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**Report  
Confirmation Ground Water Sampling  
Second Quarter 1999  
Grady Way Complex Property  
Renton, Washington**

**July 22, 1999**

**For  
Puget Sound Energy**

July 22, 1999

**Consulting Engineers  
and Geoscientists**

Offices in Washington,  
Oregon, and Alaska

Puget Sound Energy  
Environmental Services  
P.O. Box 90868, MER-04  
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Attention: Barry Lombard

We are pleased to submit our report entitled "Confirmation Ground Water Sampling, Second Quarter 1999" for Puget Sound Energy's (PSE) Grady Way Complex property located in Renton, Washington. Our study was completed in general accordance with the scope of services described in our fee estimate dated February 4, 1999 and the conditions of our general agreement with PSE (Contract No. 9600000888). Changes in the scope of services were verbally authorized by Barry Lombard of PSE.

We appreciate the opportunity to assist PSE on this project. Please contact us if you have questions regarding this report.

Yours very truly,

GeoEngineers, Inc.



*for* Kurt R. Fraese  
Principal

SCW:KRF:pb

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**CONFIRMATION GROUND WATER SAMPLING  
SECOND QUARTER 1999  
GRADY WAY COMPLEX PROPERTY  
RENTON, WASHINGTON  
FOR  
PUGET SOUND ENERGY**

**1.0 INTRODUCTION**

This report presents the results of our quarterly ground water monitoring activities at Puget Sound Energy's (PSE) Grady Way Complex property located at 915 Grady Way South in Renton, Washington. The activities described in this report were completed during May 1999. The location of the site relative to surrounding physical features is shown in Figure 1. The layout of the site is shown in Figure 2.

Three buildings currently are located on site at the locations shown in Figure 2. PSE vacated the facility in 1998 in preparation for the sale of the site.

**2.0 PROJECT BACKGROUND**

PSE has conducted business activities at the subject site since about 1903. Historical on-site business activities included the following: (1) the storage and/or repair of transformers and other electrical equipment, (2) the storage of power poles treated with chemical preservative, (3) the fueling and maintenance of vehicles. A total of 11 underground storage tanks (USTs) and several hydraulic hoists historically were located on site.

GeoEngineers has provided environmental consulting services related to the subject site since 1987. Several phases of site assessment and remedial activities were completed between 1987 and 1999. Remedial activities consisted primarily of the excavation and off-site disposal of soil containing petroleum hydrocarbons, carcinogenic polycyclic aromatic hydrocarbons (cPAHs) and polychlorinated biphenyls (PCBs) at concentrations exceeding applicable cleanup levels. Selected subsurface facilities also were removed from the site during this time. Facilities removed from the site include (1) all USTs and hydraulic hoists, (2) the storm water system in the southern portion of the site, and (3) selected subsurface vaults associated with the storm and sanitary sewer systems. The final phase of facilities removal and remedial activities was completed in November 1998. The results of the 1998 remedial and assessment activities are presented in our report entitled "1998 Site Cleanup Activities, Grady Way Complex Property, Renton, Washington," dated December 23, 1998. This report also summarizes previous studies completed at the site.

The remedial excavation activities successfully removed all known soil with contaminant (petroleum hydrocarbons, cPAHs and PCBs) concentrations exceeding applicable Model Toxics Control Act (MTCA) Method A or Method B residential cleanup levels in the developed portion of the site. Our previous studies indicate that soil contamination remaining in the developed portion of the site is protective of human health based on direct contact scenarios. The ground water monitoring activities described in this report are being completed to evaluate whether

residual on-site soil contamination is protective of ground water. Ground water monitoring is being completed at the site in accordance with our discussions with the Washington State Department of Ecology (Ecology).

### 3.0 SCOPE OF SERVICES

Ground water samples were obtained from 15 monitoring wells during this sampling event. Our specific scope of services for this ground water monitoring event is as follows:

1. Measure the depth to ground water in 17 on-site monitoring wells.
2. Calculate the ground water elevation in each monitoring well and evaluate the direction of shallow ground water flow beneath the site.
3. Measure the airspace in the monitoring well casings for combustible vapors using a Bacharach TLV Sniffer calibrated to hexane.
4. Purge at least three well volumes of water from each well prior to sampling and place the purged water in a labeled and secured 55-gallon drum.
5. Obtain ground water samples from the monitoring wells and submit the samples for chemical analysis of one or more of the following: (1) diesel- and lube oil-range hydrocarbons using Ecology Method NWTPH-D extended, (2) PCBs using EPA Method 8082, (3) cPAHs and other semivolatile organic compounds (SVOCs) using EPA Method 8270, and (4) dibenzodioxins (dioxins) and dibenzofurans (furans) using EPA Method 8290.
6. Evaluate the chemical analytical results relative to current environmental regulations.

### 4.0 GROUND WATER MONITORING RESULTS

#### 4.1 GENERAL

Ground water samples were obtained from 14 on-site monitoring wells and one off-site monitoring well during this sampling event. The locations of the monitoring wells are shown in Figure 2. All of the samples were obtained on May 20, 1999 with one exception; the GMW-4a sample analyzed for the presence of PCBs was collected on May 27, 1999.

The ground water samples were submitted for the chemical analyses identified in Table 1. Fewer ground water samples were obtained and analyzed during this monitoring event (May 1999) relative to our previous monitoring events. Analyses were not performed during this monitoring event (May 1999) for contaminants that were not detected at concentrations exceeding MTCA Method A cleanup levels during the four previous sampling events. Additionally, the ground water sample obtained from GMW-7 was not submitted for analysis of petroleum hydrocarbons because the petroleum-related ground water contamination in this well does not appear to be originating from the site. A summary of our ground water monitoring field procedures is presented in Appendix A.

#### 4.2 GROUND WATER ELEVATIONS

Ground water levels were measured in the monitoring wells on May 20, 1999. The depth to ground water ranged from about 1.64 to 8.00 feet below ground surface (bgs). The maximum depth to ground water (8.00 feet bgs) was measured in monitoring well GMW-12a, which is

located on an elevated loading dock. The depth to ground water and ground water elevations for this and previous monitoring events are presented in Table 2.

Ground water elevations were calculated relative to an assumed site datum of 100.00 feet based on the May 1999 water level measurements. The ground water elevations in each monitoring well and interpolated elevation contours are shown in Figure 2. Shallow ground water beneath the site appears to generally flow in a westerly direction based on our May 20 measurements. The interpolated shallow ground water flow direction based on our May 1999 measurements is similar to previous monitoring events.

A localized easterly ground water flow direction was observed beneath the western-most corner of the site (near GMW-8, GMW-13 and GMW-14) during previous monitoring events. This localized reversal of ground water flow direction also appeared to be present beneath the site based on our May 20, 1999 measurements; however, the observed magnitude of the gradient reversal was less during our May 20 monitoring event relative to previous monitoring events. This localized reversal of ground water flow direction may be related to ground water "mounding" associated with underground utility trenches beneath the adjacent roads (Grady Way South and Talbot Road), as summarized in our previous reports.

### **4.3 COMBUSTIBLE VAPOR CONCENTRATIONS**

Combustible vapors were detected at concentrations greater than 10,000 parts per million (ppm) in the casings of monitoring wells GMW-1, GMW-5, GMW-6, GMW-7, GMW-9, GMW-10, GMW-11 and MW-4. Combustible vapors either were not detected or were detected at concentrations less than 400 ppm in the other monitoring wells.

Based on the analytical results for ground water samples obtained from these wells, it is our opinion that elevated concentrations of combustible vapors in monitoring well casings at the site do not necessarily indicate the presence of ground water contamination. The elevated vapors measured in the casings likely are related to methane associated with the presence of coal debris in fill soil at the site.

### **4.4 CHEMICAL ANALYTICAL RESULTS**

Ground water samples obtained during the May 1999 sampling event were submitted for analysis of one or more of the following, as previously described: (1) diesel- and lube oil-range hydrocarbons, (2) PCBs, (3) cPAHs and other SVOCs, and (4) dioxins and furans. Chemical analytical results for the ground water samples are presented in Tables 3 and 4. Please note that the analytical results for cPAHs/SVOCs are presented as footnotes in Table 3. Laboratory reports for the chemical analyses are presented in Appendix B. A summary of the analytical results is presented below.

#### **4.4.1 Diesel- and Lube Oil-range Hydrocarbons**

Diesel-and lube oil-range hydrocarbons were detected at concentrations exceeding the MTCA Method A cleanup level [1.0 milligram per liter (mg/l) for total petroleum hydrocarbons] in the ground water samples obtained from monitoring wells GMW-8 and GMW-12a. The combined

concentrations of diesel- and lube oil-range hydrocarbons detected in these wells were 3.306 mg/l and 1.135 mg/l, respectively. Diesel- and lube oil-range hydrocarbons either were not detected or were detected at concentrations less than the MTCA Method A cleanup level in the other ground water samples analyzed.

#### 4.4.2 PCBs

PCBs were detected at a concentration [1.18 micrograms per liter ( $\mu\text{g/l}$ )] exceeding the MTCA Method A cleanup level (0.1  $\mu\text{g/l}$ ) in the ground water sample obtained from GMW-4a. PCBs were not detected in the other ground water samples obtained during this monitoring event.

In our opinion, PCBs likely are present in sample GMW-4a because PCB-contaminated soil was removed (excavated) from this area during remedial activities in November 1998. We anticipate that residual PCB-related ground water contamination in GMW-4a will decrease over time.

#### 4.4.3 SVOCs Including cPAHs

One or more SVOCs (acenaphthene, fluorene and/or naphthalene) were detected at concentrations less than the respective MTCA Method B cleanup levels for these compounds in the ground water sample obtained from GMW-7. These SVOCs were detected at concentrations ranging from 0.566  $\mu\text{g/l}$  to 5.94  $\mu\text{g/l}$ . Phenanthrene also was detected in GMW-5 and GMW-7 at concentrations of 0.302  $\mu\text{g/l}$  and 2.36  $\mu\text{g/l}$ , respectively. A MTCA Method B cleanup level has not been established for Phenanthrene. Other SVOCs were not detected in the ground water samples tested. Carcinogenic PAHs were not detected in any of the ground water samples obtained from the site during this monitoring event.

#### 4.4.4 Dioxins and Furans

One 2,3,7,8-substituted dioxin congener (OCDD) was detected in the ground water sample obtained from GMW-12a. OCDD was detected in this sample at a concentration of 11.84 picograms per liter (ppl). Other dioxins and furans were not detected in the ground water sample. Chemical analytical results for the dioxin/furan analysis are presented in Table 4.

The potential health risk presented by the presence of OCDD in ground water beneath the site was evaluated using the toxicity equivalency factor (TEF) approach. This approach assigns TEFs to dioxins/furans relative to 2,3,7,8-Tetrachlorinated dibenzo-p-dioxin (2,3,7,8-TCDD). TEFs are defined as the ratio of the toxicity of a given dioxin/furan to that of 2,3,7,8-TCDD in the same biological assay. The TEF approach assumes that the potency of the dioxins/furans relative to each other is constant. In this risk evaluation the TEF approach was applied by multiplying the constituent-specific TEF by the analytical result and then comparing the resulting TEQ concentration to the MTCA Method B cleanup level for 2,3,7,8-TCDD ( $5.83\text{E-}07$   $\mu\text{g/l}$ ) in ground water.

Our TEF evaluation of sample GMW-12a is shown in Table 4. The total 2,3,7,8-TCDD equivalent concentration for ground water sample GMW-12a is  $1.184\text{E-}08$   $\mu\text{g/l}$ . This

concentration is one order of magnitude less than the MTCA Method B cleanup level for 2,3,7,8-TCDD in ground water (5.83E-07 µg/l).

## 5.0 CONCLUSIONS AND RECOMMENDATIONS

GeoEngineers completed ground water monitoring activities in accordance with the sampling and analysis plan presented in our previous (first quarter 1999) quarterly monitoring report. In general, the information obtained during the May 1999 ground water monitoring event is relatively consistent with past monitoring events. Petroleum hydrocarbons (GMW-8 and GMW-12a) and PCBs (GMW-4a) were detected at concentrations exceeding MTCA Method A cleanup levels in limited portions of the site. Petroleum-related contamination has been detected in GMW-8 during previous monitoring events, and appears to be migrating onto the site from beneath adjacent roads (Talbot Road and/or Grady Way South). Petroleum-related contamination has not previously been detected in GMW-12a. However, the sum of diesel- and heavy oil-range hydrocarbons detected in GMW-12a (1.135 mg/l) only slightly exceeds the MTCA Method A cleanup level (1.0 mg/l). Residual petroleum hydrocarbons likely are present in GMW-12a because this well is located in the immediate vicinity of a remedial soil excavation completed during the fall of 1998. We anticipate that residual petroleum hydrocarbon concentrations in ground water will decrease with time at the location of GMW-12a.

PCB-related ground water contamination also has been detected in GMW-4a during previous monitoring events. We anticipate that residual concentrations of PCBs in ground water beneath this portion of the site will decrease with time because PCB-contaminated soil was excavated at this location during the fall of 1998.

At least four quarters of ground water chemical analytical data now exists for the contaminants of concern at the site (excluding cPAHs and SVOCs, as discussed below). During the past four consecutive monitoring events, contaminants of concern either have not been detected in ground water or have been detected at concentrations less than MTCA Method A cleanup levels with the following exceptions:

- Diesel- and heavy oil-range hydrocarbons in GMW-4a, GMW-8, GMW-12a, GMW-13 and GMW-14.
- PCBs in GMW-4a.

The existing ground water monitoring data suggests that the petroleum-related contamination detected in GMW-8, GMW-13 and GMW-14 is migrating onto the site from beneath adjacent roads, as previously described. Therefore, we recommend that these monitoring wells not be sampled during the next (August 1999) monitoring event. We recommend sampling and testing for petroleum hydrocarbons in GMW-12a and GMW-4a, and PCBs in GMW-4a during the next monitoring event because: (1) these ground water contaminants appear to be related to a former on-site source (contaminated soil), and (2) these contaminants have been detected in these wells at concentrations exceeding MTCA Method A cleanup levels during at least one of the last four monitoring events. Additionally, we recommend obtaining one more ground water sample (August 1999) from GMW-6 and two more samples (August and November 1999) from GMW-7

for the analysis of cPAHs/SVOCs; this will provide four quarters of data for these analytes in these wells. Four quarters of analytical data already exist for cPAHs/SVOCs in monitoring wells GMW-4a, GMW-5, GMW-10 and GMW-11. Carcinogenic PAHs and other SVOCs have not been detected at concentrations exceeding MTCA cleanup levels in these wells.

## 6.0 LIMITATIONS

We have prepared this report for use by Puget Sound Energy, their authorized agents and regulatory agencies. This report is not intended for use by others, and the information contained herein is not applicable to other sites. If a lending agency or other parties intend to place reliance on the product of our services, we require that those parties indicate in writing their acknowledgment that the scope of services provided, and the general conditions under which the services were rendered are understood and accepted by them. This is to provide our firm with reasonable protection against open-end litigation by third parties with whom there otherwise would be no contractual limits to their actions.

No ESA or remedial action can wholly eliminate the potential for contamination to remain at the property at concentrations exceeding applicable cleanup levels. Performance of this practice is intended to reduce, but not eliminate, uncertainty regarding the potential for remaining contamination in connection with a property. Our conclusions are based on chemical analytical results from soil and ground water samples obtained during our site studies. There always is a potential that areas of contamination may exist in portions of the site that were not sampled or tested during this or prior studies. Further evaluation of such potential would require additional research, subsurface exploration, sampling and testing.

Some substances may be present in the site vicinity in quantities or under conditions that may have led, or may lead, to contamination of the subject site, but are not included in current local, state, or federal regulatory definitions of hazardous substances or do not otherwise present current potential liability. GeoEngineers cannot be responsible if the standards of all appropriate inquiry or regulatory definitions of hazardous substances change, or if you are required to meet more stringent standards in the future.

GeoEngineers has performed site characterization, facilities removal and remedial action monitoring at the Puget Sound Energy property at 915 Grady Way South in Renton, Washington within the limitations of scope, schedule and budget. Our services have been executed in accordance with our general agreement with Puget Sound Energy (Contract No. 960000888) and generally accepted environmental science practices in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.



We appreciate the opportunity to assist Puget Sound Energy on this project. Please call if you have questions.

Yours very truly,

GeoEngineers, Inc.



