Chevron Newmans Bremerton

GeoScience Management, Inc. *Environmental Consulting Services*

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Release 2907
VCP NW0620

March 26, 2001

Mr. Roger Jensen
Nordic Properties, Inc.
PO Box 84
Port Orchard, Washington 98366

Re: Additional Subsurface Assessment, Interim TPH Evaluation, and Soil Excavation Report
Newman's Chevron
2021 6th Street, Port Orchard, WA

Dear Mr. Jensen:

This report documents the results of the recent additional subsurface assessment performed by GeoScience Management, Inc. (GSM), and subsequent excavation of petroleum-contaminated soil at the above-referenced site. Our assessment work was performed in September of 2000, and soil excavation was performed in late December 2000.

SITE DESCRIPTION AND PROJECT BACKGROUND

The property which is located on the southeastern corner of the intersection of 6th and Naval Streets, at 2021 6th Street, Bremerton, currently contains an active retail gasoline service station and convenience store (Figure 1). The area contains a mixture of both single family residences and small commercial establishments. The property is generally level, but surrounding topography slopes gently to the south and west. An approximately 3 to 4-foot high concrete retaining wall is located on the east and south sides of the property. The adjacent properties to the south and east are both lower in elevation than the service station property.

We understand that Nordic Properties (d.b.a. Wilkins Distributing) sold the station to the Newman's in 1990. At that time, the existing USTs, consisting of four steel, 4,000-gallon gasoline, one steel, 6,000-gallon gasoline, and one steel, 550-gallon waste oil, were removed by Pacific Environmental Services Company (PESCO), and replaced with new tanks. The five gasoline USTs were removed from a single excavation located east of the pump islands and northeast of the store building. The waste oil UST was removed from a single small excavation located just northeast of the store (Figure 2). Environmental oversight, on behalf of Nordic Properties (Wilkins) was performed by Applied Geotechnology, Inc. (AGI). AGI reported that no groundwater was encountered in either of the tank excavations, and that they anticipated that groundwater was at least 70 to 75 feet deep in a glacial advance sand unit.

AGI noted that several small holes and a leaking seam were present in the waste oil UST at the time of removal. AGI also noted that PESCO reported an apparent piping leak in the southeast corner of the tank pit, and fuel was observed being drained from an electrical conduit running over the tops of the tanks. After the tanks had been removed by PESCO, AGI collected a total of nine soil samples from the main gasoline UST excavation, and an additional 2 soil samples from the waste oil tank excavation. Samples from around the gasoline tanks were analyzed for gasoline and diesel range hydrocarbons using EPA Method 8015 Modified, and BTEX. The samples from the waste oil tank excavation were analyzed for oil-range hydrocarbons using

EPA Method 418.1. A composite sample of the sidewalls of the waste oil tank excavation was also analyzed for organochlorine pesticides and PCB's, halogenated volatile organic compounds and various metals using EPA Methods 8080, 8010, and 6000/7000 series, respectively.

Results of laboratory analyses indicated that petroleum hydrocarbon contaminants, identified by the analytical laboratory as "gas or aged gas", were identified in six of the nine samples from around the gasoline tanks. Of these, 5 of the 6 contained gasoline concentrations above the cleanup guidelines proposed under the Model Toxics Control Act (MTCA) regulations at that time. Reported concentrations of total petroleum hydrocarbons as gasoline ranged from not detected at or above the analytical method reporting limit, to 10,230 mg/kg, which was detected in the sample collected at a depth of approximately 10.5 feet bgs in the southeastern corner of the gasoline tanks excavation. Additionally, AGI reported that copper, chromium and lead, (total metals) and aldrin (a PCB compound), g-BHC, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, and Endosulfan I (pesticide compounds) were detected, but at concentrations below cleanup guideline levels. The results of the hydrocarbon analyses are summarized in Table 1, and are also listed on Figure 2. All of AGI's results are contained in their Work plan document dated October 17, 1990 included as Attachment A.

As a result of these data, AGI completed two exploratory test pits (Pits 1 and 2) to the southeast and east of the gasoline tank excavation, to determine the potential extent of impacts to soil in this area. One soil sample from a depth of approximately 13 feet bgs from Pit 1, contained gasoline at a concentration of 634 mg/kg. However, no impacted soil was excavated from the tank pit prior to installation of the new tanks due to concern for stability of the excavation because the close proximity of the convenience store. AGI installed perforated piping, for a possible vapor extraction system, in the bottom of the tank excavation before the new tanks were installed. However, the piping was subsequently not used.

SCOPE OF WORK

To further delineate the subsurface environmental conditions described by AGI , GSM personnel performed the following tasks:

- Prepared a Site-specific Safety and Operations Plan for GSM personnel addressing anticipated site field work;
- Coordinated buried utility clearances and field located 7 strataprobe locations, and coordinated with you regarding planning, scheduling, and site access;
- Conducted strataprobe soil sampling at 7 locations adjacent to the existing underground storage tanks (USTs), at locations with elevated concentrations of gasoline-range petroleum hydrocarbons in soil previously identified by AGI. Selected samples were analyzed for gasoline-range petroleum hydrocarbons (TPH-G) and benzene, toluene, ethylbenzene and total xylenes (BTEX), total lead, and Volatile Petroleum Hydrocarbons (VPH) using the Washington State Department of Ecology (Ecology) Interim TPH Policy methods;
- Evaluated the data using Ecology's Interim TPH methods, and discussed the results with you and the Newman's;
- Coordinated with you and PESCO, regarding possible remedial strategies to address identified soil impacts adjacent to the southeastern corner of the USTs;

- Provided field oversight and environmental sampling of impacted soil, and submitted three soil samples for TPH-G/BTEX analyses from the limits of the resulting excavation;
- Prepared a submittal to the Washington State Department of Ecology (Ecology) for an evaluation of the environmental cleanup actions under the Voluntary Cleanup Program (VCP); and
- Prepared this final report summarizing laboratory testing results, investigation findings, and the results of soil excavation.

ADDITIONAL SUBSURFACE ASSESSMENT

Strataprobe Soil Borings

On September 15, 2000, Transglobal Environmental Geosciences Northwest, Inc. (TEG), under contract to GSM, advanced 7 strataprobe exploration borings at the locations shown in Figure 3. Strataprobes were advanced to approximately 15 feet below ground surface (bgs), using 1-1/2-inch diameter rods and a split-barrel sampler. Sampling locations were selected to obtain soil samples from areas where AGI had reported previously that gasoline-range soil contamination existed at the limits of the UST excavation in 1990. The goal was to obtain representative soil samples from these areas for analyses using Ecology's Interim TPH methodology.

Borings B-1 and B-6 were completed in the area of AGI's sample #B immediately south of the existing tanks. Borings B-3 and B-4 were installed to the southwest and northwest of the existing tanks, in the general vicinity of AGI's samples C and W, respectively. We were unable to drill closer to AGI's locations because we were unable to definitively locate the buried product lines, which traverse this area from the tanks to the pump islands. The piping could not be located by an underground utility locator because it is composed of fiberglass. Therefore, due to the uncertainty of the piping locations, we did not drill in this area. Borings B-2, B-5, and B-7 were completed in the vicinity of AGI's samples #A and Pit #1 just southeast of the existing tanks.

Soil Sampling. Soil samples were collected at each of the strataprobe boring locations to characterize the subsurface lithology, and obtain soil samples for possible chemical analysis. Samples were retrieved using a 3-foot long, split barrel sampling barrel with a clear acrylic liner attached to the end of the rods. The sampling tools were advanced using a 90-lb. hydraulic hammer and the weight of the strataprobe truck. The rods were then removed from the hole and the sampler detached and opened, and the liner removed and cut open to allow collection of the soil sample. Samples were placed immediately in laboratory-prepared glass jars and placed in a chilled cooler and transported under chain of custody protocols to either TEG's Bellevue laboratory, or to NorthCreek Analytical, Inc. (NCA), depending on the required chemical analyses. Results of laboratory analysis of soil samples are presented in Table 2. Soil sample intervals and descriptive information were recorded on the exploration logs in Attachment B.

