not found *			1		C20-C32

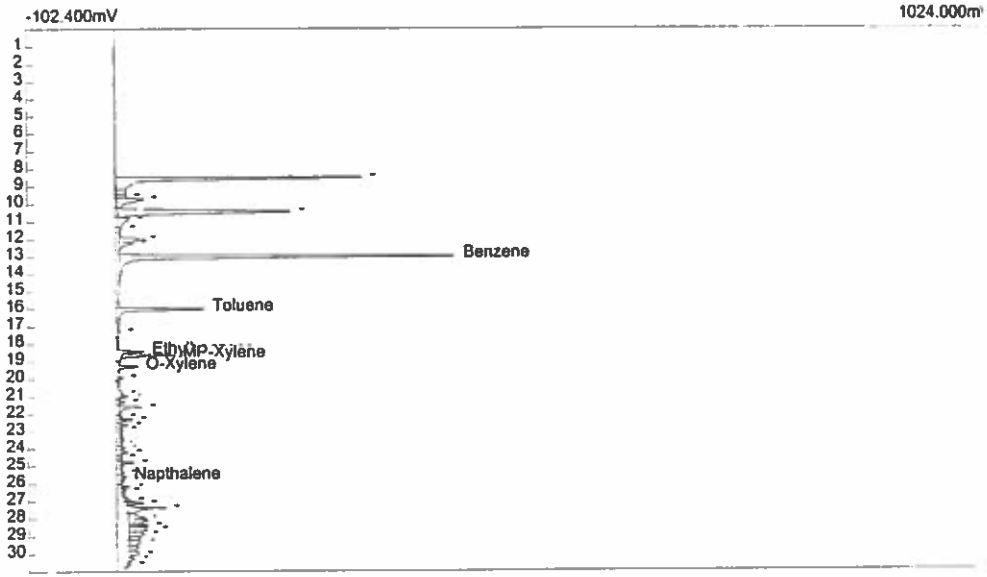
Not all calibrated peaks were found

Lab Name: Soilcon Laboratories
Client: Christie Adams Cardlock
Client ID: 99-030B
Collected: FEB 24 1999
Temp. prog: tect.tem
Components: FEBVPH99.cpt
Integration: Peak sens=95.0 Base sens= 6.0 Min area= 10.00 Standard=10.000 Sample= 1.000 Tangents=on
Data file: fBH1.CHR (c:\datawinpeak\jobs1999\99-030B\)



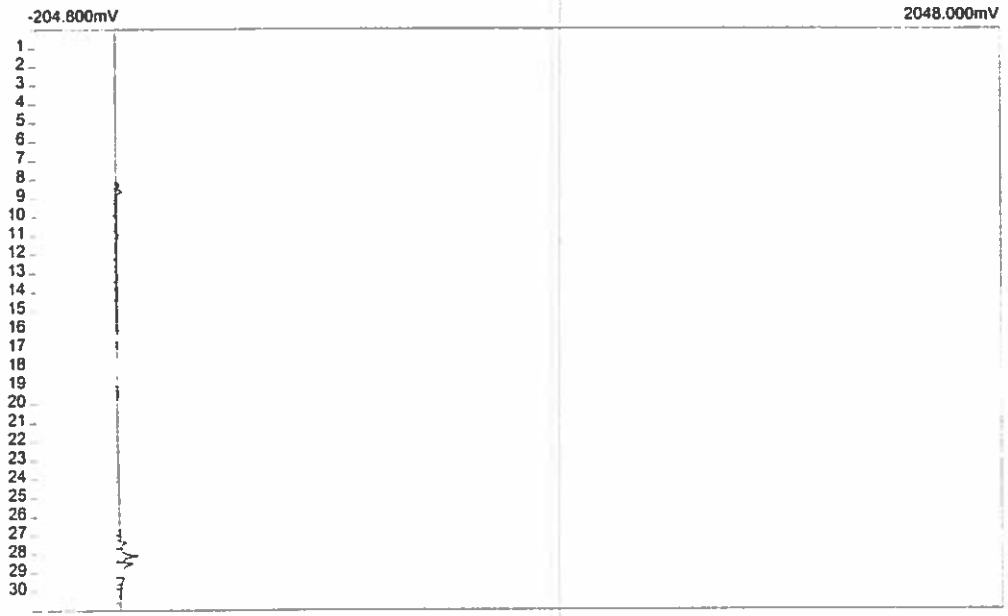
Number	Retention	Area	External	Units	Component
1	10.533	19716.396	2232.16	ppb	VPH
1		19716.396	2232.16		

Lab Name: Soilcon Laboratories
Client: Christie Adams Cardlock
Client ID: 99-030B
Collected: FEB 24 1999
Temp. prog: tect.tem
Integration: Peak sens=95.0 Base sens=60.0 Min area= 10.00 Standard=10.000 Sample= 1.000 Tangents=on
Data file: BH1.CHR (c:\datawinpeak\jobs1999\99-030B\)



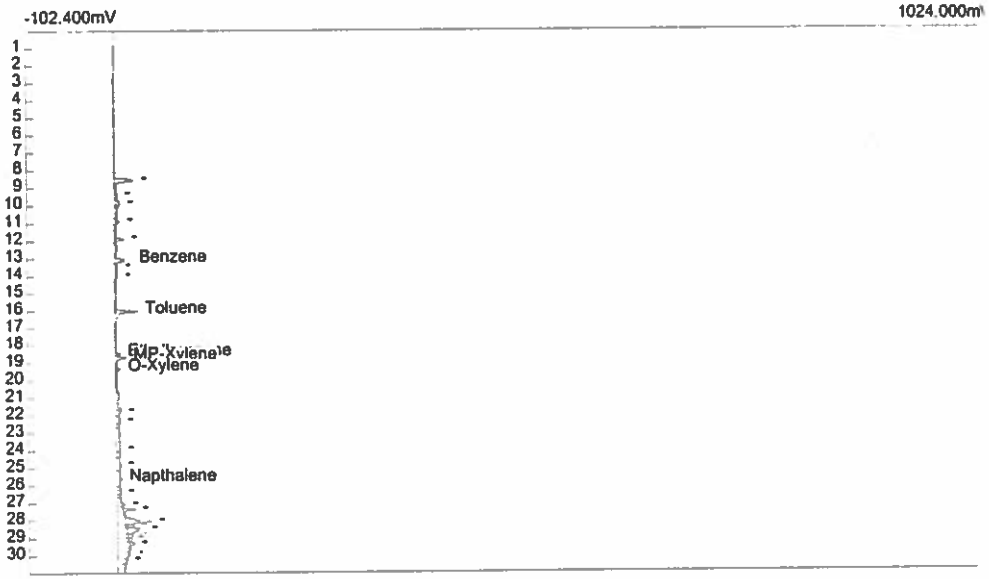
Number	Retention	Area	External	Units	Component
1	13.008	3830.830	1401.46	ppb	Benzene
2	16.016	830.864	96.98	ppb	Toluene
3	18.458	164.916	11.41	ppb	Ethylbenzene
4	18.675	421.455	37.80	ppb	MP-Xylene
5	19.316	160.560	4.16	ppb	O-Xylene
6	25.608	38.186	1.48	ppb	Napthalene
6		5446.811	1553.28		

