Consulting Engineers
and Geoscientists

GeoEngineers

Report of Environmental Services
Underground Storage Tank Removal Monitoring, Supplemental Subsurface Assessment and Research Findings
Family Fun Centers
Tukwila, Washington

April 22, 1998

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Family Fun Centers
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For
Family Fun Centers

GeoEngineers

File No. 5925-005-02-1150/042298

GeoEngineers

April 22, 1998

Consulting Engineers and Geoscientists
Offices in Washington, Oregon, and Alaska

Family Fun Centers
1155 Graves Avenue
El Cajon, California 92021

Attention: John Huish, Dick Hendry and Scott Huish

We are submitting two copies of our "Report of Environmental Services, Underground Storage Tank Removal Monitoring, Supplemental Subsurface Assessment and Research Findings" for the Family Fun Centers property located in Tukwila, Washington. Our services were completed in general accordance with the scopes provided in our proposals dated January 16 and February 18, 1998. Soil sampling at the limits of the underground storage tank (UST) excavations was conducted in accordance with Washington Administrative Code (WAC) 173-340. We appreciate the opportunity to be of continued service to Family Fun Centers. Please call if you have questions regarding this report.

Yours very truly,

GeoEngineers, Inc.

Kurt S. Anderson, C. P.G.
Associate

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FAMILY FUN CENTER
TUKWILA, WASHINGTON
FOR
FAMILY FUN CENTERS

INTRODUCTION AND BACKGROUND

This report summarizes GeoEngineers', Inc. (GeoEngineers) services during UST removal, supplemental subsurface assessment activities and research findings at the Family Fun Center site. The site is located at 15301 South Grady Way in Tukwila, Washington. The activities described in this report were conducted from November 1997 to February 1998. The site is shown relative to surrounding features on the Vicinity Map, Figure 1. The layout of the site, with former site facilities, is shown on the Site Plan, Figure 2.

The site is irregularly shaped and encompasses approximately 13 acres. The site has dimensions of roughly 600 feet by 1,000 feet in plan. Interurban Avenue and South Grady Way border the west and south property boundaries, respectively. The Green River and Burlington Northern Railroad tracks border the north and east property boundaries, respectively. Access to the site is provided near the southwest corner of the site from Monster Road. A gravel/asphalt road extends from Monster Road to the east and north to the approximate center of the site. The gravel road then extends in the east-west direction, approximately bisecting the property. The site is separated into three parcels. Parcel 1 encompasses approximately 2.1 acres near the northwest corner of the site. Parcel 2 encompasses approximately 2.8 acres near the center of the north portion of the site. The remaining 8 to 9 acres comprise Parcel 3. All former structures at the site, including five residences with ancillary buildings, an auto repair shop, barn, former nursery retail shop, a milk processing plant and shed, have been demolished.

GeoEngineers has completed a geotechnical study, Phase I environmental site assessment (ESA) and Phase II ESA at the site for Family Fun Centers. The results of those studies are summarized in our reports dated June 30, July 28 and November 17, 1997. Previous environmental and geotechnical studies also have been completed at the site by Geotech Consultants and Applied Geotechnology. We have submitted the site to Ecology's Voluntary Cleanup Program (VCP) for Technical Consultation. A summary of the environmental issues of concern at the site is provided in our November 17, 1997 report.

The scope of the services summarized in this report was developed to further prepare the site for development by Family Fun Centers and to address environmental issues that Gail Colburn of the Washington State Department of Ecology (Ecology) expressed through her technical consultation in a meeting on February 3, 1998.

The USTs at the site were removed in February 1998 because they were no longer in use. None of these tanks were registered with Ecology. A 300-gallon heating oil UST (UST No. 1), a 650-gallon heating oil tank (UST No. 2), a 1000-gallon heating oil tank (UST No. 3), and a 500-gallon gasoline tank (UST No. 4) were excavated and removed from Excavation Numbers 1 through 3. Also, three aboveground heating oil tanks (100-gallon, 275-gallon and 300-gallon) and a gasoline dispenser that were no longer in use were removed from the site in February 1998.

One monitoring well (MW-19) was drilled and installed on the upgradient portion of the site on November 18, 1997, to further assess arsenic in ground water. GeoEngineers completed three hand-auger borings (98012301-1-8, 98012301-2-8 and 98012301-3-8) in January 1997, and three additional hand-auger borings (HA-1 through HA-3) and two test pits (TP-1 and TP-2) at the site in February 1998, to further assess subsurface soil conditions at the site.

OBJECTIVE

The objectives of our study were to (1) further investigate potential on-site and off-site sources of arsenic; (2) remove the heating oil and gasoline USTs and obtain samples from the limits of the excavations to close the tanks in accordance with *Ecology's Guidance for Site Checks and Site Assessments for Underground Storage Tanks*; (3) complete a focused site assessment in areas suggested by Ecology at the February 3, 1998 meeting; (4) provide focused site assessment results to Ecology to close the data gaps outlined by Ecology; and (5) provide Ecology with documents they do not already have.

SCOPE

Our scope of services is presented below in three separate tasks including: (1) potential source of arsenic; (2) fuel tank removal; (3) additional assessment requested by Ecology. GeoEngineers' specific scope of services completed for each task follows.

POTENTIAL SOURCES OF ARSENIC

Arsenic in Ground Water

1. Observe the drilling of one boring to a depth of approximately 30 feet below the ground surface in the upgradient portion of the site.
2. Obtain samples from the borings at approximate 2.5-foot-depth intervals. Conduct field screening on each soil sample for evidence of petroleum-related contamination using visual, water sheen and headspace vapor screening methods. Visually classify the soil samples in general accordance with ASTM D2488-90.
3. Install a 2-inch-diameter polyvinyl chloride (PVC) monitoring well in the boring.
4. Develop the well using a combination of surging and hand-bailing techniques.
5. Determine the monitoring well casing rim elevation to an accuracy of 0.01 foot using an engineer's level and an assumed site datum.

6. Measure the depth to ground water in the monitoring well and calculate the ground water elevation relative to a site datum.
7. Obtain ground water samples from the monitoring well in November 1997 and January 1998. Submit the November 1997 sample for analysis of dissolved priority pollutant metals by EPA 6000/7000 series methods and the January 1998 sample for analysis of dissolved arsenic by EPA 6000/7000 series methods.
8. Evaluate the field and laboratory data with regard to existing regulatory requirements and published literature regarding arsenic in ground water.

Additional Soil Sampling

1. Complete three hand auger borings at depths of approximately 0.75 feet below the ground surface adjacent east to the former barn and in the vicinity of the former J & G Nursery.
2. Submit selected soil samples from the hand auger borings for chemical analysis of arsenic and lead by EPA 6000/7000 series methods.
3. Evaluate the field and laboratory data with regard to existing regulatory requirements.

Arsenic Research

1. Contact federal, state and local agencies regarding information on a potential off-site source of arsenic found in ground water beneath the site during previous subsurface investigations.
2. Research literature for references for natural background concentrations of arsenic in ground water.

FUEL TANK REMOVAL

1. Observe and document the removal of four USTs and three ASTs.
2. Obtain soil samples from the limits of the excavations in accordance with Ecology guidelines.
3. Assist the contractor in segregation of excavated soil into apparently noncontaminated and apparently contaminated soil stockpiles based on field screening results.
4. Obtain samples from the apparently contaminated soil stockpile for characterization, in accordance with Ecology guidelines.
5. Conduct field screening on each soil sample for evidence of petroleum-related contamination using visual, water sheen and headspace vapor screening methods.
6. Submit selected soil samples from the UST excavations and soil stockpile for chemical analysis of one or more of the following: benzene, ethylbenzene, toluene and xylenes (BETX) by EPA Method 8021B; gasoline-range hydrocarbons by Ecology Method NWTPH-G; diesel- and heavy oil-range hydrocarbons by Ecology Method NWTPH-D extended; priority pollutant metals (antimony, arsenic, beryllium, cadmium, chromium, copper, lead, nickel, selenium, silver, thallium, zinc and mercury) with barium by EPA 6000/7000 series methods; and volatile petroleum hydrocarbons (VPH) with confirmation by the June 1997 Ecology method.

7. Evaluate the field and laboratory data with regard to the site-specific cleanup levels.

ADDITIONAL RESEARCH REQUESTED BY ECOLOGY

Supplemental Subsurface Exploration

1. Complete three hand-auger borings to depths of approximately 0.5 feet below the ground surface in the detention pond and in the drainage ditch along the eastern site boundary.
2. Complete two test pits to depths of approximately 12.0 feet below the ground surface; one located in the vicinity of previous exploration SP-5, and one in the location of the former diesel AST (and exploration SP-19).
3. Obtain samples from the test pit excavations at approximately 2-foot-depth intervals.
4. Conduct field screening on each hand auger and test pit soil sample for evidence of petroleum-related contamination using visual, water sheen and headspace vapor screening methods. Visually classify the soil samples in general accordance with ASTM D2488-90.
5. Submit selected soil samples from the hand auger borings and test pits for chemical analysis of one or more of the following: diesel- and heavy oil-range hydrocarbons by Ecology Method NWTPH-D extended, arsenic and lead by EPA 6000/7000 series methods; priority pollutant metals and barium by EPA 6000/7000 series methods; and polychlorinated biphenyl compounds (PCBs) by EPA Method 8081.
6. Complete excavations at the location of a geophysical anomaly behind the former repair shop west of the former residence at 7140 Monster Road and at the location of a geophysical anomaly east of the former residence at 7100 Monster Road, to determine the sources of the geophysical anomalies.
7. Complete a test pit in the vicinity of a geophysical anomaly at the former garage of the former residence at 7150 Monster Road.
8. Field screen soil beneath the drains in the former milk processing plant for evidence of petroleum- and/or solvent-related contamination.

Search for Monitoring Wells GCW-14 and B-15

1. Complete test explorations in the assumed vicinities of monitoring wells GCW-14 and B-15, based on the locations provided by Geotech Consultants.

SITE CLEANUP LEVELS

As we discussed in our letter dated January 6, 1998, we have calculated a site-specific MTCA Method B cleanup level for total petroleum hydrocarbons (TPH) in accordance with Ecology's *Interim Interpretive and Policy Statement, Cleanup of Total Petroleum Hydrocarbons* (Interim TPH Policy). We calculated a site-specific Method B cleanup level for TPH of 2,984 milligrams per kilogram (mg/kg), with no greater than 1,786 mg/kg of aromatic compounds. For site contaminants that are not petroleum hydrocarbons, the MTCA Method A residential or Method B soil cleanup levels will apply.

SOURCES OF ARSENIC

MONITORING WELL INSTALLATION

General

One monitoring wells (MW-19) was drilled and installed at the site on November 18, 1997 by Holt Drilling. The location of the monitoring well was selected to assess ground water conditions in the upgradient portion of the site. A representative of our staff monitored drilling activities and obtained soil samples at approximate 2.5-foot-depth intervals from the monitoring well borings for soil classification, field screening and possible laboratory testing. The approximate monitoring well locations are shown in Figure 2. Our drilling and sampling procedures are described in Appendix A. The borings logs also are included in Appendix A.

Subsurface Soil Conditions

Monitoring well boring MW-19 was completed at a depth of approximately 31.5 feet below the ground surface. The boring generally encountered silty sand and silt to a depth of approximately 22 feet below the ground surface. The silty unit is underlain by a sand unit to the depth explored. Ground water was encountered at a depth of approximately 22 feet below the ground surface during drilling. Field screening results did not indicate the likely presence of petroleum-related soil contamination in the samples obtained from the borings. No soil samples were selected for chemical analysis.

Ground Water Monitoring and Sampling

Ground water samples were obtained from monitoring well MW-19 on November 20, 1997 and January 23, 1998, and submitted for chemical analysis of dissolved priority pollutant metals (November 20) and dissolved arsenic (January 23). Ground water monitoring and sampling procedures are described in Appendix A. Depths to ground water and ground water elevations and ground water analytical results are summarized in Table 1. The laboratory reports and our review of the laboratory quality control program are included in Appendix B. A 55-gallon drum of decontamination, purge and development water generated during the installation and a 55-gallon drum of drill cuttings currently is stored on site.

Depth to ground water in MW-19 was 12.39 feet below the casing rim on November 20, 1997, and 10.36 feet below the casing rim on January 23, 1998. Corresponding ground water elevations were calculated relative to a temporary benchmark at the site with an assumed elevation of 100.00 feet (Table 1).

Dissolved arsenic was not detected in the chemical analysis of water samples obtained from monitoring well MW-19 on November 20, 1997 and January 23, 1998.

ADDITIONAL SOIL SAMPLING

GeoEngineers completed three hand auger borings (98012301-1-8, 98012301-2-8 and 98012301-3-8). Hand-auger borings were completed adjacent to the former barn on Parcel 2 (98012301-1-8 and 8012301-2-8) and in the vicinity of the former J & G Nursery on Parcel 3

(98012301-3-8) at approximately 0.75 feet below the ground surface. The approximate locations of the hand-auger borings are shown in Figure 2.

Soil samples from the hand-auger borings were field-screened for petroleum hydrocarbons. Field screening results are summarized in Table 2. Field screening and soil sampling methods are described in Appendix A.

Field screening of soil samples obtained from the hand-auger borings did not indicate the obvious presence of petroleum hydrocarbons. GeoEngineers submitted a soil sample from each boring for chemical analysis of total lead and arsenic. Lead and arsenic were detected at concentrations less than MTCA Method A soil cleanup levels. Concentrations detected are within expected natural background ranges. Chemical analytical results are summarized in Table 2. The laboratory report and our review of the laboratory quality control data are presented in Appendix B.

RESEARCH

We contacted federal, state and local agencies in December 1997 and January 1998 regarding information on a potential off-site sources of arsenic. We found no documented off-site source of arsenic that likely would have impacted ground water arsenic concentrations at the site.

We also contacted Charles San Juan of Ecology on February, 20, 1998. He forwarded a journal article titled, "Arsenic in Ground Water of the Western United States" by Welch et al., 1988; Welch et al. document that the natural occurrence of ground water with moderate to high arsenic concentrations (10 to greater than 50 micrograms per liter) is common throughout much of the western United States. These findings are based on an extensive literature review, compilation of unpublished reports and data, and the review of databases containing more than 7,000 analyses of ground water samples for arsenic. Ground water arsenic concentrations for samples obtained from monitoring wells at the Family Fun Centers site are within the range given by Welch et al.

DISCUSSION

The results of subsurface assessments at the site indicate that arsenic is present in ground water samples obtained from monitoring wells at concentrations ranging from 5.2 to 22 micrograms per liter (μg/l). Chemical analytical results for grab samples obtained from two direct-push borings indicated arsenic concentrations in ground water of approximately 70 μg/l. It is our experience that grab samples do not usually represent actual contaminant concentrations and generally are skewed high. We have not encountered a source of arsenic in the soil or slag at the site, other than an isolated occurrence of arsenic near the former repair shop at a concentration of 30.4 mg/kg. Natural background concentrations of dissolved arsenic in ground water can be higher in areas with anaerobic subsurface conditions. Based on limited dissolved oxygen measurements in ground water at the Family Fun Center site, locally the aquifer appears to be anaerobic. It is our opinion that dissolved arsenic in ground water

beneath the Family Fun Center site is a result of naturally occurring background levels of arsenic.

FUEL TANK REMOVAL AND CLOSURE AND REMEDIAL EXCAVATION

GENERAL

Custom Backhoe & Dumptruck Service, Inc. (Custom Backhoe) contracted Tank Services Northwest, Inc. to inert the tanks on February 25, 1998, in preparation for removal. Custom Backhoe excavated and removed the four USTs and removed three ASTs on February 25 and 26. A representative of GeoEngineers who is registered with Ecology to perform UST site checks and site assessments was present to observe tank removal operations, document the conditions of the tanks and obtain soil samples from the final limits of the UST excavations. Soil samples were obtained during this study in accordance with Ecology's *Guidance for Site Checks and Site Assessments for Underground Storage Tanks* and *Guidance for Remediation of Releases from Underground Storage Tanks*. All of the USTs were located on Parcel 3. The approximate locations of the USTs and final limits of the excavations are shown in Figure 2.

UST REMOVAL

Heating Oil USTs

UST No. 1 was a 300-gallon steel heating oil tank. The tank was located on the north side of former residence at 7160 Monster Road. The UST was buried approximately 2.5 feet below the ground surface, and had a diameter of approximately 3 feet. Two 1/2-inch-diameter holes were observed near the top of the tank. Minor rust and pitting were observed on the tank after removal. The excavation for the removal of UST No. 1 (Excavation No. 1) was completed at a depth of approximately 6 feet below the ground surface.

UST Nos. 2 and 3 were 650- and 1000-gallon steel heating oil tanks, respectively. UST No. 2 and UST No. 3 were located adjacent to one another, north of the former residence at 7140 Monster Road. UST Nos. 2 and 3 were buried about 1 foot below the ground surface, and had diameters of approximately 3.5 feet. Rust and heavy pitting were observed on the surface of UST No. 2 and the tank was full of water. Minor rust and pitting were observed on the surface of UST No. 3. The tanks were removed from one excavation (Excavation No. 2) which was completed at a depth of approximately 5.5 feet. No holes were observed in the USTs during removal.

Native soil observed in the walls of Excavation No. 1 consisted of fine to coarse gravel from the ground surface to a depth of approximately one foot. The gravel was underlain by silty sand. Native soil observed in the walls of Excavation No. 2 consisted of silty sand from the surface to the depth of the excavation at approximately 5.5 feet. Ground water was not encountered in the heating oil UST excavations.

The possible presence of petroleum hydrocarbons was assessed by field screening soil samples obtained from the walls and base of the excavations. Field screening results for soil samples submitted for chemical analysis are summarized in Table 1. Field screening and soil sampling methods are described in Appendix A.

A small amount (approximately one-tenth of a cubic yard) of petroleum-stained soil was observed in the vicinity of the UST fill pipe in Excavation No. 1, and was excavated on February 25, 1998. This soil was placed in a separate stockpile. No petroleum-stained soil was observed in Excavation No. 2.

Three discrete soil samples (7160B-6, 7140B-5.0 and 7140EB-5.5) were obtained from the bases of the heating oil UST excavations (Excavation No. 1 and Excavation No. 2) and were submitted for chemical analysis of diesel- and heavy oil-range hydrocarbons. Diesel- and heavy-oil range hydrocarbons either were not detected or detected at concentrations below the Model Toxics Control Act (MTCA) Method A soil cleanup level. Chemical analytical results are summarized in Table 4. Approximate soil sampling locations are shown in Figure 3. Laboratory reports and our review of the laboratory quality control data are presented in Appendix B. Tank decommissioning certification is provided in Appendix C.

Gasoline UST

UST No. 4 was a 500-gallon steel tank. The tank was located west of the former milk processing plant. The UST was buried approximately 2.5 feet below the ground surface, and had a diameter of approximately 4 feet.

Native soil observed in the walls of Excavation No. 3 consisted of silty sand from ground surface to a depth of 5 feet. The silty sand was underlain by fine sand with silt to a depth of approximately 12 feet, which was underlain by a clayey silt to the depth of the excavation at 12.5 feet. Moderate ground water seepage was observed in the walls of the gasoline UST excavation at a depth of 6 feet.

The excavation for the removal of UST No. 4 (Excavation No. 3) was completed at a depth of approximately 7 feet below the ground surface. Petroleum-stained soil was observed in the walls and base of Excavation No. 3 at approximately 5 feet below the ground surface. The base of the excavation was extended to approximately 12.5 feet below ground surface. Field screening results did not indicate probable petroleum-related soil contamination in the extended base of Excavation No. 3. Field screening results did indicate that petroleum-impacted soil remained in the north and south walls of the excavation from approximately 5 to 12 feet below ground surface.

Five discrete soil samples (EX-G1-7, EX-G2-7, EX-G3-7, EX-G4-7 and B-G-12) were obtained from the wall and base of the gasoline UST excavation. Soil samples EX-G1-7, EX-G2-7 and EX-G4-7 were submitted for chemical analysis of BETX and gasoline-range hydrocarbons. BETX and gasoline-range hydrocarbons either were not detected or were detected at concentrations less than the site-specific MTCA Method B soil cleanup levels. Soil

sample EX-G3-7, obtained from a depth of 7 feet in the south wall, was submitted for chemical analysis of VPH. Soil sample B-G-12, obtained from the base at a depth of 12 feet, was submitted for chemical analysis of BETX and gasoline-range hydrocarbons. BETX and gasoline-range hydrocarbons were detected at concentrations less than the site-specific MTCA Method B cleanup levels in sample EX-G3-7. Chemical analytical results are summarized in Tables 4 and 5. Approximate soil sampling locations are shown in Figure 2. Laboratory reports and our review of the laboratory quality control data are presented in Appendix B.

ASTs

We observed a 100-gallon steel AST and a 275-gallon steel AST north of the former residence at 7160 Monster Road, and a 300-gallon steel AST adjacent to the site access gate on Monster Road on February 25, 1998. The tanks were observed to be in good condition. These tanks apparently had previously been used for heating oil storage for residences at the site. Custom Backhoe removed the ASTs from the site for disposal on February 25, 1998.

A steel AST also was observed near the drainage ditch adjacent east of the existing soil stockpile on Parcel 3. We estimate the tank capacity to be between 500 and 1,000 gallons, based on visual observation. This AST was not removed from the site. It is likely, based on the size, that this tank was the diesel AST formerly placed north of the former residence at 7160 Monster Road. The location of the AST could not be accessed from the east because of the proximity of the railroad tracks, drainage ditch and heavy overgrowth, and could not be accessed from the top of the soil stockpile because of the steep slope and heavy overgrowth. The AST will be removed during future site remediation activities.