Investigation Findings

Subsurface Geology and Groundwater Occurrence. The site is underlain by several feet of sandy fill materials in the vicinity of the tanks. We encountered a moist to wet, gray, brown and oxidized brown, fine sandy to clayey silt unit which extended to the maximum depth explored of 15 feet bgs. Two of the borings,

designated B-5 and B-7 encountered approximately 8 and 13 feet of pea gravel, respectively, above the silt, representing backfill materials surrounding the tanks (B-5) and in AGI's Pit #1 area. Hydrocarbon-like odors were present in soil from boring locations B-2, B-3, B-4, B-5, and B-7. Groundwater was not observed to occur to a depth of 15 feet bgs based on examination of soil samples collected from the soil borings.

Soil Analytical Results. The goal of the assessment was to collect soil samples from those areas identified by AGI's previous sampling, where contaminants were present at concentrations above the MTCA Method A levels, to both further assess the extent and magnitude of the residual contamination, and to allow laboratory analyses using Ecology's Interim TPH methodology. However, laboratory analyses did not detect petroleum hydrocarbons from selected soil samples collected from borings B-1 and B-6 located in the area of AGI's sample #B, nor did they detect contamination in the sample collected from boring B-3. Gasoline was reported at a concentration of 11 mg/kg from the sample collected from a depth of 12-13 feet bgs in boring B-4. The mg/kg units approximate parts per million (ppm) concentrations. From these data, we conclude that either the contaminated soil represented by AGI's previous sample #B collected from the southern sidewall of the 1990 tank excavation, which contained a concentration of 4,875 mg/kg gasoline, is either very limited in extent, or has been remediated through natural processes. We also conclude that soil in the vicinity of AGI's contaminated soil samples #C and #W along the western sidewall of the 1990 tank excavation, which contained gasoline concentrations of 1,550 mg/kg and 245 mg/kg, respectively, are also relatively limited in extent, and do not extent to the northwest or the southwest of AGI's sampled locations. Again, we were unable to evaluate soil conditions directly west of the tank complex due to the uncertainty regarding the location of the buried, active product lines.

Soil samples obtained by GSM from boring B-5 contained gasoline contamination at concentrations of 8,700 and 160 mg/kg, from depths of 10 to 11 feet, and 13 to 14 feet bgs, respectively. BTEX compounds were present in the B-5 sample at depth of 10 to 11 feet bgs, at concentrations of 24,000 ug/kg, 19,000 ug/kg, 42,000 ug/kg, and 500,000 ug/kg, respectively. The ug/kg units approximate parts per billion (ppb) concentrations. BTEX compounds were present in the B-5 sample at depth of 13 to 14 feet bgs, at concentrations of 260 ug/kg, 3200 ug/kg, 1200 ug/kg, and 15,000 ug/kg, respectively. However, the benzene data reported by TEG for these samples was subsequently shown to be in error due to additional analyses by method 8260b by NCA, as described in the following section of this report. Boring B-5 was located in the area of AGI's contaminated soil sample #A from the southeastern sidewall of the 1990 tank excavation, which contained a concentration of 10,230 mg/kg gasoline. The sample from B-7, at a depth of 13.5 to 14.5 feet, contained gasoline at a concentration of 130 mg/kg, but no detectable BTEX compounds. Boring B-7 came from the area of AGI's Pit #1 which contained a gasoline concentration of 634 mg/kg. These data are presented in Table 2. Laboratory reports are contained in Attachment C.

Based on these results, GSM submitted samples B-5, S-1 and B-5, S-2 to NCA to determine concentrations of volatile petroleum hydrocarbons (e.g., gasoline and BTEX compounds) in soil using Ecology's Interim Total Petroleum Hydrocarbons (TPH) methodology. These data were then used to determine an appropriate soil cleanup level specific to the site, which is protective of human health and the environmental. Our evaluation is discussed below.

INTERIM TPH SOIL EVALUATION AND DETERMINATION OF CLEANUP LEVEL

To establish an appropriate risk-based, site-specific cleanup level under MTCA's Method B protocols for TPH compounds, Ecology's Interim TPH Policy (Ecology, 1997) was utilized. To derive a TPH cleanup level, the Interim TPH (ITPH) Policy uses the concentrations, chemical properties, and toxicity information for individual compounds and groups of chemical fractions that comprise TPH's, and applies these data to set exposure scenarios to evaluate potential health risks. Specific analytical methods (e.g., Volatile and Extractable Petroleum Hydrocarbon Methods), that identify the TPH carbon-range fractions present in the soils from a particular site, were developed by Ecology in association with the ITPH Policy. The analyses quantify the concentrations of specific carbon-range aliphatic and aromatic hydrocarbons, which are the primary petroleum hydrocarbon components of TPH. The method of Volatile Petroleum Hydrocarbons (VPHs, Ecology, 1998) was selected as the appropriate analytical method for the Newman's Chevron site because a review of available soil TPH chromatograms indicated that gasoline range hydrocarbons are the primary type of petroleum hydrocarbons at the site.

Interim TPH Analyses

Two soil samples (B-5, S1 and B-5, S2) collected by GSM, were selected for VPH analysis. The total VPH concentration for sample B-5, S-1 was 3,194 mg/kg, while sample B-5, S-2 contained a VPH concentration of 3,263 mg/kg. TPH and VPH results for samples B-5, S-1 and B-5, S-2 were then used to derive an appropriate TPH as gasoline soil cleanup level for the site. Using Ecology's ITPH methods, a cleanup level derived in this manner, by definition, will not pose a threat to human health through direct soil contact, which is defined as a concentrations which results in a hazard index, or HI, greater than one, or in contaminant leaching to groundwater resulting in a TPH concentration in groundwater of 1 mg/L or greater. The mg/L units approximate parts per million concentrations. Samples B-5-S1 and B-5-S2 were also analyzed for carcinogenic and non-carcinogenic benzene, toluene, ethyl benzene, and xylenes to determine if these compounds could pose a potential risk to human health through direct contact with soil at the site.

Evaluation of Direct Soil Contact Pathway

Total Petroleum Hydrocarbons. A majority of the soil samples collected at the site contained primarily weathered gasoline. For the samples B-5, S-1 and B-5, S-2 total VPH concentrations were 3,194 mg/kg and 3,263 mg/kg, respectively. For these samples the calculated HI's were 0.41 and 0.65, respectively. Attachment D contains the Ecology's HI worksheet which we used to obtain these results.

A TPH cleanup level for the site was then derived by back-calculating Ecology's direct contact exposure model using VPH results for samples B-5, S-1 and B-5, S-2. Using the VPH results for sample B-5, S1, a Method B TPH soil cleanup level was calculated. Using this procedure, a total VPH concentration of 4,786 mg/kg, based on the site specific data, was estimated to result in an HI equal to one (see Table 3C for calculations). We then compared the TPH values and VPH values obtained for sample B-5, S-1, and determined a factor difference of 1.26. Using the factor difference of 1.26 between VPH and TPH concentrations indicated that a total VPH concentration of 4,786 mg/kg is equivalent to a TPH concentration 7,719 mg/kg. This TPH concentration is then, using Ecology's methodology, protective of human health via the direct soil contact pathway. However, because a gasoline-range TPH concentration of 7,719 mg/kg may

exceed the residual saturation concentrations for gasoline in soil, a conservative cleanup number for the site of 2,000 mg/kg gasoline range TPHs is proposed as an alternative cleanup level . This alternative site-specific cleanup level of 2,000 mg/kg assumes that no detectable benzene is present in the samples and the proportions of the various aromatic and aliphatic fractions remain similar to that of samples B-5, S-1 to B-5, S-2. Attachment D presents a detailed discussion of VPH and TPH results, and a discussion of how the final TPH concentration was derived.

Carcinogenic Compounds. Benzene was reported in the B-5, S-1 sample analyzed by TEG at a concentration of 24,000 ug/kg, and at a concentration of 260 ug/kg in sample B-5, S-2, using EPA test method 8021b, which is a gas chromatography (GC) method. However, analyses by NCA of these same samples using EPA test method 8260b, which using a mass spectrometer to positively identify organic compounds, indicated that benzene was not present at or above the analytical method reporting limit. In discussions with the NCA, it was determined that the compound identified by TEG as benzene, using EPA Test Method 8021B, was probably not benzene, but was in fact heptene, which has a similar GC retention time as benzene. This conclusion is based on a review of GC chromatograms and mass spectrometer ion chromatograms.