Lab Name: Silicon Laboratories
Client: Christie Adams Cardlock
Client ID: 99-030B
Collected: FEB 24 1999
Temp. prog: tect.tem
Components: FEBVPH99.cpt
Integration: Peak sens=95.0 Base sens= 6.0 Min area= 10.00 Standard= 1.000 Sample= 1.000 Tangents=on
Data file: fBH#2.CHR (c:\datawinpeak\jobs1999\99-030B\)



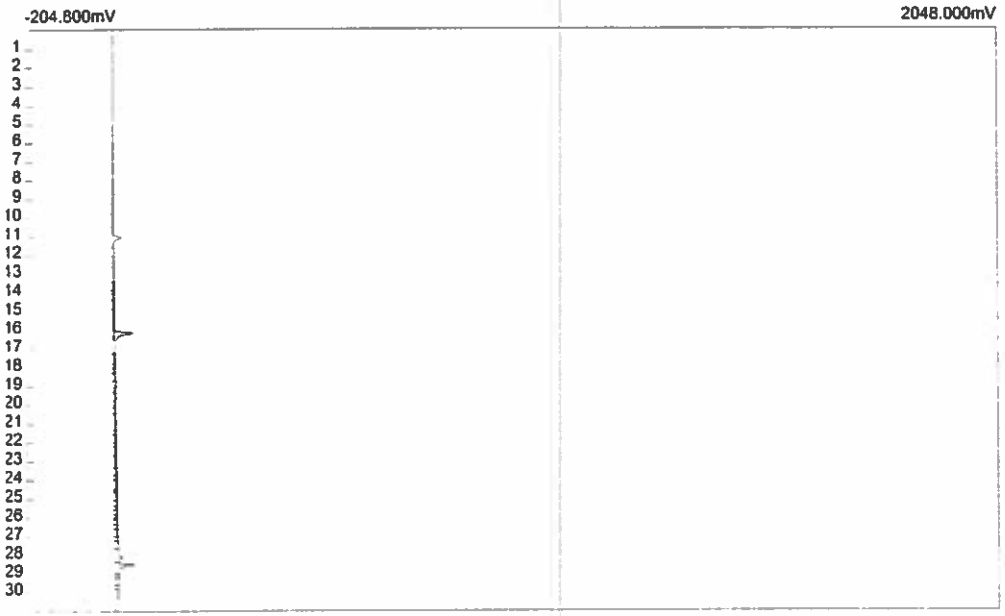
Number	Retention	Area	External	Units	Component
1	10.600	271.128	3.07	ppb	VPH
1		271.128	3.07		

Lab Name: Silicon Laboratories
Client: Christie Adams Cardlock
Client ID: 99-030B
Collected: FEB 24 1999
Temp. prog: tect.tem
Integration: Peak sens=95.0 Base sens=60.0 Min area= 10.00 Standard= 1.000 Sample= 1.000 Tangents=on
Data file: BH#2.CHR (c:\datawinpeak\jobs1999\99-030B\)



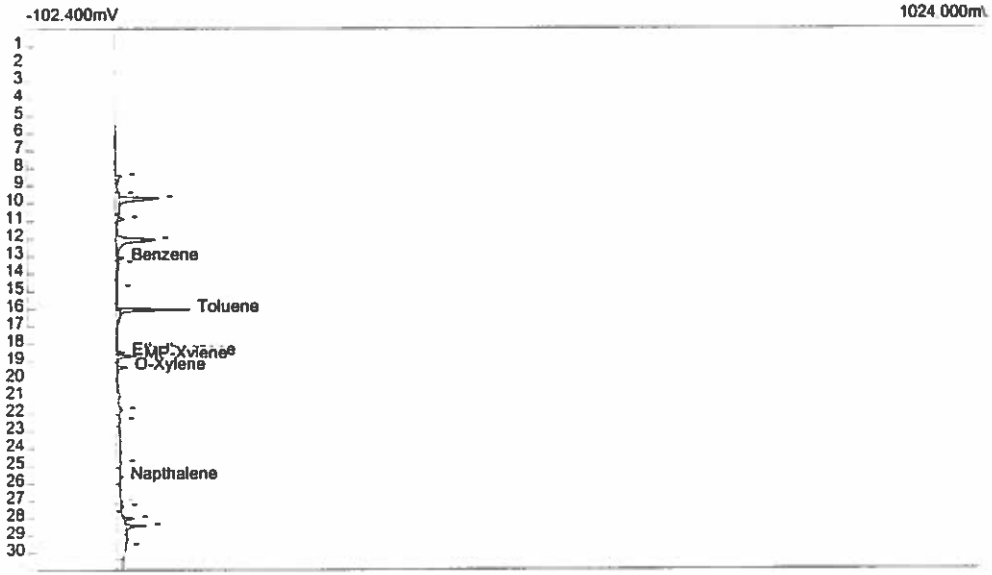
Number	Retention	Area	External	Units	Component
1	13.066	137.897	0.37	ppb	Benzene
2	16.008	226.451	0.03	ppb	Toluene
3	18.466	24.390	0.11	ppb	Ethylbenzene
4	18.675	79.605	0.26	ppb	MP-Xylene
5	19.316	40.925	0.11	ppb	O-Xylene
6	25.591	15.566	0.06	ppb	Napthalene
6		524.834	0.93		

Lab name: Soilcon Laboratories
Client: Christie Adams Cardlock
Client ID: 99-030B
Collected: FEB 24 1999
Temp. prog: tect.tem
Components: FEBVPH99.cpt
Integration: Peak sens=95.0 Base sens= 6.0 Min area= 10.00 Standard= 1.000 Sample= 1.000 Tangents=on
Data file: fBH#3.CHR (c:\datawinpeak\jobs1999\99-030B)



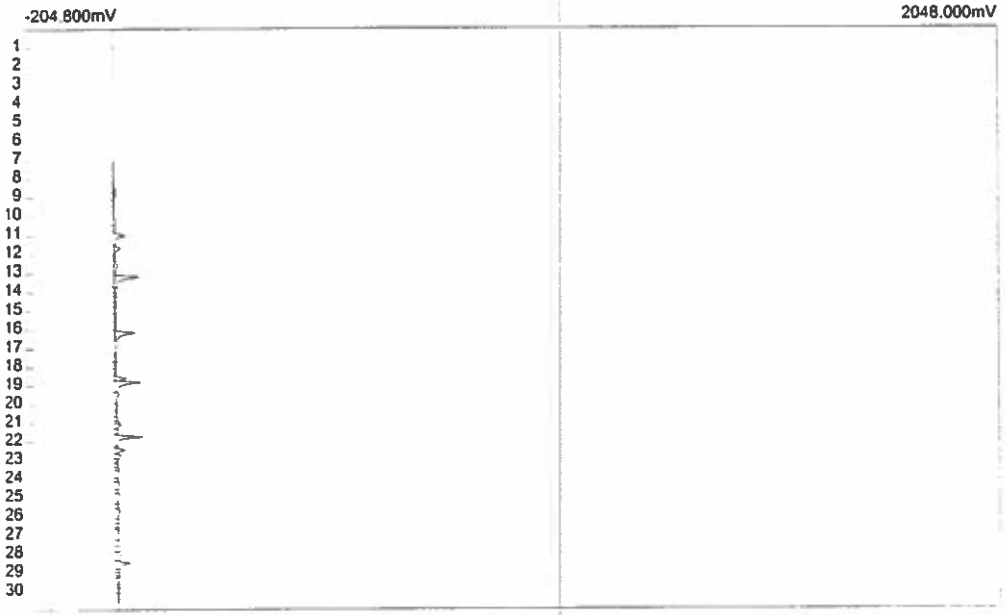
Number	Retention	Area	External	Units	Component
1	11.725	1423.798	17.34	ppb	VPH
1		1423.798	17.34		