Soil Stockpiles

Approximately 15 cubic yards (visual stockpiled estimate) of soil, removed from Excavation No. 3 and one-tenth of a cubic yard of soil removed from Excavation No. 1 were placed in a separate soil stockpile. One composite soil sample was obtained from the stockpile on February 26, 1998, and submitted for chemical analysis of BETX and gasoline-range hydrocarbons. Total petroleum hydrocarbons were detected at a concentration (8,030 mg/kg) greater than the site specific MTCA Method B soil cleanup level. The soil sample field screening and chemical analytical results are presented in Table 4. The soil stockpile was placed on the southern portion of on Parcel 3, mixed with 20 pounds of 10-10-10 fertilizer and covered with plastic sheeting.

ADDITIONAL ACTIVITIES REQUESTED BY ECOLOGY

DREDGE SPOILS

It is our understanding from our review of AGI's Phase I ESA that the Green River was dredged in 1904 in conjunction with construction of the railroad tracks east of the site. The AGI report suggested dredge spoils may have been placed on the Family Fun Center site. We have contacted the following federal, state and local agencies in regard to the dredging of the Green

River and have been unable to verify that the river was dredged or if spoils were placed on the site:

- Army Corps of Engineers
- King County Green River Flood Control District
- Green River Watershed Group

pH OF GROUND WATER

Gail Colburn of Ecology commented that a pH of 5.69 in ground water from SP-2 in October 1997 appears anomalously low, when compared to other pHs measured at the site. This low pH also is associated with an exploration location that is farthest from known slag fill areas. Where explorations were completed through slag (as in GCW-16), the pH was closer to neutral (6.35) in October 1997. Therefore, we do not associate the presence of slag with a low pH. The pH at a compliance monitoring well to be installed in this area will be monitored for pH to determine if the lower pH measured in SP-2 was a one-time anomalous reading.

TEST PITS AND HAND AUGER EXPLORATIONS

GeoEngineers completed three hand auger borings (HA-1 through HA-3) and two test pits (TP-1 and TP-2) at the site on February 26, 1997. Hand auger borings were completed in the detention pond (HA-1) and the drainage ditch along the east property boundary (HA-2 and HA-3) to depths of approximately 0.5 feet below the ground surface. The test pits were completed north of the soil stockpile (TP-1) and west of the soil stockpile in the vicinity of a former diesel AST (TP-2) to depths of 8 and 12 feet below the ground surface, respectively. The test pit exploration locations were selected to further assess the subsurface, based on the location and results of chemical analyses of soil and ground water samples collected by GeoEngineers during our 1997 Phase II environmental site assessment. Specifically, field screening results had indicated moderate combustible vapor concentrations at the location of SP-5 (TP-1), at depths ranging from approximately 14 to 22 feet below the ground surface. Chemical analytical results had indicated TPH concentrations in ground water at the location of SP-19 (TP-2) but petroleum-contaminated soil was not encountered. The hand auger exploration locations were selected by Ecology to fill data gaps. The approximate locations of the hand auger and test pit explorations are shown in Figure 2. The exploration logs for the test pits are included in Appendix A.

The test pit explorations encountered variable soil conditions, generally consisting of fill material to a depth of approximately 10.5 feet. The fill material consisted of silty sand and sand with varying amounts of gravel and wood and concrete debris. Ground water seepage was observed in TP-1 at a depth of 3 feet below ground surface and in TP-2 at a depth of 1.5 feet below ground surface. The seepage appeared to be from perched lenses of more permeable soil. The test pits were backfilled with the excavated soil.

Soil samples obtained from the hand auger borings and test pit explorations were field screened for hydrocarbons. Field screening results are summarized in Table 2. Field screening and soil sampling methods are described in Appendix A.

Field screening of soil samples obtained from the hand auger borings completed in the detention pond and drainage ditch and soil samples from test pit TP-1 did not indicate the obvious presence of petroleum hydrocarbons. The test pit was completed at a depth that did not reach the depths where vapors had been detected during drilling of SP-5 for the following reasons: (1) the backhoe excavator used could not achieve depths greater than about 13 feet; and (2) the backhoe met practical refusal at about 8 feet because of the presence of very dense soil. Field screening for soil samples obtained from test pit TP-2 (depths of approximately 2, 5 and 8 feet) indicated likely petroleum-related soil contamination.

GeoEngineers selected five soil samples from the hand auger borings and test pit TP-2 for chemical analysis of one or more of the following: diesel- and heavy oil-range hydrocarbons, priority pollutant metals with barium and PCBs. A sample was not submitted from TP-1, based on the field screening results. Chemical analytical results are summarized in Table 2. The laboratory report and our review of the laboratory quality control data are presented in Appendix B.

Diesel- and heavy oil-range hydrocarbons either were not detected or detected at concentrations below the site-specific MTCA Method B soil cleanup levels in samples submitted from HA-1, HA-2, HA-3 and TP-2. Field screening results do not indicate that dissolved-phase hydrocarbons in ground water in former exploration SP-19 was in contact with the hydrocarbons in soil encountered in TP-2 at depths ranging from approximately 2 to 7 feet. We requested analysis of PCBs in soil sample TP-2-5.0 because of the detected concentration of insulating oil-range hydrocarbons in the sample and possible association of PCBs in insulating oil. A pole-mounted transformer with insulating oil is located near the former diesel AST location. PCBs were not detected in sample TP-2-5.0. It is possible that a release from the transformer has occurred in the past; however, the resulting concentration of hydrocarbons in the soil do not exceed the site-specific Method B cleanup level for TPH.

Arsenic, barium, chromium, copper, lead, nickel, zinc and mercury were detected at concentrations less than MTCA Method A residential or Method B soil cleanup levels in samples submitted from HA-1, HA-2 and HA-3. Thallium also was detected at a concentration less than the MTCA Method B cleanup level in the sample submitted from HA-3. The presence of heavy oil-range hydrocarbons in the shallow soil samples obtained in the drainage ditch could be related to hydrocarbons in the soil stockpile to the west or possibly to the railroad to the east. The presence of lube oil-range hydrocarbons in the soil sample obtained from the detention pond could be related to the soil stockpile or to past releases of oil onto the ground surface in the vicinity of the detention pond.

TEST PIT EXPLORATIONS IN VICINITY OF GEOPHYSICAL ANOMALIES

Test pit exploration to depths ranging from 2 to 4 feet were completed in the vicinity of the geophysical anomalies identified during our 1997 Phase II environmental site assessment: near former residences at 7100 Monster Road and behind the garage associated with the former residence at 7140 Monster Road. Drain pipe associated with a septic system and several large pieces of concrete with reinforcing bar were located in the vicinity of the geophysical anomaly southeast of the former residence at 7100 Monster Road. A heating oil product supply line was encountered in the location of the geophysical anomaly near the former residence at 7150 Monster Road. There was no evidence of USTs or hydrocarbons in the vicinity of the geophysical anomalies near the former residences at 7100, 7140 and 7150 Monster Road.

FORMER MILK PROCESSING PLANT DRAINS

GeoEngineers was present at the site on April 20, 1998, as the concrete floor beneath the former milk processing plant was removed. Soil in the vicinity of several former drains was field screened. Field screening results (no sheens and low to no headspace vapors) did not indicate the likely presence of petroleum- or solvent-related soil contamination.

LOCATING GCW-14 AND B-15

Geotech Consultants provided an unscaled drawing to GeoEngineers in February, 1998, when we requested the approximate location of monitoring well B-15. The ground surface in the general vicinity shown on the drawing was graded off to a depth of approximately 2.0 feet in an approximately 600-square-foot area southeast of GCW-17. Monitoring well B-15 was not encountered during our investigation.

The surface of the paved area east of the former milk processing was cleared of soil and demolition debris and several areas of pavement were removed in an attempt to locate monitoring well GCW-14. The monitoring well was not encountered during our investigations.

CONCLUSIONS

ARSENIC

Arsenic was not detected in the chemical analysis of water samples obtained from upgradient monitoring well MW-19 on November 20, 1997 and January 23, 1998. An on-site source of arsenic has not been encountered during this study. It is our opinion that arsenic in ground water represents natural background concentrations.

FUEL TANK REMOVAL

Four USTs were excavated and removed from the site in February 1998. Approximately 15 cubic yards of petroleum-contaminated soil at concentrations above the site-specific MTCA Method B soil cleanup level for TPH were excavated with the gasoline UST. The petroleum-contaminated soil was stockpiled on the southwest portion of Parcel 3. Gasoline-range hydrocarbons were not detected at concentrations exceeding the site-specific MTCA Method B soil cleanup level for TPH in the limits of the gasoline UST excavation.

Three ASTs were removed from the site in February 1998. The remaining AST on the east side of the soil stockpile will be removed during future site activities.

ADDITIONAL ASSESSMENT

Heavy oil-range hydrocarbons were detected at concentrations below the site-specific MTCA Method B soil cleanup level for TPH in soil samples obtained from the hand auger borings completed in the drainage ditch and detention pond (HA-1, HA-2 and HA-3) and in the soil sample from TP-2, completed near the former diesel AST. GeoEngineers will investigate further the elevated vapors at location SP-5 during future remedial activities.

We did not find tanks at the location of the geophysical anomalies located near the former residence at 7100 Monster Road and the geophysical anomaly behind the former repair shop associated with the former residence at 7140 Monster Road. Field screening suggested that no hydrocarbon soil impact was associated with the fuel line found at the location of the geophysical anomaly near the former 7150 Monster Road residence.

Monitoring wells GCW-14 and B-15 were not found during this study; therefore, these wells have not been decommissioned.

LIMITATIONS

We have prepared this report for use by the Family Fun Centers. This report is not intended for use by others and the information contained herein is not applicable to other sites.

Our interpretations of subsurface conditions are based on observations and testing data from the explored portions of the site. It is possible that contamination is present in areas of the site that have not been explored or tested.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted 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 be of service on this project. Please call if you have questions regarding our report.

Respectfully submitted,

GeoEngineers, Inc.

Lisa J. Bona

Lisa J. Bona
Project Geologist

Kurt S. Anderson, C. P.G.
Associate

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06/24/97

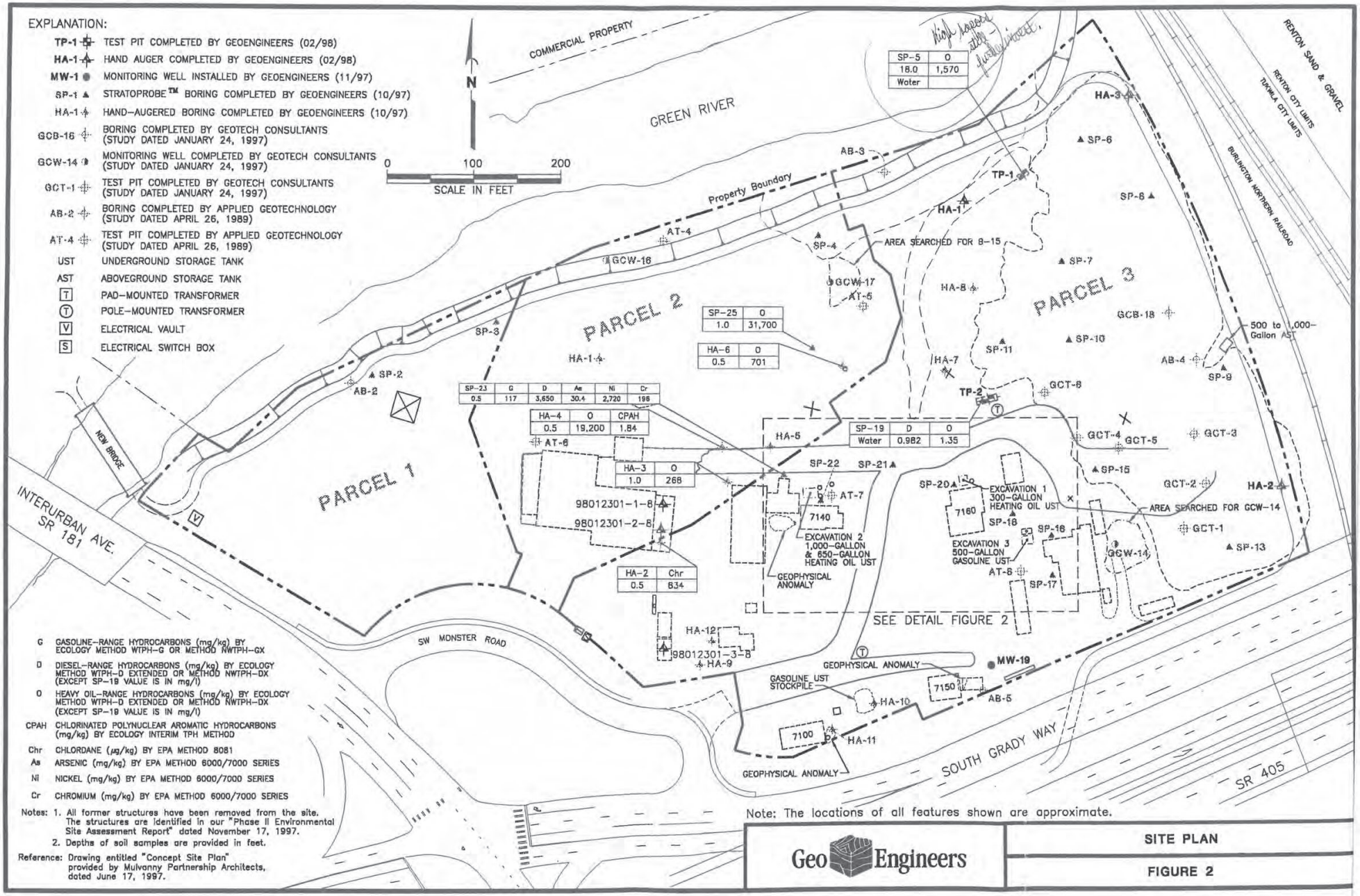
5925-001-37

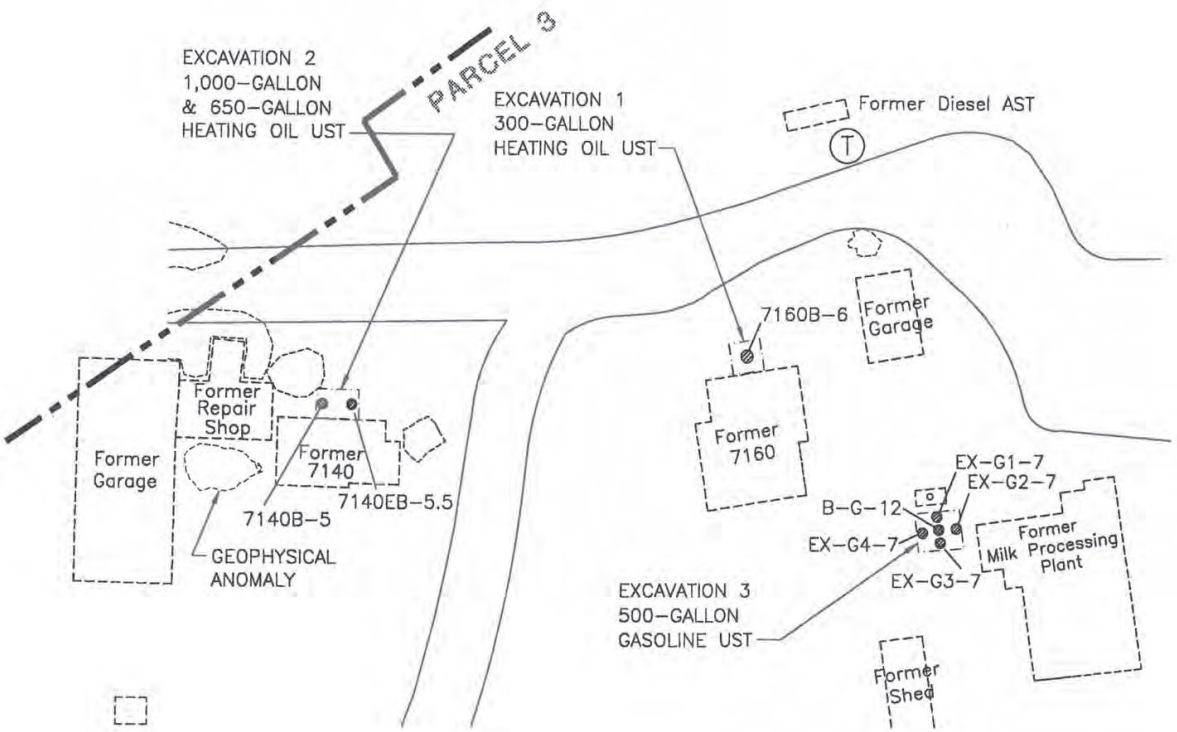
Geo Engineers

VICINITY MAP

FIGURE 1

DJM:HLA


EXPLANATION:
TP-1 TEST PIT COMPLETED BY GEOENGINEERS (02/98)
HA-1 HAND AUGER COMPLETED BY GEOENGINEERS (02/98)
MW-1 MONITORING WELL INSTALLED BY GEOENGINEERS (11/97)
SP-1 STRATOPROBE™ BORING COMPLETED BY GEOENGINEERS (10/97)
HA-1 HAND-AUGERED BORING COMPLETED BY GEOENGINEERS (10/97)
GCB-16 BORING COMPLETED BY GEOTECH CONSULTANTS (STUDY DATED JANUARY 24, 1997)
GCW-14 MONITORING WELL COMPLETED BY GEOTECH CONSULTANTS (STUDY DATED JANUARY 24, 1997)
GCT-1 TEST PIT COMPLETED BY GEOTECH CONSULTANTS (STUDY DATED JANUARY 24, 1997)
AB-2 BORING COMPLETED BY APPLIED GEOTECHNOLOGY (STUDY DATED APRIL 26, 1989)
AT-4 TEST PIT COMPLETED BY APPLIED GEOTECHNOLOGY (STUDY DATED APRIL 26, 1989)
UST UNDERGROUND STORAGE TANK
AST ABOVEGROUND STORAGE TANK
T PAD-MOUNTED TRANSFORMER
T POLE-MOUNTED TRANSFORMER
V ELECTRICAL VAULT
S ELECTRICAL SWITCH BOX
N
0 100 200
SCALE IN FEET
COMMERCIAL PROPERTY
GREEN RIVER
Property Boundary
RENTON SAND & GRAVEL
RENTON CITY LIMITS
TUKWILA CITY LIMITS
BURLINGTON NORTHERN RAILROAD
PARCEL 1
PARCEL 2
PARCEL 3
INTERURBAN AVE. SR 181
NEW BRIDGE
SW MONSTER ROAD
SOUTH GRADY WAY
SR 405
AREA SEARCHED FOR B-15
AREA SEARCHED FOR GCW-14
500 to 1,000-Gallon AST
EXCAVATION 1 300-GALLON HEATING OIL UST
EXCAVATION 2 1,000-GALLON & 650-GALLON HEATING OIL UST
EXCAVATION 3 500-GALLON GASOLINE UST
GEOPHYSICAL ANOMALY
GASOLINE UST STOCKPILE
SEE DETAIL FIGURE 2
SP-5 | 0 | 18.0 | 1,570 | Water
SP-25 | 0 | 1.0 | 31,700
HA-6 | 0 | 0.5 | 701
SP-23 | G | D | As | Ni | Cr | 0.5 | 117 | 3,650 | 30.4 | 2,720 | 198
HA-4 | 0 | CPAH | 0.5 | 19,200 | 1.84
HA-3 | 0 | 1.0 | 268
HA-2 | Chr | 0.5 | 834
SP-19 | D | 0 | Water | 0.982 | 1.35
98012301-1-8
98012301-2-8
98012301-3-8
7140
7150
7160
7100
MW-19
G GASOLINE-RANGE HYDROCARBONS (mg/kg) BY ECOLOGY METHOD WTPH-G OR METHOD NWTPH-GX
D DIESEL-RANGE HYDROCARBONS (mg/kg) BY ECOLOGY METHOD WTPH-D EXTENDED OR METHOD NWTPH-DX (EXCEPT SP-19 VALUE IS IN mg/l)
O HEAVY OIL-RANGE HYDROCARBONS (mg/kg) BY ECOLOGY METHOD WTPH-D EXTENDED OR METHOD NWTPH-DX (EXCEPT SP-19 VALUE IS IN mg/l)
CPAH CHLORINATED POLYNUCLEAR AROMATIC HYDROCARBONS (mg/kg) BY ECOLOGY INTERIM TPH METHOD
Chr CHLORDANE (µg/kg) BY EPA METHOD 8081
As ARSENIC (mg/kg) BY EPA METHOD 6000/7000 SERIES
Ni NICKEL (mg/kg) BY EPA METHOD 6000/7000 SERIES
Cr CHROMIUM (mg/kg) BY EPA METHOD 6000/7000 SERIES
Notes: 1. All former structures have been removed from the site. The structures are identified in our "Phase II Environmental Site Assessment Report" dated November 17, 1997.
2. Depths of soil samples are provided in feet.
Reference: Drawing entitled "Concept Site Plan" provided by Mulvanny Partnership Architects, dated June 17, 1997.
Note: The locations of all features shown are approximate.
Geo Engineers
SITE PLAN
FIGURE 2
DJB:HLA E:\5925005\5925005A.DWG 03/31/98



EXPLANATION:

- ⊘ SOIL SAMPLE WITH PETROLEUM HYDROCARBON CONCENTRATIONS LESS THAN THE SITE-SPECIFIC MTCA METHOD B SOIL CLEANUP LEVELS
- UST UNDERGROUND STORAGE TANK
- AST ABOVEGROUND STORAGE TANK
- Ⓣ POLE-MOUNTED TRANSFORMER

N

0 50 100

SCALE IN FEET

Note: The locations of all features shown are approximate.

Reference: Drawing entitled "Concept Site Plan" provided by Mulvanny Partnership Architects, dated June 17, 1997.