Stephen C. Woodward  
Project Geologist



for Kurt R. Fraese  
Principal

SCW:KRF:pb

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**Attachments**

**Four copies submitted**

**TABLE 1**  
**GROUND WATER ANALYTICAL PROGRAM**  
**FOR MAY 1999 SAMPLING EVENT**  
**Puget Sound Energy Grady Way Site**  
**Renton, Washington**

Monitoring Well	Proposed Analytes/Analyses			
	TPH <sup>1</sup>	PCBs <sup>2</sup>	PAHs <sup>3</sup>	Dioxins / Furans <sup>4</sup>
GMW-1		X		
GMW-2/2a	X	X		
GMW-4/4a	X	X		
GMW-5			X	
GMW-6			X	
GMW-7			X	
GMW-8	X	X		
GMW-9	X	X		
GMW-10	X	X	X	
GMW-11	X	X	X	
GMW-12/12a	X	X		X
GMW-13	X			
GMW-14	X			
MW-4	X			
MW-20	X			

**Notes:**

<sup>1</sup>TPH = Total petroleum hydrocarbons using Ecology Method NWTPH-D extended

<sup>2</sup>PCBs = Polychlorinated biphenyls using EPA Method 8082

<sup>3</sup>PAHs = Polycyclic aromatic hydrocarbons and other semivolatile organic compounds (SVOCs) using EPA Method 8270

<sup>4</sup>Dibenzodioxins and dibenzofurans using EPA Method 8290

**TABLE 2 (Page 1 of 3)**  
**SUMMARY OF GROUND WATER ELEVATIONS**

Puget Sound Energy Grady Way Site  
 Renton, Washington

Monitoring Well <sup>1</sup>	Date Measured	Depth to Ground Water <sup>2</sup> (feet)	Ground Water Elevation <sup>3</sup> (feet)
GMW-1	08/27/98	5.27	94.39
	11/03/98	5.00	94.66
	11/24/98	4.34	95.32
	11/30/98	3.74	95.92
	02/24/99	3.21	96.45
	05/20/99	4.16	95.50
GMW-2/2a <sup>4</sup>	08/27/98	4.80	94.82
	11/03/98	4.05	94.59
	11/24/98	2.59	96.05
	11/30/98	2.46	96.18
	02/24/99	1.17	97.47
	05/20/99	3.10	95.54
GMW-3/3a <sup>4</sup>	08/27/98	3.11	94.12
	11/03/98	2.33	94.79
	11/24/98	1.65	95.47
	11/30/98	1.42	95.70
	02/24/99	0.83	96.29
	05/20/99	1.64	95.48
GMW-4/4a <sup>4</sup>	08/27/98	4.26	92.81
	11/03/98	2.64	93.94
	11/24/98	-	-
	11/30/98	1.45	95.13
	02/24/99	0.58	96.00
	05/20/99	2.04	94.54
GMW-5	08/27/98	5.24	91.93
	11/03/98	4.33	92.84
	11/24/98	3.60	93.57
	11/30/98	2.93	94.24
	02/24/99	2.80	94.37
	05/20/99	3.80	93.37
GMW-6	08/27/98	3.27	92.91
	11/03/98	3.37	92.81
	11/24/98	2.23	93.95
	11/30/98	1.60	94.58
	02/24/99	1.24	94.94
	05/20/99	2.09	94.09
GMW-7	08/27/98	6.23	91.28
	11/03/98	5.58	91.93
	11/24/98	-	-
	11/30/98	4.29	93.22
	02/24/99	4.06	93.45
	05/20/99	5.09	92.42

TABLE 2 (Page 2 of 3)

Monitoring Well <sup>1</sup>	Date Measured	Depth to Ground Water <sup>2</sup> (feet)	Ground Water Elevation <sup>3</sup> (feet)
GMW-8	08/27/98	6.44	91.67
	11/03/98	6.00	92.11
	11/24/98	5.00	93.11
	11/30/98	4.60	93.51
	02/24/99	4.40	93.71
	05/20/99	5.41	92.70
GMW-9	08/27/98	7.64	91.07
	11/03/98	6.87	91.84
	11/24/98	6.29	92.42
	11/30/98	5.85	92.86
	02/24/99	5.74	92.97
	05/20/99	6.39	92.32
GMW-10	08/27/98	4.73	91.11
	11/03/98	3.83	92.01
	11/24/98	3.23	92.61
	11/30/98	2.60	93.24
	02/24/99	2.40	93.44
	05/20/99	3.35	92.49
GMW-11	08/27/98	6.05	92.70
	11/03/98	5.28	93.44
	11/24/98	5.00	93.75
	11/30/98	4.42	94.33
	02/24/99	4.09	94.66
	05/20/99	5.10	93.65
GMW-12/12a <sup>4,5</sup>	08/27/98	-	-
	11/03/98	9.49	93.09
	11/24/98	-	-
	11/30/98	8.02	94.56
	02/24/99	7.18	95.40
	05/20/99	8.00	94.58
GMW-13	08/27/98	-	-
	11/03/98	-	-
	11/24/98	6.10	92.76
	11/30/98	5.86	93.00
	02/24/99	5.67	93.19
	05/20/99	6.22	92.64
GMW-14	08/27/98	-	-
	11/03/98	-	-
	11/24/98	6.11	92.95
	11/30/98	5.66	93.40
	02/24/99	5.50	93.56
	05/20/99	6.35	92.71

Notes appear on Page 3 of 3.

TABLE 2 (Page 3 of 3)

Monitoring Well <sup>1</sup>	Date Measured	Depth to Ground Water <sup>2</sup> (feet)	Ground Water Elevation <sup>3</sup> (feet)
MW-4	08/27/98	5.76	92.45
	11/03/98	5.42	89.51
	11/24/98	4.86	90.07
	11/30/98	4.65	90.28
	02/24/99	4.45	90.48
	05/20/99	5.21	89.72
MW-10	08/27/98	8.38	91.86
	11/03/98	8.12	92.12
	11/24/98	7.40	92.84
	11/30/98	7.17	93.07
	02/24/99	6.94	93.30
	05/20/99	7.56	92.68
MW-20	08/27/98	7.23	92.31
	11/03/98	7.87	91.67
	11/24/98	7.15	92.39
	11/30/98	6.92	92.62
	02/24/99	6.75	92.79
	05/20/99	7.31	92.23

Notes:

<sup>1</sup> Approximate locations of the monitoring wells are shown in Figure 2.

<sup>2</sup> The depths to ground water were measured relative to the tops of the monitoring well casings.

<sup>3</sup> Casing elevations were surveyed relative to a temporary benchmark. The benchmark was assigned an arbitrary elevation of 100.00 feet.

<sup>4</sup> Monitoring well was abandoned during remedial activities and subsequently replaced.

<sup>5</sup> This monitoring well is located on a storage dock that is elevated several feet above surrounding site grades.

— = not measured

TABLE 3 (Page 1 of 4)  
**SUMMARY OF GROUND WATER CHEMICAL ANALYTICAL DATA<sup>1</sup>**  
 Puget Sound Energy Grady Way Site  
 Renton, Washington

Sample Number <sup>2</sup>	Date Sampled	Petroleum Hydrocarbons <sup>3</sup> (mg/l)		PCBs <sup>4</sup> (µg/l)	Dissolved Arsenic <sup>5</sup> (µg/l)	pH <sup>6</sup> (pH units)
		Diesel-Range	Lube Oil-Range			
GMW-1 ✓	02/20/98	0.320	<0.500	-	-	-
	08/29/98	<0.250	<0.500	<0.100	-	7.08
	11/03/98	<0.250	<0.500	<0.100	-	6.46
	02/24/99	<0.250	<0.500	<0.100	-	6.37
	05/20/99	-	-	<0.100	-	-
GMW-2 GMW-2a <sup>7</sup>	02/20/98	0.396	0.970	-	-	-
	08/29/98	<0.250	<0.500	<0.100	-	7.12
	11/03/98	<0.250	<0.500	<0.100	-	6.98
	02/24/99	<0.250	<0.500	<0.100	-	6.91
	05/20/99	<0.250	<0.500	<0.100	-	-
GMW-3 GMW-3a <sup>7</sup>	02/20/98	<0.250	<0.500	<0.100	-	-
	08/29/98 <sup>8</sup>	<0.250	<0.500	<0.100	-	7.20
	09/17/98	-	-	-	2.56	-
	11/03/98	<0.250	<0.500	<0.100	15.2	6.40
	02/24/99	<0.250	<0.500	<0.100	<1.00	6.47
GMW-4 GMW-4a <sup>7</sup> * } >	02/20/98 <sup>9</sup>	0.404	<0.500	1.17 <sup>10</sup>	-	-
	08/29/98 <sup>9</sup>	<0.250	<0.500	<0.100	-	6.93
	11/03/98 <sup>9</sup>	0.802	1.52	0.506 <sup>10</sup>	-	6.30
	03/02/99 <sup>11</sup>	0.361	<0.500	<0.100	-	6.35
	05/20/99 <sup>12</sup>	0.488	<0.500	1.18 <sup>10</sup>	-	-
GMW-5 ✓	02/20/98	<0.250	<0.500	<0.100	-	-
	08/29/98 <sup>9</sup>	<0.250	<0.500	<0.100	-	6.81
	11/03/98 <sup>9</sup>	<0.250	<0.500	<0.100	-	6.30
	02/24/99 <sup>9</sup>	0.267	<0.500	<0.100	-	6.26
	05/20/99 <sup>11</sup>	-	-	-	-	-
GMW-6 ✓	02/20/98	<0.250	<0.500	<0.100	-	-
	08/29/98	<0.250	<0.500	<0.100	-	6.91
	11/03/98 <sup>9</sup>	<0.250	<0.500	<0.100	-	6.47
	02/24/99 <sup>9</sup>	<0.250	<0.500	<0.100	-	6.40
	05/20/99 <sup>9</sup>	-	-	-	-	-
MTC A Method A Cleanup Level		1.0 <sup>13</sup>		0.1	5.0	NA

\* any excavation in this area?

Notes appear on Page 4 of 4

TABLE 3 (Page 2 of 4)

Sample Number <sup>2</sup>	Date Sampled	Petroleum Hydrocarbons <sup>3</sup> (mg/l)		PCBs <sup>4</sup> (µg/l)	Dissolved Arsenic <sup>5</sup> (µg/l)	pH <sup>6</sup> (pH units)
		Diesel-Range	Lube Oil-Range			
GMW-7 ✕	02/20/98	4.55	7.72	<0.100	-	-
	08/29/98	1.25	1.96	<0.100	-	6.74
	11/03/98	9.43	15.8	<0.100	-	6.52
	02/24/99 <sup>11</sup>	3.44	3.45	<0.100	-	6.38
	05/20/99 <sup>11</sup>	-	-	-	-	-
GMW-8 ✕	08/29/98	<0.250	<0.500	<0.100	5.95	7.31
	11/03/98	0.385	0.942	<0.100	2.28	6.44
	11/24/98	1.84	5.13	-	-	-
	02/24/99	0.372	<0.500	<0.100	3.19	6.24
	05/20/99	0.886	2.42	<0.100	-	-
GMW-9 ✓	08/29/98	<0.250	<0.500	<0.100	3.67	7.09
	11/03/98	<0.250	<0.500	<0.100	2.87	6.75
	02/24/99	<0.250	<0.500	<0.100	1.38	6.53
	05/20/99	<0.250	<0.500	<0.100	-	-
GMW-10 ✓	08/29/98 <sup>9</sup>	<0.250	<0.500	<0.100	16.0	6.88
	11/03/98 <sup>9</sup>	<0.250	<0.500	<0.100	5.15	6.41
	02/24/99 <sup>9</sup>	<0.250	<0.500	<0.100	2.30	6.30
	05/20/99 <sup>9</sup>	<0.250	<0.500	<0.100	-	-
GMW-11 ✓	08/29/98 <sup>9</sup>	<0.250	<0.500	<0.100	7.36	6.88
	11/03/98 <sup>9</sup>	<0.250	<0.500	<0.100	1.22	6.42
	02/24/99 <sup>9</sup>	<0.250	<0.500	<0.100	<1.00	6.33
	05/20/99 <sup>9</sup>	0.280	<0.500	<0.100	-	-
GMW-12 GMW-12a <sup>7</sup>	09/08/98	<0.250	<0.500	<0.100	<1.00	6.61
	11/03/98	<0.250	<0.500	<0.100	8.46	6.56
	02/24/99	0.325	<0.500	<0.100	1.74	6.44
	05/20/99	0.349	0.785	<0.100	-	-
GMW-13	11/24/98	0.472	1.21	-	-	-
	02/24/99	<0.250	<0.500	-	-	6.30
	05/20/99	<0.250	<0.500	-	-	-
GMW-14	11/24/98	1.05	2.95	-	-	-
	02/24/99	0.555	0.969	-	-	6.31
	05/20/99	<0.250	<0.500	-	-	-
MTCA Method A Cleanup Level		1.0 <sup>13</sup>		0.1	5.0	NA

Notes appear on Page 4 of 4

TABLE 3 (Page 3 of 4)

Sample Number <sup>2</sup>	Date Sampled	Petroleum Hydrocarbons <sup>3</sup> (mg/l)		PCBs <sup>4</sup> (µg/l)	Dissolved Arsenic <sup>5</sup> (µg/l)	pH <sup>6</sup> (pH units)
		Diesel-Range	Lube Oil-Range			
MW-4 J	08/29/98 <sup>14</sup>	<0.250	<0.500	—	55.5	6.99
	09/17/98	—	—	—	19.9	—
	11/03/98 <sup>14</sup>	<0.250	<0.500	—	12.1	6.56
	02/24/99	—	—	—	2.15	6.55
	05/20/99	<0.250	<0.500	—	—	—
MW-10 J	12/22/97	<0.250	<0.500	<0.100	—	—
	08/29/98 <sup>14</sup>	<0.250	<0.500	—	1.06	7.16
	11/03/98 <sup>14</sup>	<0.250	<0.500	<0.100	<1.00	6.54
	02/24/99	<0.250	<0.500	—	<1.00	6.57
MW-20 <sup>14</sup> J	08/29/98 <sup>14</sup>	<0.250	<0.500	—	4.26	8.08
	11/03/98 <sup>14</sup>	<0.250	<0.500	—	1.70	6.63
	02/24/99	<0.250	<0.500	—	<1.00	6.53
	05/20/99	<0.250	<0.500	—	—	—
MTCA Method A Cleanup Level		1.0 <sup>13</sup>		0.1	5.0	NA

Notes appear on Page 4 of 4

TABLE 3 (Page 4 of 4)

Notes:

- <sup>1</sup> Chemical analyses were performed by North Creek Analytical Laboratory of Bothell, Washington.
  - <sup>2</sup> Ground water sampling locations are shown in Figure 2. Ground water sampling procedures are described in Appendix A.
  - <sup>3</sup> Diesel- and lube oil-range hydrocarbons analyzed using Ecology Method NWTPH-D extended.
  - <sup>4</sup> Polychlorinated biphenyls (PCBs) analyzed using EPA Method 8082.
  - <sup>5</sup> Dissolved arsenic analyzed using EPA Method 6020.
  - <sup>6</sup> pH analyzed using EPA Method 150.1.
  - <sup>7</sup> Monitoring well was abandoned during remedial activities and subsequently replaced.
  - <sup>8</sup> The ground water sample submitted for analysis of petroleum hydrocarbons was obtained on September 8, 1998.
  - <sup>9</sup> This sample also was submitted for analysis of carcinogenic polycyclic aromatic hydrocarbons (cPAHs) and other semivolatile organic compounds (SVOCs) using EPA Method 8270. cPAHs and other SVOCs were not detected in the sample.
  - <sup>10</sup> PCBs detected in this sample consisted of Aroclor 1242.
  - <sup>11</sup> These samples also were submitted for analysis of cPAHs and other SVOCs using EPA Method 8270. One or more PAHs (acenaphthene, fluorene, naphthalene and phenanthrene) were detected in the samples at concentrations ranging from 0.113 to 5.94 µg/l, which are less than the respective MTCA Method B cleanup levels for these compounds. Carcinogenic PAHs were not detected in the samples.
  - <sup>12</sup> The ground water sample submitted for analysis of PCBs was obtained from GMW-4a on 05/27/99.
  - <sup>13</sup> The MTCA Method A cleanup level applies to the sum of all ranges of petroleum hydrocarbons.
  - <sup>14</sup> This sample also was submitted for analysis of gasoline-range hydrocarbons using NWTPH-G, and benzene, ethylbenzene, toluene and xylenes (BETX) using EPA Method 8021B. Gasoline-range hydrocarbons and BETX were not detected in the sample.
  - <sup>15</sup> A ground water sample also was obtained from MW-20 on 09/17/98 and 11/03/98 and submitted for analysis of halogenated volatile organic compounds (HVOCs) using EPA Method 8021B. HVOCs were not detected in these samples.
- "—" = not tested  
NA = not applicable  
mg/l = milligrams per liter  
µg/l = micrograms per liter  
MTCA = Model Toxics Control Act  
Shaded values exceed MTCA Method A cleanup levels.  
Entries in bold text indicate samples were obtained during the most recent monitoring event.