Soil to Groundwater Pathway

The potential impact of TPHs in representative soil samples on groundwater quality was evaluated using a soil to groundwater pathway model presented in Ecology's ITPH Policy. The model was run using Ecology's recommended default input parameters. For the samples B-5, S-1 and B-5, S-2, the model predicted groundwater TPH concentrations ranging from 1.12 and 2.26, respectively. The predicted concentrations exceed the groundwater cleanup level of 1 mg/l. A review of the soil to groundwater pathway result indicates that toluene (B-5, S-1 and B-5, S-2 were 40.8 and 152 mg/kg, respectively) is the primary compound causing the predicted groundwater concentrations to exceed the allowable cleanup level. For samples B-5, S-1 and B-5, S-2, substituting a toluene concentration of 20 mg/kg into a soil-groundwater pathway model leads to a predicted groundwater concentration of less than 1 mg/l. These findings indicate a soil TPH cleanup level of 2,000 mg/kg is protective of groundwater quality based on the established groundwater cleanup level for TPH of 1. In addition, the cleanup level assumes samples contain less than or equal to 20 mg/kg toluene, no detectable benzene, and a similar distribution of aromatic and aliphatic fractions as found in samples B-5, S-1 and B-5, S-2. Attachment C presents a detailed discussion of soil to groundwater pathway model results.

Interim TPH Evaluation Summary

Based on the results of our interim TPH evaluation, we concluded that a concentration of 2,000 mg/kg gasoline in soil at the site would be protective of human health and the environment. Because benzene was not detected in any of the soil samples collected and analyzed from GSM's soil borings, we concluded that carcinogenic compounds are not a concern at the site. We also concluded that the toluene concentrations detected in soil samples B-5, S-1 and B-5, S-2 were too high, causing Ecology's soil to groundwater pathway model results to exceed the allowable TPH level in groundwater of 1 mg/L. As a result of this finding, Nordic Properties elected to excavated the contaminated soil from the southeastern corner of the tank complex.

EXCAVATION OF CONTAMINATED SOIL SOUTHEAST OF THE TANKS

GSM coordinated with you and PESCO to determine how to excavate impacted soil from the southeastern corner of the tank complex. The logistics of this work were difficult because the tanks were surrounded with pea gravel, which sloughs easily into an excavation, and because the station and existing tanks were required to remain in operation during the work. PESCO determined that a portion of the concrete surface slab could be removed over the southeastern portion of the tank complex, and that a relatively small amount of soil could be carefully removed from the east end of the southernmost tank.

Soil Excavation, Sampling and Disposal

On December 26, 2000, PESCO saw-cut and removed the concrete surface slab as shown on Figure 4. A sanitary sewer line was encountered and removed in the excavation area also. On December 27, 2000, PESCO excavated a total of approximately 20 cubic yards (30 tons) of contaminated soil from the eastern end of the southernmost tank. The approximate area of excavation is shown on Figure 4. Excavated soils from the sidewall of the tank pit initially contained hydrocarbon vapors up to approximately 600 ppm (using a photoionization detector calibrated to isobutylene). These vapor levels dropped rapidly to less than 20 ppm as excavation progressed. A total of three discrete samples, designated Bottom-14.5, SE Wall-11.5, and NE Wall-11.5 were collected from the limits of the resulting excavation. Sample NE Wall-11.5 was collected from the northeastern sidewall of the excavation at a depth of 11.5 feet bgs. Sample SE Wall-11.5 was collected from the southeastern sidewall of the excavation at a depth of 11.5 feet bgs. Sample Bottom-14.5 was collected from the bottom of the excavation at a depth of 14.5 feet bgs. Fill materials exposed in the excavation to the north, northwest, west and southwest consisted entirely of pea gravel backfill, and were not sampled.

The excavated soil was placed directly into dump trucks and transported, under Waste Permit # 2000-194, to Olympic View Landfill for disposal. Waste disposal information is included as Attachment E. The excavation was then filled with pea gravel to match existing subgrade, and the concrete restored over the tanks.

Results of Soil Sampling at the Limits of Excavation

Soil samples collected at the limits of the excavation were submitted to NCA for analyses for gasoline-range hydrocarbons and BTEX compounds. The results of NCA's analyses are included in Table 2, and indicated that gasoline-range hydrocarbons were present at concentrations of 179 mg/kg, 19.4 mg/kg, and 18.7 mg/kg in samples Bottom-14.5, SE Wall-11.5, and NE Wall-11.5, respectively. BTEX compounds were reported in the Bottom-14.5 sample at concentrations of 0.178 mg/kg, 4.18, mg/kg, 1.68 mg/kg, and 12.3mg/kg, respectively. Toluene, ethylbenzene and xylenes were reported at concentrations of 0.337 mg/kg, 0.0799 mg/kg, and 0.465 mg/kg, respectively. Benzene was not detected at or above the analytical method reporting limits (MRL) in sample SE Wall-11.5. Toluene, ethylbenzene and xylenes were reported at concentrations of 0.137 mg/kg, 0.0792 mg/kg, and 0.257 mg/kg, respectively. Benzene was not detected at or above the MRL in sample NE Wall-11.5. These concentrations are well below the MTCA Method A cleanup levels, with the exception of the 179 mg/kg gasoline in sample Bottom-14.5. However, this concentration is well below the proposed site-specific Method B cleanup level for gasoline in soil at the site based on our ITPH evaluation, as described previously.

SUMMARY OF SITE ENVIRONMENTAL CONDITIONS AFTER SOIL EXCAVATION

AGI identified gasoline-range soil impacts at concentrations above the cleanup levels then being used by the state, at a number of locations at the limits of the tank excavation in 1990. TPH as gasoline was reported at concentrations of 10,230 mg/kg, 4,875 mg/kg, 245 mg/kg, 346 mg/kg, 1,550 mg/kg, and 57 mg/kg, in AGI's samples #A, #B, #C, #N, #W, and #2, respectively. The highest concentration of gasoline (sample #A) was reportedly obtained from the southeastern sidewall of the excavation. As a result, two exploratory test pits were completed by AGI at that time to determine the potential extent of soil impacts to the south and east of the excavation. Results of laboratory analyses of samples from the pits showed that while no gasoline-range hydrocarbons were present east of the excavation in pit #2, 634 mg/kg gasoline was present at a depth of approximately 13 feet in pit #1 to the southeast. Reportedly, no soil was excavated at that time due to concerns over the stability of the excavation sidewalls related to the nearby store and shop building, and new tanks were installed in the excavation.

In September 2000, GSM drilled as near as was practicable to AGI's sample locations #A, #B, #C, #W, and #2, to determine the apparent extent of the impacts, and to obtain representative soil samples for chemical analyses using Ecology's ITPH methods. Adjacent to AGI's sample location #B, we were unable to locate contaminated soil. This sugggests that either the contamination has degraded naturally in the 10 years since AGI collected their samples, or that the extent of impacts in this area is very limited (e.g., within a few feet of the limits of the southern wall of the 1990 tank excavation). As a result of this finding, and the fact that excavation of the south sidewall of the 1990 excavation could not be safely completed because the tanks are currently use, no further action was taken at this location.

GSM drilled northwest and southwest of AGI's contaminated soil sample locations #C and #W along the western sidewall of the 1990 tank excavation, which contained gasoline concentrations of 1,550 mg/kg and 245 mg/kg, respectively. GSM's boring B-4 located northwest of AGI's sample #C, contained only 11 mg/kg as gasoline, no benzene, toluene or ethylbenzene compounds, and only 1.1 mg/kg xylenes, while GSM's boring B-3 located southwest of AGI's sample #W did not contain any detectable concentrations of petroleum hydrocarbons. We conclude from this information, that contaminated soil in the vicinity of AGI's samples #C and #W is limited in extent, and does not extent to the northwest or the southwest of AGI's sampled locations. Again, we were unable to obtain representative samples directly west of the tank complex due to the uncertainty regarding the location of the buried, active product lines. As a consequence, no further action was taken at these locations.

Soil samples collected by GSM in the area of AGI's sample #A did contain fairly high levels of gasoline-range hydrocarbons, and were used to determine an appropriate cleanup level for gasoline in soil using Ecology's ITPH methodology. Our analyses resulted in the selection of a gasoline cleanup level of 2,000 mg/kg for the site. We also determined that the toluene levels reported for GSM's samples from boring B-5 were not protective of groundwater based on Ecology's soil to groundwater pathway model. As a consequence, we elected to excavated a relatively small amount of contaminated soil from the area of AGI's sample #A, and GSM's boring B-5.