Lab name: Soilcon Laboratories
Client: Christie Adams Cardlock
Client ID: 99-030B
Collected: FEB 24 1999
Temp. prog: tect.tem
Integration: Peak sens=95.0 Base sens=60.0 Min area= 10.00 Standard= 1.000 Sample= 1.000 Tangents=on
Data file: bh#3.chr (c:\datawinpeak\jobs1999\99-030B)



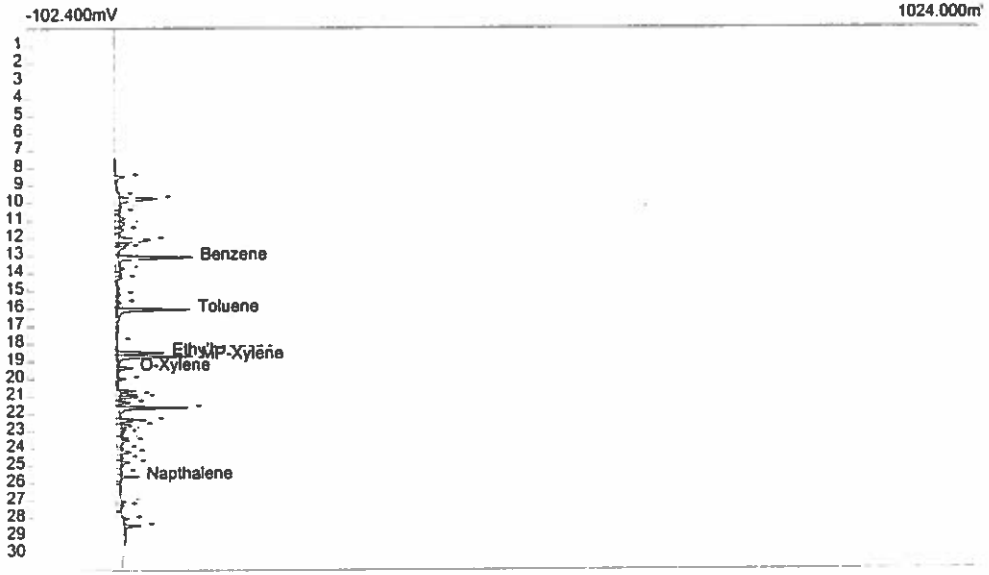
Number	Retention	Area	External	Units	Component
1	13.133	51.037	0.14	ppb	Benzene
2	16.066	295.633	0.05	ppb	Toluene
3	18.525	43.904	0.20	ppb	Ethylbenzene
4	18.733	148.534	0.48	ppb	MP-Xylene
5	19.375	86.508	0.22	ppb	O-Xylene
6	25.633	23.799	0.09	ppb	Napthalene
6		649.414	1.18		

Lab name: Soilcon Laboratories
Client: Christie Adams Cardlock
Client ID: 99-030B
Collected: FEB 24 1999
Temp. prog: tect.tem
Components: FEBVPH99.cpt
Integration: Peak sens=95.0 Base sens= 6.0 Min area= 10.00 Standard=10.000 Sample= 1.000 Tangents=on
Data file: BH#5.CHR (c:\datawinpeak\jobs1999\99-030B)



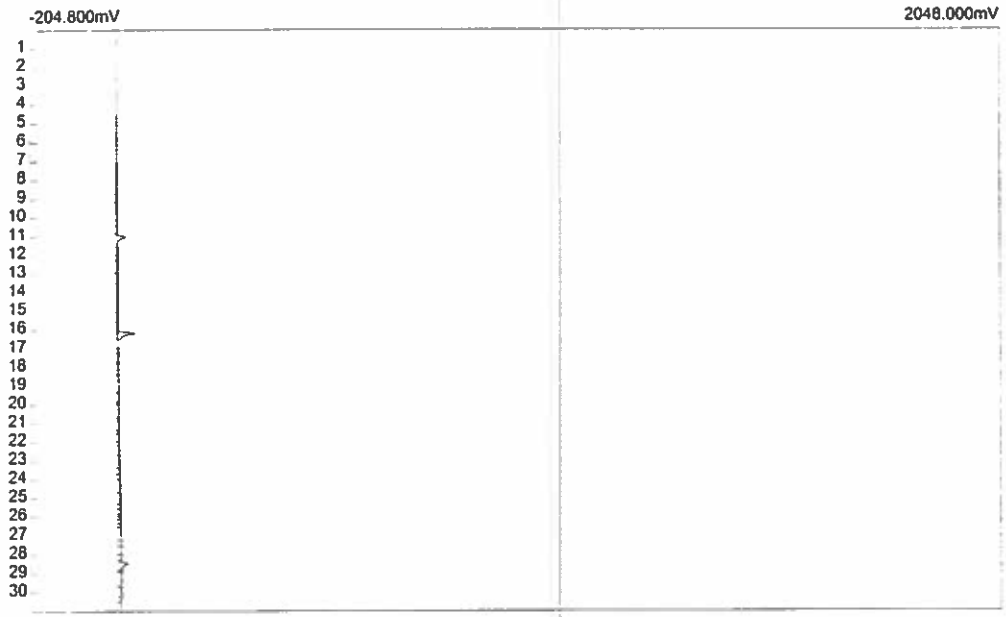
Number	Retention	Area	External	Units	Component
1	11.700	3246.552	380.99	ppb	VPH
1		3246.552	380.99		

Lab name: Soilcon Laboratories
Client: Christie Adams Cardlock
Client ID: 99-030B
Collected: FEB 24 1999
Temp. prog: tect.tem
Integration: Peak sens=95.0 Base sens=60.0 Min area= 10.00 Standard=10.000 Sample= 1.000 Tangents=on
Data file: bh#5.chr (c:\datawinpeak\jobs1999\99-030B)



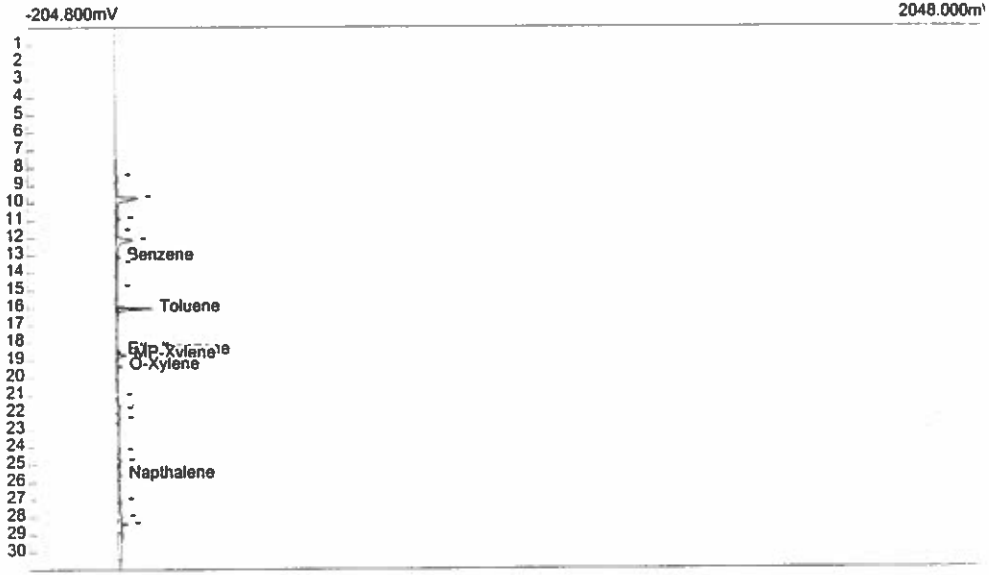
Number	Retention	Area	External	Units	Component
1	13.100	775.386	108.92	ppb	Benzene
2	16.058	748.177	76.99	ppb	Toluene
3	18.508	384.017	47.66	ppb	Ethylbenzene
4	18.725	681.212	107.92	ppb	MP-Xylene
5	19.366	127.931	3.31	ppb	O-Xylene
6	25.625	116.182	13.88	ppb	Napthalene
6		2832.905	358.68		