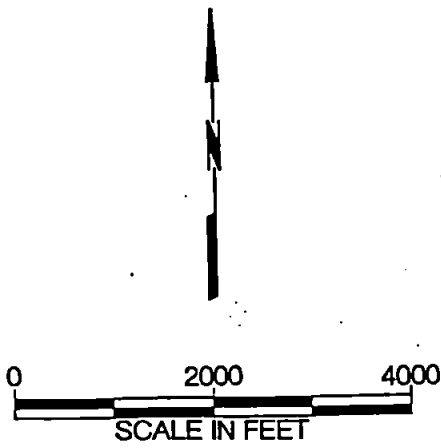
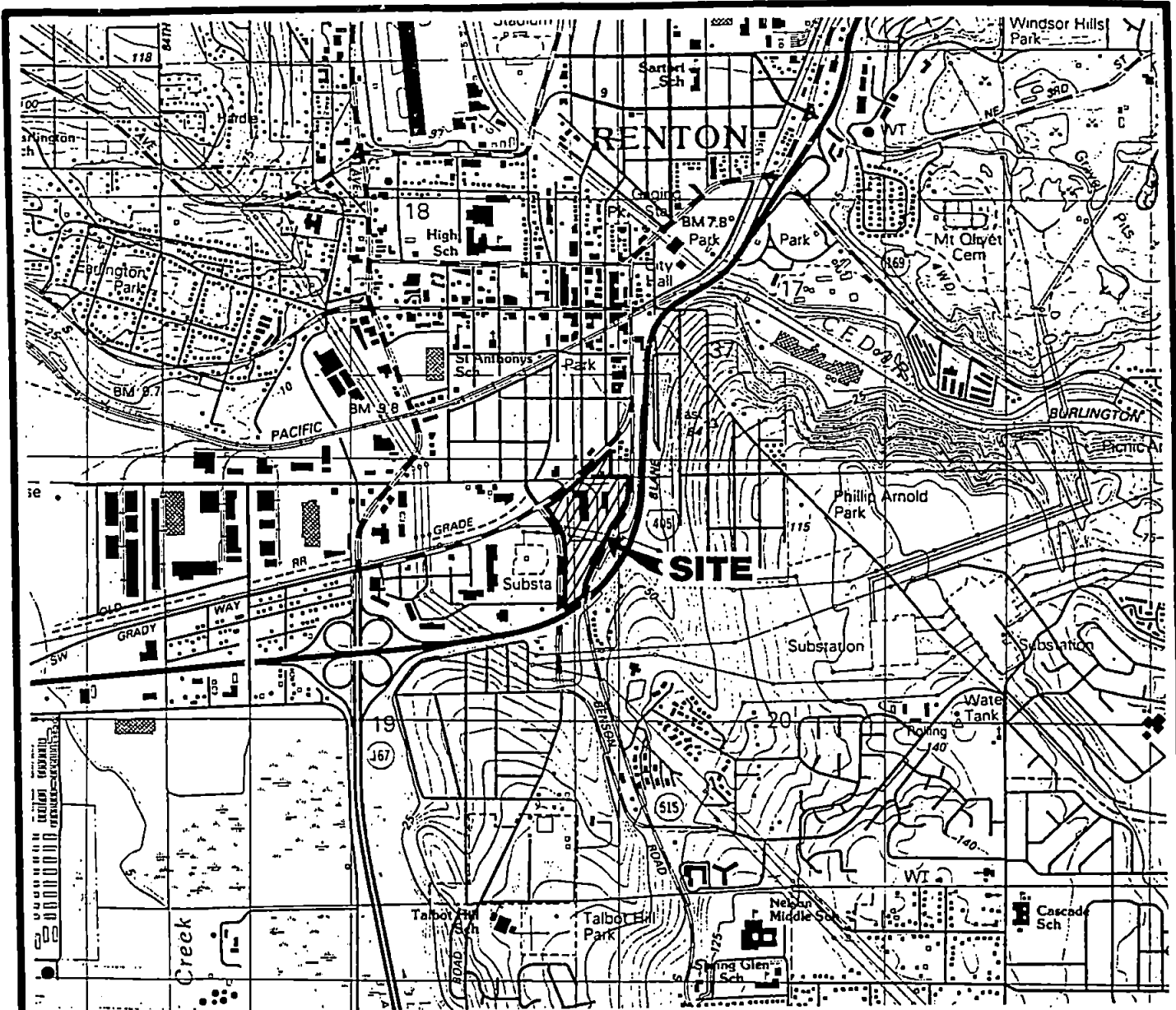
TABLE 4  
 SUMMARY OF GROUND WATER CHEMICAL ANALYTICAL DATA <sup>1</sup>  
 DIOXINS AND FURANS  
 Puget Sound Energy Grady Way Site  
 Renton, Washington

Sample Number <sup>2</sup>	Date Sampled	Analyte Detected <sup>3</sup>	Detected Concentration (pg/l)	Detected Concentration <sup>4</sup> (µg/l)	2,3,7,8-TCDD TEF <sup>5</sup>	2,3,7,8-TCDD TEQ <sup>6</sup> (µg/l)
GMW-12a	05/20/99	OCDD	11.84	1.184E-05	0.001	1.184E-08
Total						1.184E-08
MTCA Method B cleanup level for 2,3,7,8-TCDD						5.83E-07

*of a certain  
 the TEF value?*

Notes

- <sup>1</sup>Chemical analyses were performed by Quanterra Inc. of Sacramento, California. Dibenzodioxins (dioxins) and dibenzofurans (furans) were analyzed using EPA Method 8290. The laboratory report is presented in Appendix B. The potential health risk posed by dioxins/furans was evaluated using the toxicity equivalency factor (TEF) approach, as described in the text of this report.
- <sup>2</sup>Ground water sampling location is shown in Figure 2.
- <sup>3</sup>Only those analytes detected are shown. See the laboratory report for a complete list of analytes and method detection limits.
- <sup>4</sup>Detected concentrations in units of µg/l. To convert from pg/l to µg/l, the reported concentration (in pg/l) is multiplied by 1E-06.
- <sup>5</sup>EPA/600/BP-92/001C. August 1994. External Review Draft. Health Assessment Document for 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) and Related Compounds, Volume III of III. U.S. Environmental Protection Agency. (1989) Interim procedures for estimating risks associated with exposures to mixtures of chlorinated dibenzo-p-dioxins and dibenzofurans (CDDs and CDFs) and 1989 update. Risk Assessment Forum, EPA/625/3-89/016. National Technical Information Service, Springfield, VA; PB90-145756.
- <sup>6</sup>The 2,3,7,8-TCDD TEQ concentration is calculated by multiplying the detected concentration of an analyte by the TEF.
- TCDD=Tetrachlorodibenzo-p-dioxin  
 TEF=Toxicity Equivalency Factor; defined as the ratio of the toxicity of a given dioxin/furan to that of 2,3,7,8-TCDD in the same biological assay.  
 TEQ=Toxic Equivalent  
 pg/l=picograms per liter  
 µg/l=micrograms per liter



Reference: USGS 7.5' X 15' topographic-bathymetric quadrangle map "Renton, Wash.," dated 1983.



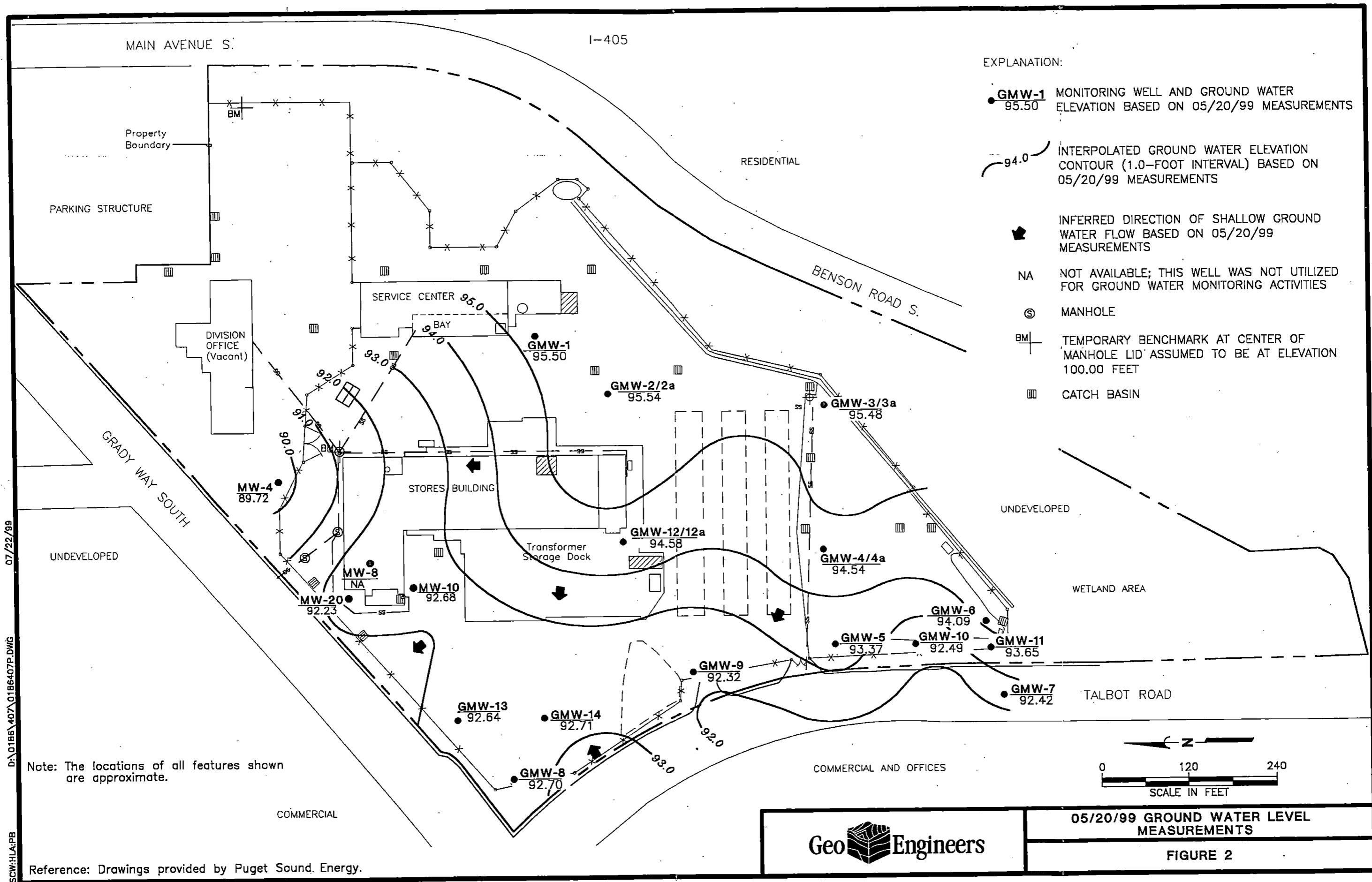
VICINITY MAP

FIGURE 1

0186-346-R85 LCM:EDH 9/1/85

TNO:HLA 0186-407-85 10/29/97

10/1/15



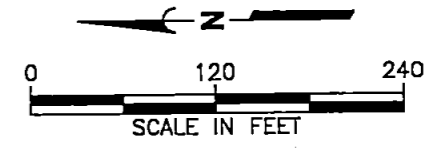
EXPLANATION:

- **GMW-1** MONITORING WELL AND GROUND WATER ELEVATION BASED ON 05/20/99 MEASUREMENTS  
95.50
- 94.0 — INTERPOLATED GROUND WATER ELEVATION CONTOUR (1.0-FOOT INTERVAL) BASED ON 05/20/99 MEASUREMENTS
- ➔ INFERRED DIRECTION OF SHALLOW GROUND WATER FLOW BASED ON 05/20/99 MEASUREMENTS
- NA NOT AVAILABLE; THIS WELL WAS NOT UTILIZED FOR GROUND WATER MONITORING ACTIVITIES
- ⊙ MANHOLE
- BM TEMPORARY BENCHMARK AT CENTER OF MANHOLE LID ASSUMED TO BE AT ELEVATION 100.00 FEET
- ▣ CATCH BASIN

07/22/99  
 D:\01BB\407\01B6407P.DWG  
 SCW:HIA:PB

Note: The locations of all features shown are approximate.

Reference: Drawings provided by Puget Sound Energy.



	<b>05/20/99 GROUND WATER LEVEL MEASUREMENTS</b>
<b>FIGURE 2</b>	

**APPENDIX A**

**FIELD PROCEDURES**

## APPENDIX A

### FIELD PROCEDURES

#### GROUND WATER MONITORING

Prior to obtaining ground water samples, we measured combustible vapors and the depth to ground water in each monitoring well. Combustible vapors were measured using a Bacharach TLV Sniffer calibrated to hexane. The depths to ground water were measured using an electronic water level indicator. The water level indicator was cleaned with a Liquinox wash and distilled water rinse prior to use in each well.

Ground water samples were obtained from the monitoring wells after purging a minimum of three well volumes of water from the well casings. The ground water samples were obtained using disposable polyethylene bailers. The samples were transferred to laboratory-prepared bottles in the field and kept cool during transport to the testing laboratory. Chain-of-custody procedures were observed during transport of the samples to the laboratory.

#### PURGE WATER DISPOSAL

A sample of the purge/decontamination water stored in on-site drums was obtained during the previous monitoring event and submitted for analysis of benzene, ethylbenzene, toluene and xylenes (BETX) using EPA Method 8021B, PCBs using EPA Method 8082, and fats, oil and grease (FOG) using EPA Methods 418.1/413.2. Based on the analytical results, purge water from the site is acceptable for disposal at GeoEngineers' Redmond office in accordance with a Metro permit. Purge water was removed from the site during this monitoring event and transported to GeoEngineers' Redmond office for permitted disposal into the sanitary sewer.

**APPENDIX B**

**CHEMICAL ANALYTICAL PROGRAM**

## APPENDIX B

### CHEMICAL ANALYTICAL PROGRAM

#### ANALYTICAL METHODS

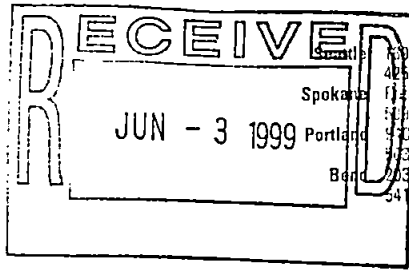
Chain-of-custody procedures were followed during the transport of the water and soil samples to North Creek Analytical in Bothell, Washington. The samples were held in cold storage pending extraction and/or analysis. The analytical results, analytical methods reference and laboratory quality assurance/quality control (QA/QC) records are included in this appendix. The analytical results are also summarized in the text and tables of this report.

#### ANALYTICAL DATA REVIEW

The laboratory maintains an internal quality assurance program as documented in its laboratory quality assurance manual. The laboratory uses a combination of blanks, surrogate recoveries, duplicates, matrix spike recoveries, matrix spike duplicate recoveries, blank spike recoveries and blank spike duplicate recoveries to evaluate the validity of the analytical results. The laboratory also uses data quality goals for individual chemicals or groups of chemicals based on the long-term performance of the test methods. The data quality goals are included in the laboratory reports. The laboratory compared each group of samples with the existing data quality goals and noted any exceptions in the laboratory report. Data quality exceptions documented by the laboratory in the laboratory reports are reviewed by GeoEngineers using the applicable data validation guidelines from the following documents: "National Functional Guidelines For Organic Data Review" draft dated 1991 and "Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses" dated 1988.

#### ANALYTICAL DATA REVIEW SUMMARY

The laboratory reports identified one significant data quality exception. The surrogate recovery was not within acceptable limits for the analysis of PCBs in the ground water sample obtained from GMW4/4a on May 20, 1999. Monitoring well GMW4/4a was resampled on May 27, 1999 and submitted for analysis of PCBs. There were no data quality exceptions associated with this analysis. The PCB analytical results for the May 27 ground water sample are presented in this report.