Geo Engineers

EXCAVATION SOIL SAMPLE LOCATIONS

FIGURE 3

DJB:HLA D:\5925005\5925005B.DWG 03/31/98

TABLE 1
SUMMARY OF GROUND WATER ELEVATIONS AND CHEMICAL ANALYTICAL DATA
MONITORING WELL MW-19
FAMILY FUN CENTER
TUKWILA, WASHINGTON

Monitoring Well Number[1]	Date Sampled	Depth to Water from Casing Rim (feet)	Ground Water Elevation[2] (feet)	Arsenic[3] (µg/l)
MW-19	11/20/97	12.39	79.19	ND
	01/26/98	10.36	81.22	ND
MTCA Method A Cleanup Levels				5.0

Notes:

[1]Approximate monitoring well location is shown in Figure 2.

[2]Elevations are measured relative to a temporary benchmark with an assumed elevation of 100.00 feet.

[3]Analyzed by EPA 6000/7000 series methods.

µg/l = micrograms per liter

ND = not detected

Chemical analyses conducted by North Creek Analytical of Bothell, Washington. The laboratory report is provided in Appendix B.

TABLE 2
SUMMARY OF SOIL FIELD SCREENING AND CHEMICAL ANALYTICAL DATA
HAND AUGER BORINGS AND TEST PITS

FAMILY FUN CENTERS

TUKWILA, WASHINGTON

Sample Number[1]	Date Sampled	Depth of Sample (feet)	Field Screening Results[2]		Lube Oil-Range Hydrocarbons[3] (mg/kg)	Insulating Oil Range Hydrocarbons[3] (mg/kg)	Priority Pollutant Metals[4] and Barium (mg/kg)	Arsenic and Lead[4] (mg/kg)
			Headspace Vapors (ppm)	Sheen				
98012301-1-8	01/23/98	0.75	<100	NS	--	--	--	Below cleanup levels[5]
98012301-2-8	01/23/98	0.75	<100	NS	--	--	--	Below cleanup levels[5]
98012301-3-8	01/23/98	0.75	<100	NS	--	--	--	Below cleanup levels[5]
HA-1-1.0	02/26/98	1.0	<100	NS	400	<25.0	Below cleanup levels[5]	--
HA-2-0.5	02/26/98	0.5	<100	NS	59.1	<25.0	Below cleanup levels[5]	--
HA-3-0.5	02/26/98	0.5	<100	NS	468	<25.0	Below cleanup levels[5]	--
TP-2-5.0	02/26/98	5.0	<100	HS	535	226	--	--
TP-2-8.0	02/26/98	8.0	<100	SS	<25.0	<25.0	--	--

Notes:

[1]Approximate soil sample locations are shown in Figure 2.

[2]Field screening methods are described in Appendix A. NS = no sheen, SS = slight sheen, HS = heavy sheen.

[3]Analyzed by Ecology Method NWTPH-Dx.

[4]Analyzed by EPA 6000/7000 series methods. Priority pollutant metals include antimony, arsenic, beryllium, cadmium, chromium, copper, lead, nickel, selenium, silver, thallium, zinc and mercury.

[5]Chemical analyses either resulted in concentrations less than detection level or concentrations less than the MTCA Method A or Method B cleanup level for soil.

mg/kg = milligrams per kilogram

"--" = not analyzed

Chemical analyses conducted by North Creek Analytical of Bothell, Washington. The laboratory report is presented in Appendix B.

TABLE 3 (Page 1 of 2)
SUMMARY OF SOIL FIELD SCREENING AND CHEMICAL ANALYTICAL DATA
EXCAVATION LIMITS AND SOIL STOCKPILE
FAMILY FUN CENTERS
TUKWILA, WASHINGTON

Sample Number[1]	Date Sampled	Sample Location[1]	Depth of Sample (feet)	Field Screening Results[2]		BETX[3] (mg/kg)				Gasoline-range Hydrocarbons[4] (mg/kg)	Diesel-range Hydrocarbons[5] (mg/kg)	Heavy Oil-range Hydrocarbons[5] (mg/kg)
				Headspace Vapors (ppm)	Sheen	B	E	T	X			
UST No. 1 - Heating Oil Tank of Former Residence 7160												
7160B-6	02/25/98	Base	6.0	<100	NS	--	--	--	--	--	<10.0	<25.0
UST Nos. 2 and 3 - Heating Oil Tanks at Former Residence 7140												
7140B-5	02/25/98	West Base	5.0	<100	NS	--	--	--	--	--	13.2	<25.0
7140EB-5.5	02/25/98	East Base	5.5	<100	NS	--	--	--	--	--	12.7	<25.0
UST No. 4 - Gasoline UST												
EX-G1-7	02/25/98	North Wall	7.0	550	SS	<0.0500	<0.0500	<0.100	10.1	235	--	--
EX-G2-7	02/25/98	East Wall	7.0	150	SS	0.101	0.0791	0.739	3.45	37.1	--	--
EX-G3-7	02/25/98	South Wall	7.0	600	SS	1.16	24.5	55.5	208	1,990	--	--
EX-G4-7	02/25/98	West Wall	7.0	<100	SS	<0.0500	<0.0500	<0.0500	0.159	<5.0	--	--
B-G-12	02/25/98	Base	12.0	<100	NS	<0.0500	<0.0500	<0.0500	<0.100	<5.0	--	--
Soil Stockpile (UST No. 1 and UST No. 4 Excavations)												
CSP-1	02/26/98	--	--	800	MS	11.1	156	395	782	8,030	--	--
MTCA Method B Cleanup Levels						34.5	8,000	16,000	160,000	2,985		

Notes appear on page 2 of 2.

TABLE 3 (Page 2 of 2)

Notes:

[1]Approximate soil sample locations are shown in Figure 3.

[2]Field screening methods are described in Appendix A. NS = no sheen, SS = slight sheen, MS = moderate sheen.

[3]Analyzed by EPA Method 8021B. B = benzene, E = ethylbenzene, T = toluene, X = xylenes.

[4]Analyzed by Ecology Method NWTPH-Gx.

[5]Analyzed by Ecology Method NWTPH-Dx.

"--" = not analyzed

ppm = parts per million

mg/kg = milligrams per kilogram

UST = underground storage tank

Shading indicates concentration exceeds the site-specific MTCA Method B soil cleanup level.

Chemical analyses conducted by North Creek Analytical of Bothell, Washington. The laboratory report is presented in Appendix B.

TABLE 4 (Page 1 of 2)
SUMMARY OF SOIL FIELD SCREENING AND CHEMICAL ANALYTICAL RESULTS FEBRUARY 1998 GASOLINE UST EXCAVATION

FAMILY FUN CENTER
TUKWILA, WASHINGTON

Description	EX-G3-7[1]	MTCA Method B Cleanup Level [2] (mg/kg)
Date Sampled	02/25/98	
Depth of Sample (feet bgs)	7.0	
Field Screening Results[3]		
Headspace Vapors (ppm)	600	
Sheen	SS	
TPH[4] (mg/kg)		
Gasoline-range	1990	2,985
Diesel-range	–	2,985
Heavy Oil-range	–	2,985
VPH[5] (mg/kg)		
Aliphatics		
EC5-EC6	<100	
EC6-EC8	<100	
EC8-EC10	<100	
EC10-EC12	160	
EC12-EC13	–	
Aromatics		
EC8-EC10	338	
EC10-EC12	246	
Other Volatile Petroleum Hydrocarbons[5] (mg/kg)		
Benzene	1.38	34.5
Ethylbenzene	16.7	8,000
Toluene	45.9	16,000
Xylenes	178.3	160000
Naphthalene	<0.200	3,200
MTBE	<1.00	NE

Notes appear on Page 2 of 2.

Table 4 (Page 2 of 2)

Notes:

[1]Approximate exploration locations are shown in Figure 2.

[2] From MTCA Cleanup Levels and Risk Calculations (CLARC II) Update February 1996 Publication #94-145 and site-specific cleanup level calculations.

[3] Field screening procedures are described in Appendix A. NS = no sheen, SS = slight sheen, MS = moderate sheen, HS = heavy sheen

[4]TPH = total petroleum hydrocarbons. Gasoline-, diesel- and heavy oil-range hydrocarbons analyzed by Ecology WTPH series.

[5]VPH = volatile petroleum hydrocarbons, BETX, naphthalene, and methyl tert butylether (MTBE) by Ecology Method (June 1997).

– = not analyzed or measured

ppm = parts per million

NE = not established

Chemical analyses conducted by North Creek Analytical of Bothell, Washington. The laboratory reports are presented in Appendix B.

TABLE 5
ARSENIC RESEARCH
FAMILY FUN CENTER
TUKWILA, WASHINGTON

Date	Business	Contact	Regarding	Comments
11/24/97	Department of Ecology	Norm Peck	Salmon Bay Steel	Arsenic in slag, located 4 miles from Family Fun Centers site
12/09/97	Department of Ecology	Sally Perkins	Renton Junction Landfill	No arsenic mentioned in file
12/03/97	Department of Ecology	Sally Perkins	Daniel Boone Paints	One ground water sample for arsenic, result = <10 ug/l
12/04/97	City of Tukwila Water Department	--	Site Vicinity	No wells
12/04/97	City of Renton Public Works	--	Raysled Maintenance Division	Approximately 2 years ago arsenic in wells = <10 ug/l
12/04/97	Lakeridge Water and Sewer	Bryn Mawr	Lakeridge area wells	Arsenic = <10 ug/l (1995)
12/04/97	King County Health Department	Judy	Site vicinity	No information
		Bob James	Site vicinity	No information
12/09/97	King County Health Department	Jenny Sterns	Site vicinity	PUD Seattle wells- arsenic = <3 ug/l (1995) Drinking wells in Section 16: arsenic = 1.8 ug/l Drinking wells in Section 12: arsenic = <10 ug/l
12/09/97	Developer	Tom Lee	Arsenic in valley and steelmill	No further information
12/09/97	DNR-Water Resources Division	Mark Isaccson	Arsenic in wells in valley	No information
12/09/97	DNR-Water Resources Division	Katie Morrel	Site vicinity-federal wells	No information
12/15/97	USGS-Earth Science Information Center	--	Site vicinity-federal wells	No information
12/15/97	Public Water System (PWS)	Twana Dorcey	Site vicinity-federal wells	No information
12/22/97	Public Water System (PWS)	Jane Schuster	Site vicinity-federal wells	No information
12/23/97	Public Water System (PWS)	Scott Downy	Site vicinity-federal wells	No information
01/05/98	United States Geologic Survey (USGS)	Carol Marlow	Site vicinity-federal wells	No information
01/05/98	United States Geologic Survey (USGS)	Luis Fuste	Site vicinity-federal wells	No information

APPENDIX A

FIELD METHODS

DRILLING AND SOIL SAMPLING PROCEDURES

Soil samples from the excavations, test pits and the stockpiles were obtained either from the bucket of a backhoe excavator or directly using a stainless steel spoon. Soil samples obtained with a hand auger were taken directly from the auger. Sampling equipment was decontaminated prior to each sampling attempt with a Liquinox™ solution wash and a distilled water rinse.

The monitoring well boring was drilled to a depth of approximately 31.5 feet below the ground surface using truck-mounted, hollow-stem auger equipment owned and operated by Holt Drilling. The drilling equipment was cleaned with a hot-water pressure washer before the boring was drilled.

A geologist from our staff selected the hand auger, power boring and test pit locations and sampling depths, examined and classified the soil units encountered and prepared a detailed log of each boring. Soils encountered were classified visually in general accordance with ASTM D-2488-90, which is described in Figure A-1. An explanation of boring log symbols is presented in Figure A-2. The exploration logs for MW-19, TP-1 and TP-2 are presented in Figures A-3 and A-4.

Soil samples from the monitoring well borings were obtained at approximate 2.5-foot intervals using a heavy-duty split-barrel sampler with 2.5-inch-diameter stainless steel or brass liners that were fitted within the sampler prior to each sampling attempt. The sampler was driven a maximum of 18 inches by a 300-pound weight falling a vertical distance of approximately 30 inches. The number of blows needed to advance the sampler the final 12 inches or other specified distance is indicated to the left of the corresponding sample notation on the boring log. Upon collection, sample liners were sealed with a Teflon™ liner and a plastic end cap to minimize headspace. A portion of the remaining sample was used for field screening. The sampling equipment was decontaminated before each sampling attempt with a Liquinox™ solution wash and a distilled water rinse. A portion of every sample was placed in a plastic bag for field screening.

Soil samples from the excavations, test pits, hand augers and the stockpile were placed directly in laboratory-prepared sample containers. The containers were packed full of soil to minimize headspace. A portion of sample was retained for field screening purposes. Selected soil samples from the explorations were submitted for chemical analysis, based on field screening results. Samples submitted for chemical analysis are denoted with "CA" on the explorations logs. The soil samples were kept cool in a cooler with ice before transport to the laboratory. The samples were kept cool during transport to the testing laboratory. Chain-of-custody procedures were followed in transporting the soil samples to the laboratory.

FIELD SCREENING OF SOIL SAMPLES

A GeoEngineers representative field screened soil samples obtained from the excavations, test pits, monitoring well borings, hand augers and soil stockpiles. Field screening results are used as a general guideline to delineate areas of possible petroleum-related contamination. In addition, screening results are used to aid in the selection of soil samples for chemical analysis. The screening methods used include (1) visual screening, (2) water sheen screening, and (3) headspace vapor screening using a Bacharach TLV™ Sniffer.

Visual screening consists of inspecting the soil for stains indicative of petroleum-related contamination. Visual screening is generally more effective when contamination is related to heavy petroleum hydrocarbons such as motor oil, or when hydrocarbon concentrations are high. Water sheen screening and headspace vapor screening are more sensitive methods that have been effective in detecting contamination at concentrations less than regulatory cleanup guidelines. However, field screening results are site-specific. The effectiveness of field screening results will vary with temperature, moisture content, organic content, soil type and type and age of contaminant. The presence or absence of a sheen or headspace vapors does not necessarily indicate the presence or absence of petroleum hydrocarbons.

Water sheen screening involves placing soil in water and observing the water surface for signs of sheen. Sheen screening may detect both volatile and nonvolatile petroleum hydrocarbons. Sheen classifications are as follows:

No Sheen (NS)	No visible sheen on water surface.
Slight Sheen (SS)	Light, colorless, dull sheen; spread is irregular, not rapid; sheen dissipates rapidly. Natural organic matter in the soil may produce a slight sheen.
Moderate Sheen (MS)	Light to heavy sheen; may have some color/iridescence; spread is irregular to flowing, may be rapid; few remaining areas of no sheen on water surface.
Heavy Sheen (HS)	Heavy sheen with color/iridescence; spread is rapid; entire water surface may be covered with sheen.

Headspace vapor screening involves placing a soil sample in a plastic sample bag. Air is captured in the bag, and the bag is shaken to expose the soil to the air trapped in the bag. The probe of a Bacharach TLV™ Sniffer is inserted in the bag, and the TLV™ Sniffer measures the concentration of combustible vapors present within the sample bag headspace. Headspace vapor screening targets volatile petroleum hydrocarbon compounds. The TLV™ Sniffer measures combustible vapor concentrations in ppm (parts per million) and is calibrated to hexane. The TLV™ Sniffer is designed to quantify combustible gas concentrations from 100 to 10,000 ppm in this application.

MONITORING WELL CONSTRUCTION

Two-inch-diameter, Schedule 40 polyvinyl chloride (PVC) well casing and screen was installed in the boring at the completion of drilling. The lower portion of the well is machine-slotted (0.02-inch slot width) to allow entry of water, floating product and combustible vapors into the well. Medium sand was placed in the borehole annulus surrounding the slotted portion of the wells. The wells are protected within lockable flush-grade monuments. Monitoring well construction details are shown in Figures A-2.

Monitoring well MW-19 was developed on November 18, 1997 by removing at least five well volumes of water using a clean stainless steel bailer. Development water from the monitoring wells was placed in a labeled 55-gallon drum and temporarily stored on site.

We measured the elevations of the well casings to the nearest 0.01 foot with an engineer's level and a fiberglass level rod on January 23, 1998. Elevations of the monitoring well casing rims and the ground surface adjacent to the monument are referenced to an assumed elevation datum of 100.00 feet. Elevations referenced to this datum are included on the monitoring well logs.

GROUND WATER ELEVATIONS

Depths to the ground water table relative to the monitoring well casing rim was measured on December 22, 1997 and January 26, 1998. The measurements were made using an electric water level indicator. The electric indicator was cleaned with a Liquinox™ soap solution wash and a distilled water rinse prior to use. Ground water elevations were calculated by subtracting the water table depth from the surveyed casing rim elevations. The field data are presented in Table 1.

GROUND WATER SAMPLING

Ground water samples were obtained from monitoring well MW-19. Each water sample was obtained with a new disposable polyethylene bailer and clean nylon bailing rope after at least three well volumes of water were removed from each well casing. The water samples were transferred in the field to laboratory-prepared sample containers and kept cool during transport to the testing laboratory. The sample containers were filled completely to minimize headspace in the container. Chain-of-custody procedures were followed in transporting the water samples to the testing laboratory.

SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GROUP SYMBOL	GROUP NAME
COARSE GRAINED SOILS More Than 50% Retained on No. 200 Sieve	GRAVEL More Than 50% of Coarse Fraction Retained on No. 4 Sieve	CLEAN GRAVEL	GW	WELL-GRADED GRAVEL, FINE TO COARSE GRAVEL
			GP	POORLY-GRADED GRAVEL
		GRAVEL WITH FINES	GM	SILTY GRAVEL
			GC	CLAYEY GRAVEL
	SAND More Than 50% of Coarse Fraction Passes No. 4 Sieve	CLEAN SAND	SW	WELL-GRADED SAND, FINE TO COARSE SAND
			SP	POORLY-GRADED SAND
		SAND WITH FINES	SM	SILTY SAND
			SC	CLAYEY SAND
FINE GRAINED SOILS More Than 50% Passes No. 200 Sieve	SILT AND CLAY Liquid Limit Less Than 50	INORGANIC	ML	SILT
			CL	CLAY
		ORGANIC	OL	ORGANIC SILT, ORGANIC CLAY
	SILT AND CLAY Liquid Limit 50 or More	INORGANIC	MH	SILT OF HIGH PLASTICITY, ELASTIC SILT
			CH	CLAY OF HIGH PLASTICITY, FAT CLAY
		ORGANIC	OH	ORGANIC CLAY, ORGANIC SILT
HIGHLY ORGANIC SOILS			PT	PEAT

NOTES:

1. Field classification is based on visual examination of soil in general accordance with ASTM D2488-90.
2. Soil classification using laboratory tests is based on ASTM D2487-90.
3. Descriptions of soil density or consistency are based on interpretation of blow count data, visual appearance of soils, and/or test data.

SOIL MOISTURE MODIFIERS:

Dry - Absence of moisture, dusty, dry to the touch

Moist - Damp, but no visible water

Wet - Visible free water or saturated, usually soil is obtained from below water table

GEI 85-85 Rev. 05/93

Geo Engineers

SOIL CLASSIFICATION SYSTEM

FIGURE A-1

LABORATORY TESTS

CA Chemical Analysis

FIELD SCREENING TESTS:

Headspace vapor concentration data given in parts per million

Sheen classification system:

NS	No Visible Sheen
SS	Slight Sheen
MS	Moderate Sheen
HS	Heavy Sheen
NT	Not Tested

SOIL GRAPH:

SM Soil Group Symbol (See Note 2)

Distinct Contact Between Soil Strata

Gradual or Approximate Location of Change Between Soil Strata

Water Level

Bottom of Boring

BLOW COUNT/SAMPLE DATA:

Blows required to drive a 2.4-inch I.D. split-barrel sampler 12 inches or other indicated distances using a 300-pound hammer falling 30 inches.

22 Location of relatively undisturbed sample

12 Location of disturbed sample

17 Location of sampling attempt with no recovery

Blows required to drive a 1.5-inch I.D. (SPT) split-barrel sampler 12 inches or other indicated distances using a 140-pound hammer falling 30 inches.

10 Location of sample obtained in general accordance with Standard Penetration Test (ASTM D-1586) procedures

26 Location of SPT sampling attempt with no recovery

Location of grab sample

"P" indicates sampler pushed with weight of hammer or against weight of drill rig.

NOTES:

1. The reader must refer to the discussion in the report text, the Key to Boring Log Symbols and the exploration logs for a proper understanding of subsurface conditions.
2. Soil classification system is summarized in Figure A-1.