Lab name: Soilcon Laboratories
Client: Christie Adams Cardlock
Client ID: 99-030B
Collected: FEB 24 1999
Temp. prog: tect.tem
Components: FEBVPH99.cpt
Integration: Peak sens=95.0 Base sens= 6.0 Min area= 10.00 Standard= 1.000 Sample= 1.000 Tangents=on
Data file: fBH#6.CHR (c:\datawinpeak\jobs1999\99-030B)



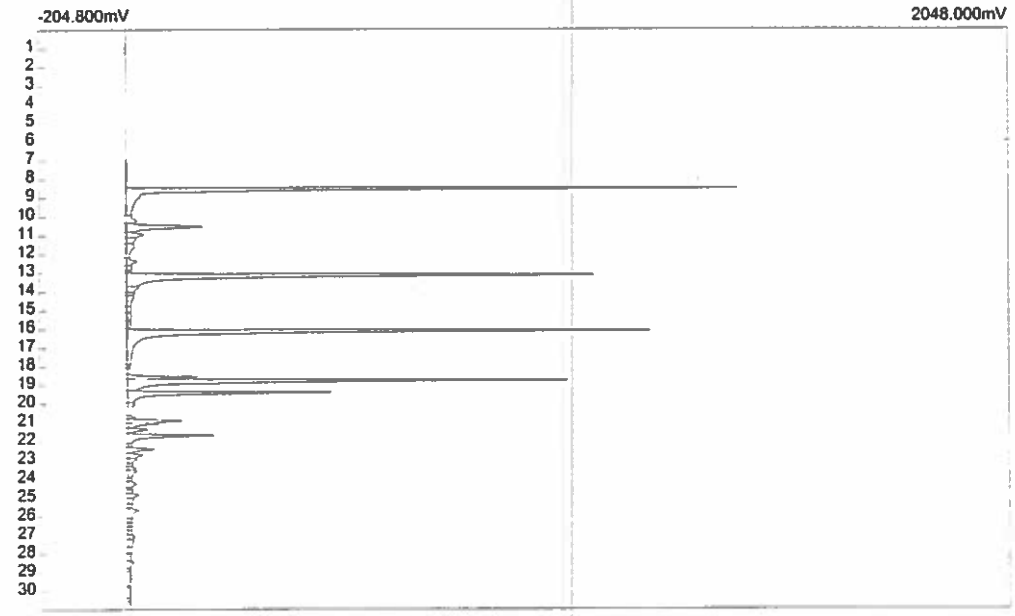
Number	Retention	Area	External	Units	Component
1	11.716	1183.060	14.39	ppb	VPH
1		1183.060	14.39		

Lab name: Soilcon Laboratories
Client: Christie Adams Cardlock
Client ID: 99-030B
Collected: FEB 24 1999
Temp. prog: tect.tem
Integration: Peak sens=95.0 Base sens=60.0 Min area= 10.00 Standard= 1.000 Sample= 1.000 Tangents=on
Data file: bh#6.CHR (c:\datawinpeak\jobs1999\99-030B)



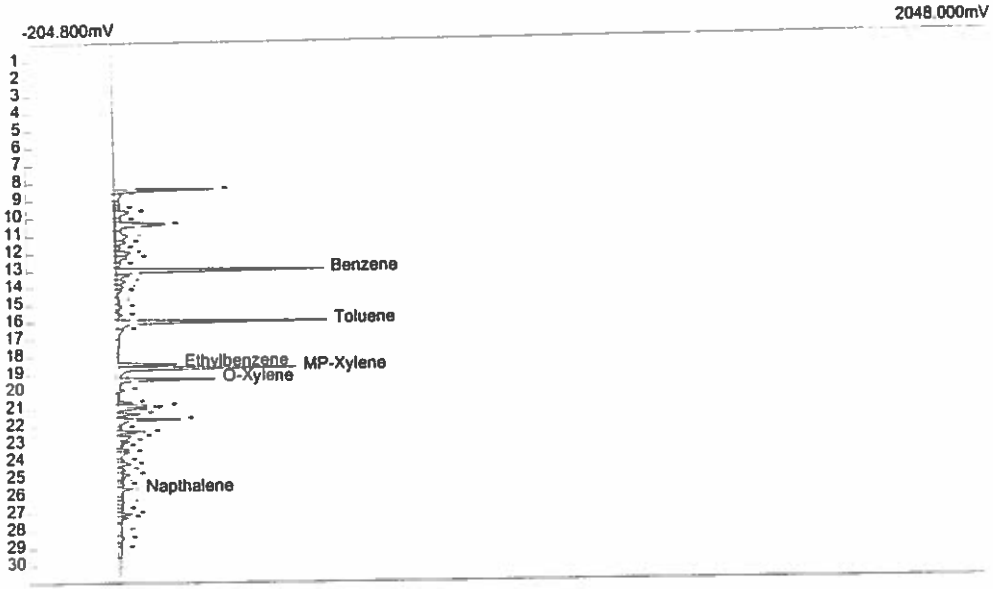
Number	Retention	Area	External	Units	Component
1	13.133	49.312	0.13	ppb	Benzene
2	16.066	414.205	1.47	ppb	Toluene
3	18.516	41.781	0.19	ppb	Ethylbenzene
4	18.725	139.990	0.45	ppb	MP-Xylene
5	19.375	83.603	0.22	ppb	O-Xylene
6	25.616	27.606	0.11	ppb	Napthalene
6		756.497	2.56		

Lab name: Soilcon Laboratories
Client: Christie Adams Cardlock
Client ID: 99-030B
Collected: FEB 24 1999
Temp. prog: tect.tem
Components: FEBVPH99.cpt
Integration: Peak sens=95.0 Base sens= 6.0 Min area= 10.00 Standard=10.000 Sample= 1.000 Tangents=on
Data file: fBH#A.CHR (c:\datawinpeak\jobs1999\99-030B)