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Geo Engineers - Seattle 600 Stewart Street, Suite 1215 Seattle, WA 98101	Project: PSE-Grady Way Project Number: 0186-407-00 Project Manager: Steve Woodward	Sampled: 5/20/99 Received: 5/21/99 Reported: 6/1/99 08:57
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**ANALYTICAL REPORT FOR SAMPLES:**

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
GMW-1	B905405-01	Water	5/20/99
GMW-2/2A	B905405-02	Water	5/20/99
GMW-4/4A	B905405-03	Water	5/20/99
GMW-5	B905405-04	Water	5/20/99
GMW-6	B905405-05	Water	5/20/99
GMW-7	B905405-06	Water	5/20/99
GMW-8	B905405-07	Water	5/20/99
GMW-9	B905405-08	Water	5/20/99
GMW-10	B905405-09	Water	5/20/99
GMW-11	B905405-10	Water	5/20/99
GMW-12/12A	B905405-11	Water	5/20/99
GMW-13	B905405-12	Water	5/20/99
GMW-14	B905405-13	Water	5/20/99
MW-4	B905405-14	Water	5/20/99
MW-20	B905405-15	Water	5/20/99

North Creek Analytical - Bothell

*The results in this report apply to the samples analyzed in accordance with the chain of custody document.  
 This analytical report must be reproduced in its entirety.*

Steve Davis, Project Manager

**North Creek Analytical, Inc.  
 Environmental Laboratory Network**



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 503.906.9200 fax 503.906.9210  
 Bend 20354 Empire Avenue, Suite E-9, Bend, OR 97708-1883  
 541.383.9310 fax 541.382.7588

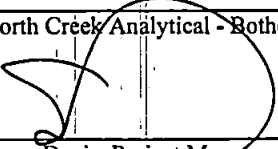
Geo Engineers - Seattle 600 Stewart Street, Suite 1215 Seattle, WA 98101	Project: PSE-Grady Way Project Number: 0186-407-00 Project Manager: Steve Woodward	Sampled: 5/20/99 Received: 5/21/99 Reported: 6/1/99 08:57
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**Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)  
 North Creek Analytical - Bothell**

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
<b>GMW-2/2A</b> <span style="float:right"><b>B905405-02</b></span>								
Diesel Range Hydrocarbons	0590603	5/23/99	5/25/99		0.250	ND	mg/l	
Lube Oil Range Hydrocarbons	"	"	"		0.500	ND	"	
Surrogate: 2-FBP	"	"	"	50.0-150		105	%	
<b>GMW-4/4A</b> <span style="float:right"><b>B905405-03</b></span>								
Diesel Range Hydrocarbons	0590603	5/23/99	5/25/99		0.250	0.488	mg/l	1
Lube Oil Range Hydrocarbons	"	"	"		0.500	ND	"	
Surrogate: 2-FBP	"	"	"	50.0-150		93.5	%	
<b>GMW-8</b> <span style="float:right"><b>B905405-07</b></span>								
Diesel Range Hydrocarbons	0590603	5/23/99	5/25/99		0.250	0.886	mg/l	1
Lube Oil Range Hydrocarbons	"	"	"		0.500	2.42	"	
Surrogate: 2-FBP	"	"	"	50.0-150		96.1	%	
<b>GMW-9</b> <span style="float:right"><b>B905405-08</b></span>								
Diesel Range Hydrocarbons	0590603	5/23/99	5/25/99		0.250	ND	mg/l	
Lube Oil Range Hydrocarbons	"	"	"		0.500	ND	"	
Surrogate: 2-FBP	"	"	"	50.0-150		90.6	%	
<b>GMW-10</b> <span style="float:right"><b>B905405-09</b></span>								
Diesel Range Hydrocarbons	0590603	5/23/99	5/25/99		0.250	ND	mg/l	
Lube Oil Range Hydrocarbons	"	"	"		0.500	ND	"	
Surrogate: 2-FBP	"	"	"	50.0-150		50.0	%	
<b>GMW-11</b> <span style="float:right"><b>B905405-10</b></span>								
Diesel Range Hydrocarbons	0590603	5/23/99	5/25/99		0.250	0.280	mg/l	1
Lube Oil Range Hydrocarbons	"	"	"		0.500	ND	"	
Surrogate: 2-FBP	"	"	"	50.0-150		84.9	%	
<b>GMW-12/12A</b> <span style="float:right"><b>B905405-11</b></span>								
Diesel Range Hydrocarbons	0590603	5/23/99	5/25/99		0.250	0.349	mg/l	1
Lube Oil Range Hydrocarbons	"	"	"		0.500	0.786	"	
Surrogate: 2-FBP	"	"	"	50.0-150		98.0	%	
<b>GMW-13</b> <span style="float:right"><b>B905405-12</b></span>								
Diesel Range Hydrocarbons	0590603	5/23/99	5/25/99		0.250	ND	mg/l	
Lube Oil Range Hydrocarbons	"	"	"		0.500	ND	"	
Surrogate: 2-FBP	"	"	"	50.0-150		83.8	%	

North Creek Analytical - Bothell

\*Refer to end of report for text of notes and definitions.

  
 Steve Davis, Project Manager

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Geo Engineers - Seattle 600 Stewart Street, Suite 1215 Seattle, WA 98101	Project: PSE-Grady Way Project Number: 0186-407-00 Project Manager: Steve Woodward	Sampled: 5/20/99 Received: 5/21/99 Reported: 6/1/99 08:57
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**Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)  
 North Creek Analytical - Bothell**

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
<b>GMW-14</b>				<b>B905405-13</b>		<b>Water</b>		
Diesel Range Hydrocarbons	0590603	5/23/99	5/25/99		0.250	ND	mg/l	
Lube Oil Range Hydrocarbons	"	"	"		0.500	ND	"	
Surrogate: 2-FBP	"	"	"	50.0-150		96.1	%	
<b>MW-4</b>				<b>B905405-14</b>		<b>Water</b>		
Diesel Range Hydrocarbons	0590603	5/23/99	5/25/99		0.250	ND	mg/l	
Lube Oil Range Hydrocarbons	"	"	"		0.500	ND	"	
Surrogate: 2-FBP	"	"	"	50.0-150		92.2	%	
<b>MW-20</b>				<b>B905405-15</b>		<b>Water</b>		
Diesel Range Hydrocarbons	0590603	5/23/99	5/25/99		0.250	ND	mg/l	
Lube Oil Range Hydrocarbons	"	"	"		0.500	ND	"	
Surrogate: 2-FBP	"	"	"	50.0-150		102	%	

North Creek Analytical - Bothell

\*Refer to end of report for text of notes and definitions.

Steve Davis, Project Manager

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Geo Engineers - Seattle 600 Stewart Street, Suite 1215 Seattle, WA 98101	Project: PSE-Grady Way Project Number: 0186-407-00 Project Manager: Steve Woodward	Sampled: 5/20/99 Received: 5/21/99 Reported: 6/1/99 08:57
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**Polychlorinated Biphenyls by EPA Method 8082  
 North Creek Analytical - Bothell**

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
				<b><u>B905405-01</u></b>			<b><u>Water</u></b>	
Aroclor 1016	0590601	5/23/99	5/24/99		0.100	ND	ug/l	
Aroclor 1221	"	"	"		0.100	ND	"	
Aroclor 1232	"	"	"		0.100	ND	"	
Aroclor 1242	"	"	"		0.100	ND	"	
Aroclor 1248	"	"	"		0.100	ND	"	
Aroclor 1254	"	"	"		0.100	ND	"	
Aroclor 1260	"	"	"		0.100	ND	"	
Aroclor 1262	"	"	"		0.100	ND	"	
Aroclor 1268	"	"	"		0.100	ND	"	
Surrogate: TCX	"	"	"	40.0-130		51.3	%	
				<b><u>B905405-02</u></b>			<b><u>Water</u></b>	
Aroclor 1016	0590601	5/23/99	5/24/99		0.100	ND	ug/l	
Aroclor 1221	"	"	"		0.100	ND	"	
Aroclor 1232	"	"	"		0.100	ND	"	
Aroclor 1242	"	"	"		0.100	ND	"	
Aroclor 1248	"	"	"		0.100	ND	"	
Aroclor 1254	"	"	"		0.100	ND	"	
Aroclor 1260	"	"	"		0.100	ND	"	
Aroclor 1262	"	"	"		0.100	ND	"	
Aroclor 1268	"	"	"		0.100	ND	"	
Surrogate: TCX	"	"	"	40.0-130		69.1	%	
				<b><u>B905405-03</u></b>			<b><u>Water</u></b>	
Aroclor 1016	0590601	5/23/99	5/24/99		0.100	ND	ug/l	
Aroclor 1221	"	"	"		0.100	ND	"	
Aroclor 1232	"	"	"		0.100	ND	"	
Aroclor 1242	"	"	"		0.100	ND	"	
Aroclor 1248	"	"	"		0.100	ND	"	
Aroclor 1254	"	"	"		0.100	ND	"	
Aroclor 1260	"	"	"		0.100	ND	"	
Aroclor 1262	"	"	"		0.100	ND	"	
Aroclor 1268	"	"	"		0.100	ND	"	
Surrogate: TCX	"	"	"	40.0-130		24.8	%	2
				<b><u>B905405-07</u></b>			<b><u>Water</u></b>	
Aroclor 1016	0590601	5/23/99	5/24/99		0.100	ND	ug/l	
Aroclor 1221	"	"	"		0.100	ND	"	

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\*Refer to end of report for text of notes and definitions.

Steve Davis, Project Manager

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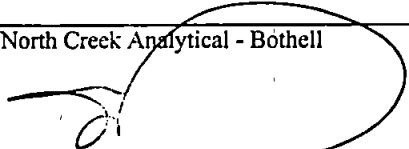
Geo Engineers - Seattle 600 Stewart Street, Suite 1215 Seattle, WA 98101	Project: PSE-Grady Way Project Number: 0186-407-00 Project Manager: Steve Woodward	Sampled: 5/20/99 Received: 5/21/99 Reported: 6/1/99 08:57
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**Polychlorinated Biphenyls by EPA Method 8082  
 North Creek Analytical - Bothell**

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
<b>GMW-8 (continued)</b>				<b>B905405-07</b>			<b>Water</b>	
Aroclor 1232	0590601	5/23/99	5/24/99		0.100	ND	ug/l	
Aroclor 1242	"	"	"		0.100	ND	"	
Aroclor 1248	"	"	"		0.100	ND	"	
Aroclor 1254	"	"	"		0.100	ND	"	
Aroclor 1260	"	"	"		0.100	ND	"	
Aroclor 1262	"	"	"		0.100	ND	"	
Aroclor 1268	"	"	"		0.100	ND	"	
Surrogate: TCX	"	"	"	40.0-130		40.2	%	
<b>GMW-9</b>				<b>B905405-08</b>			<b>Water</b>	
Aroclor 1016	0590601	5/23/99	5/25/99		0.100	ND	ug/l	
Aroclor 1221	"	"	"		0.100	ND	"	
Aroclor 1232	"	"	"		0.100	ND	"	
Aroclor 1242	"	"	"		0.100	ND	"	
Aroclor 1248	"	"	"		0.100	ND	"	
Aroclor 1254	"	"	"		0.100	ND	"	
Aroclor 1260	"	"	"		0.100	ND	"	
Aroclor 1262	"	"	"		0.100	ND	"	
Aroclor 1268	"	"	"		0.100	ND	"	
Surrogate: TCX	"	"	"	40.0-130		55.8	%	
<b>GMW-10</b>				<b>B905405-09</b>			<b>Water</b>	
Aroclor 1016	0590601	5/23/99	5/25/99		0.100	ND	ug/l	
Aroclor 1221	"	"	"		0.100	ND	"	
Aroclor 1232	"	"	"		0.100	ND	"	
Aroclor 1242	"	"	"		0.100	ND	"	
Aroclor 1248	"	"	"		0.100	ND	"	
Aroclor 1254	"	"	"		0.100	ND	"	
Aroclor 1260	"	"	"		0.100	ND	"	
Aroclor 1262	"	"	"		0.100	ND	"	
Aroclor 1268	"	"	"		0.100	ND	"	
Surrogate: TCX	"	"	"	40.0-130		75.8	%	
<b>GMW-11</b>				<b>B905405-10</b>			<b>Water</b>	
Aroclor 1016	0590601	5/23/99	5/25/99		0.100	ND	ug/l	
Aroclor 1221	"	"	"		0.100	ND	"	
Aroclor 1232	"	"	"		0.100	ND	"	
Aroclor 1242	"	"	"		0.100	ND	"	

North Creek Analytical - Bothell

\*Refer to end of report for text of notes and definitions.

  
 Steve Davis, Project Manager

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Geo Engineers - Seattle 600 Stewart Street, Suite 1215 Seattle, WA 98101	Project: PSE-Grady Way Project Number: 0186-407-00 Project Manager: Steve Woodward	Sampled: 5/20/99 Received: 5/21/99 Reported: 6/1/99 08:57
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**Polychlorinated Biphenyls by EPA Method 8082  
 North Creek Analytical - Bothell**

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
<b>GMW-11 (continued)</b>				<b>B905405-10</b>			<b>Water</b>	
Aroclor 1248	0590601	5/23/99	5/25/99		0.100	ND	ug/l	
Aroclor 1254	"	"	"		0.100	ND	"	
Aroclor 1260	"	"	"		0.100	ND	"	
Aroclor 1262	"	"	"		0.100	ND	"	
Aroclor 1268	"	"	"		0.100	ND	"	
Surrogate: TCX	"	"	"	40.0-130		87.4	%	
<b>GMW-12/12A</b>				<b>B905405-11</b>			<b>Water</b>	
Aroclor 1016	0590601	5/23/99	5/25/99		0.100	ND	ug/l	
Aroclor 1221	"	"	"		0.100	ND	"	
Aroclor 1232	"	"	"		0.100	ND	"	
Aroclor 1242	"	"	"		0.100	ND	"	
Aroclor 1248	"	"	"		0.100	ND	"	
Aroclor 1254	"	"	"		0.100	ND	"	
Aroclor 1260	"	"	"		0.100	ND	"	
Aroclor 1262	"	"	"		0.100	ND	"	
Aroclor 1268	"	"	"		0.100	ND	"	
Surrogate: TCX	"	"	"	40.0-130		57.9	%	

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Geo Engineers - Seattle 600 Stewart Street, Suite 1215 Seattle, WA 98101	Project: PSE-Grady Way Project Number: 0186-407-00 Project Manager: Steve Woodward	Sampled: 5/20/99 Received: 5/21/99 Reported: 6/1/99 08:57
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**Polynuclear Aromatic Compounds by GC/MS with Selected Ion Monitoring  
 North Creek Analytical - Bothell**

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
<b>GMW-5</b>				<b>B905405-04</b>			<b>Water</b>	
Acenaphthene	0590790	5/28/99	5/30/99		0.200	ND	ug/l	
Acenaphthylene	"	"	"		0.200	ND	"	
Anthracene	"	"	"		0.200	ND	"	
Benzo (a) anthracene	"	"	"		0.200	ND	"	
Benzo (a) pyrene	"	"	"		0.200	ND	"	
Benzo (b) fluoranthene	"	"	"		0.200	ND	"	
Benzo (ghi) perylene	"	"	"		0.200	ND	"	
Benzo (k) fluoranthene	"	"	"		0.200	ND	"	
Chrysene	"	"	"		0.200	ND	"	
Dibenz (a,h) anthracene	"	"	"		0.200	ND	"	
Fluoranthene	"	"	"		0.600	ND	"	
Fluorene	"	"	"		0.200	ND	"	
Indeno (1,2,3-cd) pyrene	"	"	"		0.200	ND	"	
Naphthalene	"	"	"		0.600	ND	"	
Phenanthrene	"	"	"		0.200	0.302	"	
Pyrene	"	"	"		0.600	ND	"	
Surrogate: 2-FBP	"	"	"	30.0-150		57.0	%	
Surrogate: Nitrobenzene-d5	"	"	"	30.0-150		57.0	"	
Surrogate: p-Terphenyl-d14	"	"	"	30.0-150		56.4	"	
<b>GMW-6</b>				<b>B905405-05</b>			<b>Water</b>	
Acenaphthene	0590790	5/28/99	5/30/99		0.100	ND	ug/l	
Acenaphthylene	"	"	"		0.100	ND	"	
Anthracene	"	"	"		0.100	ND	"	
Benzo (a) anthracene	"	"	"		0.100	ND	"	
Benzo (a) pyrene	"	"	"		0.100	ND	"	
Benzo (b) fluoranthene	"	"	"		0.100	ND	"	
Benzo (ghi) perylene	"	"	"		0.100	ND	"	
Benzo (k) fluoranthene	"	"	"		0.100	ND	"	
Chrysene	"	"	"		0.100	ND	"	
Dibenz (a,h) anthracene	"	"	"		0.100	ND	"	
Fluoranthene	"	"	"		0.300	ND	"	
Fluorene	"	"	"		0.100	ND	"	
Indeno (1,2,3-cd) pyrene	"	"	"		0.100	ND	"	
Naphthalene	"	"	"		0.300	ND	"	
Phenanthrene	"	"	"		0.100	ND	"	
Pyrene	"	"	"		0.300	ND	"	
Surrogate: 2-FBP	"	"	"	30.0-150		48.3	%	

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Geo Engineers - Seattle 600 Stewart Street, Suite 1215 Seattle, WA 98101	Project: PSE-Grady Way Project Number: 0186-407-00 Project Manager: Steve Woodward	Sampled: 5/20/99 Received: 5/21/99 Reported: 6/1/99 08:57
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**Polynuclear Aromatic Compounds by GC/MS with Selected Ion Monitoring  
 North Creek Analytical - Bothell**

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
<b>GMW-6 (continued)</b>				<b>B905405-05</b>		<b>Water</b>		
Surrogate: Nitrobenzene-d5	0590790	5/28/99	5/30/99	30.0-150		48.1	%	
Surrogate: p-Terphenyl-d14	"	"	"	30.0-150		50.4	"	
<b>GMW-7</b>				<b>B905405-06</b>		<b>Water</b>		
Acenaphthene	0590790	5/28/99	5/30/99		0.500	<b>0.566</b>	ug/l	
Acenaphthylene	"	"	"		0.500	ND	"	
Anthracene	"	"	"		0.500	ND	"	
Benzo (a) anthracene	"	"	"		0.500	ND	"	
Benzo (a) pyrene	"	"	"		0.500	ND	"	
Benzo (b) fluoranthene	"	"	"		0.500	ND	"	
Benzo (ghi) perylene	"	"	"		0.500	ND	"	
Benzo (k) fluoranthene	"	"	"		0.500	ND	"	
Chrysene	"	"	"		0.500	ND	"	
Dibenz (a,h) anthracene	"	"	"		0.500	ND	"	
Fluoranthene	"	"	"		1.50	ND	"	
<b>Fluorene</b>	"	"	"		0.500	<b>1.04</b>	"	
Indeno (1,2,3-cd) pyrene	"	"	"		0.500	ND	"	
<b>Naphthalene</b>	"	"	"		1.50	<b>5.94</b>	"	
<b>Phenanthrene</b>	"	"	"		0.500	<b>2.36</b>	"	
Pyrene	"	"	"		1.50	ND	"	
Surrogate: 2-FBP	"	"	"	30.0-150		67.2	%	
Surrogate: Nitrobenzene-d5	"	"	"	30.0-150		57.8	"	
Surrogate: p-Terphenyl-d14	"	"	"	30.0-150		62.3	"	
<b>GMW-10</b>				<b>B905405-09</b>		<b>Water</b>		
Acenaphthene	0590790	5/28/99	5/30/99		0.100	ND	ug/l	
Acenaphthylene	"	"	"		0.100	ND	"	
Anthracene	"	"	"		0.100	ND	"	
Benzo (a) anthracene	"	"	"		0.100	ND	"	
Benzo (a) pyrene	"	"	"		0.100	ND	"	
Benzo (b) fluoranthene	"	"	"		0.100	ND	"	
Benzo (ghi) perylene	"	"	"		0.100	ND	"	
Benzo (k) fluoranthene	"	"	"		0.100	ND	"	
Chrysene	"	"	"		0.100	ND	"	
Dibenz (a,h) anthracene	"	"	"		0.100	ND	"	
Fluoranthene	"	"	"		0.300	ND	"	
Fluorene	"	"	"		0.100	ND	"	
Indeno (1,2,3-cd) pyrene	"	"	"		0.100	ND	"	