GeoEngineers

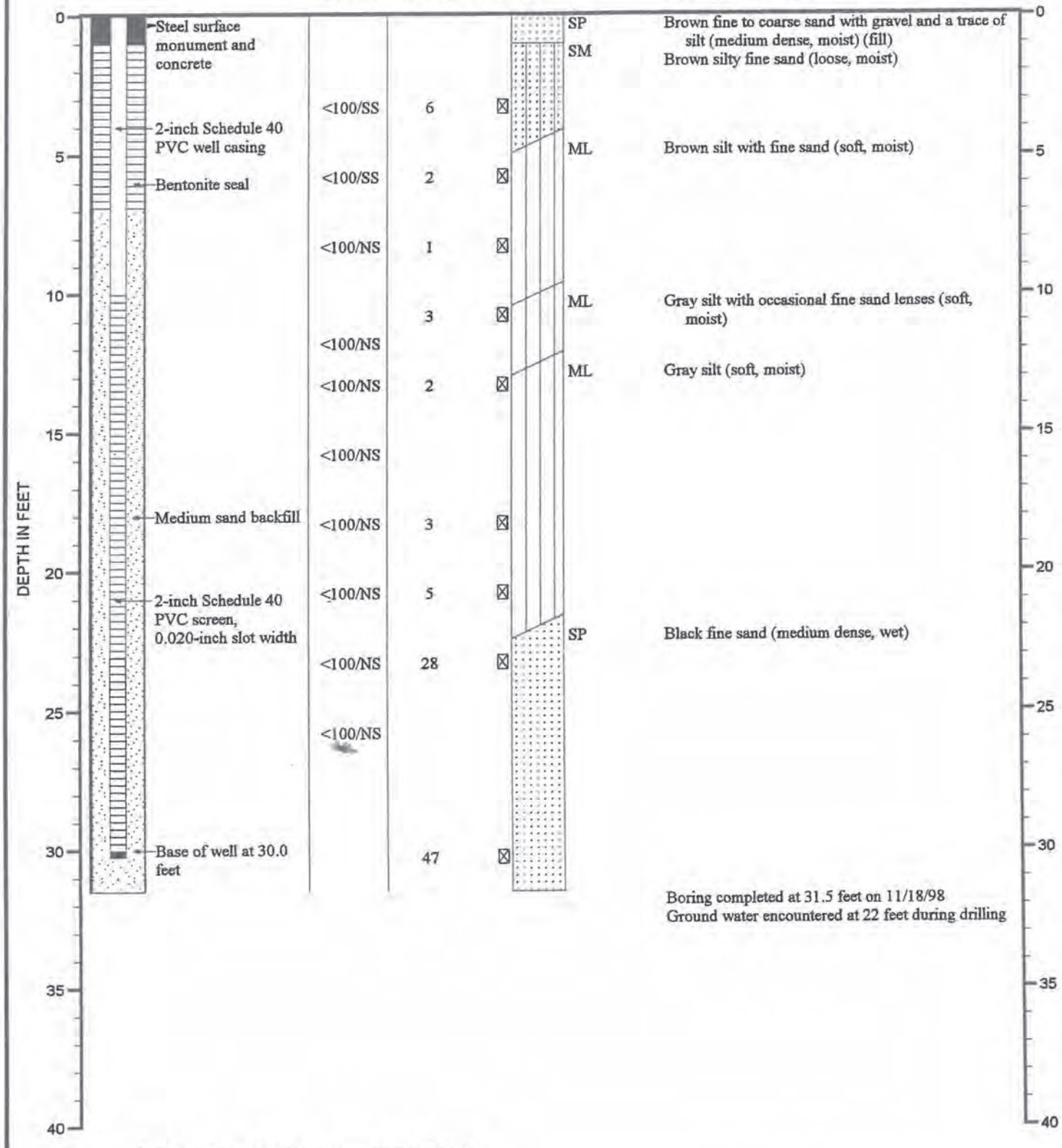
KEY TO BORING LOG SYMBOLS

FIGURE A-2

MONITORING WELL MW-19

WELL SCHEMATIC

Casing Elevation (ft.): 87.74
Casing Stickup (ft.): -0.61



Note: See Figure A- 2 for explanation of symbols

Geo Engineers

LOG OF MONITORING WELL

FIGURE A-3

LOG OF TEST PIT

DEPTH BELOW GROUND SURFACE (FEET)		SAMPLE NUMBER	FIELD SCREENING RESULTS	SOIL GROUP CLASSI-FICATION SYMBOL	DESCRIPTION
					TEST PIT 1
0.0 - 2.5				SM	Brown silty fine sand (loose, wet) (fill)
2.5 - 8.0		TP-1-3.0	<100/NS	SM	Gray silty fine sand with gravel and occasional cobbles (very dense, moist) (fill)
		TP-1-6.0	<100/NS		
		TP-1-7.5	<100/NS	SM	Gray silty fine sand with occasional chunks of concrete (very dense, moist) (fill)
					Test pit completed at 8.0 feet on 02/26/98 Slight ground water seepage observed at 3.0 feet
					TEST PIT 2
0.0 - 3.5		TP-2-2.0	<100/MS	GW	Gray fine to coarse gravel and occasional cobbles (very dense, wet) (fill)
3.5 - 7.0	CA	TP-2-5.0	<100/HS	SP-SM	Gray fine to coarse sand with silt and gravel (very dense, moist) (fill). Strong natural gas-like odor.
7.0 - 10.5	CA	TP-2-8.0	<100/SS	SW	Gray fine to coarse sand with gravel and occasional cobbles, wood and concrete debris (dense, wet) (fill)
10.5 - 12.0		TP-2-12	<100/NS	SP-SM	Gray fine to coarse sand with silt, gravel and occasional cobbles (very dense, wet)
					Test pit completed at 12.0 feet on 02/26/98 Rapid ground water seepage observed at 1.0 feet

THE DEPTHS OF THE TEST PIT LOGS, ALTHOUGH SHOWN TO 0.1 FOOT, ARE BASED ON AN AVERAGE OF MEASUREMENTS ACROSS THE TEST PIT AND SHOULD BE CONSIDERED ACCURATE TO 0.5 FOOT

LOG OF TEST PIT

FIGURE A-4

APPENDIX B

CHEMICAL ANALYTICAL PROGRAM

ANALYTICAL METHODS

Chain-of-custody procedures were followed during the transport of the field samples to the analytical laboratory. The samples were held in cold storage pending extraction and/or analysis. The analytical results, analytical methods reference and laboratory quality control) 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 were 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. The laboratory quality control and data quality exceptions documented by the laboratory were reviewed by GeoEngineers using the applicable data validation guidelines from the following documents: "Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses" dated July 1988 (EPA document number EPA540/R94/083) and "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review" dated February 1994 (EPA document number EPA540/R94/012).

ANALYTICAL DATA REVIEW SUMMARY

Based on our data quality review, it is our opinion that the analytical data are of acceptable quality for their intended use.

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Geo Engineers - Redmond	Project:	Family Fun Center (FFC)	Sampled: 11/20/97
8410 154th Ave NE	Project Number:	5925-003-54	Received: 11/20/97
Redmond, WA 98052	Project Manager:	Lisa Bona	Reported: 12/10/97 17:16

ANALYTICAL REPORT FOR SAMPLES:

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
MW-19	B711391-01	Water	11/20/97

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8410 154th Ave NE	Project Number:	5925-003-54	Received: 11/20/97
Redmond, WA 98052	Project Manager:	Lisa Bona	Reported: 12/10/97 17:16

Dissolved Metals by EPA 6000/7000 Series Methods
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Notes*
MW-19			B711391-01				Water	
Antimony	1270217	12/8/97	12/8/97	EPA 6010A	0.100	ND	mg/l	
Beryllium	"	"	"	EPA 6010A	0.00500	ND	"	
Cadmium	"	"	"	EPA 6010A	0.00500	ND	"	
Chromium	"	"	"	EPA 6010A	0.0100	ND	"	
Copper	"	"	"	EPA 6010A	0.0300	ND	"	
Nickel	"	"	"	EPA 6010A	0.0300	ND	"	
Zinc	"	"	"	EPA 6010A	0.0200	ND	"	
Arsenic	1270120	12/4/97	"	EPA 7060A	0.00400	ND	"	
Lead	"	"	12/5/97	EPA 7421	0.00200	ND	"	
Mercury	1270218	12/8/97	12/9/97	EPA 7470A	0.00100	ND	"	
Selenium	1270120	12/4/97	12/8/97	EPA 7740	0.00500	ND	"	
Silver	1270217	12/8/97	12/9/97	EPA 7760A	0.0200	ND	"	
Thallium	1270120	12/4/97	12/4/97	EPA 7841	0.00200	ND	"	

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Geo Engineers - Redmond	Project: Family Fun Center (FFC)	Sampled: 11/20/97
8410 154th Ave NE	Project Number: 5925-003-54	Received: 11/20/97
Redmond, WA 98052	Project Manager: Lisa Bona	Reported: 12/10/97 17:16

Dissolved Metals by EPA 6000/7000 Series Methods/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*
Batch: 1270120	**Date Prepared: 12/4/97**					**Extraction Method: EPA 3020**				
Blank	**1270120-BLK1**									
Arsenic	12/8/97			ND	mg/l	0.00400				
Lead	12/5/97			ND	"	0.00200				
Selenium	12/8/97			ND	"	0.00500				
Thallium	12/4/97			ND	"	0.00200				
LCS	**1270120-BS1**									
Arsenic	12/8/97	0.0500		0.0404	mg/l	75.0-125	80.8			
Lead	12/5/97	0.0250		0.0261	"	75.0-125	104			
Selenium	12/8/97	0.0250		0.0263	"	75.0-125	105			
Thallium	12/4/97	0.0300		0.0262	"	75.0-125	87.3			
Duplicate	**1270120-DUP1**		**B711391-01**							
Arsenic	12/8/97		ND	ND	mg/l			20.0		
Lead	12/5/97		ND	ND	"			20.0		
Selenium	12/8/97		ND	ND	"			20.0		
Thallium	12/4/97		ND	ND	"			20.0		
Matrix Spike	**1270120-MS1**		**B711391-01**							
Arsenic	12/8/97	0.0500	ND	0.0372	mg/l	70.0-130	**74.4**			
Lead	12/5/97	0.0250	ND	0.0268	"	70.0-130	**107**			
Selenium	12/8/97	0.0250	ND	0.0228	"	70.0-130	**91.2**			
Thallium	12/4/97	0.0300	ND	0.0255	"	70.0-130	**85.0**			
Matrix Spike Dup	**1270120-MSD1**		**B711391-01**							
Arsenic	12/8/97	0.0500	ND	0.0403	mg/l	70.0-130	**80.6**	20.0	**8.00**	
Lead	12/5/97	0.0250	ND	0.0269	"	70.0-130	**108**	20.0	**0.930**	
Selenium	12/8/97	0.0250	ND	0.0242	"	70.0-130	**96.8**	20.0	**5.96**	
Thallium	12/4/97	0.0300	ND	0.0262	"	70.0-130	**87.3**	20.0	**2.67**	
Batch: 1270217	**Date Prepared: 12/8/97**					**Extraction Method: EPA 3010**				
Blank	**1270217-BLK1**									
Antimony	12/8/97			ND	mg/l	0.100				
Beryllium	"			ND	"	0.00500				
Cadmium	"			ND	"	0.00500				
Chromium	"			ND	"	0.0100				
Copper	"			ND	"	0.0300				
Nickel	"			ND	"	0.0300				

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

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Geo Engineers - Redmond	Project:	Family Fun Center (FFC)	Sampled: 11/20/97
8410 154th Ave NE	Project Number:	5925-003-54	Received: 11/20/97
Redmond, WA 98052	Project Manager:	Lisa Bona	Reported: 12/10/97 17:16

Dissolved Metals by EPA 6000/7000 Series Methods/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
Blank (continued)	1270217-BLK1									
Zinc	12/8/97			**ND**	mg/l	**0.0200**				
Silver	12/9/97			**ND**	"	**0.0200**				
LCS	1270217-BS1									
Antimony	12/8/97	1.00		0.969	mg/l	80.0-120	96.9			
Beryllium	"	1.00		1.02	"	80.0-120	102			
Cadmium	"	1.00		1.02	"	80.0-120	102			
Chromium	"	1.00		0.994	"	80.0-120	99.4			
Copper	"	1.00		0.996	"	80.0-120	99.6			
Nickel	"	1.00		0.991	"	80.0-120	99.1			
Zinc	"	1.00		0.988	"	80.0-120	98.8			
Silver	12/9/97	1.00		0.932	"	75.0-125	93.2			
Duplicate	1270217-DUP1		B711391-01							
Antimony	12/8/97		ND	ND	mg/l			20.0		
Beryllium	"		ND	ND	"			20.0		
Cadmium	"		ND	ND	"			20.0		
Chromium	"		ND	ND	"			20.0		
Copper	"		ND	ND	"			20.0		
Nickel	"		ND	ND	"			20.0		
Zinc	"		ND	ND	"			20.0		
Silver	12/9/97		ND	ND	"			20.0		
Matrix Spike	1270217-MS1		B711391-01							
Antimony	12/8/97	1.00	ND	0.902	mg/l	80.0-120	**90.2**			
Beryllium	"	1.00	ND	0.961	"	80.0-120	**96.1**			
Cadmium	"	1.00	ND	0.972	"	80.0-120	**97.2**			
Chromium	"	1.00	ND	0.951	"	80.0-120	**95.1**			
Copper	"	1.00	ND	0.964	"	80.0-120	**96.4**			
Nickel	"	1.00	ND	0.935	"	80.0-120	**93.5**			
Zinc	"	1.00	ND	0.983	"	80.0-120	**98.3**			
Silver	12/9/97	1.00	ND	0.979	"	75.0-125	97.9			
Matrix Spike Dup	1270217-MSD1		B711391-01							
Antimony	12/8/97	1.00	ND	0.944	mg/l	80.0-120	**94.4**	20.0	**4.55**	
Beryllium	"	1.00	ND	0.960	"	80.0-120	**96.0**	20.0	**0.104**	
Cadmium	"	1.00	ND	0.959	"	80.0-120	**95.9**	20.0	**1.35**	
Chromium	"	1.00	ND	0.955	"	80.0-120	**95.5**	20.0	**0.420**	

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Geo Engineers - Redmond	Project:	Family Fun Center (FFC)	Sampled: 11/20/97
8410 154th Ave NE	Project Number:	5925-003-54	Received: 11/20/97
Redmond, WA 98052	Project Manager:	Lisa Bona	Reported: 12/10/97 17:16

Dissolved Metals by EPA 6000/7000 Series Methods/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*
Matrix Spike Dup (continued)	**1270217-MSD1**		**B711391-01**							
Copper	12/8/97	1.00	ND	0.944	mg/l	80.0-120	94.4	20.0	2.10	
Nickel	"	1.00	ND	0.941	"	80.0-120	94.1	20.0	0.640	
Zinc	"	1.00	ND	0.967	"	80.0-120	96.7	20.0	1.64	
Silver	12/9/97	1.00	ND	0.988	"	75.0-125	98.8	20.0	0.915	
Batch: 1270218	**Date Prepared: 12/8/97**					**Extraction Method: BrCl Digestion**				
Blank	**1270218-BLK1**									
Mercury	12/9/97			ND	mg/l	0.00100				
LCS	**1270218-BS1**									
Mercury	12/9/97	0.00500		0.00461	mg/l	70.0-130	92.2			
Duplicate	**1270218-DUP1**		**B712081-03**							
Mercury	12/9/97		ND	ND	mg/l			20.0		
Matrix Spike	**1270218-MS1**		**B712081-03**							
Mercury	12/9/97	0.00500	ND	0.00448	mg/l	75.0-125	89.6			
Matrix Spike Dup	**1270218-MSD1**		**B712081-03**							
Mercury	12/9/97	0.00500	ND	0.00464	mg/l	75.0-125	92.8	20.0	3.51	

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Geo Engineers - Redmond	Project:	Family Fun Center (FFC)	Sampled: 11/20/97
8410 154th Ave NE	Project Number:	5925-003-54	Received: 11/20/97
Redmond, WA 98052	Project Manager:	Lisa Bona	Reported: 12/10/97 17:16

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

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CHAIN OF CUSTODY REPORT

Work Order # B711391

REPORT TO:		INVOICE TO:	
ATTENTION:	Lisa Bona	ATTENTION:	Lisa Bona
ADDRESS:	8410 154th Ave NE	ADDRESS:	9410 154th Ave NE
PHONE:	425-861-6000	FAX:	861-6050
PROJECT NAME:	Family Fun Center	P.O. NUMBER:	NCA QUOTE #:
PROJECT NUMBER:	5425-003-54		
SAMPLED BY:	TNO		

TURNAROUND REQUEST in Business Days *

Organic & Inorganic Analyses: ~~10~~ Standard | 7 | 5 | 4 | 3 | 2 | 1 | Same Day

Fuels & Hydrocarbon Analyses: 5 Standard | 3-4 | 2 | 1 | Same Day

OTHER Specify:

* Turnaround Requests less than standard may incur Rush Charges

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NCA SAMPLE ID (Laboratory Use Only)	Analysis Request: Dissolved Priority Pollutant Metals Inclusively Filtered	MATRIX (W, S, A, O)	# OF CONTAINERS	COMMENTS
1.	MW-19	11/20/97 10:30 am	B711391-01	X	W	1	
2.	B1						
3.	8						
4.							
5.							
6.							
7.							
8.							
9.							
10.							

RELINQUISHED BY (Signature):		3:10	DATE: 11/20/97	RECEIVED BY (Signature):	DATE: 11/20/97
PRINT NAME:	Tony Dime	FIRM: GET	TIME:	PRINT NAME: D. HEINZ	FIRM: NCAR TIME: 15:1
RELINQUISHED BY (Signature):			DATE:	RECEIVED BY (Signature):	DATE:
PRINT NAME:		FIRM:	TIME:	PRINT NAME:	FIRM: TIME:

ADDITIONAL REMARKS:

PAGE 1 OF 1

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Geo Engineers - Redmond	Project: Family Fun Center (FFC)	Sampled: 1/23/98
8410 154th Ave NE	Project Number: 5925-002	Received: 1/23/98
Redmond, WA 98052	Project Manager: Lisa Bona	Reported: 2/5/98 15:45

ANALYTICAL REPORT FOR SAMPLES:

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
MW-19	B801340-01	Water	1/23/98
98012301-1-8	B801340-02	Soil	1/23/98
98012301-2-8	B801340-03	Soil	1/23/98
98012301-3-8	B801340-04	Soil	1/23/98

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Geo Engineers - Redmond	Project:	Family Fun Center (FFC)	Sampled: 1/23/98
8410 154th Ave NE	Project Number:	5925-002	Received: 1/23/98
Redmond, WA 98052	Project Manager:	Lisa Bona	Reported: 2/5/98 15:45

Total Metals by EPA 6000/7000 Series Methods
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Notes*
98012301-1-8			B801340-02				Soil	
Arsenic	0180728	1/30/98	2/2/98	EPA 6020	0.500	**7.69**	mg/kg dry	
Lead	"	"	"	EPA 6020	0.500	**168**	"	
98012301-2-8			B801340-03				Soil	
Arsenic	0280103	2/4/98	2/4/98	EPA 6020	0.500	**4.50**	mg/kg dry	
Lead	"	"	"	EPA 6020	0.500	**6.14**	"	
98012301-3-8			B801340-04				Soil	
Arsenic	0180728	1/30/98	2/2/98	EPA 6020	0.500	**3.67**	mg/kg dry	
Lead	"	"	"	EPA 6020	0.500	**6.31**	"	

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Geo Engineers - Redmond	Project:	Family Fun Center (FFC)	Sampled: 1/23/98
8410 154th Ave NE	Project Number:	5925-002	Received: 1/23/98
Redmond, WA 98052	Project Manager:	Lisa Bona	Reported: 2/5/98 15:45

Dissolved Metals by EPA 6000/7000 Series Methods
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Notes*
MW-19			B801340-01				Water	
Arsenic	0280158	2/5/98	2/5/98	EPA 6020	0.00100	ND	mg/l	

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Geo Engineers - Redmond	Project:	Family Fun Center (FFC)	Sampled: 1/23/98
8410 154th Ave NE	Project Number:	5925-002	Received: 1/23/98
Redmond, WA 98052	Project Manager:	Lisa Bona	Reported: 2/5/98 15:45

Dry Weight Determination
North Creek Analytical - Bothell

Sample Name	Lab ID	Matrix	Result	Units
98012301-1-8	B801340-02	Soil	66.0	%
98012301-2-8	B801340-03	Soil	73.4	%
98012301-3-8	B801340-04	Soil	73.8	%

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Geo Engineers - Redmond	Project:	Family Fun Center (FFC)	Sampled: 1/23/98
8410 154th Ave NE	Project Number:	5925-002	Received: 1/23/98
Redmond. WA 98052	Project Manager:	Lisa Bona	Reported: 2/5/98 15:45

Total Metals by EPA 6000/7000 Series Methods/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*
Batch: 0180728	**Date Prepared: 1/30/98**					**Extraction Method: EPA 3050**				
Blank	**0180728-BLK1**									
Arsenic	2/2/98			**ND**	mg/kg dry	**0.500**				
Lead	"			**ND**	"	**0.500**				
LCS	**0180728-BS1**									
Arsenic	2/2/98	151		123	mg/kg dry	70.0-130	81.5			
Lead	"	84.9		78.1	"	80.0-120	92.0			
Duplicate	**0180728-DUP1**		**B801144-08**							
Arsenic	2/2/98		49.1	66.8	mg/kg dry			20.0	**30.5**	1
Lead	"		2230	2610	"			20.0	**15.7**	
Matrix Spike	**0180728-MS1**		**B801144-08**							
Arsenic	2/2/98	12.0	49.1	41.8	mg/kg dry	70.0-130	**NR**			2
Lead	"	12.0	2230	35200	"	70.0-130	**NR**			2
Matrix Spike	**0180728-MS2**		**B801144-08**							
Arsenic	2/2/98	6160	49.1	6210	mg/kg dry	70.0-130	**100**			
Lead	"	6160	2230	8720	"	70.0-130	**105**			
Batch: 0280103	**Date Prepared: 2/4/98**					**Extraction Method: EPA 3050**				
Blank	**0280103-BLK1**									
Arsenic	2/4/98			**ND**	mg/kg dry	**0.500**				
Lead	"			**ND**	"	**0.500**				
LCS	**0280103-BS1**									
Arsenic	2/4/98	151		128	mg/kg dry	70.0-130	84.8			
Lead	"	84.9		75.6	"	80.0-120	89.0			
Duplicate	**0280103-DUP1**		**B801340-03**							
Arsenic	2/4/98		4.50	4.41	mg/kg dry			20.0	**2.02**	
Lead	"		6.14	5.12	"			20.0	**18.1**	
Matrix Spike	**0280103-MS1**		**B801340-03**							
Arsenic	2/4/98	13.2	4.50	15.8	mg/kg dry	70.0-130	**85.6**			
Lead	"	13.2	6.14	17.8	"	70.0-130	**88.3**			

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

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Geo Engineers - Redmond	Project:	Family Fun Center (FFC)	Sampled: 1/23/98
8410 154th Ave NE	Project Number:	5925-002	Received: 1/23/98
Redmond, WA 98052	Project Manager:	Lisa Bona	Reported: 2/5/98 15:45

Dissolved Metals by EPA 6000/7000 Series Methods/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*
Batch: 0280158	**Date Prepared: 2/5/98**					**Extraction Method: EPA 200 Series**				
Blank	**0280158-BLK1**									
Arsenic	2/5/98			**ND**	mg/l	**0.00100**				
LCS	**0280158-BS1**									
Arsenic	2/5/98	0.200		0.180	mg/l	80.0-120	90.0			
Duplicate	**0280158-DUP1**		**B801340-01**							
Arsenic	2/5/98		ND	ND	mg/l			20.0		
Matrix Spike	**0280158-MS1**		**B801340-01**							
Arsenic	2/5/98	0.200	ND	0.220	mg/l	75.0-125	**110**			

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Geo Engineers - Redmond	Project:	Family Fun Center (FFC)	Sampled: 1/23/98
8410 154th Ave NE	Project Number:	5925-002	Received: 1/23/98
Redmond, WA 98052	Project Manager:	Lisa Bona	Reported: 2/5/98 15:45

Notes and Definitions

#	Note
1	Visual evaluation indicates the RPD is above the control limit due to a non-homogeneous sample matrix.
2	The spike recovery for this QC sample is outside of established control limits. Review of associated batch QC indicates the recovery for this analyte does not represent an out-of-control condition for the batch.
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

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CHAIN OF CUSTODY REPORT

Work Order # B801340

REPORT TO: GEO ENGINEERS
ATTENTION: LISA RUNA
ADDRESS: 8410 154TH AVE NE
REDMOND WA 98052
PHONE: FAX:
PROJECT NAME: Family Fun Center
PROJECT NUMBER: 5925-002
SAMPLED BY: D BAUMGARTEN

INVOICE TO:
ATTENTION: SAME
ADDRESS:
P.O. NUMBER: NCA QUOTE #:

TURNAROUND REQUEST in Business Days *
Organic & Inorganic Analyses: (10) Standard | 7 | 5 | 4 | 3 | 2 | 1 | Same Day
Fuels & Hydrocarbon Analyses: 5 Standard | 3-4 | 2 | 1 | Same Day
OTHER Specify:
* Turnaround Requests less than standard may incur Rush Charges

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NCA SAMPLE ID (Laboratory Use Only)	Analysis Request: DISSOLVED ARSENIC	TOTAL (200.8) ARSENIC	MATRIX (W, S, A, O)	# OF CONTAINERS	COMMENTS
1.	MW-19	1/23/98 1215	B801340-01	X		W	1	not field filtered Washed out nitric
2.	980123O1-1-8	1230	-02		X	S	1	
3.	980123O1-2-8	1215	-03		X	S	1	
4.	980123O1-3-8	1145	-04		X	S	1	
5.								
6.								
7.								
8.								
9.								
10.								