A total of approximately 20 cubic yards (30 tons) of contaminated soil was excavated from the southeastern sidewall and bottom of the existing tank complex and disposed of off site at a permitted landfill. Three

confirmation samples collected at the limits of the resulting excavation confirmed that contaminated soil had been removed from the southeastern tank complex sidewall, and that remaining soil meets MTCA Method A or Method B cleanup levels in this area.

Given that the area around AGI's sample #A and GSM's boring B-5 has been excavated, and that all other areas identified by AGI in 1990, or GSM in 2000, appear to be very limited in aerial extent, and are below the proposed site cleanup level of 2,000 mg/kg gasoline-range hydrocarbons in soil, we believe that the site currently meets Ecology's requirements for the protection of human health and the environment under either Method A, Method B, using the ITPH Policy, and that no further remedial actions are necessary.

LIMITATIONS

The services described in this report were performed consistent with generally accepted professional consulting principles and practices at the time the work was performed. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, nor the use of segregated portions of this report.

We appreciate the opportunity to be of service. If you have any questions or wish to discuss the information presented here, please call at your earliest convenience.

Sincerely,

Howard W. Small, R.G., C.P.G.
Project Manager

Attachments:

Table 1 – Summary of AGI Analytical Data 1990
Table 2 – Summary of Assessment Analytical Data 2000
Figure 1 – Vicinity Map
Figure 2 – Exploration Locations
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Attachment A – AGI's Work Plan dated October 17, 1990
Attachment B – Standard Field Operating Procedures and Exploration Logs
Attachment C – Laboratory Reports
Attachment D – Interim TPH Evaluation Calculations
Attachment E – Waste Disposal Permit

TABLES

Table 1
Summary of AGI's Analytical Data from 1990

Table 2
Summary of Assessment Analytical Data from 2000

Table 1
Summary of AGI's Analytical Data from 1999
Newman's Texaco (Formerly Newman's Chevron)
2021 6th Street, Bremerton, Washington

Soil Samples	Depth (Feet)	Collection Date	TPH [1] (mg/kg)	Product [2]
A	10.5	August 1999	10,230	Gas
B	10.5	August 1999	4,875	Gas
C	10.0	August 1999	245	Aged Gas
N	10-11.0	August 1999	346	Gas
W	10-11.0	August 1999	1,550	Aged Gas, Mineral Spirits, Diesel
E	10-11.0	August 1999	<10	
1	13.5	August 1999	<10	
2	13.5	August 1999	57	Gas
3	14.0	August 1999	<10	
4	10.0	August 1999	<10 (TPH by EPA Method 418.1)	
5	7-7.5	August 1999	40.4 (TPH by EPA Method 418.1)	
Pit 1 (South)	13.8	August 1999	634	Gas
Pit 2 (East)	13.8	August 1999	4	Gas

Notes:

[1] Total Petroleum Hydrocarbons, EPA Method 8015, Modified, unless otherwise noted.

[2] Product as identified by Sound Analytical Services, Inc.

Soil analytical data reported in mg/kg which approximates parts per million (ppm) concentrations.

Table 2
Summary of Assessment Analytical Data from 2000
Newman's Texaco (Formerly Newman's Chevron)
2021 6th Street, Bremerton, Washington

Soil Samples	Depth (feet)	Date	TPH-G [1] (mg/kg)		Benzene [2] (ug/kg)		Toluene (ug/kg)		Ethylbenzene (ug/kg)		Xylenes (ug/kg)		Naphthalene (ug/kg)	MTBE (ug/kg)	Total [3] Lead (mg/kg)
			TEG	NCA	8021b	8260b	8021b	8260b	8021b	8260b	8021b	8260b			
Soil Borings															
B1-S4	10.5	9/15/00	ND	--	ND	--	ND	--	ND	--	ND	--	--	--	--
B2-S4	10.5	9/15/00	ND	--	ND	--	ND	--	ND	--	ND	--	--	--	--
B2-S5	13.5	9/15/00	7.1	--	ND	--	ND	--	ND	--	120	--	--	--	--
B3-S4	12.5	9/15/00	ND	--	ND	--	ND	--	ND	--	ND	--	--	--	--
B4-S4	12.5	9/15/00	11	--	ND	--	ND	--	ND	--	1,100	--	--	--	--
B5-S1	10.5	*9/15/00*	*8,700*	*4,750*	*24,000*	*ND*	*19,000*	*40,800*	*42,000*	*64,100*	*500,000*	*711,000*	*25,600*	*ND*	13
B5-S2	12.5	*9/15/00*	*160*	*5,300*	*260*	*ND*	*3,200*	*152,000*	*1,200*	*83,000*	*15,000*	*709,000*	*56,800*	*ND*	--
B6-S4	10.5	9/15/00	ND	--	ND	--	ND	--	ND	--	ND	--	--	--	--
B7-S1	14.0	9/15/00	--	130	--	ND	--	ND	--	ND	--	ND	--	ND	--
Excavation Samples															
Bottom-14.5	14.5	12/27/00	--	179	--	178	--	4,180	--	1,680	--	12,300	--	--	--
NE Wall-11.5	11.5	12/27/00	--	19.4	--	ND	--	337	--	79.9	--	465	--	--	--
SE Wall-11.5	11.5	12/27/00	--	18.7	--	ND	--	137	--	79	--	257	--	--	--
MTCA Method A Cleanup Level			100		500		40,000		20,000		20,000				250
MTCA Method B Cleanup Level			2,000 [4]												

Notes:

[1] Total Petroleum Hydrocarbons as Gasoline, WDOE Method WTPH-G, by TEG Northwest, Inc. and NorthCreek Analytical, Inc.

[3] BTEX by EPA Methods 8021b, (gas chromatography by TEG Northwest, Inc.) and EPA Method 8260b (gas chromatography with confirmation by mass spectrometer by NCA).

[3] Total lead by EPA Method 7420.

-- Indicates analysis not performed on specified sample.

Soil analytical data reported in mg/kg, and ug/kg which approximate parts per million (ppm) and parts per billion (ppb) concentrations, respectively.

Italics denotes samples which were later excavated.

[4] Method B cleanup level for gasoline in soil proposed for this site.

Table 3
Results of Volatile Petroleun Hydrocarbons Analyses
Newman's Texaco (Formerly Newman's Chevron)
2021 6th Street, Bremerton, Washington

Analyte	Soil Sample B-5, S-1 VPH Results in mg/kg	Soil Sample B-5, S-1 VPH Results in mg/kg
C5-C6 Aliphatics	ND	318
C6-C8 Aliphatics	936.0	809
C8-C10 Aliphatics	482.0	453
C10-C12 Aliphatics	309.0	437
C8-C10 Aromatics	326.0	334
C10-C12 Aromatics	599.0	368
C12-C13 Aromatics	501.0	392
Total VPH (TVPH)	3150.0	3110

Notes:

VPH mean Volatile Petroleum Hydrocarbons by WDOE Interim TPH Policy Method.

Soil analytical data reported in mg/kg which approximates parts per million (ppm) concentrations.