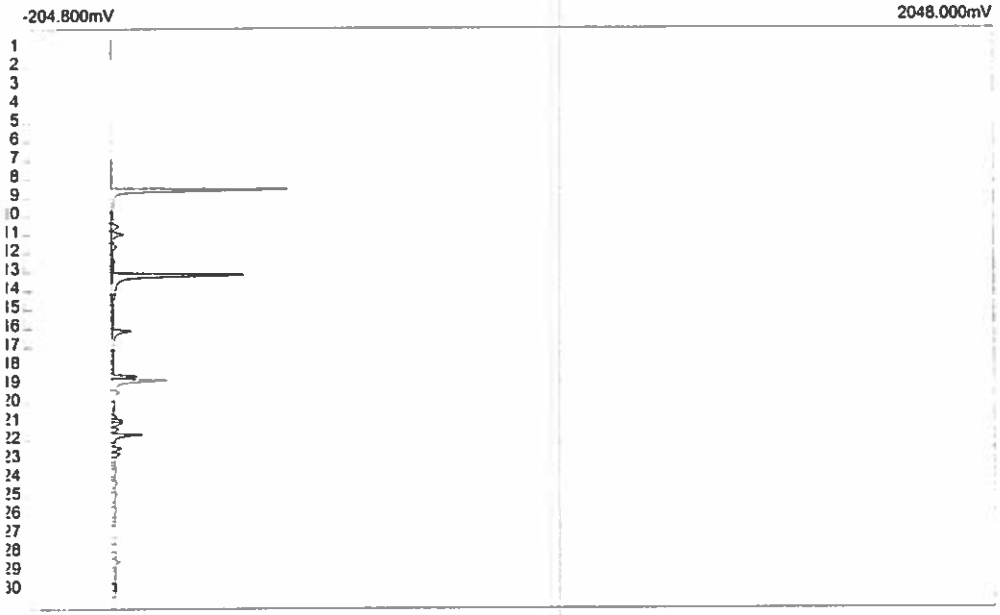
Number	Retention	Area	External	Units	Component
1	11.575	41375.706	7986.88	ppb	VPH
1		41375.706	7986.88		

Lab name: Soilcon Laboratories
Client: Christie Adams Cardlock
Client ID: 99-030B
Collected: FEB 24 1999
Temp. prog: tect.tem
Integration: Peak sens=95.0 Base sens=60.0 Min area= 10.00 Standard=10.000 Sample= 1.000 Tangents=on
Data file: bh#A.chr (c:\datawinpeak\jobs1999\99-030B)



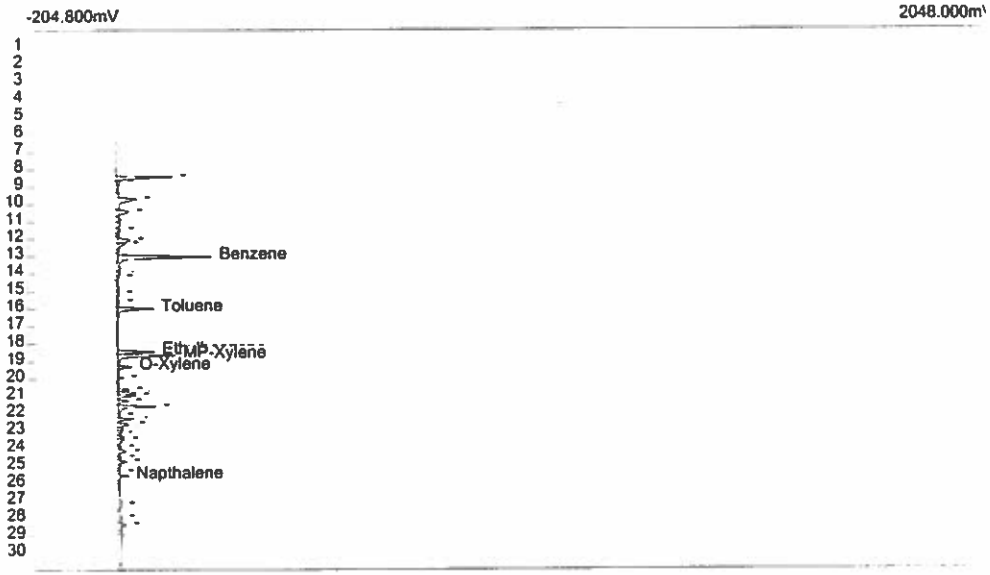
Number	Retention	Area	External	Units	Component
1	13.075	4157.067	1552.30	ppb	Benzene
2	16.041	3872.602	1402.10	ppb	Toluene
3	18.483	941.937	247.83	ppb	Ethylbenzene
4	18.708	3069.913	1374.99	ppb	MP-Xylene
5	19.341	1601.143	595.24	ppb	O-Xylene
6	25.608	217.465	52.54	ppb	Napthalene
6		13860.126	5225.00		

Lab name: Silicon Laboratories
Client: Christie Adams Cardlock
Client ID: 99-030B
Collected: FEB 24 1999
Temp. prog: tect.tem
Components: FEBVPH99.cpt
Integration: Peak sens=95.0 Base sens= 6.0 Min area= 10.00 Standard=10.000 Sample= 1.000 Tangents=on
Data file: fBHB.CHR (c:\datawinpeak\jobs1999\99-030B)

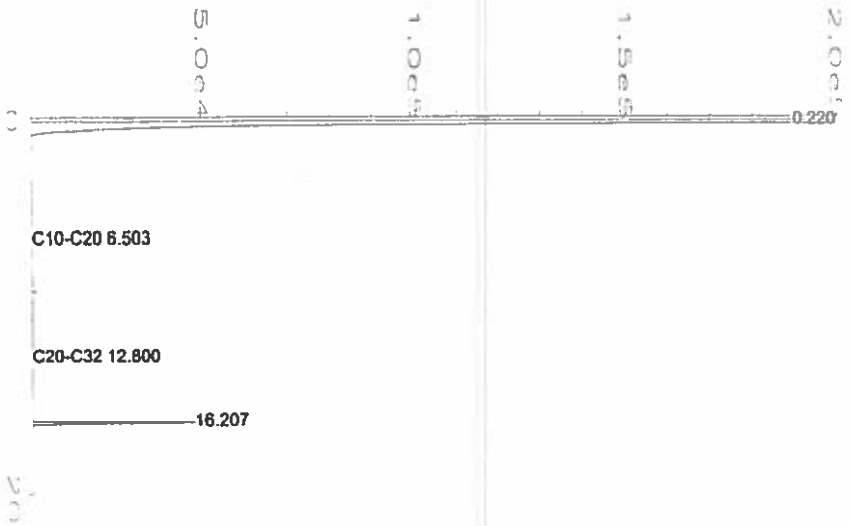


Number	Retention	Area	External	Units	Component
1	11.683	7212.589	977.74	ppb	VPH
1		7212.589	977.74		

Lab name: Silicon Laboratories
Client: Christie Adams Cardlock
Client ID: 99-030B
Collected: FEB 24 1999
Temp. prog: tect.tem
Integration: Peak sens=95.0 Base sens=60.0 Min area= 10.00 Standard=10.000 Sample= 1.000 Tangents=on
Data file: bh#B.CHR (c:\datawinpeak\jobs1999\99-030B)



Number	Retention	Area	External	Units	Component
1	13.091	1984.037	540.80	ppb	Benzene
2	16.050	712.706	68.91	ppb	Toluene
3	18.483	607.361	110.67	ppb	Ethylbenzene
4	18.708	1014.471	227.71	ppb	MP-Xylene
5	19.341	219.982	9.16	ppb	O-Xylene
6	25.608	117.166	14.10	ppb	Napthalene
6		4655.723	971.35		