RELINQUISHED BY (Signature): DATE: 1/23/98
PRINT NAME: DAVID BAUMGARTEN FIRM: GEI TIME: 1330

RECEIVED BY (Signature):
PRINT NAME: B. Dightman FIRM: NCA TIME: 13:3

RELINQUISHED BY (Signature): DATE:
PRINT NAME: FIRM: TIME:

RECEIVED BY (Signature): DATE:
PRINT NAME: FIRM: TIME:

ADDITIONAL REMARKS:

PAGE OF

NORTH CREEK ANALYTICAL
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PORTLAND ▪ (503) 906-9200 ▪ FAX 906-9210

Geo Engineers - Redmond	Project:	Family Fun Center (FFC)	Sampled: 2/25/98
410 154th Ave NE	Project Number:	5925-003	Received: 2/26/98
Redmond, WA 98052	Project Manager:	Lisa Bona	Reported: 3/9/98 13:26

ANALYTICAL REPORT FOR SAMPLES:

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
EX-G1-7	B802492-01	Soil	2/25/98
EX-G2-7	B802492-02	Soil	2/25/98
EX-G4-7	B802492-03	Soil	2/25/98

GeoEngineers

MAR 1 1998

Routing

File

North Creek Analytical, Inc.

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.

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410 154th Ave NE	Project Number:	5925-003	Received: 2/26/98
edmond, WA 98052	Project Manager:	Lisa Bona	Reported: 3/9/98 13:26

Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by NWTPH-Gx and EPA 8021B
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
X-G1-7			**B802492-01**				**Soil**	
enzene	0380026	3/3/98	3/3/98		0.0500	ND	mg/kg dry	
oluene	"	"	"		0.100	ND	"	1
thylbenzene	"	"	"		0.0500	ND	"	
ylenes (total)	"	"	"		0.100	**10.1**	"	
viation Gasoline Range Hydrocarbons	"	"	"		5.00	ND	"	
asoline Range Hydrocarbons	"	"	"		5.00	**235**	"	
M&P Naphtha Range Hydrocarbons	"	"	"		5.00	ND	"	
ineral Spirits Range Hydrocarbons	"	"	"		5.00	ND	"	
x Range Hydrocarbons [>C12]	"	"	"		5.00	ND	"	
urrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*90.3*	*%*	
urrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*93.6*	"	
X-G2-7			**B802492-02**				**Soil**	
enzene	0380026	3/3/98	3/4/98		0.0500	**0.101**	mg/kg dry	
oluene	"	"	"		0.0500	**0.739**	"	
thylbenzene	"	"	"		0.0500	**0.0791**	"	
ylenes (total)	"	"	"		0.100	**3.45**	"	
viation Gasoline Range Hydrocarbons	"	"	"		5.00	ND	"	
asoline Range Hydrocarbons	"	"	"		5.00	**37.1**	"	
M&P Naphtha Range Hydrocarbons	"	"	"		5.00	ND	"	
ineral Spirits Range Hydrocarbons	"	"	"		5.00	ND	"	
x Range Hydrocarbons [>C12]	"	"	"		5.00	ND	"	
urrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*74.2*	*%*	
urrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*88.6*	"	
X-G4-7			**B802492-03**				**Soil**	
enzene	0380026	3/3/98	3/4/98		0.0500	ND	mg/kg dry	
oluene	"	"	"		0.0500	ND	"	
thylbenzene	"	"	"		0.0500	ND	"	
ylenes (total)	"	"	"		0.100	**0.159**	"	
viation Gasoline Range Hydrocarbons	"	"	"		5.00	ND	"	
asoline Range Hydrocarbons	"	"	"		5.00	ND	"	
M&P Naphtha Range Hydrocarbons	"	"	"		5.00	ND	"	
ineral Spirits Range Hydrocarbons	"	"	"		5.00	ND	"	
x Range Hydrocarbons [>C12]	"	"	"		5.00	ND	"	
urrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*79.8*	*%*	
urrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*83.8*	"	

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

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Geo Engineers - Redmond	Project:	Family Fun Center (FFC)	Sampled: 2/25/98
8410 154th Ave NE	Project Number:	5925-003	Received: 2/26/98
Redmond, WA 98052	Project Manager:	Lisa Bona	Reported: 3/9/98 13:26

Dry Weight Determination
North Creek Analytical - Bothell

Sample Name	Lab ID	Matrix	Result	Units
FX-G1-7	B802492-01	Soil	82.7	%
FX-G2-7	B802492-02	Soil	78.3	%
FX-G4-7	B802492-03	Soil	76.0	%

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410 154th Ave NE	Project Number:	5925-003	Received: 2/26/98
Redmond, WA 98052	Project Manager:	Lisa Bona	Reported: 3/9/98 13:26

Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by NWTPH-Gx and EPA 8021B/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*
Batch: 0380026	**Date Prepared: 3/3/98**					**Extraction Method: EPA 5030B (MeOH)**				
Blank	**0380026-BLK1**									
Benzene	3/3/98			**ND**	mg/kg dry	**0.0500**				
Toluene	"			**ND**	"	**0.0500**				
Ethylbenzene	"			**ND**	"	**0.0500**				
Xylenes (total)	"			**ND**	"	**0.100**				
Aviation Gasoline Range Hydrocarbons	"			**ND**	"	**5.00**				
Gasoline Range Hydrocarbons	"			**ND**	"	**5.00**				
MM&P Naphtha Range Hydrocarbons	"			**ND**	"	**5.00**				
Mineral Spirits Range Hydrocarbons	"			**ND**	"	**5.00**				
Dx Range Hydrocarbons [>C12]	"			**ND**	"	**5.00**				
Surrogate: 4-BFB (FID)	"	*4.00*		*3.83*	"	*50.0-150*	*95.7*			
Surrogate: 4-BFB (PID)	"	*4.00*		*4.15*	"	*50.0-150*	*104*			
LCS	**0380026-BS1**									
Gasoline Range Hydrocarbons	3/3/98	25.0		29.0	mg/kg dry	75.0-125	116			
Surrogate: 4-BFB (FID)	"	*4.00*		*4.02*	"	*50.0-150*	*100*			
Duplicate	**0380026-DUP1**		**B802492-03**							
Aviation Gasoline Range Hydrocarbons	3/4/98		ND	ND	mg/kg dry			50.0		
Gasoline Range Hydrocarbons	"		ND	ND	"			50.0		
MM&P Naphtha Range Hydrocarbons	"		ND	ND	"			50.0		
Mineral Spirits Range Hydrocarbons	"		ND	ND	"			50.0		
Dx Range Hydrocarbons [>C12]	"		ND	ND	"			50.0		
Surrogate: 4-BFB (FID)	"	*5.26*		*4.07*	"	*50.0-150*	*77.4*			
Matrix Spike	**0380026-MS1**		**B802492-01**							
Benzene	3/4/98	0.605	ND	0.569	mg/kg dry	60.0-140	**94.0**			
Toluene	"	0.605	ND	0.615	"	60.0-140	**102**			
Ethylbenzene	"	0.605	ND	0.600	"	60.0-140	**99.2**			
Xylenes (total)	"	1.81	10.1	8.68	"	60.0-140	**NR**			2
Surrogate: 4-BFB (PID)	"	*4.84*		*4.46*	"	*50.0-150*	*92.1*			
Matrix Spike Dup	**0380026-MSD1**		**B802492-01**							
Benzene	3/4/98	0.605	ND	0.571	mg/kg dry	60.0-140	**94.4**	20.0	**0.425**	
Toluene	"	0.605	ND	0.610	"	60.0-140	**101**	20.0	**0.985**	
Ethylbenzene	"	0.605	ND	0.595	"	60.0-140	**98.3**	20.0	**0.911**	
Xylenes (total)	"	1.81	10.1	7.00	"	60.0-140	**NR**	20.0		2
Surrogate: 4-BFB (PID)	"	*4.84*		*4.41*	"	*50.0-150*	*91.1*			

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Geo Engineers - Redmond	Project:	Family Fun Center (FFC)	Sampled: 2/25/98
8410 154th Ave NE	Project Number:	5925-003	Received: 2/26/98
Redmond, WA 98052	Project Manager:	Lisa Bona	Reported: 3/9/98 13:26

Notes and Definitions

	Note
	The reporting limit for this analyte has been raised to account for interference from coeluting organic compounds present in the sample.
	The RPD and/or percent recovery for this QC spike sample cannot be accurately calculated due to interference from coeluting organic compounds present in the sample.
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

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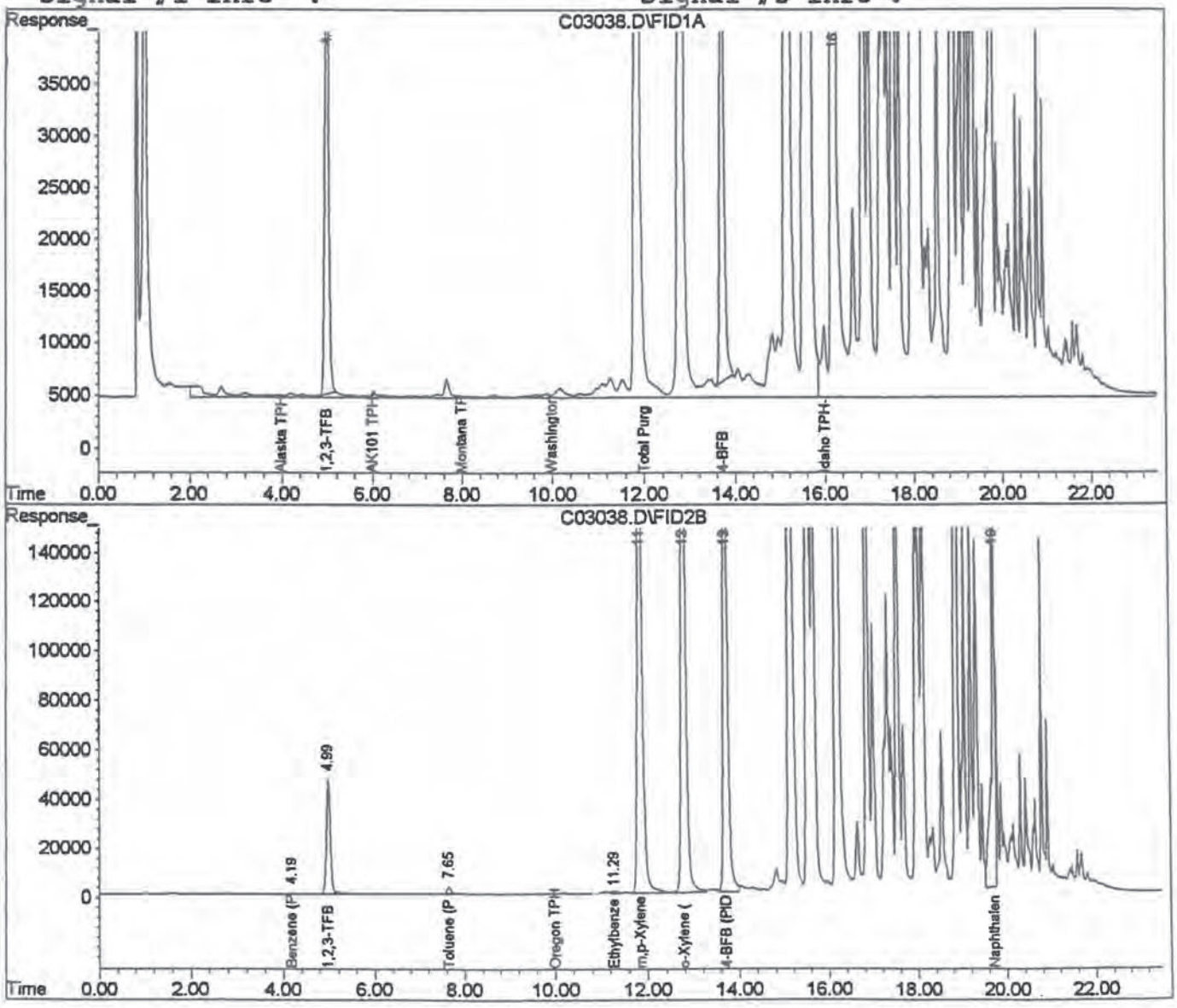
Data File : C:\HPCHEM\2\DATA\030398\C03038.D\FID1A.CH Vial: 38
Acq On : 3 Mar 1998 11:56 pm Operator: hsd
Sample : b802492-01 Inst : GC #4
Misc : 100 uL Multiplr: 1.00
IntFile : SURR.E

Data File : C:\HPCHEM\2\DATA\030398\C03038.D\FID2B.CH Vial: 38
Acq On : 3 Mar 98 11:56 pm Operator: hsd
Sample : b802492-01 Inst : GC #4
Misc : 100 uL Multiplr: 1.00
IntFile : SURR2.E
Quant Time: Mar 4 6:55 1998 Quant Results File: TPHGS.RES

Quant Method : C:\HPCHEM\2\METHODS\TPHGS.M (Chemstation Integrator)
Title : TPH-G Soil Method
Last Update : Thu Feb 12 16:12:47 1998
Response via : Multiple Level Calibration
DataAcq Meth : TPHGS.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

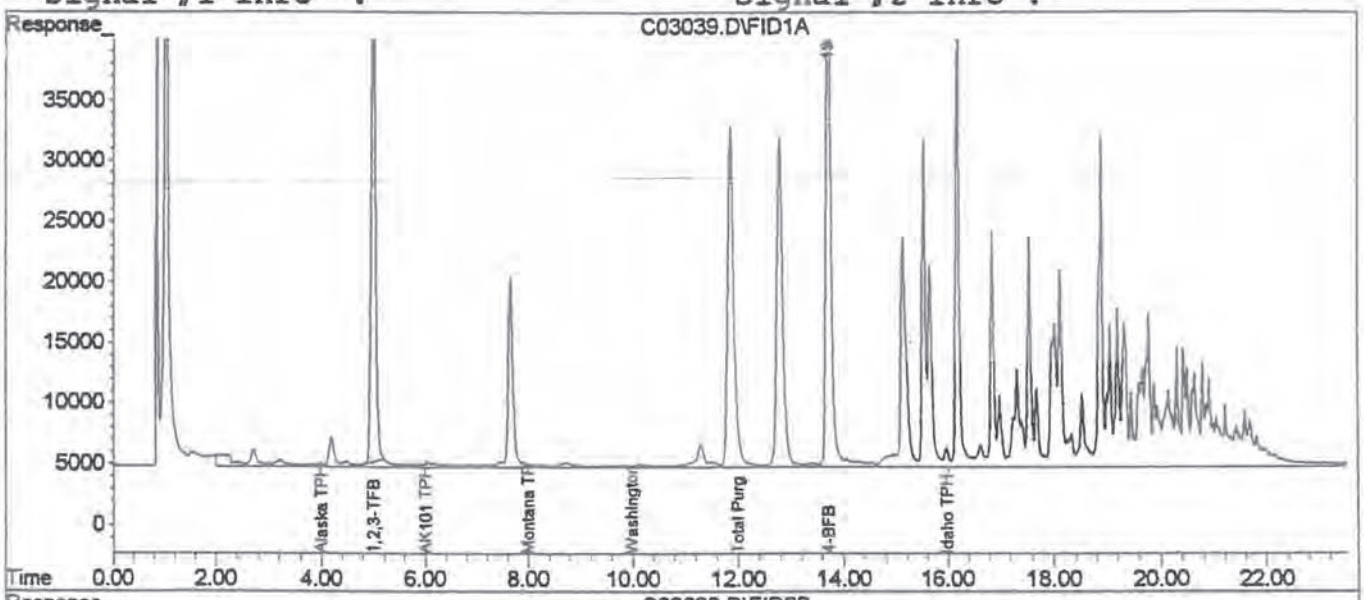


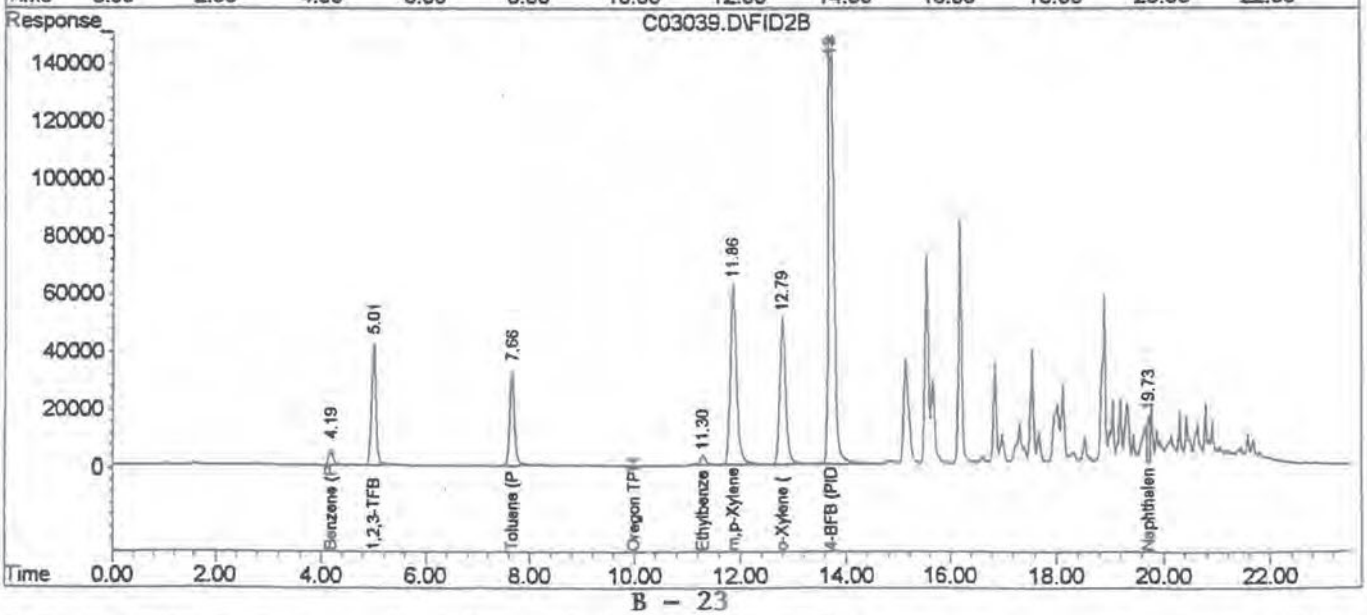
Data File : C:\HPCHEM\2\DATA\030398\C03039.D\FID1A.CH Vial: 39
Acq On : 4 Mar 1998 12:26 am Operator: hsd
Sample : b802492-02 Inst : GC #4
Misc : 100 uL Multiplr: 1.00
IntFile : SURR.E

Data File : C:\HPCHEM\2\DATA\030398\C03039.D\FID2B.CH Vial: 39
Acq On : 4 Mar 98 12:26 am Operator: hsd
Sample : b802492-02 Inst : GC #4
Misc : 100 uL Multiplr: 1.00
IntFile : SURR2.E
Quant Time: Mar 4 6:55 1998 Quant Results File: TPHGS.RES

Quant Method : C:\HPCHEM\2\METHODS\TPHGS.M (Chemstation Integrator)
Title : TPH-G Soil Method
Last Update : Thu Feb 12 16:12:47 1998
Response via : Multiple Level Calibration
DataAcq Meth : TPHGS.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