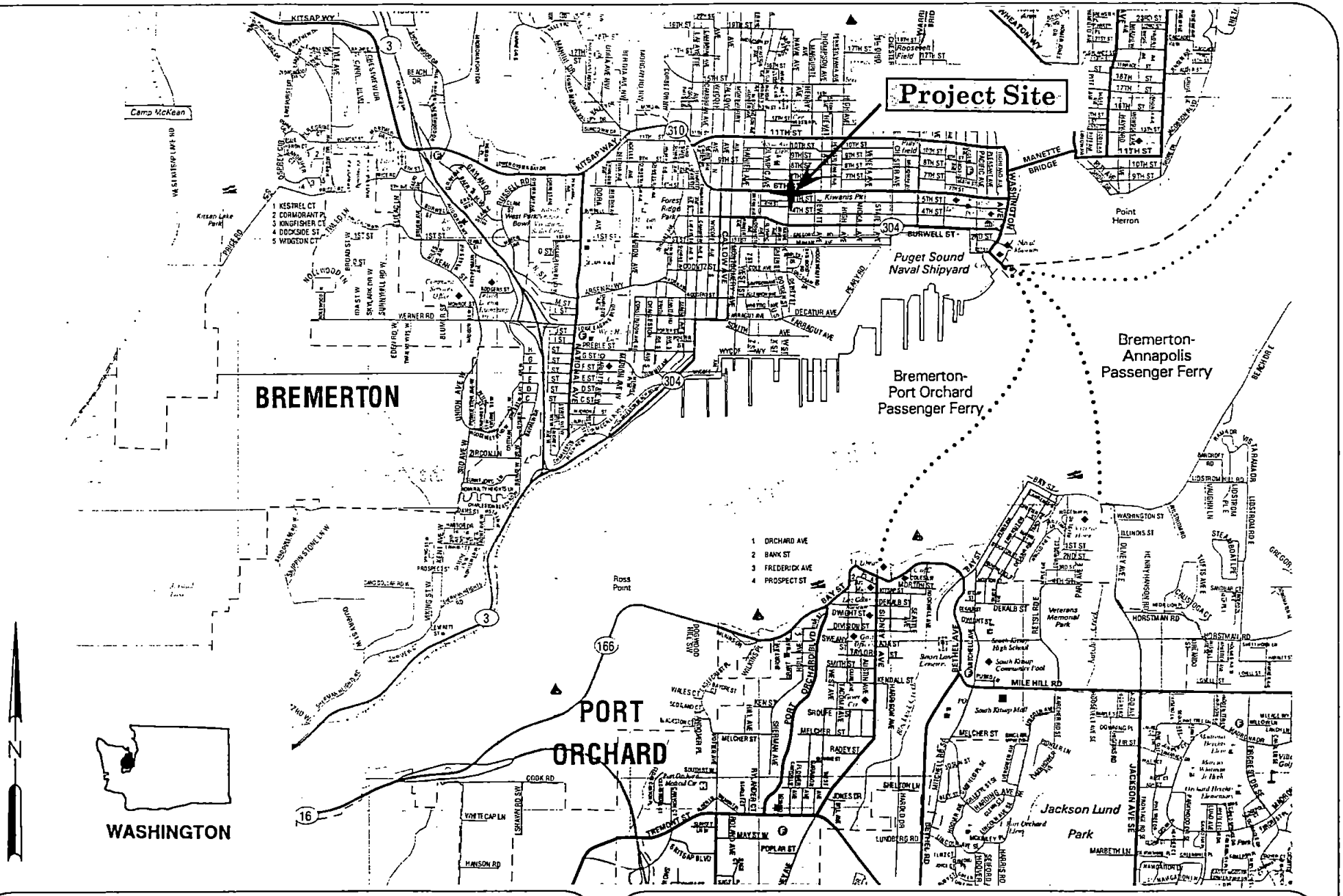
FIGURES

Figure 1
Vicinity Map

Figure 2
Exploration Locations

Figure 3
Soil Boring Exploration Locations

Figure 4
Locations



Base Map from Kitsap County, King of the Road Maps, by King of the Road Map Service. Copyright 1998

GeoScience Management, Inc.
Environmental Consulting Services
18608 69th Avenue NE
Bothell, Washington 98011

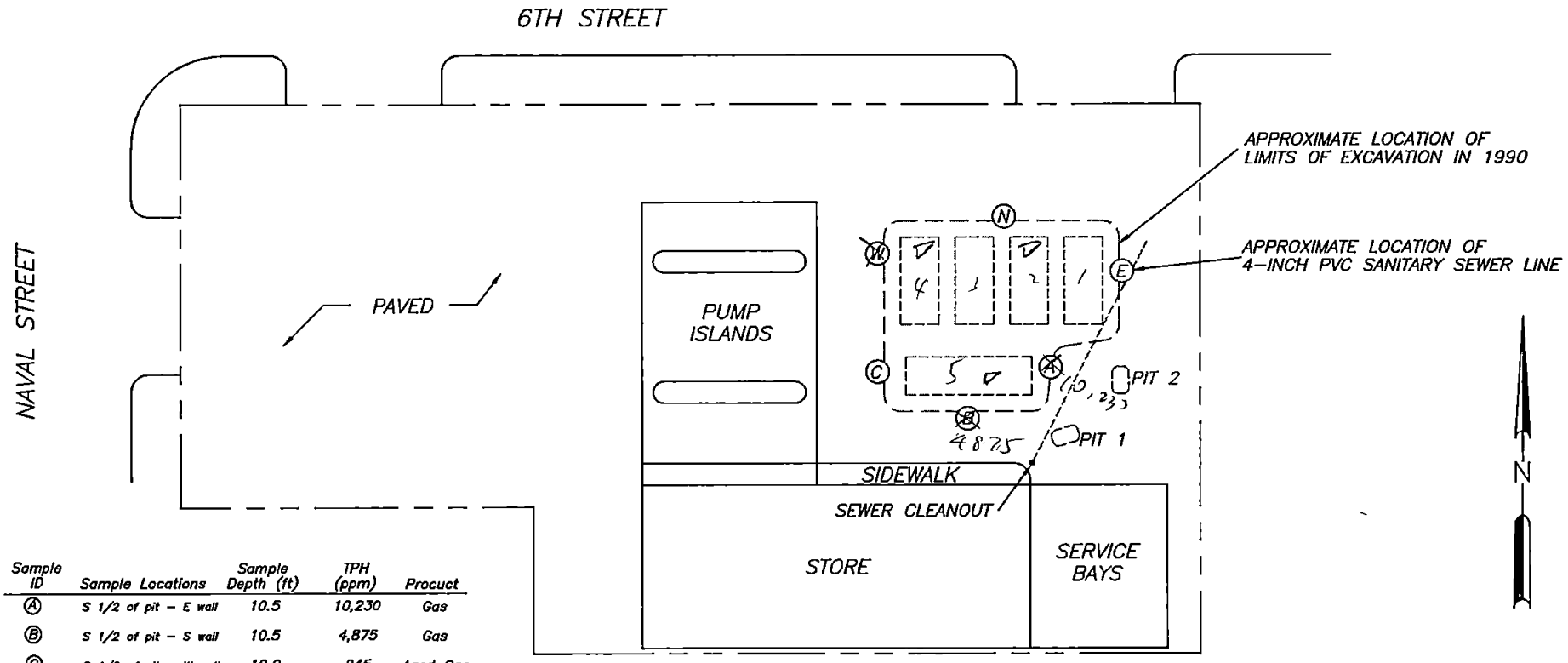
NEWMANS CHEVRON STATION

VICINITY MAP

2021 6TH STREET, BREMERTON, WA

FIGURE 1

DATE	PROJECT NUMBER	DWN BY	DWG #
2/2001	3003	HWS	3003-04



Sample ID	Sample Locations	Sample Depth (ft)	TPH (ppm)	Procuct
(A)	S 1/2 of pit – E wall	10.5	10,230	Gas
(B)	S 1/2 of pit – S wall	10.5	4,875	Gas
(C)	S 1/2 of pit – W wall	10.0	245	Aged Gas
(N)	N 1/2 of pit – N wall	10–11.0	346	Gas
(W)	N 1/2 of pit – W wall	10–11.0	1,550	Aged Gas, Mineral Spirits, Diesel
(E)	N 1/2 of pit – E wall	10–11.0	<10	
(1)	Under Tank 4 – N 1/2 of pit	13.5	<10	
(2)	Under Tank 2 – N 1/2 of pit	13.5	57	Gas
(3)	Under Tank 5 – N 1/2 of pit	14	<10	
( )	Test Pit 1 (S)	13.8	634	Gas
( )	Test Pit 2 (E)	13.0	4	Gas

Legend

(W) APPROXIMATE LOCATION OF CONFIRMATION SOIL SAMPLE BY AGI IN 1990.

APPROXIMATE LOCATION OF UST REMOVED IN 1990

PIT 2 APPROXIMATE LOCATION OF TEST PITS COMPLETED BY AGI IN 1990

0 30 60

SCALE (ft)

BASE MAP FROM AGI 1990.