North Creek Analytical - Bothell

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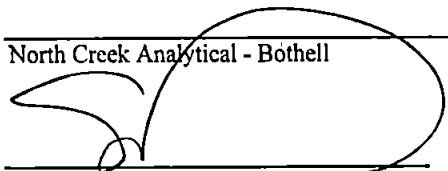
Geo Engineers - Seattle 600 Stewart Street, Suite 1215 Seattle, WA 98101	Project: PSE-Grady Way Project Number: 0186-407-00 Project Manager: Steve Woodward	Sampled: 5/20/99 Received: 5/21/99 Reported: 6/1/99 08:57
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**Polynuclear Aromatic Compounds by GC/MS with Selected Ion Monitoring  
 North Creek Analytical - Bothell**

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
<b>GMW-10 (continued)</b>				<b>B905405-09</b>			<b>Water</b>	
Naphthalene	0590790	5/28/99	5/30/99		0.300	ND	ug/l	
Phenanthrene	"	"	"		0.100	ND	"	
Pyrene	"	"	"		0.300	ND	"	
Surrogate: 2-FBP	"	"	"	30.0-150		55.9	%	
Surrogate: Nitrobenzene-d5	"	"	"	30.0-150		57.8	"	
Surrogate: p-Terphenyl-d14	"	"	"	30.0-150		55.5	"	
<b>GMW-11</b>				<b>B905405-10</b>			<b>Water</b>	
Acenaphthene	0590790	5/28/99	5/30/99		0.100	ND	ug/l	
Acenaphthylene	"	"	"		0.100	ND	"	
Anthracene	"	"	"		0.100	ND	"	
Benzo (a) anthracene	"	"	"		0.100	ND	"	
Benzo (a) pyrene	"	"	"		0.100	ND	"	
Benzo (b) fluoranthene	"	"	"		0.100	ND	"	
Benzo (ghi) perylene	"	"	"		0.100	ND	"	
Benzo (k) fluoranthene	"	"	"		0.100	ND	"	
Chrysene	"	"	"		0.100	ND	"	
Dibenz (a,h) anthracene	"	"	"		0.100	ND	"	
Fluoranthene	"	"	"		0.300	ND	"	
Fluorene	"	"	"		0.100	ND	"	
Indeno (1,2,3-cd) pyrene	"	"	"		0.100	ND	"	
Naphthalene	"	"	"		0.300	ND	"	
Phenanthrene	"	"	"		0.100	ND	"	
Pyrene	"	"	"		0.300	ND	"	
Surrogate: 2-FBP	"	"	"	30.0-150		53.4	%	
Surrogate: Nitrobenzene-d5	"	"	"	30.0-150		55.1	"	
Surrogate: p-Terphenyl-d14	"	"	"	30.0-150		52.3	"	

North Creek Analytical - Bothell

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 Steve Davis, Project Manager

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Geo Engineers - Seattle Project: PSE-Grady Way Sampled: 5/20/99  
 600 Stewart Street, Suite 1215 Project Number: 0186-407-00 Received: 5/21/99  
 Seattle, WA 98101 Project Manager: Steve Woodward Reported: 6/1/99 08:57

**Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)/Quality Control**  
**North Creek Analytical - Bothell**

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
<b>Batch: 0590603</b>			<b>Date Prepared: 5/23/99</b>			<b>Extraction Method: EPA 3520C/600 Series</b>				
<b>Blank</b>			<b>0590603-BLK1</b>							
Diesel Range Hydrocarbons	5/24/99			ND	mg/l	0.250				
Lube Oil Range Hydrocarbons	"			ND	"	0.500				
Surrogate: 2-FBP	"	0.321		0.292	"	50.0-150	91.0			
<b>LCS</b>			<b>0590603-BS1</b>							
Diesel Range Hydrocarbons	5/24/99	2.00		2.05	mg/l	60.0-140	102			
Surrogate: 2-FBP	"	0.321		0.378	"	50.0-150	118			
<b>LCS Dup</b>			<b>0590603-BSD1</b>							
Diesel Range Hydrocarbons	5/24/99	2.00		1.97	mg/l	60.0-140	98.5	40.0	3.49	
Surrogate: 2-FBP	"	0.321		0.289	"	50.0-150	90.0			
<b>Duplicate</b>			<b>0590603-DUP1 B905393-03</b>							
Diesel Range Hydrocarbons	5/24/99		ND	ND	mg/l				50.0	
Lube Oil Range Hydrocarbons	"		ND	ND	"				50.0	
Surrogate: 2-FBP	"	0.614		0.731	"	50.0-150	119			

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\*Refer to end of report for text of notes and definitions.

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Page 10 of 13



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 Bend 20354 Empire Avenue, Suite E-9, Bend, OR 97708-1883  
 541.383.9310 fax 541.382.7588

Geo Engineers - Seattle 600 Stewart Street, Suite 1215 Seattle, WA 98101	Project: PSE-Grady Way Project Number: 0186-407-00 Project Manager: Steve Woodward	Sampled: 5/20/99 Received: 5/21/99 Reported: 6/1/99 08:57
--	--	---

**Polychlorinated Biphenyls by EPA Method 8082/Quality Control  
 North Creek Analytical - Bothell**

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
<b>Batch: -0590601</b>			<b>Date Prepared: 5/23/99</b>			<b>Extraction Method: EPA 3520C/600 Series</b>				
<b>Blank</b>			<b>0590601-BLK1</b>							
Aroclor 1016	5/24/99			ND	ug/l	0.100				
Aroclor 1221	"			ND	"	0.100				
Aroclor 1232	"			ND	"	0.100				
Aroclor 1242	"			ND	"	0.100				
Aroclor 1248	"			ND	"	0.100				
Aroclor 1254	"			ND	"	0.100				
Aroclor 1260	"			ND	"	0.100				
Aroclor 1262	"			ND	"	0.100				
Aroclor 1268	"			ND	"	0.100				
Surrogate: TCX	"	0.200		0.179	"	40.0-130	89.5			
<b>LCS</b>			<b>0590601-BS1</b>							
Aroclor 1260	5/24/99	10.0		11.6	ug/l	33.0-122	116			
Surrogate: TCX	"	0.200		0.200	"	40.0-130	100			
<b>LCS Dup</b>			<b>0590601-BSD1</b>							
Aroclor 1260	5/24/99	10.0		11.3	ug/l	33.0-122	113	21.0	2.62	
Surrogate: TCX	"	0.200		0.191	"	40.0-130	95.5			

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Geo Engineers - Seattle 600 Stewart Street, Suite 1215 Seattle, WA 98101	Project: PSE-Grady Way Project Number: 0186-407-00 Project Manager: Steve Woodward	Sampled: 5/20/99 Received: 5/21/99 Reported: 6/1/99 08:57
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**Polynuclear Aromatic Compounds by GC/MS with Selected Ion Monitoring/Quality Control  
 North Creek Analytical - Bothell**

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Reporting Limit Units	Recov. %	RPD Limit	RPD %	Notes*
<b>Batch: 0590790</b>		<b>Date Prepared: 5/28/99</b>		<b>Extraction Method: EPA 3510C/600 Series</b>					
<b>Blank</b>		<b>0590790-BLK1</b>							
Acenaphthene	5/30/99			ND	ug/l		0.100		
Acenaphthylene	"			ND	"		0.100		
Anthracene	"			ND	"		0.100		
Benzo (a) anthracene	"			ND	"		0.100		
Benzo (a) pyrene	"			ND	"		0.100		
Benzo (b) fluoranthene	"			ND	"		0.100		
Benzo (ghi) perylene	"			ND	"		0.100		
Benzo (k) fluoranthene	"			ND	"		0.100		
Chrysene	"			ND	"		0.100		
Dibenz (a,h) anthracene	"			ND	"		0.100		
Fluoranthene	"			ND	"		0.300		
Fluorene	"			ND	"		0.100		
Indeno (1,2,3-cd) pyrene	"			ND	"		0.100		
Naphthalene	"			ND	"		0.300		
Phenanthrene	"			ND	"		0.100		
Pyrene	"			ND	"		0.300		
Surrogate: 2-FBP	"	50.0		27.8	"		30.0-150	55.6	
Surrogate: Nitrobenzene-d5	"	50.0		29.5	"		30.0-150	59.0	
Surrogate: p-Terphenyl-d14	"	50.0		32.1	"		30.0-150	64.2	
<b>LCS</b>		<b>0590790-BS1</b>							
Chrysene	5/30/99	10.0		9.48	ug/l		50.0-150	94.8	
Fluorene	"	10.0		8.36	"		50.0-150	83.6	
Indeno (1,2,3-cd) pyrene	"	10.0		9.02	"		50.0-150	90.2	
Surrogate: 2-FBP	"	50.0		28.3	"		30.0-150	56.6	
Surrogate: Nitrobenzene-d5	"	50.0		29.5	"		30.0-150	59.0	
Surrogate: p-Terphenyl-d14	"	50.0		30.0	"		30.0-150	60.0	
<b>LCS Dup</b>		<b>0590790-BSD1</b>							
Chrysene	5/30/99	10.0		9.00	ug/l		50.0-150	90.0	25.0 5.19
Fluorene	"	10.0		7.46	"		50.0-150	74.6	25.0 11.4
Indeno (1,2,3-cd) pyrene	"	10.0		8.48	"		50.0-150	84.8	25.0 6.17
Surrogate: 2-FBP	"	50.0		26.0	"		30.0-150	52.0	
Surrogate: Nitrobenzene-d5	"	50.0		27.5	"		30.0-150	55.0	
Surrogate: p-Terphenyl-d14	"	50.0		27.1	"		30.0-150	54.2	

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Geo Engineers - Seattle 600 Stewart Street, Suite 1215 Seattle, WA 98101	Project: PSE-Grady Way Project Number: 0186-407-00 Project Manager: Steve Woodward	Sampled: 5/20/99 Received: 5/21/99 Reported: 6/1/99 08:57
--	--	---

**Notes and Definitions**

#	Note
---	------

- 1 The sample chromatographic pattern does not resemble the fuel standard used for quantitation.
- 2 Due to an extraction anomaly results should be considered estimate only.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- Recov. Recovery
- RPD Relative Percent Difference

North Creek Analytical - Bothell

Steve Davis, Project Manager

**North Creek Analytical, Inc.  
 Environmental Laboratory Network**

Quantitation Report

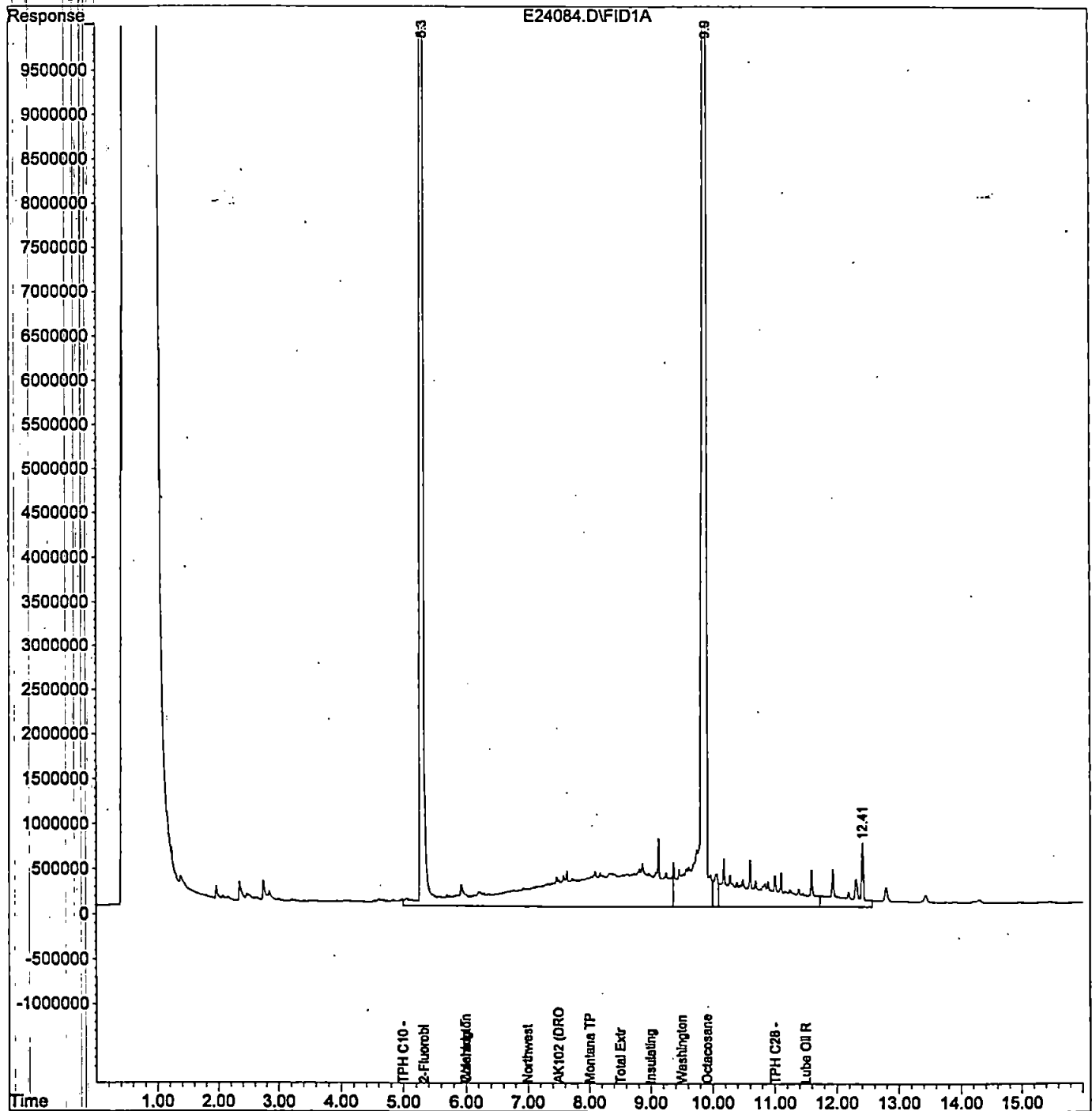
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Acq On : 5-25-99 2:20:43 AM  
Sample : b905405-14  
Misc : w  
IntFile : SURR.E  
Quant Time: May 25 8:11 1999

Vial: 61  
Operator: MAO  
Inst : GC #7  
Multiplr: 1.00

Quant Results File: TPHD.RES

Quant Method : C:\HPCHEM\4\METHODS\TPHD.M (Chemstation Integrator)  
Title : TPH-D Front Method  
Last Update : Thu Apr 29 17:46:57 1999  
Response via : Multiple Level Calibration  
DataAcq Meth : TPHD.M

Volume Inj. :  
Signal Phase :  
Signal Info :