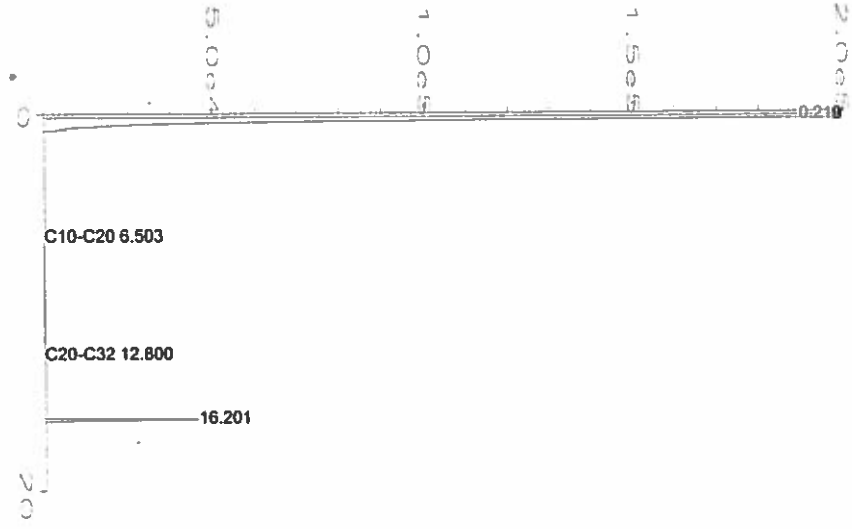
External Standard Report

Data File Name : C:\HPCHEM\1\DATA\99-074\SAMP0005.D
Operator : douglas
Instrument : SOILCON 5
Sample Name : 99-030B BH2
Run Time Bar Code:
Acquired on : 02 Mar 99 01:14 PM
Report Created on: 02 Mar 99 04:45 PM
Last Recalib on : 03 FEB 99 11:11 AM
Multiplier : 0.001

Page Number : 1
Vial Number : 5
Injection Number : 1
Sequence Line : 1
Instrument Method: FEB99W.MTH
Analysis Method : FEB99W.MTH
Sample Amount : 0
ISTD Amount :

Sig. 1 in C:\HPCHEM\1\DATA\99-074\SAMP0005.D

Ret Time	Area	Type	Width	Ref#	mg\L	Name
6.503	736667	HHA	1.127	1	0.594	C10-C20
12.800	554938	HH +	0.000	1	0.439	C20-C32



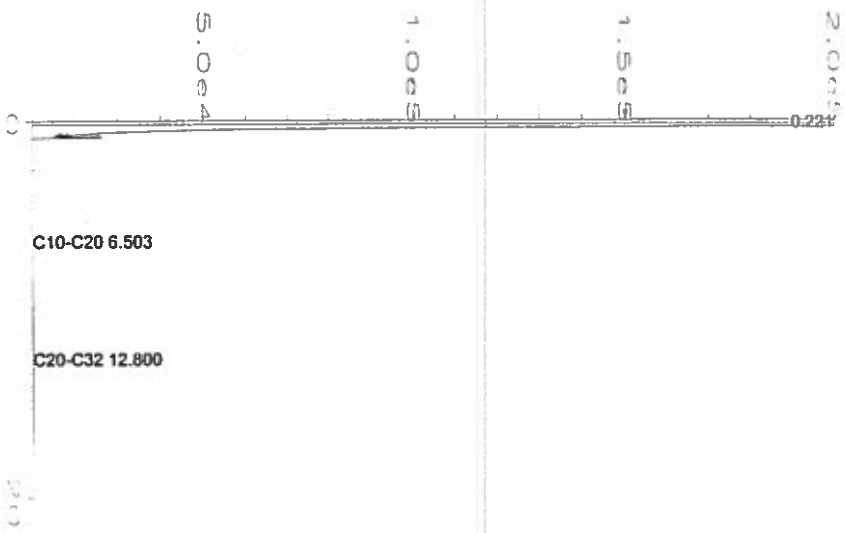
External Standard Report

Data File Name : C:\HPCHEM\1\DATA\99-074\SAMP0004.D
Operator : douglas
Instrument : SOILCON 5
Sample Name : 99-030B BH1
Run Time Bar Code:
Acquired on : 02 Mar 99 12:40 PM
Report Created on: 02 Mar 99 04:45 PM
Last Recalib on : 03 FEB 99 11:11 AM
Multiplier : 0.001

Page Number : 1
Vial Number : 4
Injection Number : 1
Sequence Line : 1
Instrument Method: FEB99W.MTH
Analysis Method : FEB99W.MTH
Sample Amount : 0
ISTD Amount :

Sig. 1 in C:\HPCHEM\1\DATA\99-074\SAMP0004.D

Ret Time	Area	Type	Width	Ref#	mg\L	Name
6.503	813759	HH +	0.000	1	0.668	C10-C20
12.800	576764	HH +	0.000	1	0.458	C20-C32



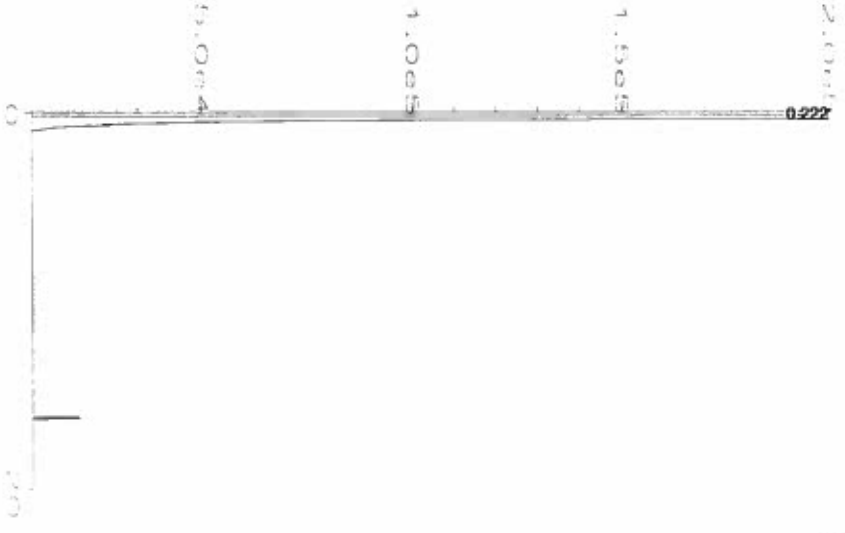
External Standard Report

Data File Name : C:\HPCHEM\1\DATA\99-074\SAMP0007.D
Operator : douglas
Instrument : SOILCON 5
Sample Name : 99-030B BH5
Run Time Bar Code:
Acquired on : 02 Mar 99 02:21 PM
Report Created on: 02 Mar 99 04:46 PM
Last Recalib on : 03 FEB 99 11:11 AM
Multiplier : 0.001

Page Number : 1
Vial Number : 7
Injection Number : 1
Sequence Line : 1
Instrument Method: FEB99W.MTH
Analysis Method : FEB99W.MTH
Sample Amount : 0
ISTD Amount :

Sig. 1 in C:\HPCHEM\1\DATA\99-074\SAMP0007.D

Ret Time	Area	Type	Width	Ref#	mg\L	Name
6.503	685870	HHA	1.458	1	0.551	C10-C20
12.800	251677	HH +	0.000	1	0.175	C20-C32