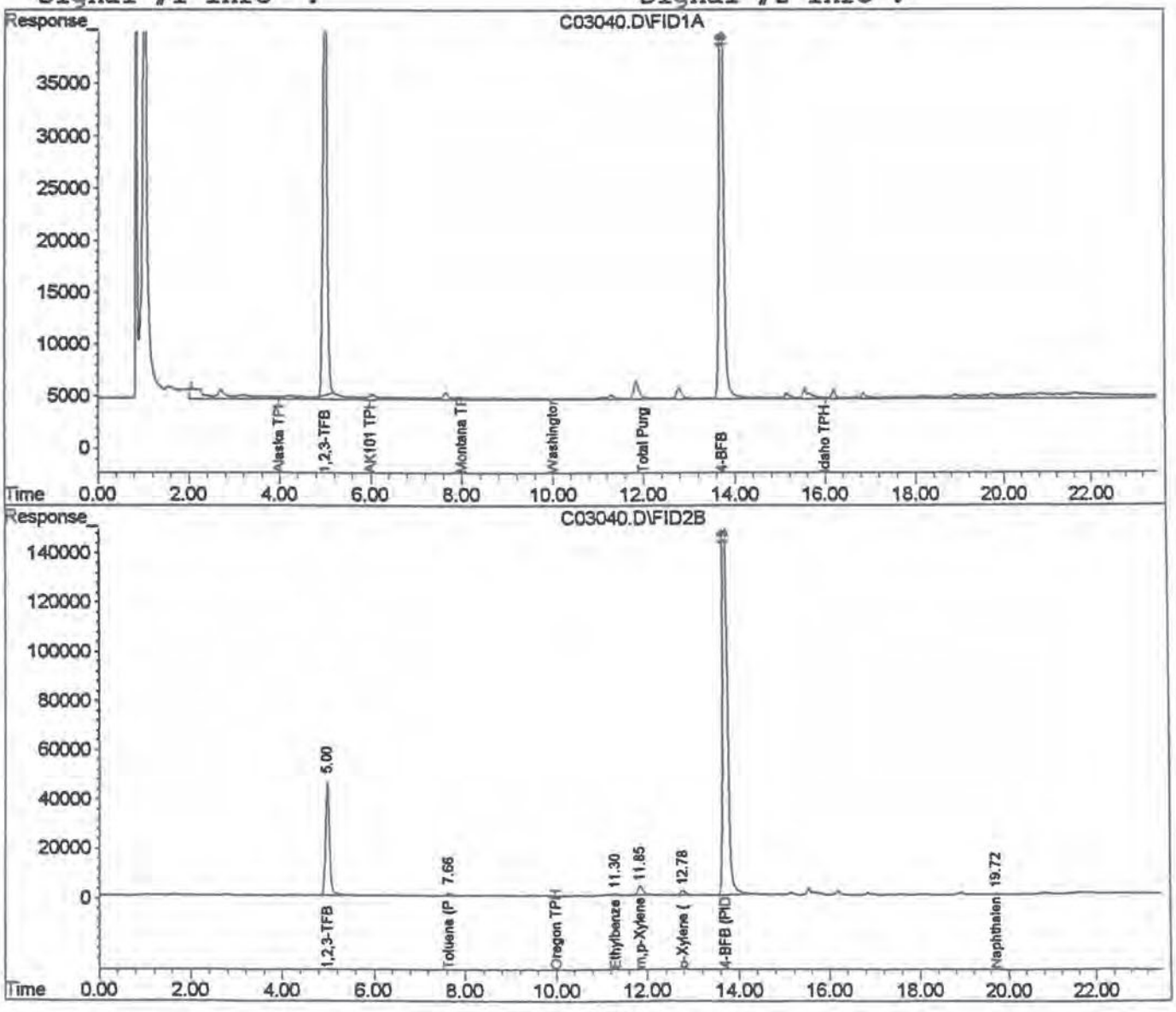


Data File : C:\HPCHEM\2\DATA\030398\C03040.D\FID1A.CH Vial: 40
Acq On : 4 Mar 1998 12:55 am Operator: hsd
Sample : b802492-03 Inst : GC #4
Misc : 100 uL Multiplr: 1.00
IntFile : SURR.E

Data File : C:\HPCHEM\2\DATA\030398\C03040.D\FID2B.CH Vial: 40
Acq On : 4 Mar 98 12:55 am Operator: hsd
Sample : b802492-03 Inst : GC #4
Misc : 100 uL Multiplr: 1.00
IntFile : SURR2.E
Quant Time: Mar 4 6:56 1998 Quant Results File: TPHGS.RES

Quant Method : C:\HPCHEM\2\METHODS\TPHGS.M (Chemstation Integrator)
Title : TPH-G Soil Method
Last Update : Thu Feb 12 16:12:47 1998
Response via : Multiple Level Calibration
DataAcq Meth : TPHGS.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



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~~UNOCAL~~ CHAIN OF CUSTODY REPORT B802492

~~UNOCAL~~ INFORMATION

Facility Number: Family Fun Center, Tukwila
Site Address:
City, State, ZIP:
Site Release Number:
Unocal Manager:
CERT INFO: (check one) ☐ Evaluation ☐ Remediation
☐ Detection ☐ Demolition ☐ Closure ☐ Miscellaneous

CONSULTANT INFORMATION

Firm: GeoEngineers Project# 5925-003-00 task 003
Address: 8410 154th Ave NE Redmond WA
Phone: 861-6000 Fax: 861-6050
Project Manager: Lisa Borna
Sample Collection by: Dave Baumgarten

Chain of Custody Record #:

Quality Assurance Data Level: ☐ A ☒ ~~B~~
A: Standard Summary
B: Standard + Chromatograms

Laboratory Turnaround Days: ☒ ~~TR~~ ☐ 5 ☐ 3 ☐ 2 ☐ 1

○ OR ○ WA ○ AK ○ NW Series

B – 25 SAMPLE INDENTIFICATION	SAMPLING DATE / TIME	MATRIX (W,S,O)	# OF CON-TAINERS	TPH-HCID	TPH-Gas	BTEX EPA 8021 Mod.	TPH-Gas + BTEX	TPH-Diesel	TPH-Diesel Extended	TPH-Diesel-Ext. w/SG Cleanup	Halogen. Volatiles EPA 8021	Pesticides/PCBs or PCBs Only	GC/MS Volatiles EPA 8260	GC/MS SemiVols. EPA 8270	PAH's: 8270 SIM or 8310	Lead: Total or Dissolved	TCLP or RCRA Metals (8)	NCA SAMPLE NUMBER
1. EX-G1-7	02/25/98	S	1				X											B802492-01
2. EX-G2-7	↓	S	1				X											-02
3. EX-G4-7	↓	S	1				X											-03
4.																		
5.																		
6.																		
7.																		
8.																		
9.																		
10.																		

	Relinquished by:	Firm:	Date & Time	Received by:	Firm:	Date & Time
1.	Lisa J Borna	GEI	2/26/98 0830	[signature]	NCA	2/26/98 12:45
2.						
3.						

Final Report Approval

Were all requested results provided? ☐ yes ☐ no Define
Were results within requested turnaround? ☐ yes ☐ no "No"
Final Approval Signature: on back
Firm: Date:

Page 1 of 1

Comments: 3.7

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Rev. UNO3.1 10/97

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Geo Engineers - Redmond	Project:	Family Fun Center (FFC)	Sampled: 2/25/98
4410 154th Ave NE	Project Number:	5925-003	Received: 2/26/98
Redmond, WA 98052	Project Manager:	Lisa Bona	Reported: 3/6/98 13:26

ANALYTICAL REPORT FOR SAMPLES:

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
160B-6	B802490-01	Soil	2/25/98
140B-5.0	B802490-02	Soil	2/25/98
140EB-5.5	B802490-03	Soil	2/25/98
-G-12	B802490-04	Soil	2/25/98
X-G3-7	B802490-05	Soil	2/25/98

GeoEngineers

MAR 0 9 1998

Routing

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Geo Engineers - Redmond	Project:	Family Fun Center (FFC)	Sampled:	2/25/98
8410 154th Ave NE	Project Number:	5925-003	Received:	2/26/98
Redmond, WA 98052	Project Manager:	Lisa Bona	Reported:	3/6/98 13:26

Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by NWTPH-Gx and EPA 8021B
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
B-G-12			**B802490-04**				**Soil**	
Benzene	0380026	3/3/98	3/4/98		0.0500	ND	mg/kg dry	
Toluene	"	"	"		0.0500	ND	"	
Ethylbenzene	"	"	"		0.0500	ND	"	
Xylenes (total)	"	"	"		0.100	ND	"	
Aviation Gasoline Range Hydrocarbons	"	"	"		5.00	ND	"	
Gasoline Range Hydrocarbons	"	"	"		5.00	ND	"	
VM&P Naphtha Range Hydrocarbons	"	"	"		5.00	ND	"	
Mineral Spirits Range Hydrocarbons	"	"	"		5.00	ND	"	
Dx Range Hydrocarbons [>C12]	"	"	"		5.00	ND	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*76.8*	*%*	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*95.5*	"	
EX-G3-7			**B802490-05**				**Soil**	
Benzene	0380026	3/3/98	3/5/98		1.00	**1.16**	mg/kg dry	
Toluene	"	"	"		1.00	**55.5**	"	
Ethylbenzene	"	"	"		1.00	**24.5**	"	
Xylenes (total)	"	"	"		2.00	**208**	"	
Aviation Gasoline Range Hydrocarbons	"	"	"		100	ND	"	
Gasoline Range Hydrocarbons	"	"	"		100	**1990**	"	
VM&P Naphtha Range Hydrocarbons	"	"	"		100	ND	"	
Mineral Spirits Range Hydrocarbons	"	"	"		100	ND	"	
Dx Range Hydrocarbons [>C12]	"	"	"		100	ND	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*NR*	*%*	*1*
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*NR*	"	*1*

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Geo Engineers - Redmond	Project:	Family Fun Center (FFC)	Sampled: 2/25/98
8410 154th Ave NE	Project Number:	5925-003	Received: 2/26/98
Redmond, WA 98052	Project Manager:	Lisa Bona	Reported: 3/6/98 13:26

Volatile Petroleum Hydrocarbons by WDOE Interim TPH Policy Method
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
EX-G3-7			**B802490-05**				**Soil**	
C5-C6 Aliphatics	0380093	3/4/98	3/4/98		100	ND	mg/kg dry	
C6-C8 Aliphatics	"	"	"		100	ND	"	
C8-C10 Aliphatics	"	"	"		100	ND	"	
C10-C12 Aliphatics	"	"	"		100	**160**	"	
C8-C10 Aromatics	"	"	"		100	**338**	"	
C10-C12 Aromatics	"	"	"		100	**246**	"	
C12-C13 Aromatics	"	"	"		100	ND	"	
Surrogate: 4-BFB (FID)	"	"	"	*60.0-140*		*NR*	*%*	*1*
Surrogate: 4-BFB (PID)	"	"	"	*60.0-140*		*197*	"	*1*

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Geo Engineers - Redmond	Project:	Family Fun Center (FFC)	Sampled: 2/25/98
8410 154th Ave NE	Project Number:	5925-003	Received: 2/26/98
Redmond, WA 98052	Project Manager:	Lisa Bona	Reported: 3/6/98 13:26

BTEX, MTBE and Naphthalene by WDOE Interim TPH Policy Method using GC/MS
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
EX-G3-7			**B802490-05**				**Soil**	
Methyl tert-butyl ether	0280722	2/27/98	2/27/98		1.00	ND	mg/kg dry	
Benzene	"	"	"		0.200	**1.38**	"	
Toluene	"	"	3/2/98		4.00	**45.9**	"	
Ethylbenzene	"	"	"		4.00	**16.7**	"	
m,p-Xylene	"	"	"		8.00	**114**	"	
o-Xylene	"	"	"		4.00	**64.3**	"	
Naphthalene	"	"	2/27/98		0.200	**14.0**	"	
Surrogate: 2-Bromopropene	"	"	"	*70.0-130*		*88.1*	%	
Surrogate: 1,2-DCA-d4	"	"	"	*70.0-130*		*91.2*	"	
Surrogate: Toluene-d8	"	"	"	*70.0-130*		*90.8*	"	
Surrogate: 4-BFB	"	"	"	*70.0-130*		*93.1*	"	

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Geo Engineers - Redmond	Project:	Family Fun Center (FFC)	Sampled: 2/25/98
8410 154th Ave NE	Project Number:	5925-003	Received: 2/26/98
Redmond, WA 98052	Project Manager:	Lisa Bona	Reported: 3/6/98 13:26

Diesel Hydrocarbons (C12-C24) and Heavy Oil (C24-C40) by NWTPH-Dx with Silica Gel Clean-up
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
7160B-6			**B802490-01**				**Soil**	
Gx Range Hydrocarbons [<C10]	0380071	3/4/98	3/6/98		10.0	ND	mg/kg dry	
Kerosene Range Hydrocarbons	"	"	"		10.0	ND	"	
Diesel Range Hydrocarbons	"	"	"		10.0	ND	"	
Transformer Oil Range Hydrocarbons	"	"	"		25.0	ND	"	
Heavy Fuel Oil Range Hydrocarbons	"	"	"		25.0	ND	"	
Lube Oil Range Hydrocarbons	"	"	"		25.0	ND	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*82.8*	*%*	
7140B-5.0			**B802490-02**				**Soil**	
Gx Range Hydrocarbons [<C10]	0380071	3/4/98	3/6/98		10.0	ND	mg/kg dry	
Kerosene Range Hydrocarbons	"	"	"		10.0	ND	"	
Diesel Range Hydrocarbons	"	"	"		10.0	**13.6**	"	
Transformer Oil Range Hydrocarbons	"	"	"		25.0	ND	"	
Heavy Fuel Oil Range Hydrocarbons	"	"	"		25.0	ND	"	
Lube Oil Range Hydrocarbons	"	"	"		25.0	ND	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*107*	*%*	
7140EB-5.5			**B802490-03**				**Soil**	
Gx Range Hydrocarbons [<C10]	0380071	3/4/98	3/6/98		10.0	ND	mg/kg dry	
Kerosene Range Hydrocarbons	"	"	"		10.0	ND	"	
Diesel Range Hydrocarbons	"	"	"		10.0	**12.7**	"	
Transformer Oil Range Hydrocarbons	"	"	"		25.0	ND	"	
Heavy Fuel Oil Range Hydrocarbons	"	"	"		25.0	ND	"	
Lube Oil Range Hydrocarbons	"	"	"		25.0	ND	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*87.6*	*%*	

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Geo Engineers - Redmond	Project:	Family Fun Center (FFC)	Sampled:	2/25/98
8410 154th Ave NE	Project Number:	5925-003	Received:	2/26/98
Redmond, WA 98052	Project Manager:	Lisa Bona	Reported:	3/6/98 13:26

Dry Weight Determination
North Creek Analytical - Bothell

Sample Name	Lab ID	Matrix	Result	Units
7160B-6	B802490-01	Soil	79.7	%
7140B-5.0	B802490-02	Soil	89.3	%
7140EB-5.5	B802490-03	Soil	87.9	%
B-G-12	B802490-04	Soil	71.3	%
EX-G3-7	B802490-05	Soil	76.6	%

North Creek Analytical, Inc.

Joy B Chang, Project Manager

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8410 154th Ave NE	Project Number:	5925-003	Received: 2/26/98
Redmond, WA 98052	Project Manager:	Lisa Bona	Reported: 3/6/98 13:26

Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by NWTPH-Gx and EPA 8021B/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*
Batch: 0380026	**Date Prepared: 3/3/98**					**Extraction Method: EPA 5030B (MeOH)**				
Blank	**0380026-BLK1**									
Benzene	3/3/98			**ND**	mg/kg dry	**0.0500**				
Toluene	"			**ND**	"	**0.0500**				
Ethylbenzene	"			**ND**	"	**0.0500**				
Xylenes (total)	"			**ND**	"	**0.100**				
Aviation Gasoline Range Hydrocarbons	"			**ND**	"	**5.00**				
Gasoline Range Hydrocarbons	"			**ND**	"	**5.00**				
VM&P Naphtha Range Hydrocarbons	"			**ND**	"	**5.00**				
Mineral Spirits Range Hydrocarbons	"			**ND**	"	**5.00**				
Dx Range Hydrocarbons [>C12]	"			**ND**	"	**5.00**				
Surrogate: 4-BFB (FID)	"	*4.00*		*3.83*	"	*50.0-150*	*95.7*			
Surrogate: 4-BFB (PID)	"	*4.00*		*4.15*	"	*50.0-150*	*104*			
LCS	**0380026-BS1**									
Gasoline Range Hydrocarbons	3/3/98	25.0		29.0	mg/kg dry	75.0-125	116			
Surrogate: 4-BFB (FID)	"	*4.00*		*4.02*	"	*50.0-150*	*100*			
Duplicate	**0380026-DUP1**		**B802492-03**							
Aviation Gasoline Range Hydrocarbons	3/4/98		ND	ND	mg/kg dry			50.0		
Gasoline Range Hydrocarbons	"		ND	ND	"			50.0		
VM&P Naphtha Range Hydrocarbons	"		ND	ND	"			50.0		
Mineral Spirits Range Hydrocarbons	"		ND	ND	"			50.0		
Dx Range Hydrocarbons [>C12]	"		ND	ND	"			50.0		
Surrogate: 4-BFB (FID)	"	*5.26*		*4.07*	"	*50.0-150*	*77.4*			
Matrix Spike	**0380026-MS1**		**B802492-01**							
Benzene	3/4/98	0.605	ND	0.569	mg/kg dry	60.0-140	**94.0**			
Toluene	"	0.605	0.0508	0.615	"	60.0-140	**93.3**			
Ethylbenzene	"	0.605	ND	0.600	"	60.0-140	**99.2**			
Xylenes (total)	"	1.81	10.1	8.68	"	60.0-140	**NR**			2
Surrogate: 4-BFB (PID)	"	*4.84*		*4.46*	"	*50.0-150*	*92.1*			
Matrix Spike Dup	**0380026-MSD1**		**B802492-01**							
Benzene	3/4/98	0.605	ND	0.571	mg/kg dry	60.0-140	**94.4**	20.0	**0.425**	
Toluene	"	0.605	0.0508	0.610	"	60.0-140	**92.4**	20.0	**0.969**	
Ethylbenzene	"	0.605	ND	0.595	"	60.0-140	**98.3**	20.0	**0.911**	
Xylenes (total)	"	1.81	10.1	7.00	"	60.0-140	**NR**	20.0		2
Surrogate: 4-BFB (PID)	"	*4.84*		*4.41*	"	*50.0-150*	*91.1*			

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

Joy B Chang, Project Manager

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Geo Engineers - Redmond	Project:	Family Fun Center (FFC)	Sampled: 2/25/98
8410 154th Ave NE	Project Number:	5925-003	Received: 2/26/98
Redmond, WA 98052	Project Manager:	Lisa Bona	Reported: 3/6/98 13:26

Volatile Petroleum Hydrocarbons by WDOE Interim TPH Policy Method/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*
Batch: 0380093	**Date Prepared: 3/4/98**					**Extraction Method: EPA 5030B (MeOH)**				
Blank	**0380093-BLK1**									
C5-C6 Aliphatics	3/4/98			**ND**	mg/kg dry	**5.00**				
C6-C8 Aliphatics	"			**ND**	"	**5.00**				
C8-C10 Aliphatics	"			**ND**	"	**5.00**				
C10-C12 Aliphatics	"			**ND**	"	**5.00**				
C8-C10 Aromatics	"			**ND**	"	**5.00**				
C10-C12 Aromatics	"			**ND**	"	**5.00**				
C12-C13 Aromatics	"			**ND**	"	**5.00**				
Surrogate: 4-BFB (FID)	"	*4.00*		*4.04*	"	*60.0-140*	*101*			
Surrogate: 4-BFB (PID)	"	*4.00*		*3.67*	"	*60.0-140*	*91.8*			
LCS	**0380093-BS1**									
C5-C6 Aliphatics	3/4/98	2.00		2.10	mg/kg dry	70.0-130	105			
C6-C8 Aliphatics	"	1.00		1.33	"	70.0-130	133			3
C8-C10 Aliphatics	"	1.00		0.630	"	70.0-130	63.0			3
C10-C12 Aliphatics	"	1.00		0.732	"	70.0-130	73.2			
C8-C10 Aromatics	"	4.00		2.83	"	70.0-130	70.7			
C10-C12 Aromatics	"	1.00		0.822	"	70.0-130	82.2			
C12-C13 Aromatics	"	1.00		0.700	"	70.0-130	70.0			
Surrogate: 4-BFB (FID)	"	*4.00*		*4.39*	"	*60.0-140*	*110*			
Surrogate: 4-BFB (PID)	"	*4.00*		*4.06*	"	*60.0-140*	*101*			
Duplicate	**0380093-DUP1**		**B802490-05**							
C5-C6 Aliphatics	3/4/98		ND	ND	mg/kg dry			25.0		4
C6-C8 Aliphatics	"		ND	ND	"			25.0		
C8-C10 Aliphatics	"		ND	ND	"			25.0		
C10-C12 Aliphatics	"		160	167	"			25.0	**4.28**	
C8-C10 Aromatics	"		338	360	"			25.0	**6.30**	
C10-C12 Aromatics	"		246	256	"			25.0	**3.98**	
C12-C13 Aromatics	"		ND	ND	"			25.0		
Surrogate: 4-BFB (FID)	"	*5.22*		*ND*	"	*60.0-140*	*NR*			*1*
Surrogate: 4-BFB (PID)	"	*5.22*		*10.6*	"	*60.0-140*	*NR*			*1*

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8410 154th Ave NE	Project Number:	5925-003	Received: 2/26/98
Redmond, WA 98052	Project Manager:	Lisa Bona	Reported: 3/6/98 13:26

BTEX, MTBE and Naphthalene by WDOE Interim TPH Policy Method using GC/MS/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*
Batch: 0280722	**Date Prepared: 2/27/98**					**Extraction Method: EPA 5030B [MeOH]**				
Blank	**0280722-BLK1**									
Methyl tert-butyl ether	2/27/98			**ND**	mg/kg dry	**1.00**				
Benzene	"			**ND**	"	**0.200**				
Toluene	"			**ND**	"	**0.200**				
Ethylbenzene	"			**ND**	"	**0.200**				
m,p-Xylene	"			**ND**	"	**0.400**				
o-Xylene	"			**ND**	"	**0.200**				
Naphthalene	"			**ND**	"	**0.200**				
Surrogate: 2-Bromopropene	"	*2.00*		*2.25*	"	*70.0-130*	*113*			
Surrogate: 1,2-DCA-d4	"	*2.00*		*2.58*	"	*70.0-130*	*129*			
Surrogate: Toluene-d8	"	*2.00*		*2.19*	"	*70.0-130*	*110*			
Surrogate: 4-BFB	"	*2.00*		*2.18*	"	*70.0-130*	*109*			
LCS	**0280722-BS1**									
Benzene	2/27/98	1.00		1.09	mg/kg dry	70.0-130	109			
Toluene	"	1.00		1.03	"	70.0-130	103			
Surrogate: 2-Bromopropene	"	*2.00*		*2.12*	"	*70.0-130*	*106*			
Surrogate: 1,2-DCA-d4	"	*2.00*		*2.40*	"	*70.0-130*	*120*			
Surrogate: Toluene-d8	"	*2.00*		*2.08*	"	*70.0-130*	*104*			
Surrogate: 4-BFB	"	*2.00*		*2.22*	"	*70.0-130*	*111*			
Matrix Spike	**0280722-MS1**		**B802362-05**							
Benzene	2/27/98	1.11	ND	1.08	mg/kg dry	70.0-130	**97.3**			
Toluene	"	1.11	ND	1.06	"	70.0-130	**95.5**			
Surrogate: 2-Bromopropene	"	*2.21*		*2.24*	"	*70.0-130*	*101*			
Surrogate: 1,2-DCA-d4	"	*2.21*		*2.15*	"	*70.0-130*	*97.3*			
Surrogate: Toluene-d8	"	*2.21*		*2.14*	"	*70.0-130*	*96.8*			
Surrogate: 4-BFB	"	*2.21*		*2.25*	"	*70.0-130*	*102*			
Matrix Spike Dup	**0280722-MSD1**		**B802362-05**							
Benzene	2/27/98	1.11	ND	1.07	mg/kg dry	70.0-130	**96.4**	20.0	**0.929**	
Toluene	"	1.11	ND	1.01	"	70.0-130	**91.0**	20.0	**4.83**	
Surrogate: 2-Bromopropene	"	*2.21*		*1.90*	"	*70.0-130*	*86.0*			
Surrogate: 1,2-DCA-d4	"	*2.21*		*2.10*	"	*70.0-130*	*95.0*			
Surrogate: Toluene-d8	"	*2.21*		*2.07*	"	*70.0-130*	*93.7*			
Surrogate: 4-BFB	"	*2.21*		*2.07*	"	*70.0-130*	*93.7*			

North Creek Analytical, Inc.