Quantitation Report

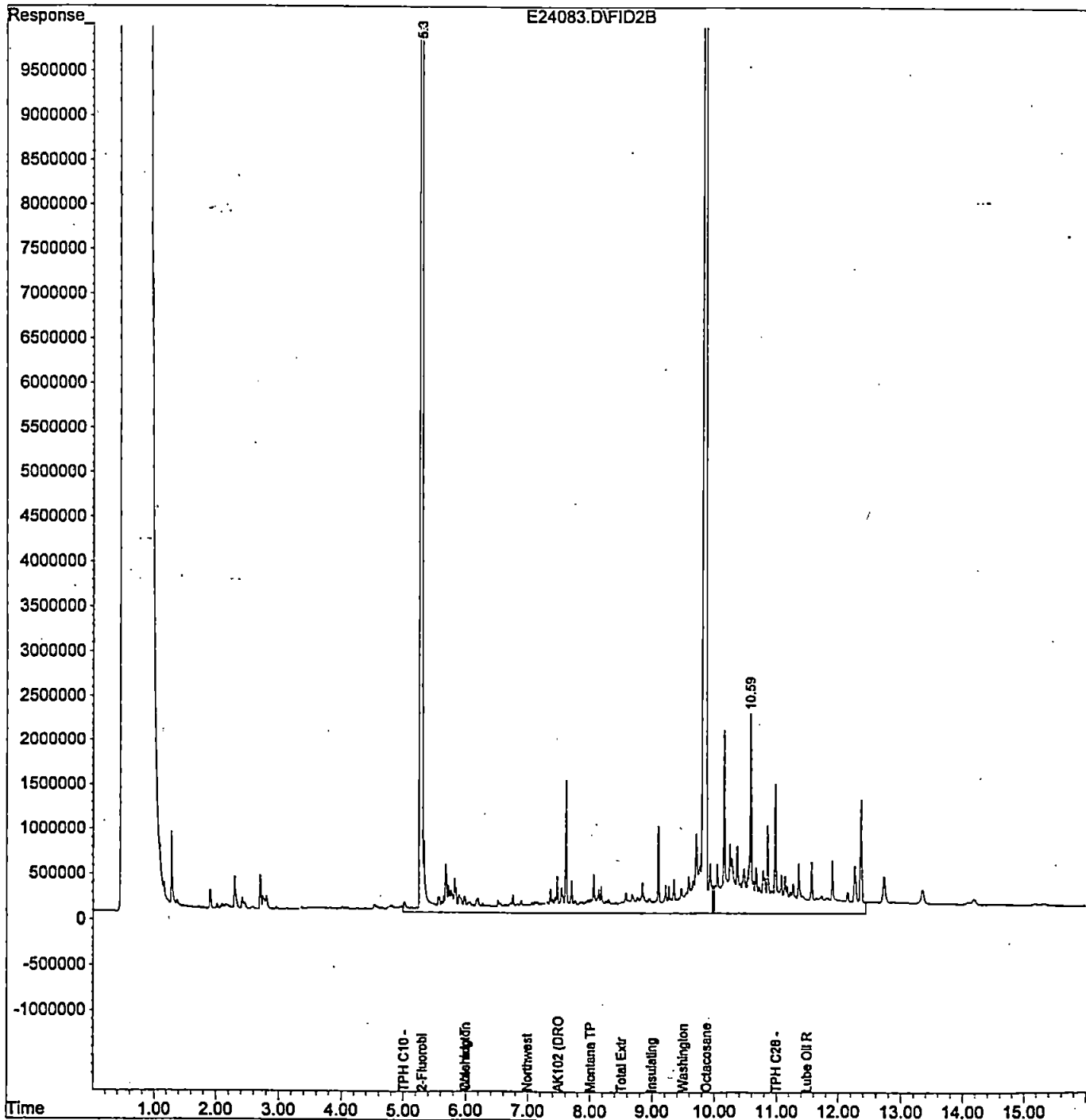
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Sample : b905405-13  
Misc : w  
IntFile : SURR.E  
Quant Time: May 25 7:56 1999

Vial: 60  
Operator: MAO  
Inst : GC #7  
Multiplr: 1.00

Quant Results File: TPHD2.RES

Quant Method : C:\HPCHEM\4\METHODS\TPHD2.M (Chemstation Integrator)  
Title : TPH-D Rear Method  
Last Update : Wed May 12 20:11:25 1999  
Response via : Multiple Level Calibration  
DataAcq Meth : TPHD.M

Volume Inj. :  
Signal Phase :  
Signal Info :



Quantitation Report

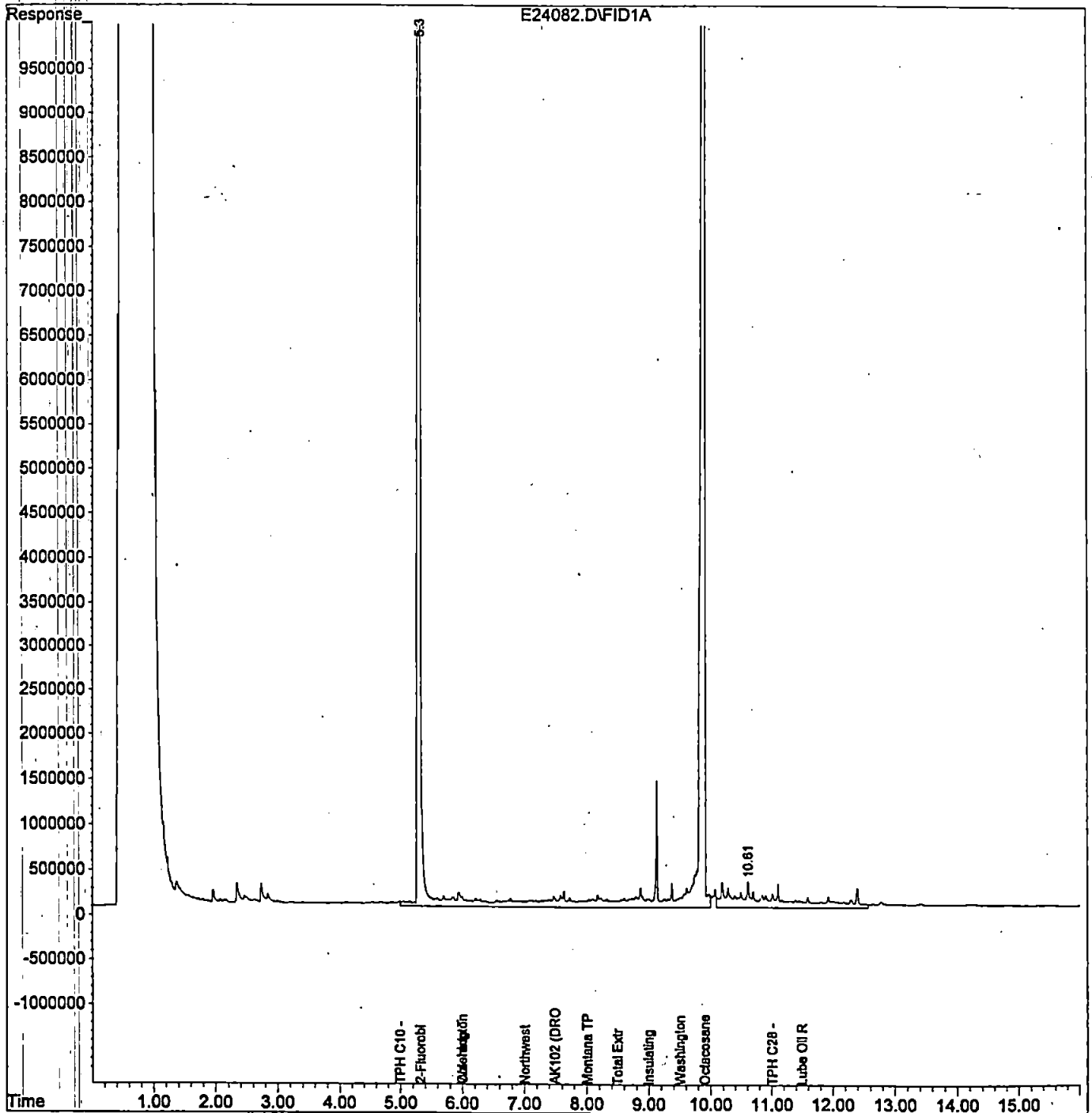
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Acq On : 5-25-99 1:57:28 AM  
Sample : b905405-12  
Misc : w  
IntFile : SURR.E  
Quant Time: May 25 8:10 1999

Vial: 59  
Operator: MAO  
Inst : GC #7  
Multiplr: 1.00

Quant Results File: TPHD.RES

Quant Method : C:\HPCHEM\4\METHODS\TPHD.M (Chemstation Integrator)  
Title : TPH-D Front Method  
Last Update : Thu Apr 29 17:46:57 1999  
Response via : Multiple Level Calibration  
DataAcq Meth : TPHD.M

Volume Inj. :  
Signal Phase :  
Signal Info :



Quantitation Report

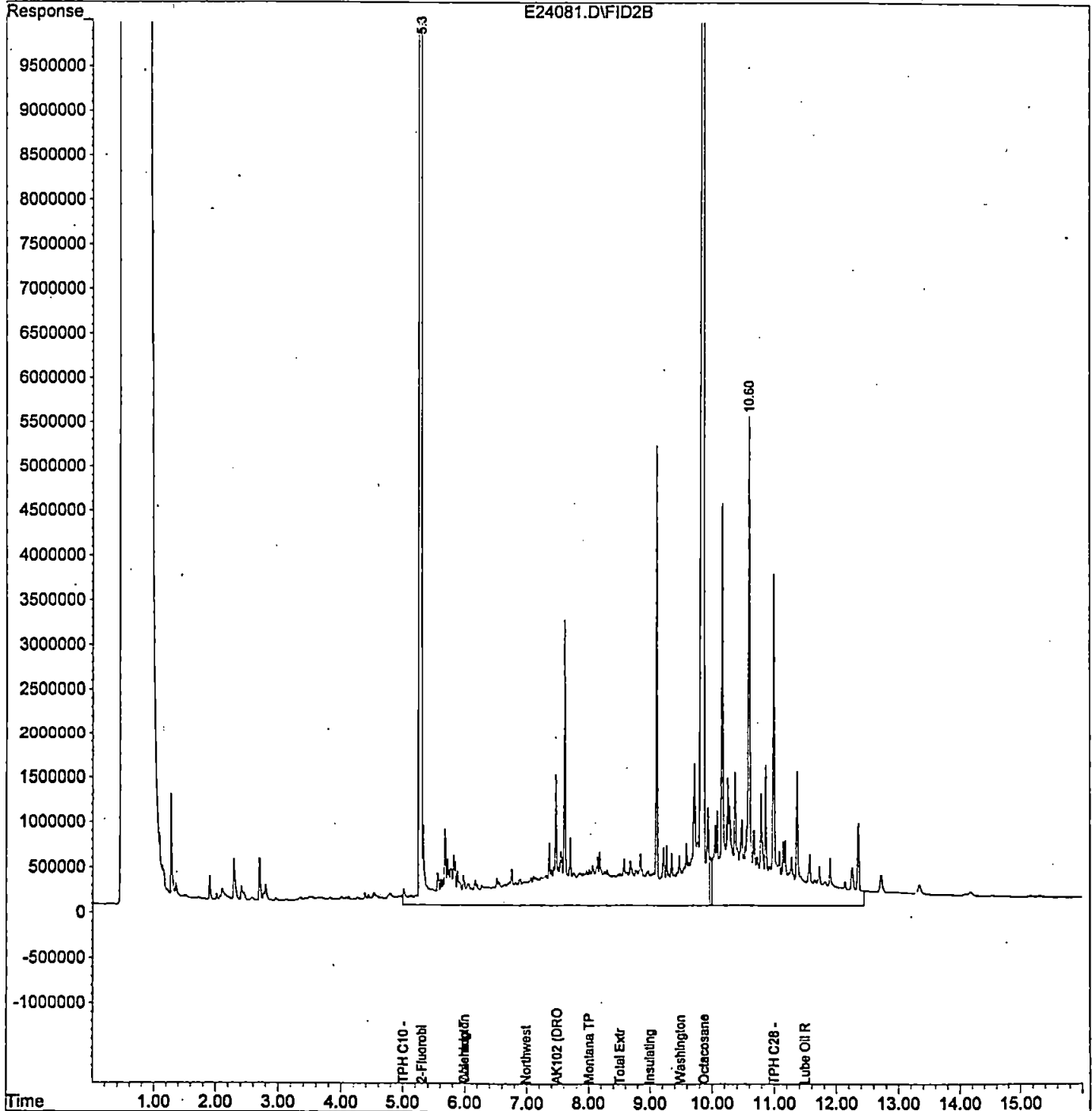
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Sample : b905405-11  
Misc : w  
IntFile : SURR.E  
Quant Time: May 25 7:56 1999

Vial: 58  
Operator: MAO  
Inst : GC #7  
Multiplr: 1.00

Quant Results File: TPHD2.RES

Quant Method : C:\HPCHEM\4\METHODS\TPHD2.M (Chemstation Integrator)  
Title : TPH-D Rear Method  
Last Update : Wed May 12 20:11:25 1999  
Response via : Multiple Level Calibration  
DataAcq Meth : TPHD.M

Volume Inj. :  
Signal Phase :  
Signal Info :



Quantitation Report

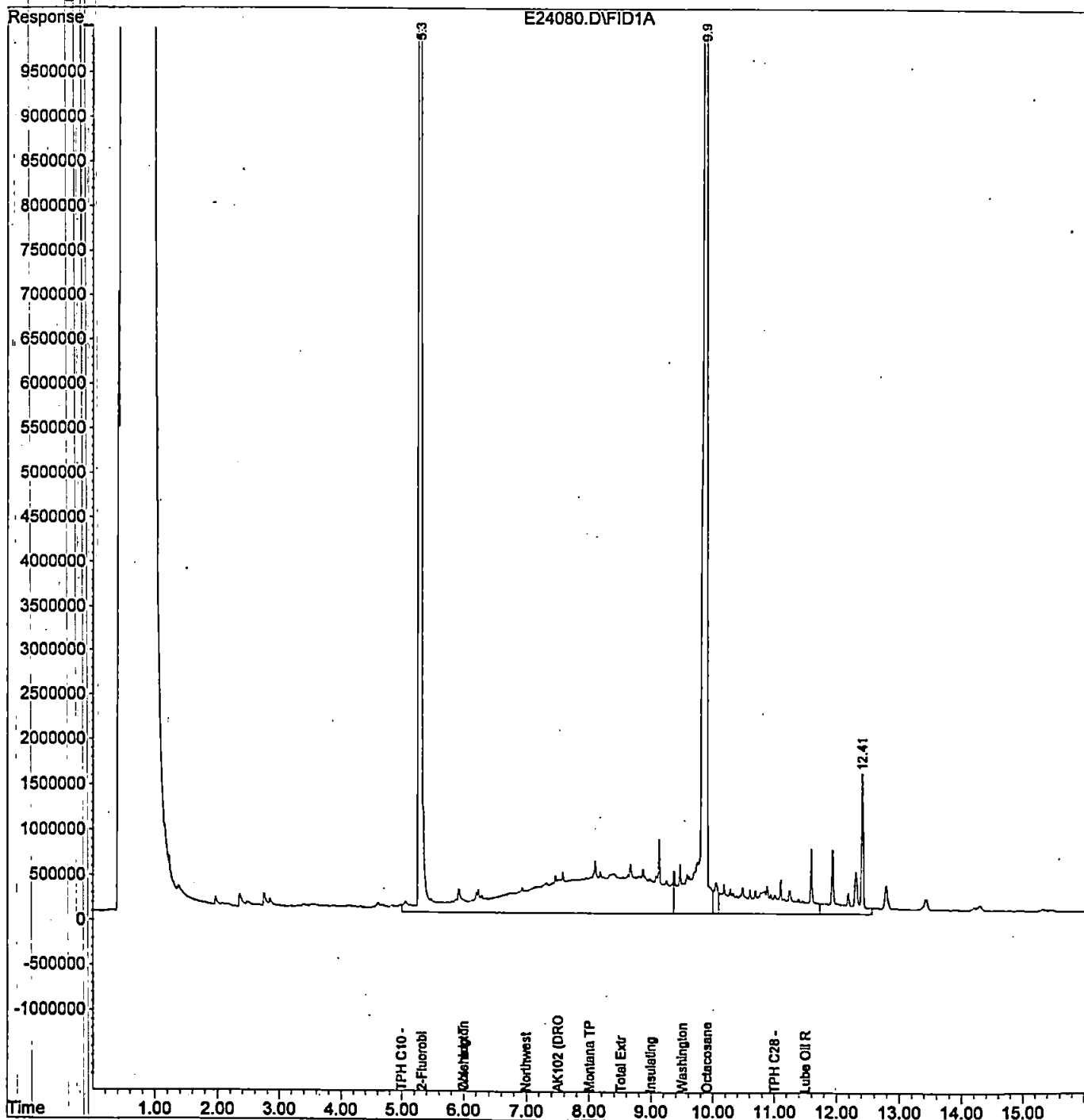
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Sample : b905405-10  
Misc : w  
IntFile : SURR.E

Vial: 57  
Operator: MAO  
Inst : GC #7  
Multiplr: 1.00

Quant Time: May 25 8:10 1999 Quant Results File: TPHD.RES

Quant Method : C:\HPCHEM\4\METHODS\TPHD.M (Chemstation Integrator)  
Title : TPH-D Front Method  
Last Update : Thu Apr 29 17:46:57 1999  
Response via : Multiple Level Calibration  
DataAcq Meth : TPHD.M

Volume Inj. :  
Signal Phase :  
Signal Info :