External Standard Report

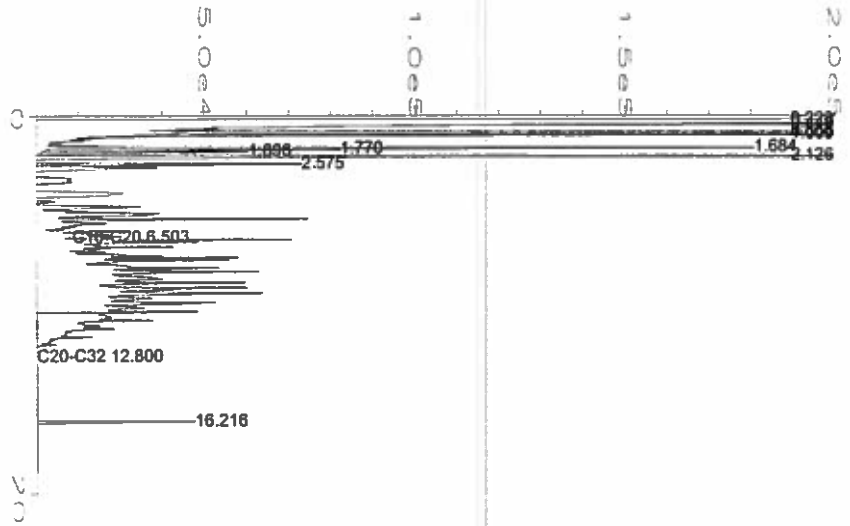
Data File Name : C:\HPCHEM\1\DATA\99-074\SAMP0006.D
Operator : douglas
Instrument : SOILCON 5
Sample Name : 99-030B BH3
Run Time Bar Code:
Acquired on : 02 Mar 99 01:47 PM
Report Created on: 02 Mar 99 04:50 PM
Last Recalib on : 03 FEB 99 11:11 AM
Multiplier : 0.001

Page Number : 1
Vial Number : 6
Injection Number : 1
Sequence Line : 1
Instrument Method: FEB99W.MTH
Analysis Method : FEB99W.MTH
Sample Amount : 0
ISTD Amount :

Sig. 1 in C:\HPCHEM\1\DATA\99-074\SAMP0006.D

Ret Time	Area	Type	Width	Ref#	mg\L	Name
6.536	* not found *			1		C10-C20
12.800	* not found *			1		C20-C32

Not all calibrated peaks were found



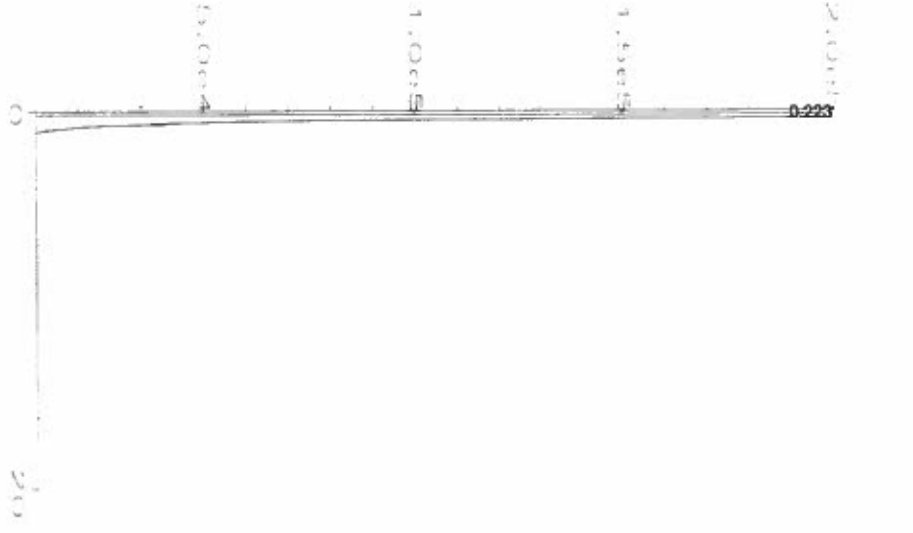
External Standard Report

Data File Name : C:\HPCHEM\1\DATA\99-074\SAMP0009.D
Operator : douglas
Instrument : SOILCON 5
Sample Name : 99-030B BHA
Run Time Bar Code:
Acquired on : 02 Mar 99 03:37 PM
Report Created on: 02 Mar 99 04:46 PM
Last Recalib on : 03 FEB 99 11:11 AM
Multiplier : 0.001

Page Number : 1
Vial Number : 9
Injection Number : 1
Sequence Line : 1
Instrument Method: FEB99W.MTH
Analysis Method : FEB99W.MTH
Sample Amount : 0
ISTD Amount :

Sig. 1 in C:\HPCHEM\1\DATA\99-074\SAMP0009.D

Ret Time	Area	Type	Width	Ref#	mg\L	Name
6.503	1.26108E+007	HHA	2.824	1	13.552	C10-C20
12.800	3140507	HH +	0.000	1	3.228	C20-C32



External Standard Report

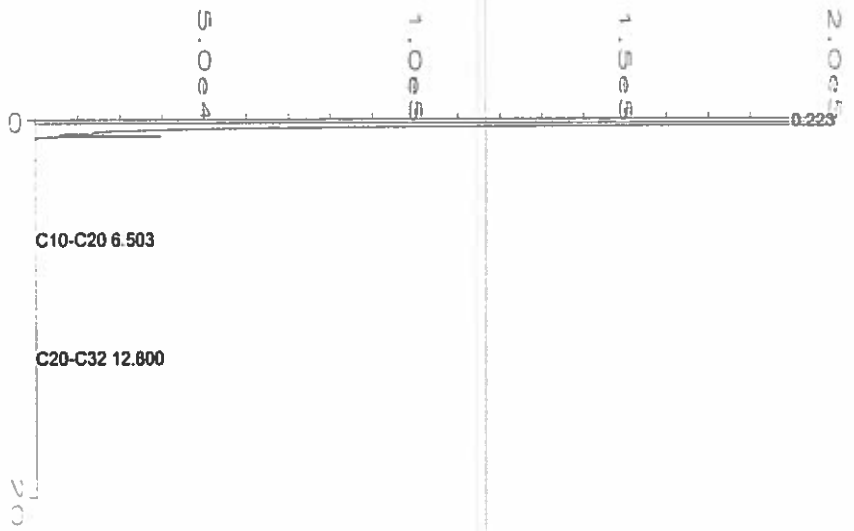
Data File Name : C:\HPCHEM\1\DATA\99-074\SAMP0008.D
Operator : douglas
Instrument : SOILCON 5
Sample Name : 99-030B BH6
Run Time Bar Code:
Acquired on : 02 Mar 99 02:55 PM
Report Created on: 02 Mar 99 04:50 PM
Last Recalib on : 03 FEB 99 11:11 AM
Multiplier : 0.001

Page Number : 1
Vial Number : 8
Injection Number : 1
Sequence Line : 1
Instrument Method: FEB99W.MTH
Analysis Method : FEB99W.MTH
Sample Amount : 0
ISTD Amount :

Sig. 1 in C:\HPCHEM\1\DATA\99-074\SAMP0008.D

Ret Time	Area	Type	Width	Ref#	mg\L	Name
6.536	* not found *			1		C10-C20
12.800	* not found *			1		C20-C32

Not all calibrated peaks were found



External Standard Report

Data File Name : C:\HPCHEM\1\DATA\99-074\SAMP0010.D
Operator : douglas
Instrument : SOILCON 5
Sample Name : 99-030B BHB
Run Time Bar Code:
Acquired on : 02 Mar 99 04:11 PM
Report Created on: 02 Mar 99 04:46 PM
Last Recalib on : 03 FEB 99 11:11 AM
Multiplier : 0.001