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

oy B Chang, Project Manager

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East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
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NORTH CREEK ANALYTICAL
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SPOKANE ▪ (509) 924-9200 ▪ FAX 924-9290
PORTLAND ▪ (503) 643-9200 ▪ FAX 644-2202

Geo Engineers - Redmond	Project:	Family Fun Center (FFC)	Sampled: 2/25/98
8410 154th Ave NE	Project Number:	5925-003	Received: 2/26/98
Redmond, WA 98052	Project Manager:	Lisa Bona	Reported: 3/6/98 13:26

Diesel Hydrocarbons (C12-C24) and Heavy Oil (C24-C40) by NWTPH-Dx with 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*
Batch: 0380071	**Date Prepared: 3/4/98**				**Extraction Method: EPA 3550B**					
Blank	**0380071-BLK1**									
Gx Range Hydrocarbons [<C10]	3/6/98			ND	mg/kg dry	10.0				
Kerosene Range Hydrocarbons	"			ND	"	10.0				
Diesel Range Hydrocarbons	"			ND	"	10.0				
Transformer Oil Range Hydrocarbons	"			ND	"	25.0				
Heavy Fuel Oil Range Hydrocarbons	"			ND	"	25.0				
Lube Oil Range Hydrocarbons	"			ND	"	25.0				
Surrogate: 2-FBP	"	*10.7*		*11.4*	"	*50.0-150*	*107*			
LCS	**0380071-BS1**									
Diesel Range Hydrocarbons	3/6/98	66.7		54.1	mg/kg dry	50.0-150	81.1			
Surrogate: 2-FBP	"	*10.7*		*10.9*	"	*50.0-150*	*102*			
Duplicate	**0380071-DUP1**		**B802490-02**							
Gx Range Hydrocarbons [<C10]	3/6/98		ND	ND	mg/kg dry			50.0		
Kerosene Range Hydrocarbons	"		ND	ND	"			50.0		
Diesel Range Hydrocarbons	"		13.6	13.2	"			50.0	2.99	
Transformer Oil Range Hydrocarbons	"		ND	ND	"			50.0		
Heavy Fuel Oil Range Hydrocarbons	"		ND	ND	"			50.0		
Lube Oil Range Hydrocarbons	"		ND	ND	"			50.0		
Surrogate: 2-FBP	"	*12.0*		*12.0*	"	*50.0-150*	*100*			

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Geo Engineers - Redmond	Project:	Family Fun Center (FFC)	Sampled: 2/25/98
8410 154th Ave NE	Project Number:	5925-003	Received: 2/26/98
Redmond, WA 98052	Project Manager:	Lisa Bona	Reported: 3/6/98 13:26

Notes and Definitions

#	Note
1	The surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample.
2	The RPD and/or percent recovery for this QC spike sample cannot be accurately calculated due to interference from coeluting organic compounds present in the sample.
3	The spike recovery for this QC sample is outside of established control limits. Review of associated batch QC indicates the recovery for this analyte does not represent an out-of-control condition for the batch.
4	Analyses are not controlled on RPD values from sample concentrations less than 10 times the reporting limit.
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

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ieo Engineers - Redmond	Project:	Family Fun Center (FFC)	Sampled: 2/26/98
410 154th Ave NE	Project Number:	5925-003	Received: 2/27/98
edmond, WA 98052	Project Manager:	Lisa Bona	Reported: 3/18/98 08:08

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*
Batch: 0380322	**Date Prepared: 3/12/98**					**Extraction Method: EPA 3550B**				
Blank	**0380322-BLK1**									
Aroclor 1016	3/13/98			**ND**	ug/kg dry	**50.0**				
Aroclor 1221	"			**ND**	"	**50.0**				
Aroclor 1232	"			**ND**	"	**50.0**				
Aroclor 1242	"			**ND**	"	**50.0**				
Aroclor 1248	"			**ND**	"	**50.0**				
Aroclor 1254	"			**ND**	"	**50.0**				
Aroclor 1260	"			**ND**	"	**50.0**				
Aroclor 1262	"			**ND**	"	**50.0**				
Aroclor 1268	"			**ND**	"	**50.0**				
Surrogate: TCX	"	*6.67*		*3.32*	"	*38.0-117*	*49.8*			
LCS	**0380322-BS1**									
Aroclor 1260	3/13/98	333		206	ug/kg dry	44.0-123	61.9			
Surrogate: TCX	"	*6.67*		*3.60*	"	*38.0-117*	*54.0*			
Matrix Spike	**0380322-MS1**		**B802518-03**							
Aroclor 1260	3/13/98	501	ND	193	ug/kg dry	28.0-132	**38.5**			
Surrogate: TCX	"	*10.0*		*6.26*	"	*38.0-117*	*62.6*			
Matrix Spike Dup	**0380322-MSD1**		**B802518-03**							
Aroclor 1260	3/13/98	501	ND	191	ug/kg dry	28.0-132	**38.1**	23.0	**1.04**	
Surrogate: TCX	"	*10.0*		*5.16*	"	*38.0-117*	*51.6*			

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Geo Engineers - Redmond	Project:	Family Fun Center (FFC)	Sampled: 2/26/98
4410 154th Ave NE	Project Number:	5925-003	Received: 2/27/98
Redmond, WA 98052	Project Manager:	Lisa Bona	Reported: 3/18/98 08:08

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, Inc.

Roy B Chang, Project Manager

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Geo Engineers - Redmond	Project:	Family Fun Center (FFC)	Sampled: 2/26/98
8410 154th Ave NE	Project Number:	5925-003	Received: 2/27/98
Redmond, WA 98052	Project Manager:	Lisa Bona	Reported: 3/11/98 11:46

Total Metals by EPA 6000/7000 Series Methods/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
Batch: 0380061	**Date Prepared: 3/3/98**				**Extraction Method: EPA 7471A**					
Blank	**0380061-BLK1**									
Mercury	3/4/98			0.0500	mg/kg dry	0.0500				
LCS	**0380061-BS1**									
Mercury	3/4/98	0.500		0.538	mg/kg dry	80.0-120	108			
LCS	**0380061-BS2**									
Mercury	3/4/98	1.16		0.943	mg/kg dry	80.0-120	81.3			
Duplicate	**0380061-DUP1**		**B802362-12**							
Mercury	3/4/98		0.0778	0.0648	mg/kg dry			20.0	**18.2**	
Matrix Spike	**0380061-MS1**		**B802362-12**							
Mercury	3/4/98	0.586	0.0778	0.583	mg/kg dry	80.0-120	**86.2**			
Matrix Spike Dup	**0380061-MSD1**		**B802362-12**							
Mercury	3/4/98	0.586	0.0778	0.581	mg/kg dry	80.0-120	**85.9**	20.0	**0.349**	
Batch: 0380211	**Date Prepared: 3/9/98**				**Extraction Method: EPA 3050B**					
Blank	**0380211-BLK1**									
Antimony	3/9/98			**ND**	mg/kg dry	**5.00**				
Arsenic	"			**ND**	"	**0.500**				
Barium	"			**ND**	"	**0.500**				
Beryllium	"			**ND**	"	**0.500**				
Cadmium	"			**ND**	"	**0.500**				
Chromium	"			**ND**	"	**0.500**				
Copper	"			**ND**	"	**0.500**				
Lead	"			**ND**	"	**0.500**				
Nickel	"			**ND**	"	**0.500**				
Selenium	"			**ND**	"	**0.500**				
Silver	"			**ND**	"	**0.500**				
Thallium	3/10/98			**ND**	"	**0.500**				
Zinc	3/9/98			**ND**	"	**0.500**				
LCS	**0380211-BS1**									
Antimony	3/9/98	23.2		17.5	mg/kg dry	80.0-120	75.4			1
Arsenic	"	151		144	"	70.0-130	95.4			
Barium	"	178		189	"	80.0-120	106			

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

by B Chang, Project Manager

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Geo Engineers - Redmond	Project: Family Fun Center (FFC)	Sampled:	2/26/98
8410 154th Ave NE	Project Number: 5925-003	Received:	2/27/98
Redmond, WA 98052	Project Manager: Lisa Bona	Reported:	3/11/98 11:46

Total Metals by EPA 6000/7000 Series Methods/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*
LCS (continued)	**0380211-BS1**									
Beryllium	3/9/98	51.6		57.0	mg/kg dry	80.0-120	110			
Cadmium	"	136		143	"	70.0-130	105			
Chromium	"	57.6		62.2	"	80.0-120	108			
Copper	"	60.0		62.5	"	80.0-120	104			
Lead	"	84.9		94.3	"	80.0-120	111			
Nickel	"	138		156	"	80.0-120	113			
Selenium	"	132		114	"	70.0-130	86.4			
Silver	"	57.0		63.0	"	80.0-120	111			
Thallium	"	50.8		52.1	"	80.0-120	103			
Zinc	"	986		996	"	70.0-130	101			
Duplicate	**0380211-DUP1**		**B802518-03**							
Antimony	3/9/98		ND	ND	mg/kg dry			20.0		
Arsenic	"		6.05	6.92	"			20.0	**13.4**	
Barium	"		87.4	81.7	"			20.0	**6.74**	
Beryllium	"		ND	ND	"			20.0		
Cadmium	"		ND	ND	"			20.0		
Chromium	"		29.0	27.9	"			20.0	**3.87**	
Copper	"		31.9	33.3	"			20.0	**4.29**	
Lead	"		43.3	42.6	"			20.0	**1.63**	
Nickel	"		33.1	33.0	"			20.0	**0.303**	
Selenium	"		ND	ND	"			20.0		
Silver	"		ND	ND	"			20.0		
Thallium	3/10/98		0.794	ND	"			20.0		3
Zinc	3/9/98		66.5	66.8	"			20.0	**0.450**	
Matrix Spike	**0380211-MS1**		**B802518-03**							
Antimony	3/9/98	7.37	ND	ND	mg/kg dry	70.0-130	**NR**			2
Arsenic	"	7.37	6.05	12.5	"	70.0-130	**87.5**			
Barium	"	7.37	87.4	81.3	"	70.0-130	**NR**			2
Beryllium	"	7.37	ND	6.15	"	70.0-130	**83.4**			
Cadmium	"	7.37	ND	6.43	"	70.0-130	**87.2**			
Chromium	"	7.37	29.0	32.3	"	70.0-130	**44.8**			2
Copper	"	7.37	31.9	44.9	"	70.0-130	**176**			2
Lead	"	7.37	43.3	49.2	"	70.0-130	**80.1**			
Nickel	"	7.37	33.1	37.2	"	70.0-130	**55.6**			2
Selenium	"	7.37	ND	5.22	"	70.0-130	**70.8**			
Silver	"	7.37	ND	6.57	"	70.0-130	**89.1**			

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

Approved by B Chang, Project Manager

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Geo Engineers - Redmond	Project:	Family Fun Center (FFC)	Sampled: 2/26/98
8410 154th Ave NE	Project Number:	5925-003	Received: 2/27/98
Redmond, WA 98052	Project Manager:	Lisa Bona	Reported: 3/11/98 11:46

Total Metals by EPA 6000/7000 Series Methods/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*
Matrix Spike (continued)	0380211-MS1		B802518-03							
Thallium	3/9/98	7.37	0.794	5.82	mg/kg dry	70.0-130	**68.2**			
Zinc	"	7.37	66.5	71.6	"	70.0-130	**69.2**			2
Matrix Spike	0380211-MS2		B802518-03							
Antimony	3/9/98	141	ND	147	mg/kg dry	70.0-130	**104**			
Barium	"	141	87.4	237	"	70.0-130	**106**			
Chromium	"	141	29.0	171	"	70.0-130	**101**			
Copper	"	141	31.9	183	"	70.0-130	**107**			
Nickel	"	141	33.1	171	"	70.0-130	**97.8**			
Zinc	"	141	66.5	224	"	70.0-130	**112**			

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Geo Engineers - Redmond	Project:	Family Fun Center (FFC)	Sampled: 2/26/98
8410 154th Ave NE	Project Number:	5925-003	Received: 2/27/98
Redmond, WA 98052	Project Manager:	Lisa Bona	Reported: 3/11/98 11:46

Notes and Definitions

#	Note
1	The spike recovery for this QC sample was outside the laboratory's default control limits but within the vendor's published acceptance criteria.
2	The spike recovery for this QC sample is outside of established control limits. Review of associated batch QC indicates the recovery for this analyte does not represent an out-of-control condition for the batch.
3	Analyses are not controlled on RPD values from sample concentrations less than 10 times the reporting limit.
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, Inc.

Joy B Chang, Project Manager

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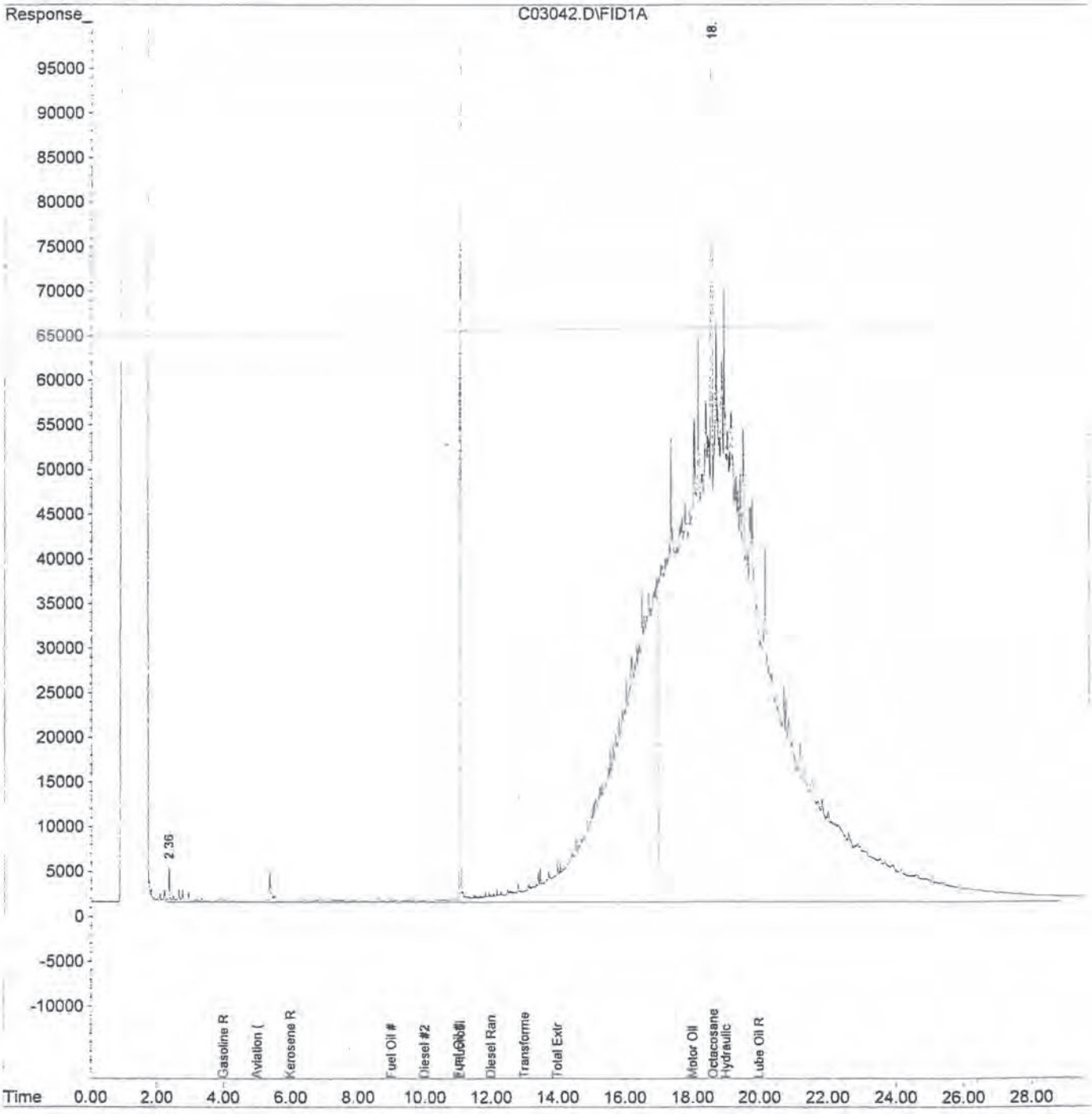
Data File : C:\HPCHEM\1\DATA\C03042.D Vial: 20
Acq On : 3 Mar 1998 9:24 pm Operator: ajg
Sample : b802518-03 Inst : GC #1
Misc : S Multiplr: 1.00
IntFile : SURR.E
Quant Time: Mar 4 8:36 1998 Quant Results File: NWTPHD.RES

Quant Method : C:\HPCHEM\1\METHODS\NWTPHD.M (Chemstation Integrator)
Title : Northwest Front Method
Last Update : Tue Mar 03 13:50:18 1998
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

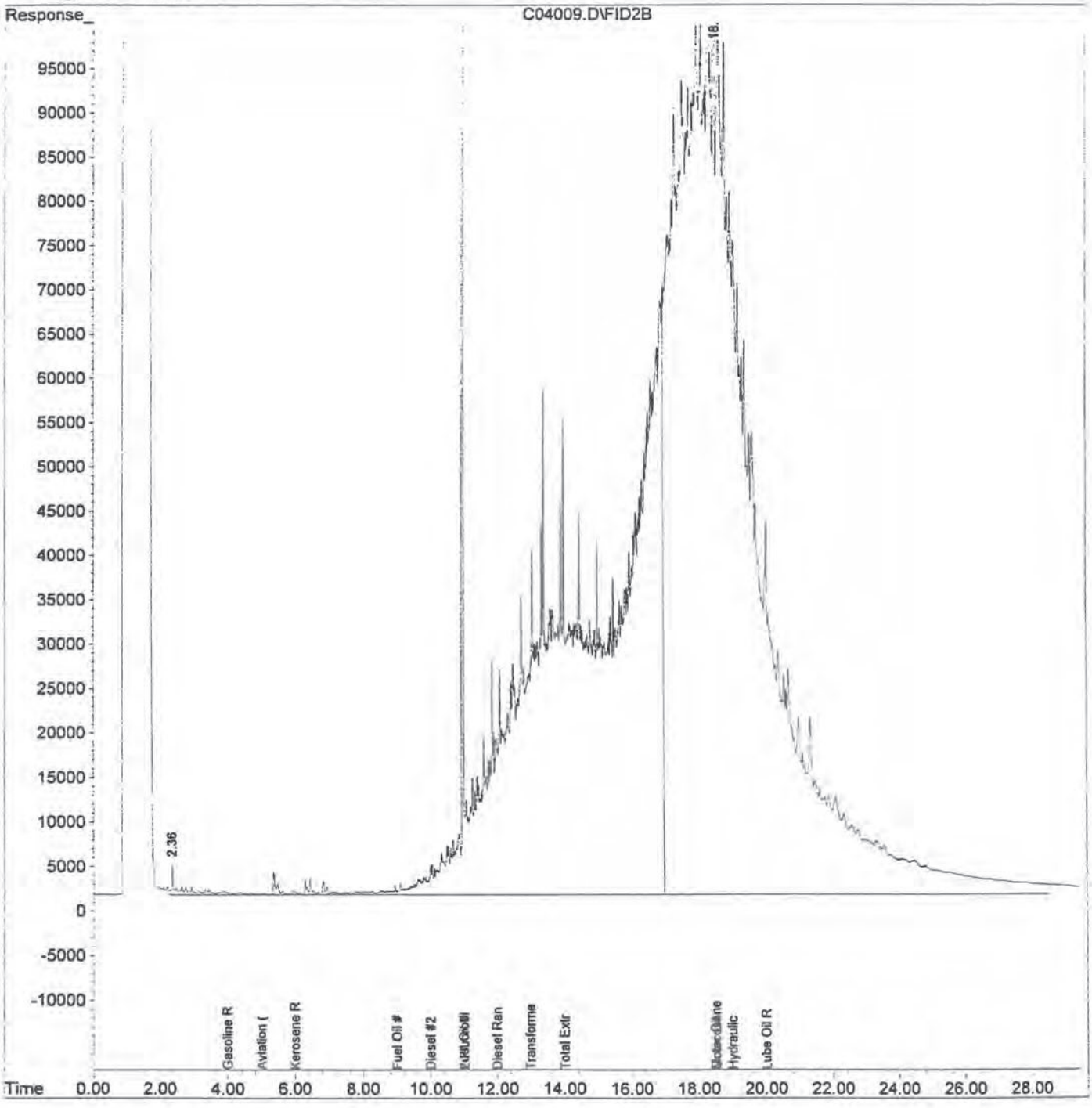
Volume Inj. :
Signal Phase :
Signal Info :