GeoScience Management, Inc.
Environmental Consulting Services
18608 69th Avenue NE
Bothell, Washington 98011

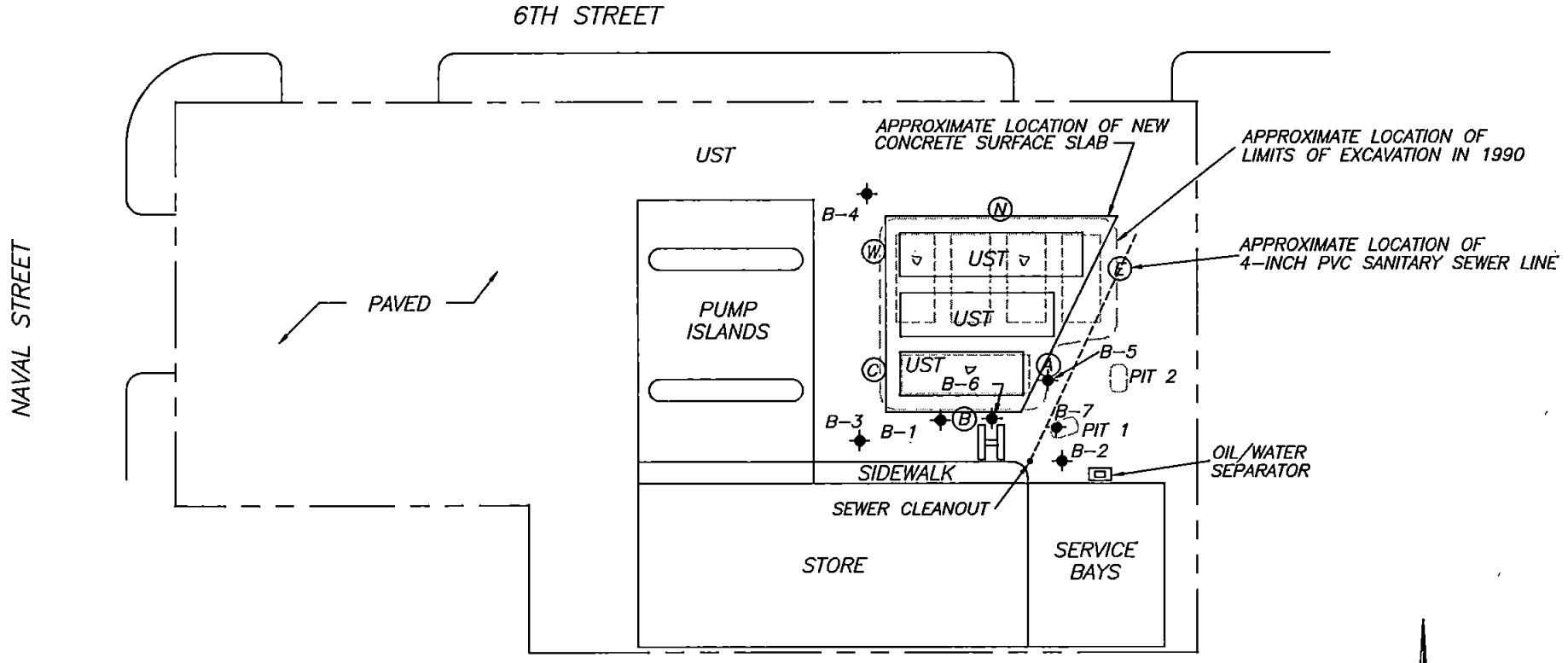
NEWMANS CHEVRON STATION

GEOPROBE EXPLORATION LOCATIONS

2021 6TH STREET, BREMERTON, WA

FIGURE 2

DATE	PROJECT NUMBER	DWN BY	DWG #
11/00	3003	HWS	3003-03



Legend

B–1 ✦ APPROXIMATE LOCATION OF GEOPROBE BORING BY GEOSCIENCE MANAGEMNT, INC., 9/15/00

APPROXIMATE LOCATION OF UST REMOVED IN 1990

APPROXIMATE LOCATION OF ABOVEGROUND CAR HOIST

APPROXIMATE LOCATION OF TEST PITS COMPLETED BY AGI IN 1990

BASE MAP FROM AGI 1990.

0 30 60

SCALE (ft)

GeoScience Management, Inc.
Environmental Consulting Services
18608 69th Avenue NE
Bothell, Washington 98011

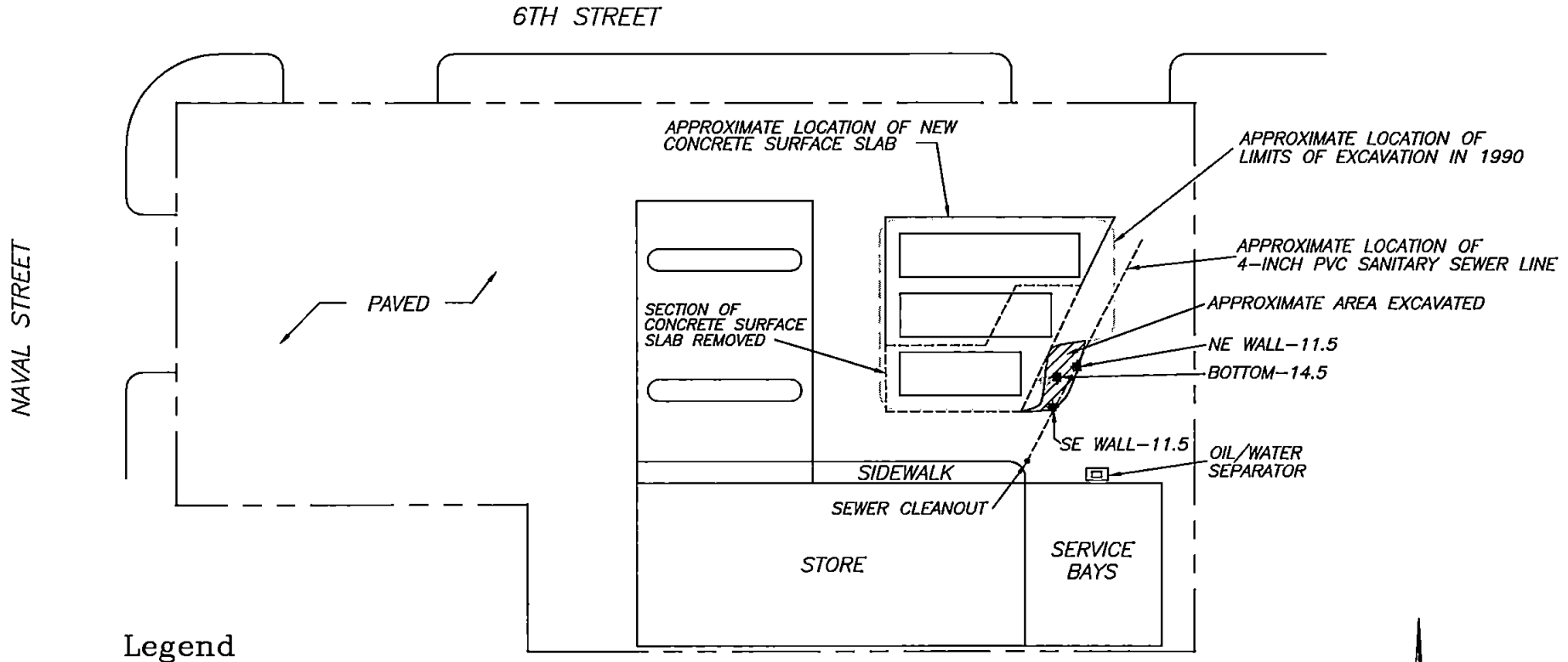
NEWMANS CHEVRON STATION

GEOPROBE EXPLORATION LOCATIONS

2021 6TH STREET, BREMERTON, WA

FIGURE 3

DATE	PROJECT NUMBER	DWN BY	DWG #
11/00	3003	HWS	3003-03



Legend

APPROXIMATE LOCATION OF GEOPROBE BORING GP-5 BY GEOSCIENCE MANAGEMENT, INC., 9/15/00

APPROXIMATE LOCATION OF ABOVEGROUND CAR HOIST

BOTTOM-14.5 APPROXIMATE LOCATION OF CONFIRMATION SOIL SAMPLES BY GEOSCIENCE MANAGEMENT, INC., 12/29/00.

EXISTING UST

APPROXIMATE LOCATION OF SOIL EXCAVATED IN DECEMBER 2000.