Quantitation Report

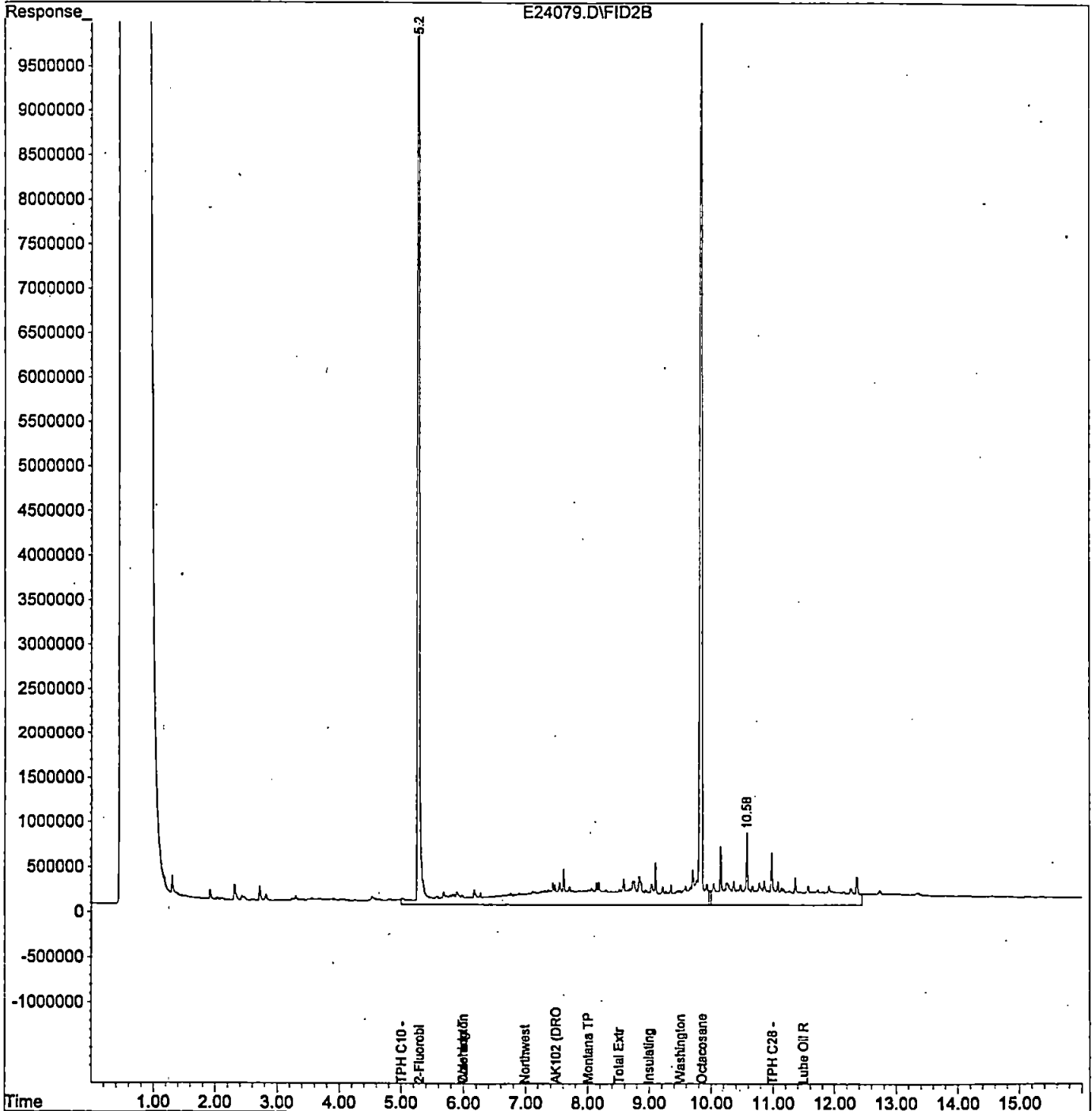
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Acq On : 5-25-99 1:34:04 AM  
Sample : b905405-09  
Misc : w  
IntFile : SURR.E  
Quant Time: May 25 7:55 1999

Vial: 56  
Operator: MAO  
Inst : GC #7  
Multiplr: 1.00

Quant Results File: TPHD2.RES

Quant Method : C:\HPCHEM\4\METHODS\TPHD2.M (Chemstation Integrator)  
Title : TPH-D Rear Method  
Last Update : Wed May 12 20:11:25 1999  
Response via : Multiple Level Calibration  
DataAcq Meth : TPHD.M

Volume Inj. :  
Signal Phase :  
Signal Info :



Quantitation Report

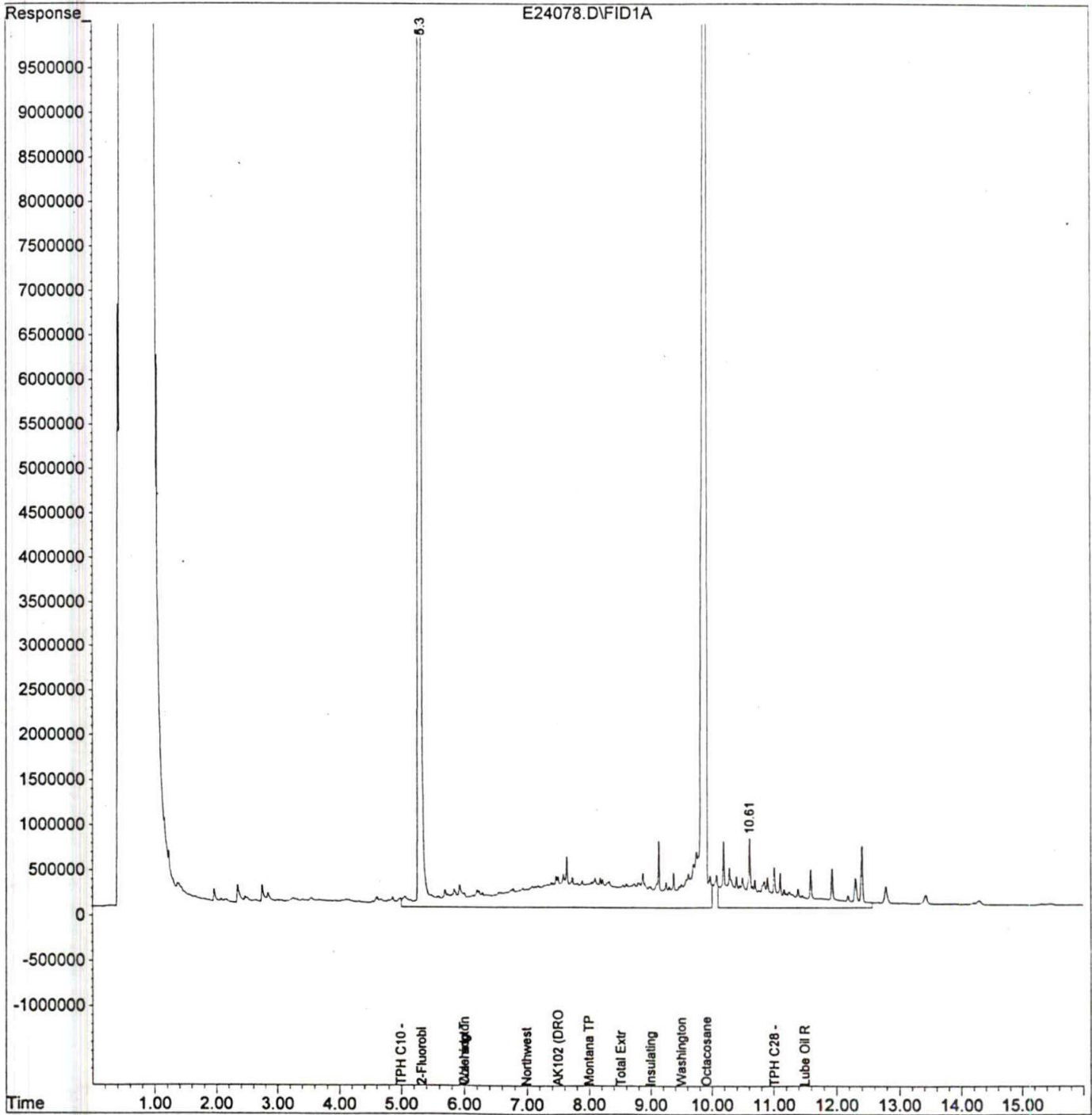
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Sample : b905405-08  
Misc : w  
IntFile : SURR.E  
Quant Time: May 25 8:10 1999

Vial: 55  
Operator: MAO  
Inst : GC #7  
Multiplr: 1.00

Quant Results File: TPHD.RES

Quant Method : C:\HPCHEM\4\METHODS\TPHD.M (Chemstation Integrator)  
Title : TPH-D Front Method  
Last Update : Thu Apr 29 17:46:57 1999  
Response via : Multiple Level Calibration  
DataAcq Meth : TPHD.M

Volume Inj. :  
Signal Phase :  
Signal Info :



Quantitation Report

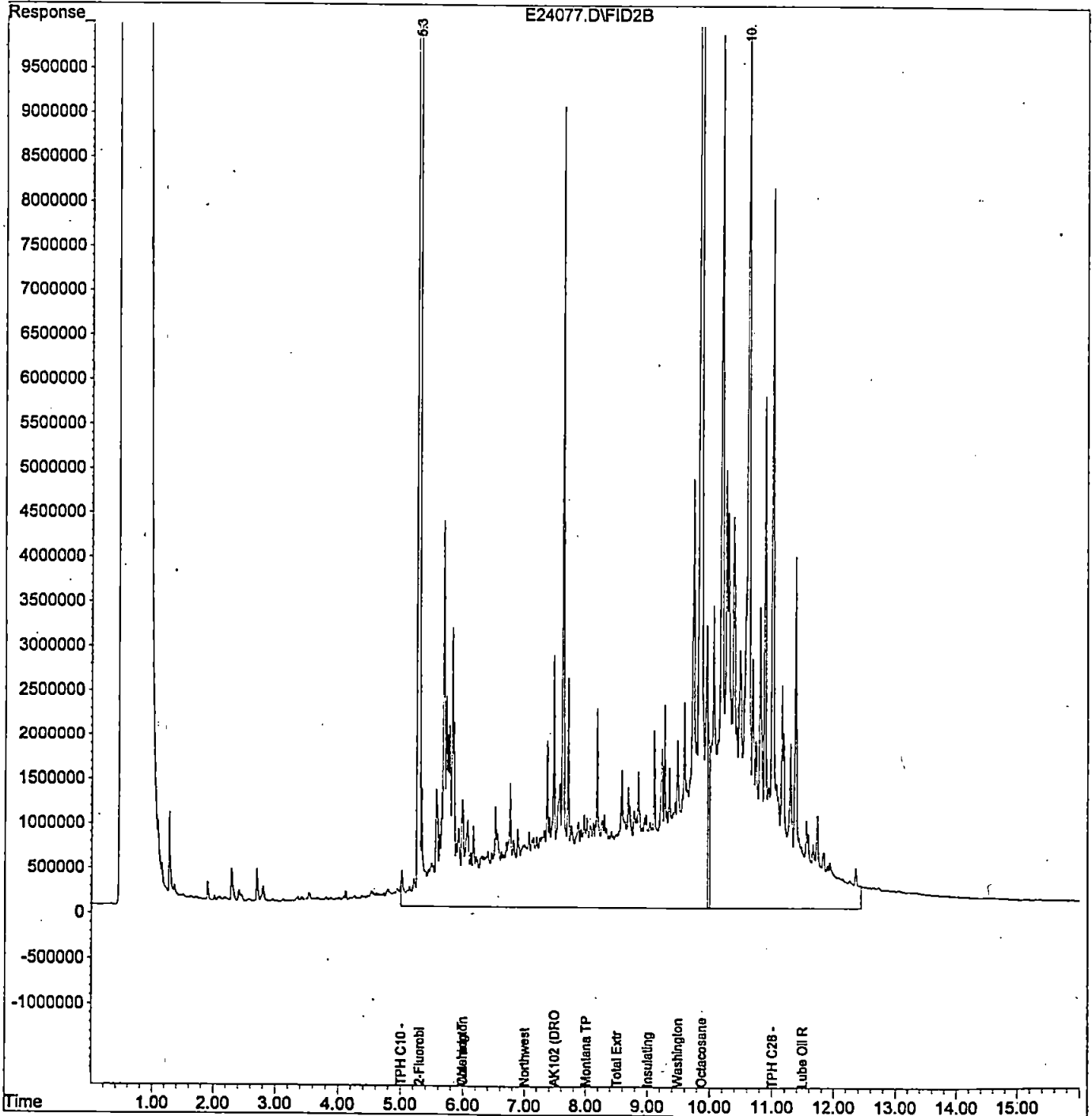
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Acq On : 5-25-99 1:10:38 AM  
Sample : b905405-07  
Misc : w  
IntFile : SURR.E  
Quant Time: May 25 7:55 1999

Vial: 54  
Operator: MAO  
Inst : GC #7  
Multiplr: 1.00

Quant Results File: TPHD2.RES

Quant Method : C:\HPCHEM\4\METHODS\TPHD2.M (Chemstation Integrator)  
Title : TPH-D Rear Method  
Last Update : Wed May 12 20:11:25 1999  
Response via : Multiple Level Calibration  
DataAcq Meth : TPHD.M

Volume Inj. :  
Signal Phase :  
Signal Info :



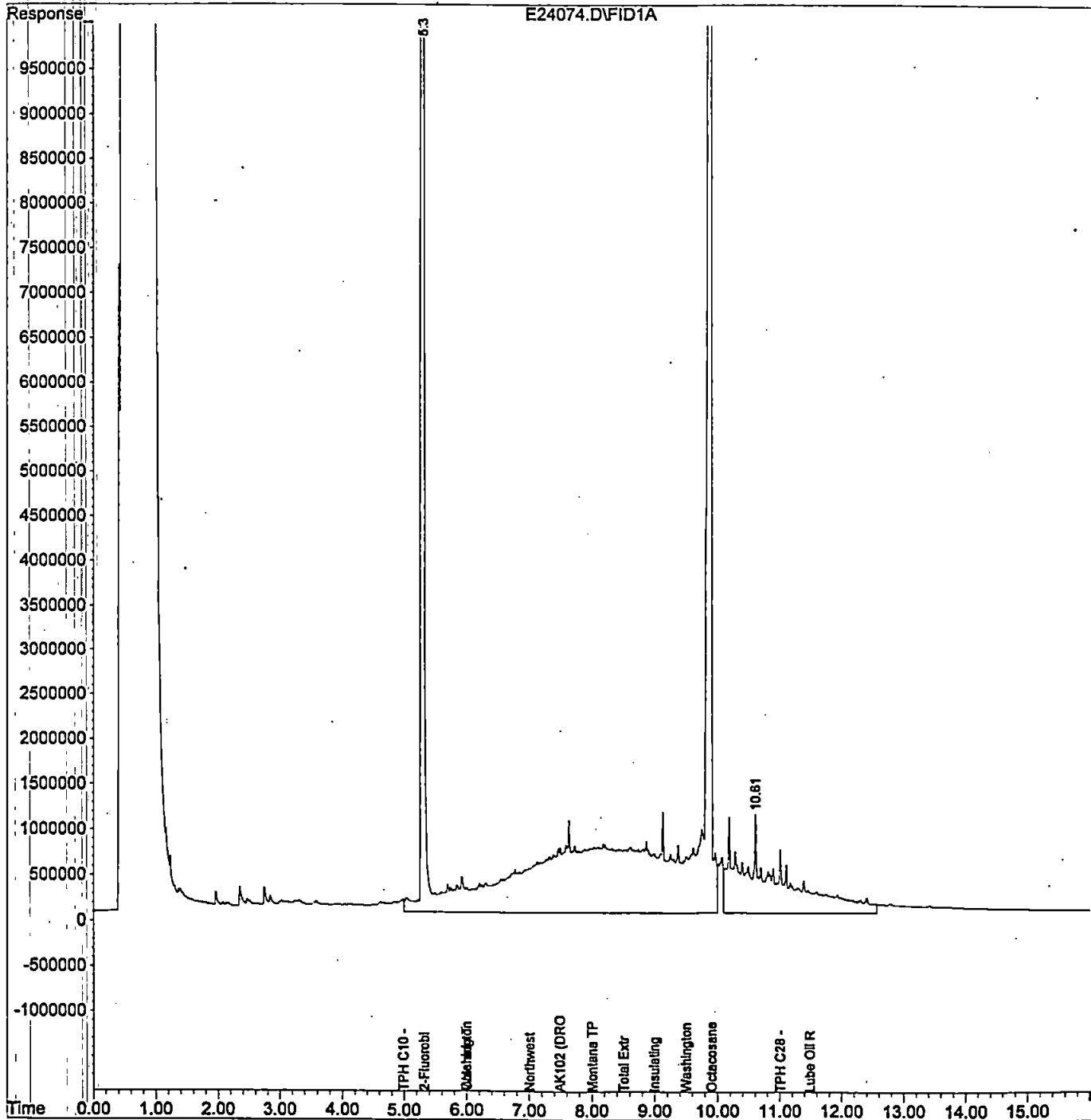
Quantitation Report

Data File : C:\HPCHEM\4\DATA\E24074.D  
Acq On : 5-25-99 12:23:47 AM  
Sample : b905405-03  
Misc : w  
IntFile : SURR.E  
Quant Time: May 25 8:09 1999

Vial: 53  
Operator: MAO  
Inst : GC #7  
Multiplr: 1.00

Quant Method : C:\HPCHEM\4\METHODS\TPHD.M (Chemstation Integrator)  
Title : TPH-D Front Method  
Last Update : Thu Apr 29 17:46:57 1999  
Response via : Multiple Level Calibration  
DataAcq Meth : TPHD.M

Volume Inj. :  
Signal Phase :  
Signal Info :