Page Number : 1
Vial Number : 10
Injection Number : 1
Sequence Line : 1
Instrument Method: FEB99W.MTH
Analysis Method : FEB99W.MTH
Sample Amount : 0
ISTD Amount :

Sig. 1 in C:\HPCHEM\1\DATA\99-074\SAMP0010.D

Ret Time	Area	Type	Width	Ref#	mg\L	Name
6.503	836196	HHA	3.286	1	0.693	C10-C20
12.800	453153	HH +	0.000	1	0.353	C20-C32

CAVENDISH LABORATORY LTD.
1650 Pandora Street, Vancouver, B.C. V5L 1L6
Ph: 604-251-4456 Fax: 604-258-9497
email: cavendsh@portal.ca

To: **Soilcon Laboratories Ltd.**
#275-11780 River Road
Richmond, BC Canada V6X 1Z7

Attention: **DOUGLAS**
Project: **99-030A**

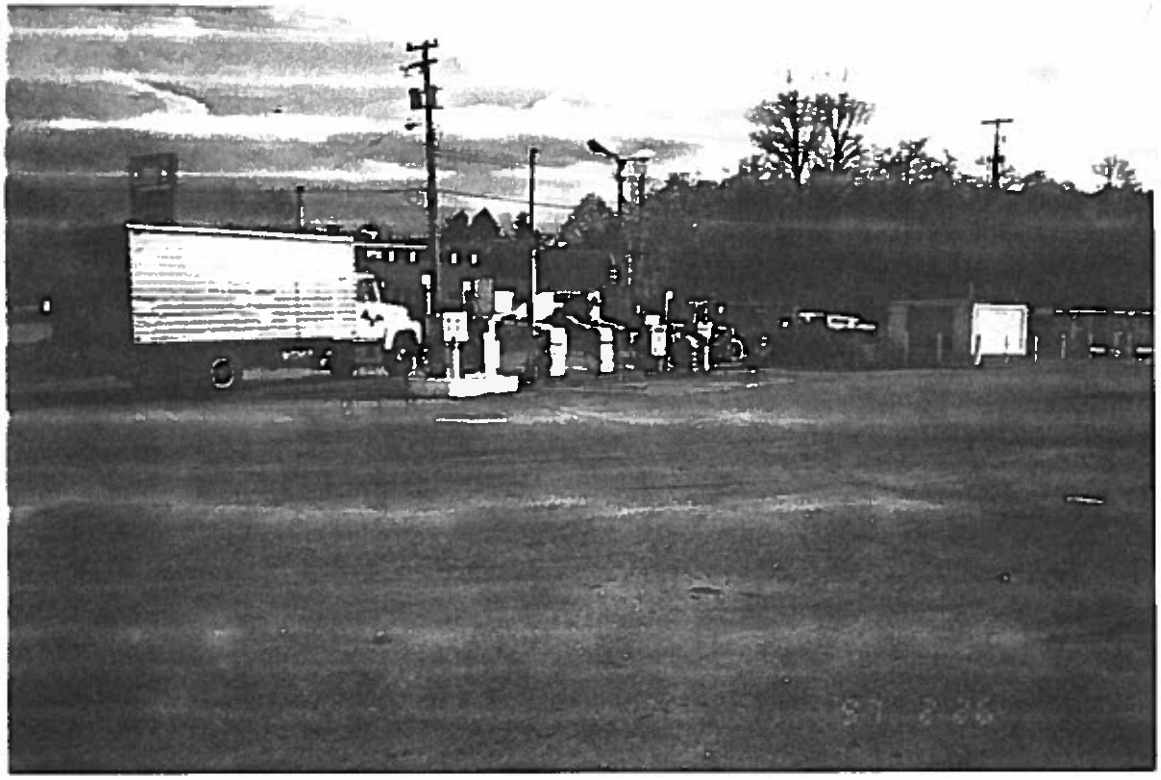
Samples: **2**
Date In: **2/23/99**
Date Out: **2/25/99**
Sample Type: Soil
Physical Preparation: DRY/SIEVE
Type of Analysis: **GENMET**

CERTIFICATE OF ANALYSIS: 990223E

Sample Name	PPM Ag	% Al	PPM As	PPM B	PPM Ba	PPM Be	PPM Bi	% Ca	PPM Cd	PPM Co	PPM Cr	PPM Cu	% Fe	PPM Hg	% K	PPM La	% Mg	PPM Mn	PPM Mo	% Na	PPM Ni	PPM P	PPM Pb	% S	PPM Sb	PPM Se	% Si	PPM Sn	PPM Sr	% Ti	PPM V	PPM W	PPM Zn
99-030A #2	<.1	1.84	7	19	175	.4	<3	.31	.2	9	21	44	2.47	<.01	.09	4	.51	356	3	.03	24	639	14	n/a	<2	<1	.05	<5	57	.11	56	<2	132
99-030A #35	<.1	.62	11	33	52	.3	<3	.81	<.2	3	10	41	.99	<.01	.03	3	.20	133	7	.03	22	233	7	n/a	<2	<1	.04	<5	50	.08	31	<2	41

CERTIFIED BY: *Wade Reeves*

Appendix H: Photographs



Appendix I: Author's Qualifications

Statement of Qualifications of
Matthew Byrne, B.E.S.

EDUCATION:

Bachelor of Environmental Studies BES
(University of Waterloo, Geography 1992)

Professional Education
Contaminated Site Health & Safety
Environment Canada, US E.P.A.
(WTI, 1996)

Contaminated Sites & Toxic Real Estate
(University of British Columbia, 1993)

EXPERIENCE:

Matthew Byrne developed a solid background in environmental studies while attending the University of Waterloo. Through combined studies in geology, ecology, and environmental waste management, he developed good reporting and writing skills needed for work in the environmental field. Matthew has worked in the environmental field since 1992 as a manager dealing mainly with the aspects of environmental protection. As a senior Project Manger, Matthew has developed a broad knowledge of the complexities involved with site investigations and related environmental site works.

Matthew has completed over 200 assignments for industry and has submitted numerous reports to government for review. In the field of environmental protection these assignments have included the detailed site investigation and remediation of numerous retail and bulk petroleum facilities throughout British Columbia. Site upgrade projects that have included complete site decommissioning in order for installation of new facilities have been completed by Matthew for service stations in Kamloops, Quesnel, Chetwynd, Chilliwack, and throughout the Lower Mainland. This has given Matthew a knowledgeable background in environmental protection throughout the province.

Some of the projects Matthew has worked on include project management and remediation of the Chevron Bulk Plant Facility located in Prince George, BC. Matthew assisted in the development of the sampling and testing protocol for Chevron's Quality Assurance program. This program was designed for Chevron in order to detect pollution, if any, prior to it's effects on the environment and to maintain environmental protection throughout Chevron's facilities. Matthew also assisted in the development of sampling protocol as well as the specific site selection for BC Environment's Background Soil Quality Study.

Matthew has combined strong reporting skills with field experience and knowledge of current governmental guidelines to provide Soilcon with a senior manger able to lead all aspects of environmental protection. The following is a selected list of clients for whom Matthew has completed site investigation and remediation projects:

Chevron Canada Ltd.
Imperial Oil Ltd.
Petro Canada Ltd.
Husky Oil Ltd.
Lafarge Canada Inc.
Construction Aggregates Ltd.
Agro-Pacific Industries
Canadian Helicopters
Fraser River Pile & Dredge
Ministry of Environment
Ministry of Forests
University of British Columbia