N

0 30 60

SCALE (ft)

BASE MAP FROM ACI 1990.

GeoScience Management, Inc.
Environmental Consulting Services
18608 69th Avenue NE
Bothell, Washington 98011

NEWMANS CHEVRON STATION

CONFIRMATION SOIL SAMPLING LOCATIONS

2021 6TH STREET, BREMERTON, WA

FIGURE 4

DATE	PROJECT NUMBER	DWN BY	DWG #
2/2001	3003	HWS	3003-04

ATTACHMENT A

AGI's Work Plan, 1990

A Work Plan prepared for:

Mr. Roger Jensen
Wilkins Distributing Company
Post Office Box 147
Port Orchard, Washington 98366

WORK PLAN
VAPOR EXTRACTION SYSTEM
NEWMAN TEXACO
2021 6TH STREET
BREMERTON, WASHINGTON

AGI Project No. 15,526.001

Charles H. Soule, P.G.
Project Hydrogeologist

John E. Newby, P.E.
President

JOHN E. NEWBY
STATE OF WASHINGTON
REGISTERED
PROFESSIONAL ENGINEER

APPLIED GEOTECHNOLOGY INC.
300 120th Avenue N.E.,
Building 4, Suite 215
Bellevue, Washington 98005
206/453-8383

October 17, 1990

1.0 INTRODUCTION

This Work Plan describes actions to be performed by Applied Geotechnology Inc. (AGI) on behalf of Wilkins Distributing Company to remediate soil contaminated with petroleum hydrocarbons at Newman Texaco service station, located at 2021 6th Street in Bremerton, Washington. Remediation will consist of installation and operation of a vapor extraction system (VES) to reduce hydrocarbon contamination in the soil. Contaminated soil removed from the tank cavity was disposed at Kitsap County Landfill.

Underground storage tanks (UST) were removed in August 1990. The tank and soil removal activities are summarized in Section 1.0 of this report. Recommendations for remediation, including installation of subsurface VES piping, were described in a letter from AGI to Wilkins Distributing dated August 27, 1990.

1.1 Description of Facility

The Newman Texaco service station is situated southeast of the intersection of 6th and Naval Streets. The site is bounded on the west by Naval Street, on the north by 6th Street, and by commercial businesses and residences to the east and south. The lot is generally level, but surrounding topography slopes gently down to the west and south. There is a 3- to 4-foot-high retaining wall along the southern property line with a 10- to 12-foot drop on the other side. A Site Plan is presented in Figure 1.

Six USTs have been removed from two cavities in the northeast corner of the site. The waste oil tank was in one cavity, and the other five tanks were in another large cavity. Four 4,000-gallon tanks were oriented with their long axes north to south. The 550-gallon waste oil tank and 6,000-gallon gasoline tank were oriented with their long axes east to west. The five large tanks previously contained gasoline. Two service islands were located north of the building and west of the tanks. Two test pits were excavated southeast of the tank cavity to delineate lateral extent of contamination.

1.2 Site Background

1.2.1 Geology

Beneath the asphalt subgrade, native soil was medium dense sandy silt to the greatest depth penetrated. A layer of medium dense sand at 10 to 12 feet below ground surface (bgs) was observed along the north, west and south walls of the excavation. This seam was not observed in two test pits excavated to 13 feet bgs at the southeast corner of the main tank cavity. Sandy silt was present again beneath the sand seam, and extended to 14 feet bgs, the greatest depth excavated.

Tank backfill consisted of sandy gravel. Most of the backfill was removed from the site during tank removal.

1.2.2 Hydrogeology

No groundwater was encountered, nor were any groundwater seeps observed during excavation of the USTs. Groundwater likely occurs in a thick sand unit (Glacial Advance Outwash), at a depth of 70 to 75 feet below ground surface.

1.3 Assessment Activity

AGI was present during tank removal operations on August 7 to 9, 1990. All six tanks were constructed of steel. Five of the tanks (one 6,000-gallon and four 4,000-gallon tanks) were apparently sandblasted and lined in 1988. Field evidence (presence of fine black sand around fill pipes) confirmed the sandblasting. The lined tanks were in good condition with little exterior corrosion. A slight dent was made in the 6,000-gallon tank during removal operations. No holes were visible in any of the lined tanks. A large dent, running along the long axes on the south side of the 550-gallon waste oil tank, was observed prior to removal. Several holes (1/4 inch to 1 inch in diameter) and a leaking seam were observed in the sides of the waste oil tank.

Pacific Environmental Services (Pacific) reported the presence of a leak in tank piping in the southeast corner of the main tank cavity, and AGI personnel observed gasoline being drained from an electrical conduit running across the middle of the main tank cavity. Gasoline and approximately 7 gallons of oil, possibly diesel fuel, were drained from product lines running across the northwest corner of the main cavity. Diesel fuel has not been sold at the site in the 26 years Wilkins Distributing has been associated with it.

An organic vapor meter equipped with a photoionization detector (OVM), along with visual observations, were used to check for hydrocarbon contamination during tank removal and subsequent soil excavation. Soil screening tests were performed by placing a fixed amount of soil into a resealable plastic bag, agitating it, allowing it to equilibrate with air in the bag, then placing the OVM probe into the headspace above the sample. The peak OVM reading provides a relative measure of the soil's volatile organic compound content.

Headspace readings provided the basis to select soil samples for laboratory analysis from each of the sides and base of the tank cavities. Selected soil samples were submitted to Sound Analytical Services (Sound) in Tacoma, Washington for chemical analysis of total petroleum hydrocarbons (TPH) using Modified EPA Method 8015, organochlorine pesticides and PCBs by EPA Method 8080, halogenated volatiles by EPA Method 8010, and metals by EPA Method 6010.

1.4 Analytical Results and Conclusions

Modified EPA Method 8015 provides both a concentration value and a description of the predominant petroleum product based upon the detected carbon range. The analytical results for soil samples collected from the main tank cavity and the base of the waste oil tank cavity are presented in Table 1. Reports of the analytical testing results from the laboratory are attached.

TABLE 1
Soil Analytical Results

Sample ID	Sample Locations	Sample Depth (ft)	TPH (ppm)	Product
A	South 1/2 of pit, east wall	10.5	10,230	Gas
B	South 1/2 of pit, south wall	10.5	4,875	Gas
C	South 1/2 of pit, west wall	10.0	245	Aged Gas
N	North 1/2 of pit, north wall	10 - 11.0	346	Gas
W	North 1/2 of pit, west wall	10 - 11.0	1,550	Aged Gas, Mineral Spirits, Diesel
E	North 1/2 of pit, east wall	10 - 11.0	<10	
1	Under Tank No. 4, north 1/2 of pit	13.5	<10	
2	Under Tank No. 2, north 1/2 of pit	13.5	57	Gas
3	Under Tank No. 5, north 1/2 of pit	14.0	<10	
5	Base of Waste Oil Pit	10.0	<10	
6	Composite of Walls of Waste Oil Pit	7 to 7.5	40.4	
Pit 1	Test Pit No. 1 (south)	13.8	634	Gas
Pit 2	Test Pit No. 2 (east)	13.0	4	Gas
Ecology Cleanup Guideline			200	Waste Oil and Diesel
			100	Gas

Testing results indicate hydrocarbon levels in subsurface soil exceed Washington State Department of Ecology (Ecology) cleanup guidelines along the west and north walls, and in the southeast corner of the main tank cavity. This soil contamination likely originated from overfill spillage and/or small tank or line leaks over an extended period of time.

All the analyses presented in Table 1 are representative of soil remaining in-place. This Work Plan outlines procedures to remediate the remaining contamination around the gasoline tank cavity.

A single composite soil sample of the four sides of the waste oil tank cavity was analyzed for pesticides, PCBs, and halogenated volatiles and heavy metals; copies of the analytical laboratory reports are attached. Analytical results indicate no detectable PCBs or halogenated volatiles, but show the presence of chromium, copper, lead, and pesticides. The metals and pesticides detected were below their respective cleanup guidelines or accepted tolerance levels as shown in Table 2 below, and, in our opinion, do not pose a risk to human health or the environment. We believe no further action is necessary with regard to the soil around the waste oil tank cavity.