Data File : C:\HPCHEM\1\DATA.SEC\C04009.D Vial: 6
Acq On : 4 Mar 1998 12:54 pm Operator: ajg
Sample : b802518-04 r1 Inst : GC #1
Misc : S Multiplr: 1.00
IntFile : SURR.E
Quant Time: Mar 4 14:19 1998 Quant Results File: NWTPHD2.RES

Quant Method : C:\HPCHEM\1\METHODS\NWTPHD2.M (Chemstation Integrator)
Title : Northwest Rear Method
Last Update : Tue Mar 03 13:55:30 1998
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

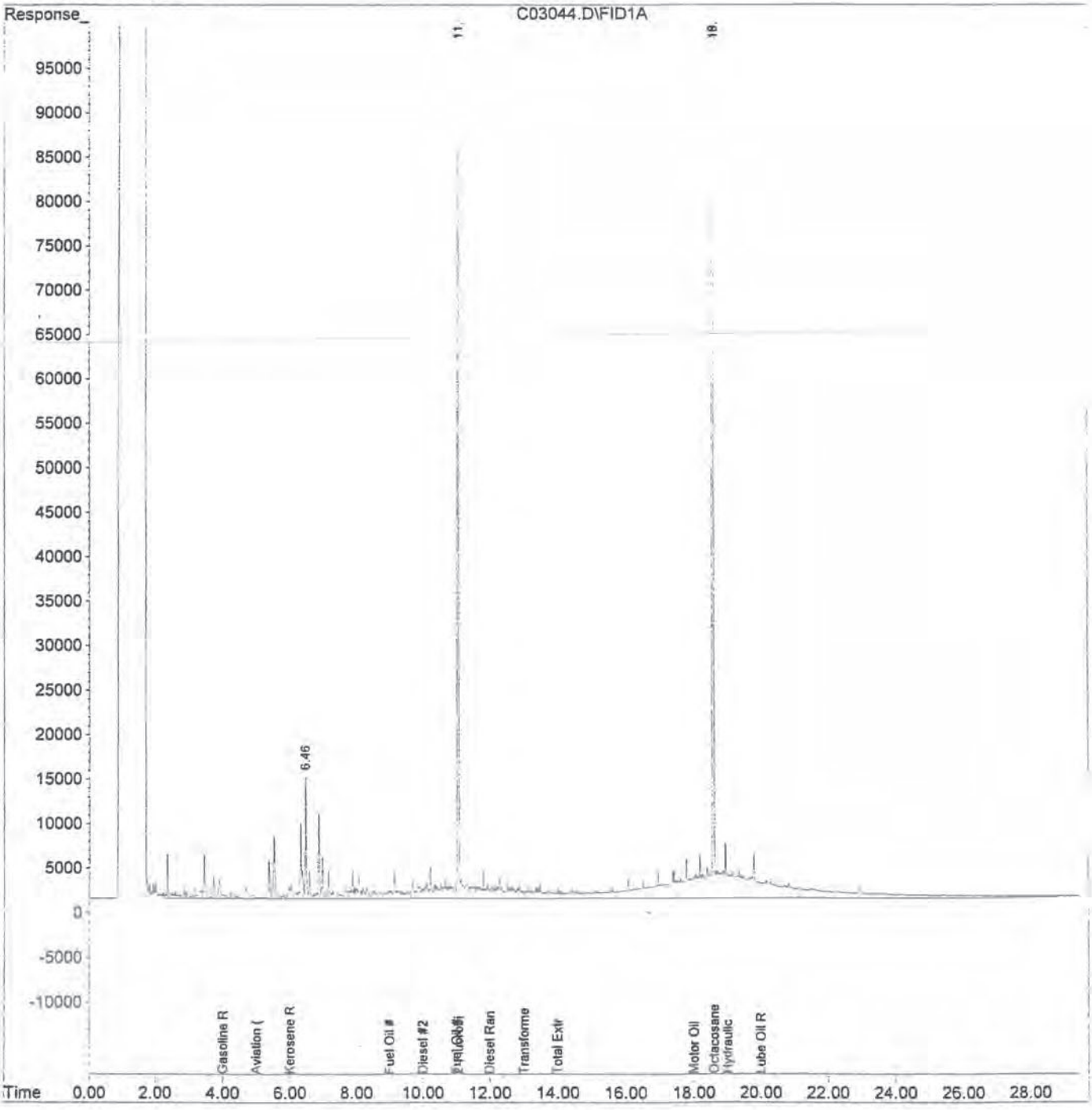
Volume Inj. :
Signal Phase :
Signal Info :



Data File : C:\HPCHEM\1\DATA\C03044.D Vial: 22
Acq On : 3 Mar 1998 10:02 pm Operator: ajg
Sample : b802518-05 Inst : GC #1
Misc : S Multiplr: 1.00
IntFile : SURR.E
Quant Time: Mar 4 8:37 1998 Quant Results File: NWTPHD.RES

Quant Method : C:\HPCHEM\1\METHODS\NWTPHD.M (Chemstation Integrator)
Title : Northwest Front Method
Last Update : Tue Mar 03 13:50:18 1998
Response via : Multiple Level Calibration
DataAcq Meth : TPHD.M

Volume Inj. :
Signal Phase :
Signal Info :



CHAIN OF CUSTODY RECORD

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

Geo Engineers

B802518

DATE 2/27/98
PAGE 1 OF 1
LAB North Creek
LAB NO.

PROJECT NAME/LOCATION FAMILY FUN CENTER/ISSAQUAH
PROJECT NUMBER 5925-005-00
PROJECT MANAGER LISA BURNS
SAMPLED BY D BAUMGARTEN

SAMPLE IDENTIFICATION		SAMPLE COLLECTION			# OF	ANALYSIS REQUIRED											NOTES/COMMENTS
LAB	GEOENGINEERS	DATE	TIME	MATRIX	JARS	NWTPH-Dx+	priority pollutant metals + Barium										(Preserved, filtered, etc.)
	HA-1-1	2/26/98	1541	S	1	X	X										B802518-01
	HA-2-0.5		1615	S	1	X	X										-02
	HA-3-0.5		1641	S	1	X	X										-03
	TP-2-5.0		1450	S	1	X											-04
	TP-2-8.0		1645	S	1	X											-05

PJB

RELINQUISHED BY	FIRM	RELINQUISHED BY	FIRM	RELINQUISHED BY	FIRM
SIGNATURE	GEI	SIGNATURE	NCA	SIGNATURE	
PRINTED NAME	DAVID BAUMGARTEN	PRINTED NAME	KBarker	PRINTED NAME	
DATE 2/27/98	TIME 730	DATE 2/27/98	TIME 1300	DATE	TIME
RECEIVED BY	FIRM	RECEIVED BY	FIRM	RECEIVED BY	FIRM
SIGNATURE		SIGNATURE		SIGNATURE	
PRINTED NAME		PRINTED NAME		PRINTED NAME	
DATE	TIME	DATE	TIME	DATE	TIME

ADDITIONAL COMMENTS:

1.5 W/C7

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Geo Engineers - Redmond	Project:	Family Fun Center (FFC)	Sampled: 2/26/98
3410 154th Ave NE	Project Number:	5925-003	Received: 2/27/98
Redmond, WA 98052	Project Manager:	Lisa Bona	Reported: 3/4/98 10:55

ANALYTICAL REPORT FOR SAMPLES:

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
TSP-1	B802521-01	Soil	2/26/98

GeoEngineers

MAR 05 1998

Routing

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Environmental Laboratory Services

BOTHELL ▪ (425) 481-9200 ▪ FAX 485-2992
SPOKANE ▪ (509) 924-9200 ▪ FAX 924-9290
PORTLAND ▪ (503) 643-9200 ▪ FAX 644-2202

Geo Engineers - Redmond	Project:	Family Fun Center (FFC)	Sampled: 2/26/98
8410 154th Ave NE	Project Number:	5925-003	Received: 2/27/98
Redmond, WA 98052	Project Manager:	Lisa Bona	Reported: 3/4/98 10:55

Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by NWTPH-Gx and EPA 8021B
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
CSP-1			B802521-01				Soil	
Benzene	0280728	3/2/98	3/3/98		2.50	**11.1**	mg/kg dry	
Toluene	"	"	"		5.00	**395**	"	
Ethylbenzene	"	"	"		2.50	**156**	"	
Xylenes (total)	"	"	"		5.00	**782**	"	
Aviation Gasoline Range Hydrocarbons	"	"	"		250	ND	"	
Gasoline Range Hydrocarbons	"	"	"		250	**8030**	"	
VM&P Naphtha Range Hydrocarbons	"	"	"		250	ND	"	
Mineral Spirits Range Hydrocarbons	"	"	"		250	ND	"	
Dx Range Hydrocarbons [>C12]	"	"	"		250	ND	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*NR*	*%*	*1*
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*NR*	"	*1*

NORTH CREEK ANALYTICAL
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Geo Engineers - Redmond	Project:	Family Fun Center (FFC)	Sampled:	2/26/98
8410 154th Ave NE	Project Number:	5925-003	Received:	2/27/98
Redmond, WA 98052	Project Manager:	Lisa Bona	Reported:	3/4/98 10:55

Dry Weight Determination
North Creek Analytical - Bothell

Sample Name	Lab ID	Matrix	Result	Units
CSP-1	B802521-01	Soil	76.7	%

NORTH CREEK ANALYTICAL
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Geo Engineers - Redmond	Project:	Family Fun Center (FFC)	Sampled: 2/26/98
8410 154th Ave NE	Project Number:	5925-003	Received: 2/27/98
Redmond, WA 98052	Project Manager:	Lisa Bona	Reported: 3/4/98 10:55

Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by NWTPH-Gx and EPA 8021B/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*
Batch: 0280728	**Date Prepared: 3/2/98**					**Extraction Method: EPA 5030B (MeOH)**				
Blank	**0280728-BLK1**									
Benzene	3/3/98			**ND**	mg/kg dry	**0.0500**				
Toluene	"			**ND**	"	**0.0500**				
Ethylbenzene	"			**ND**	"	**0.0500**				
Xylenes (total)	"			**ND**	"	**0.100**				
Aviation Gasoline Range Hydrocarbons	"			**ND**	"	**5.00**				
Gasoline Range Hydrocarbons	"			**ND**	"	**5.00**				
VM&P Naphtha Range Hydrocarbons	"			**ND**	"	**5.00**				
Mineral Spirits Range Hydrocarbons	"			**ND**	"	**5.00**				
Dx Range Hydrocarbons [>C12]	"			**ND**	"	**5.00**				
Surrogate: 4-BFB (FID)	"	*4.00*		*5.08*	"	*50.0-150*	*127*			
Surrogate: 4-BFB (PID)	"	*4.00*		*4.81*	"	*50.0-150*	*120*			
LCS	**0280728-BS1**									
Gasoline Range Hydrocarbons	3/3/98	25.0		26.2	mg/kg dry	75.0-125	105			
Surrogate: 4-BFB (FID)	"	*4.00*		*5.49*	"	*50.0-150*	*137*			
Duplicate	**0280728-DUP1**		**B802473-04**							
Aviation Gasoline Range Hydrocarbons	3/3/98		ND	ND	mg/kg dry			50.0		
Gasoline Range Hydrocarbons	"		52.9	43.4	"			50.0	**19.7**	
VM&P Naphtha Range Hydrocarbons	"		ND	ND	"			50.0		
Mineral Spirits Range Hydrocarbons	"		ND	ND	"			50.0		
Dx Range Hydrocarbons [>C12]	"		ND	ND	"			50.0		
Surrogate: 4-BFB (FID)	"	*4.72*		*6.13*	"	*50.0-150*	*130*			
Duplicate	**0280728-DUP2**		**B802521-01**							
Aviation Gasoline Range Hydrocarbons	3/3/98		ND	ND	mg/kg dry			50.0		
Gasoline Range Hydrocarbons	"		8030	8730	"			50.0	**8.35**	
VM&P Naphtha Range Hydrocarbons	"		ND	ND	"			50.0		
Mineral Spirits Range Hydrocarbons	"		ND	ND	"			50.0		
Dx Range Hydrocarbons [>C12]	"		ND	ND	"			50.0		
Surrogate: 4-BFB (FID)	"	*5.22*		*ND*	"	*50.0-150*	*NR*			*1*
Matrix Spike	**0280728-MS1**		**B802473-05**							
Benzene	3/3/98	0.619	ND	0.672	mg/kg dry	60.0-140	**109**			
Toluene	"	0.619	ND	0.706	"	60.0-140	**114**			
Ethylbenzene	"	0.619	ND	0.668	"	60.0-140	**108**			
Xylenes (total)	"	1.86	ND	2.06	"	60.0-140	**111**			

North Creek Analytical, Inc.

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

Joy B Chang, Project Manager

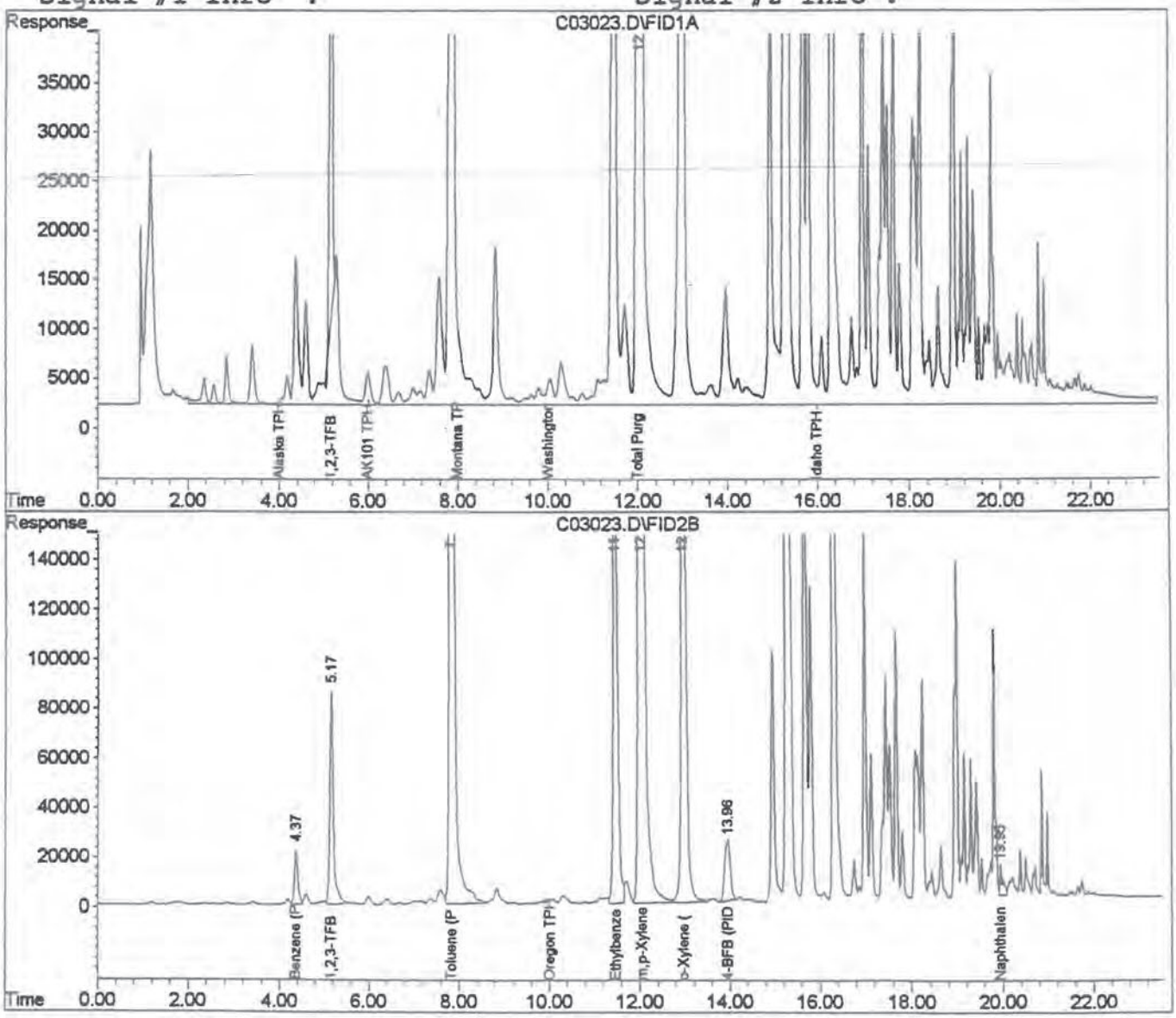
18939 120th Avenue N.E., Suite 101, Bothell, WA 98011-9508
East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132

Data File : C:\HPCHEM\1\DATA\C03023.D\FID1A.CH Vial: 23
Acq On : 3 Mar 1998 4:24 pm Operator: lac
Sample : b802521-01 Inst : GC #2
Misc : 2 uL Multiplr: 50.00
IntFile : SURR.E

Data File : C:\HPCHEM\1\DATA\C03023.D\FID2B.CH Vial: 23
Acq On : 3 Mar 98 4:24 pm Operator: lac
Sample : b802521-01 Inst : GC #2
Misc : 2 uL Multiplr: 50.00
IntFile : SURR2.E
Quant Time: Mar 3 16:48 1998 Quant Results File: TPHGS.RES

Quant Method : C:\HPCHEM\1\METHODS\TPHGS.M (Chemstation Integrator)
Title : TPH-G Soil Method
Last Update : Tue Mar 03 07:16:36 1998
Response via : Multiple Level Calibration
DataAcq Meth : TPHGS.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



CHAIN OF CUSTODY RECORD

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

Geo Engineers

DATE 2/27/98
PAGE 1 OF 1
LAB North Creek
LAB NO. B802521

PROJECT NAME/LOCATION FAMILY FUN CENTER/TUKWILA
PROJECT NUMBER 5925-003-00
PROJECT MANAGER LISA BOMA
SAMPLED BY DAVE BAUMGARTEN

SAMPLE IDENTIFICATION		SAMPLE COLLECTION			# OF	ANALYSIS REQUIRED			NOTES/COMMENTS
LAB	GEOENGINEERS	DATE	TIME	MATRIX	JARS	BTEX	NWTPH-Gx/BTEX		(Preserved, filtered, etc.)
	CSP-1	2/26/98	940	S	1		X		B802521-01

RELINQUISHED BY / FIRM GEE
SIGNATURE
PRINTED NAME DAVID BAUMGARTEN
DATE 2/27/98 TIME 930

RELINQUISHED BY / FIRM GEA
SIGNATURE K Barker
PRINTED NAME K Barker
DATE 2/27/98 TIME 1310

RELINQUISHED BY / FIRM
SIGNATURE
PRINTED NAME
DATE TIME

RECEIVED BY / FIRM
SIGNATURE
PRINTED NAME
DATE TIME

RECEIVED BY / FIRM
SIGNATURE
PRINTED NAME
DATE TIME

RECEIVED BY / FIRM
SIGNATURE
PRINTED NAME
DATE TIME

ADDITIONAL COMMENTS:

5.1 w/cs

APPENDIX C

FUEL STORAGE TANK DECOMMISSIONING CERTIFICATION

TANK SERVICES NORTHWEST, INC.

Specialists in Solving Tank and Fuel Problems

Spill Response • Remediation • Decommissioning • Installation • Tank & Fuel Cleaning • Site Assessment • IFCI Certified

20360 Paradise Lake Road, Woodinville, WA 98072
Phone (425) 788-8418 • Toll Free 1-800-532-5902
FAX (425) 788-7086

FUEL STORAGE TANK DECOMMISSIONING CERTIFICATION

DATE: February 25-26, 1998

CUSTOMER: Custom Backhoe & Dumptruck Service Inc.
13032 Southeast 45th Court
Bellevue, WA 98006

TANK ADDRESS: 15034 Grady Way South
Tukwila, WA

CONTENTS:
1,000-gallon underground heating oil tank
650-gallon underground heating oil tank
500-gallon underground gasoline tank
300-gallon underground heating oil tank
275-gallon aboveground heating oil tank
300-gallon aboveground heating oil tank
100-gallon aboveground heating oil tank
1 gasoline dispenser
930 gallons waste gas/diesel/water

CERTIFICATION: Tank Services Northwest, Inc. certifies that on the above date the above fuel storage tanks at the above location ("Tank Address") were properly decommissioned by removal in accordance with Uniform Fire Code and City of Tukwila regulations. Tanks, gas dispenser and waste were all properly disposed of.

TANK SERVICES NORTHWEST, INC.

Patricia R. Haglin
President