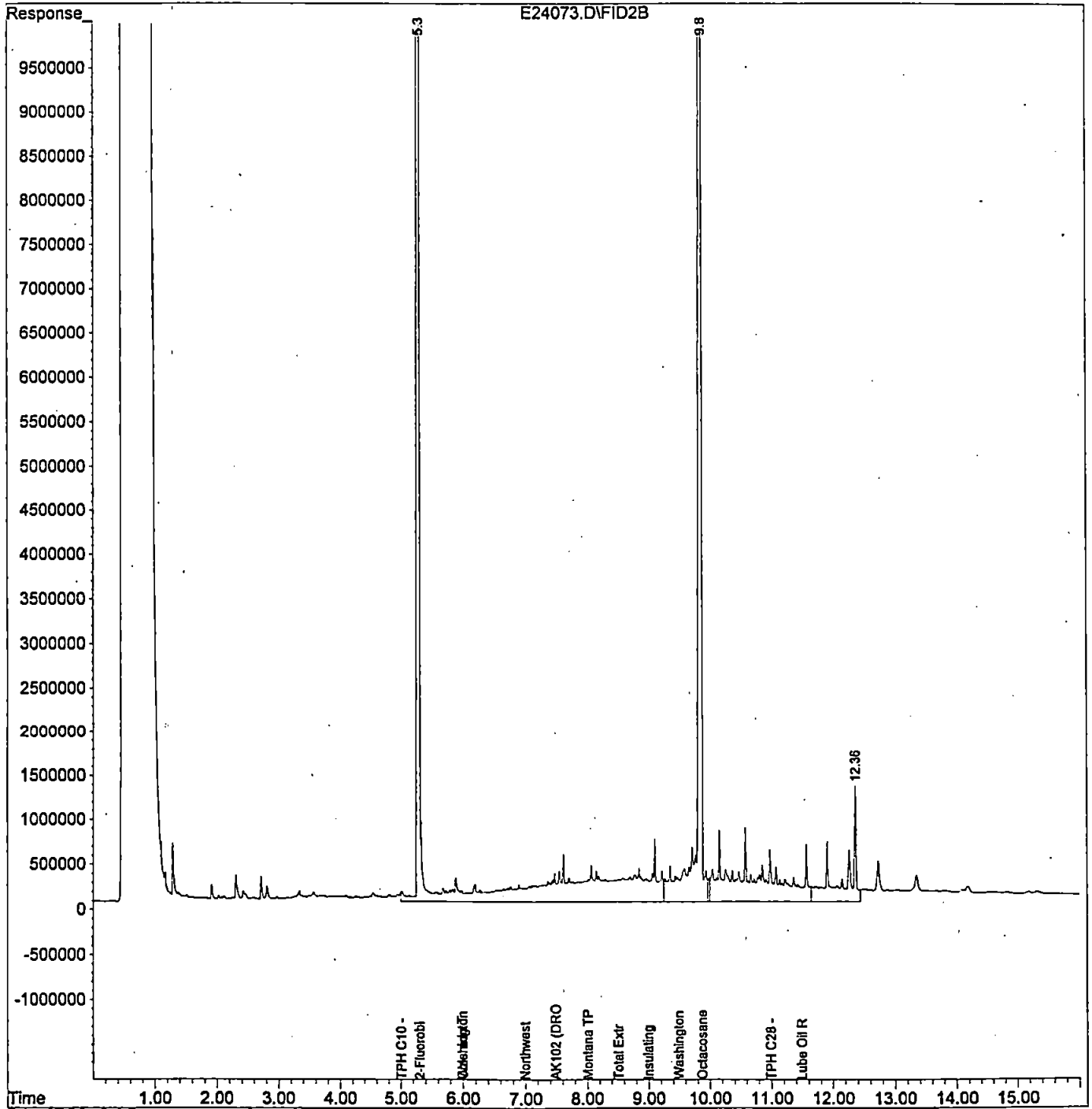
Quantitation Report

Data File : C:\HPCHEM\4\DATA.SEC\E24073.D  
Acq On : 5-25-99 12:23:47 AM  
Sample : b905405-02  
Misc : w  
IntFile : SURR.E  
Quant Time: May 25 7:54 1999

Vial: 52  
Operator: MAO  
Inst : GC #7  
Multiplr: 1.00

Quant Method : C:\HPCHEM\4\METHODS\TPHD2.M (Chemstation Integrator)  
Title : TPH-D Rear Method  
Last Update : Wed May 12 20:11:25 1999  
Response via : Multiple Level Calibration  
DataAcq Meth : TPHD.M

Volume Inj. :  
Signal Phase :  
Signal Info :



Quantitation Report

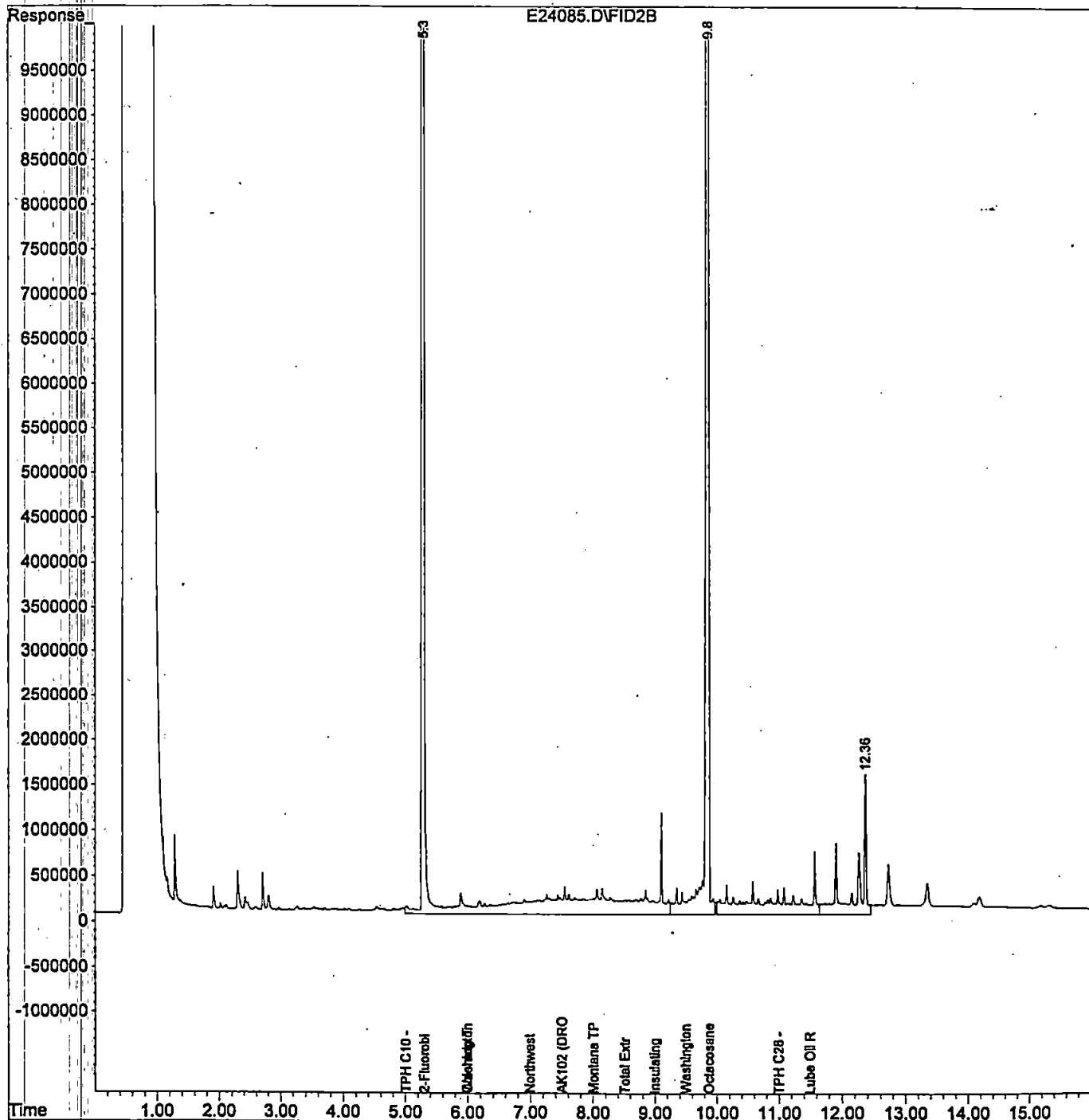
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Sample : b905405-15  
Misc : w  
IntFile : SURR.E  
Quant Time: May 25 7:57 1999

Vial: 62  
Operator: MAO  
Inst : GC #7  
Multiplr: 1.00

Quant Results File: TPHD2.RES

Quant Method : C:\HPCHEM\4\METHODS\TPHD2.M (Chemstation Integrator)  
Title : TPH-D Rear Method  
Last Update : Wed May 12 20:11:25 1999  
Response via : Multiple Level Calibration  
DataAcq Meth : TPHD.M

Volume Inj. :  
Signal Phase :  
Signal Info :



# CHAIN OF CUSTODY RECORD

B905405

**GEOENGINEERS, INC.**  
**8410 154TH AVENUE N.E.**  
**REDMOND, WASHINGTON 98052**  
**(206) 861-6000**



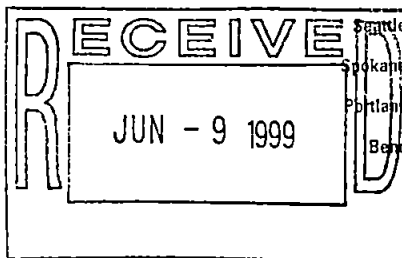
DATE 5-20-99  
 PAGE 1 OF 2  
 LAB NCA  
 LAB NO. \_\_\_\_\_

PROJECT NAME/LOCATION <u>PSE - Grady Way</u>						ANALYSIS REQUIRED										NOTES/COMMENTS									
PROJECT NUMBER <u>0186-407-00</u>						TPH by Ecology NWTPH	PCBs by EPA 8082	PAHs by EPA 827D																(Preserved, filtered, etc.)	
PROJECT MANAGER <u>Steve Woodward</u>																									
SAMPLED BY <u>Brian Peterka</u>																									
SAMPLE IDENTIFICATION		SAMPLE COLLECTION			# OF JARS																				
LAB	GEOENGINEERS	DATE	TIME	MATRIX																					
	GMW-1	5-20-99	0845	W	1		x															B905405-01			
	GMW-2/2a		0900		2	x	x															02			
	GMW-4/4a		0915		2	x	x															03			
	GMW-5		1030		1								x									04			
	GMW-6		0930		1								x									05			
	GMW-7		1315		1								x									06			
	GMW-8		1400		2	x	x															07			
	GMW-9		0800		2	x	x															08			
	GMW-10		1000		3	x	x	x														09			
	GMW-11		0945		3	x	x	x														10			
	GMW-12/12a	↓	1100	↓	2	x	x															11			

ADDITIONAL COMMENTS: Normal TAT

1-1-1 W/CS





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 541.383.9310 fax 541.382.7588

Geo Engineers - Seattle 600 Stewart Street, Suite 1215 Seattle, WA 98101	Project: PSE-Grady Way Project Number: 0186-407-00 Project Manager: Steve Woodward	Sampled: 5/27/99 Received: 5/28/99 Reported: 6/7/99 15:53
--	--	---

**ANALYTICAL REPORT FOR SAMPLES:**

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
GMW-4/4A	B905580-01	Water	5/27/99

North Creek Analytical - Bothell

Steve Davis, Project Manager

*The results in this report apply to the samples analyzed in accordance with the chain of custody document.  
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Geo Engineers - Seattle 600 Stewart Street, Suite 1215 Seattle, WA 98101	Project: PSE-Grady Way Project Number: 0186-407-00 Project Manager: Steve Woodward	Sampled: 5/27/99 Received: 5/28/99 Reported: 6/7/99 15:53
--	--	---

**Polychlorinated Biphenyls by EPA Method 8082  
 North Creek Analytical - Bothell**

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
<u>GMW-4/4A</u>				<u>B905580-01</u>			<u>Water</u>	
Aroclor 1016	0590803	5/30/99	6/2/99		0.100	ND	ug/l	
Aroclor 1221	"	"	"		0.100	ND	"	
Aroclor 1232	"	"	"		0.100	ND	"	
<b>Aroclor 1242</b>	"	"	"		0.100	<b>1.18</b>	"	
Aroclor 1248	"	"	"		0.100	ND	"	
Aroclor 1254	"	"	"		0.100	ND	"	
Aroclor 1260	"	"	"		0.100	ND	"	
Aroclor 1262	"	"	"		0.100	ND	"	
Aroclor 1268	"	"	"		0.100	ND	"	
Surrogate: TCX	"	"	"	40.0-130		43.7	%	

North Creek Analytical - Bothell

\*Refer to end of report for text of notes and definitions.

Steve Davis, Project Manager

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**Environmental Laboratory Network**



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Geo Engineers - Seattle 600 Stewart Street, Suite 1215 Seattle, WA 98101	Project: PSE-Grady Way Project Number: 0186-407-00 Project Manager: Steve Woodward	Sampled: 5/27/99 Received: 5/28/99 Reported: 6/7/99 15:53
--	--	---

**Polychlorinated Biphenyls by EPA Method 8082/Quality Control  
 North Creek Analytical - Bothell**

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
<b>Batch: 0590803</b>	<b>Date Prepared: 5/30/99</b>					<b>Extraction Method: EPA 3520C/600 Series</b>				
<b>Blank</b>	<b>0590803-BLK1</b>									
Aroclor 1016	6/2/99			ND	ug/l	0.100				
Aroclor 1221	"			ND	"	0.100				
Aroclor 1232	"			ND	"	0.100				
Aroclor 1242	"			ND	"	0.100				
Aroclor 1248	"			ND	"	0.100				
Aroclor 1254	"			ND	"	0.100				
Aroclor 1260	"			ND	"	0.100				
Aroclor 1262	"			ND	"	0.100				
Aroclor 1268	"			ND	"	0.100				
Surrogate: TCX	"	0.400		0.304	"	40.0-130	76.0			
<b>LCS</b>	<b>0590803-BS1</b>									
Aroclor 1260	6/3/99	20.0		19.1	ug/l	33.0-122	95.5			
Surrogate: TCX	"	0.400		0.303	"	40.0-130	75.7			
<b>LCS Dup</b>	<b>0590803-BSD1</b>									
Aroclor 1260	6/3/99	20.0		20.2	ug/l	33.0-122	101	21.0	5.60	
Surrogate: TCX	"	0.400		0.321	"	40.0-130	80.3			

North Creek Analytical - Bothell

\*Refer to end of report for text of notes and definitions.

Steve Davis, Project Manager

North Creek Analytical, Inc.  
 Environmental Laboratory Network



Seattle 18939 120th Avenue NE, Suite 101, Bothell, WA 98011-9508

425.420.9200 fax 425.420.9210  
Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776  
509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132  
503.906.9200 fax 503.906.9210

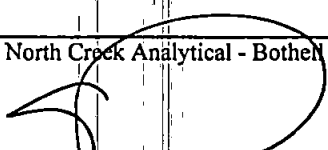
Bend 20354 Empire Avenue, Suite E-9, Bend, OR 97708-1883  
541.383.9310 fax 541.382.7588

Geo Engineers - Seattle 600 Stewart Street, Suite 1215 Seattle, WA 98101	Project: PSE-Grady Way Project Number: 0186-407-00 Project Manager: Steve Woodward	Sampled: 5/27/99 Received: 5/28/99 Reported: 6/7/99 15:53
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### Notes and Definitions

#	Note
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
Recov.	Recovery
RPD	Relative Percent Difference

North Creek Analytical - Bothell

  
Steve Davis, Project Manager

**North Creek Analytical, Inc.**  
**Environmental Laboratory Network**

GEOENGINEERS, INC.  
8410 154TH AVENUE N.E.  
REDMOND, WASHINGTON 98052  
(206) 861-6000



6905580

DATE 5-20-99  
PAGE 1 OF 1  
LAB NCA  
LAB NO.

PROJECT NAME/LOCATION						ANALYSIS REQUIRED										NOTES/COMMENTS									
PROJECT NUMBER						PcBs by 8082																			(Preserved, filtered, etc.)
PROJECT MANAGER																									
SAMPLED BY																									
SAMPLE IDENTIFICATION		SAMPLE COLLECTION			# OF JARS																				
LAB	GEOENGINEERS	DATE	TIME	MATRIX	JARS																				
	GMW-4/4a	5-27-99	1415	W	1	X																	6905580-01		

RELINQUISHED BY SIGNATURE <i>[Signature]</i>	FIRM <u>GEI</u>	RELINQUISHED BY SIGNATURE <i>[Signature]</i>	FIRM <u>NCA</u>	RELINQUISHED BY SIGNATURE	FIRM
PRINTED NAME <u>Brian Peterka</u>		PRINTED NAME <u>Adam Reed</u>		PRINTED NAME	
DATE <u>5-27-99</u>	TIME <u>1600</u>	DATE <u>5-28-99</u>	TIME <u>16:30</u>	DATE	TIME
RECEIVED BY SIGNATURE	FIRM	RECEIVED BY SIGNATURE	FIRM	RECEIVED BY SIGNATURE	FIRM
PRINTED NAME		PRINTED NAME		PRINTED NAME	
DATE	TIME	DATE	TIME	DATE	TIME

ADDITIONAL COMMENTS: Normal TAT

w/CS