TABLE 2
Metals and Pesticides in Soil

Contaminant	Concentration (ppm)	Cleanup Guideline (ppm)
Total Chromium	16.3	100
Total Copper	25.1	500
Total Lead	69.8	250
Aldrin	0.03	0.1 (tolerance level)
g-BHC (isomer of Lindane)	0.15	1.0
4,4'-DDD	1.16	Insecticidally inert
4,4'-DDE	0.37	Insecticidally inert
4,4'-DDT	0.06	1.0
Endosulfan I	0.13	2.0 (tolerance level)

Notes: Tolerance levels were taken from Pesticide Manufacturing and Toxic Materials Control Encyclopedia, edited by Marshall Sittig, Noyes Data Corporation, Park Ridge, New Jersey, 1989, 810 pp.

Cleanup guidelines derived from interim draft Method A Cleanup Levels for Soil, Washington Department of Ecology.

1.5 Recommendations

Hydrocarbon contamination levels in the vicinity of the tank cavity are above Ecology action guidelines. We believe the most cost effective way to remediate this remaining contamination is by installation of a VES. Sections 2 and 3 of this Work Plan describe installation, operation, and demobilization of the proposed VES.

Because contamination was above Ecology guidelines at the greatest depth penetrated in the test pits, AGI recommends drilling a well in the vicinity of test pit TP1, as discussed between you and AGI in a telephone conversation on September 14, 1990. This well would evaluate the maximum depth of contamination, and would be available if remediation at greater depths than the tank cavity were necessary.

2.0 VAPOR EXTRACTION SYSTEM (VES)

Subsurface remediation will consist of vapor extraction to volatilize and remove hydrocarbons from contaminated soil surrounding the main tank cavity.

2.1 Vapor Extraction Process

The VES uses in-situ volatilization of hydrocarbons to decontaminate soil in-place. The process consists of applying a vacuum to a well, series of wells, or perforated pipes in the zone of contamination to induce air flow through the subsurface soil.

As air passes through the contaminated soil, the clean air displaces soil gas laden with volatilized hydrocarbons and the volatile vapors are extracted through the central well. The clean air drawn into the contaminated soil volatilizes more hydrocarbons present within the soil and these vapors are, in turn, removed. Exhaust vapor is discharged to the atmosphere in compliance with governmental requirements. In addition to vapor removal, the introduction of air into the contaminated soil will enhance the biodegradation of hydrocarbons by increasing the amount of oxygen available for bacterial degradation.

2.2 VES Design

A schematic of the VES is presented in Figure 2. AGI will apply to the Puget Sound Air Pollution Control Agency (PSAPCA) for a permit to allow discharge of air emissions from the VES to the atmosphere. The application will be submitted upon authorization from Wilkins Distributing. Processing by PSAPCA normally requires four to six weeks. Construction normally requires four weeks lead time for equipment and two days on-site installation.

The VES contains the following four basic components:

1. Underground vapor extraction piping consists of 4-inch-diameter vapor extraction well piping leading to the equipment area. The subsurface piping has been installed at this site. The extraction piping is slotted in the area of contamination and hard piped to the equipment. Installation of piping is shown on the Piping Diagram, Figure 3.

2. The blower assembly will consist of a blower fan with explosion-proof motor, explosion-proof circuit breaker and starter box. The system will generate a vacuum of up to 6 inches of water at VES intake.

3. Emissions control will be maintained by dilution with fresh air if necessary. An air vent installed upstream from the blower provides this capability. The airstream will be discharged to the atmosphere through a 20-foot-high, 6-inch-diameter PVC vent pipe.

4. Piping manifolds and valves connecting the extraction piping, blower, and emissions control system allow control of hydrocarbon vapor concentration exiting the VES.

2.3 VES Operation and Monitoring

When the VES is placed in operation, maintenance requirements will be minimal. Monitoring will constitute the primary activity, with frequent measurements at startup. Once the system has stabilized, frequency of monitoring will quickly diminish. Vapor concentrations and air flow volume will be measure several times per day for the first two days, decreasing to twice weekly for the balance of the first two weeks, then weekly to the end of the first month. Thereafter, measurements will be taken only biweekly to monthly. The system will probably remain in operation for six months to a year.

Monitoring will consist of calculating the volume of air passing through the system and measuring the concentration of volatile hydrocarbons exiting from the system. During the first two days of operation, volatile gas concentrations will also be monitored at ground surface to detect and control any accumulation of vapors.

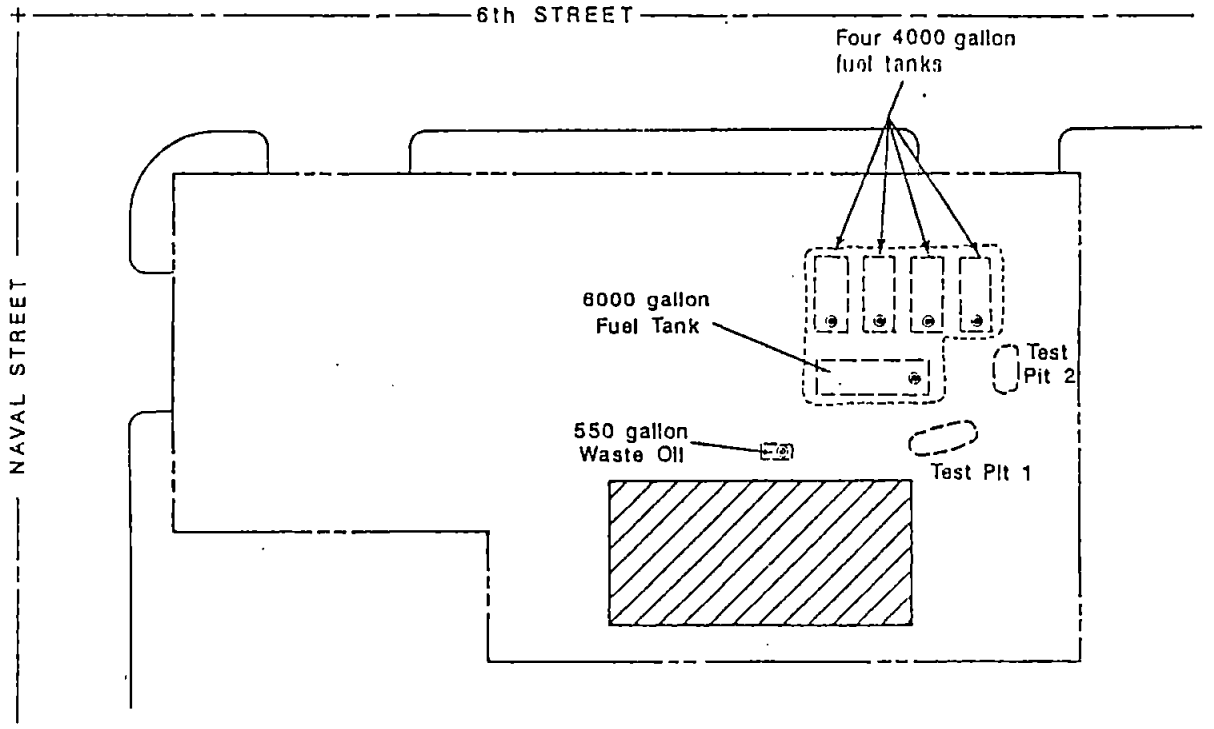
One monitoring point is located on the vacuum side of the blower and the other on the vent stack. The vacuum side monitor point will allow measuring the vacuum in inches of water (inches H_2O) developed by the extraction system.

The downstream monitoring point is located on the vent stack. At this location, discharge velocity (flow rate), temperature, pressure, and vapor concentration are measured. The exhaust contains air and aromatic hydrocarbons, and the vapor concentration is used to estimate the total mass of hydrocarbon removed from the soil. The permissible hydrocarbon concentration allowed at this point will be indicated by the permitting agency (PSAPCA).

3.0 SITE RESTORATION

Vapor concentration will diminish with time. The criteria for turning off the system will be when vapor concentrations are below the limit of detection.

Upon termination of vapor extraction, the blower and stack will be disassembled and removed from the site. AGI will prepare a final report summarizing the remediation.



LEGEND

- Property Boundary
- Building
- Underground Storage Tank
- Limits of excavation

N

0 40 80

Scale in Feet

Applied Geotechnology Inc.
Geotechnical Engineering
Geology & Hydrogeology

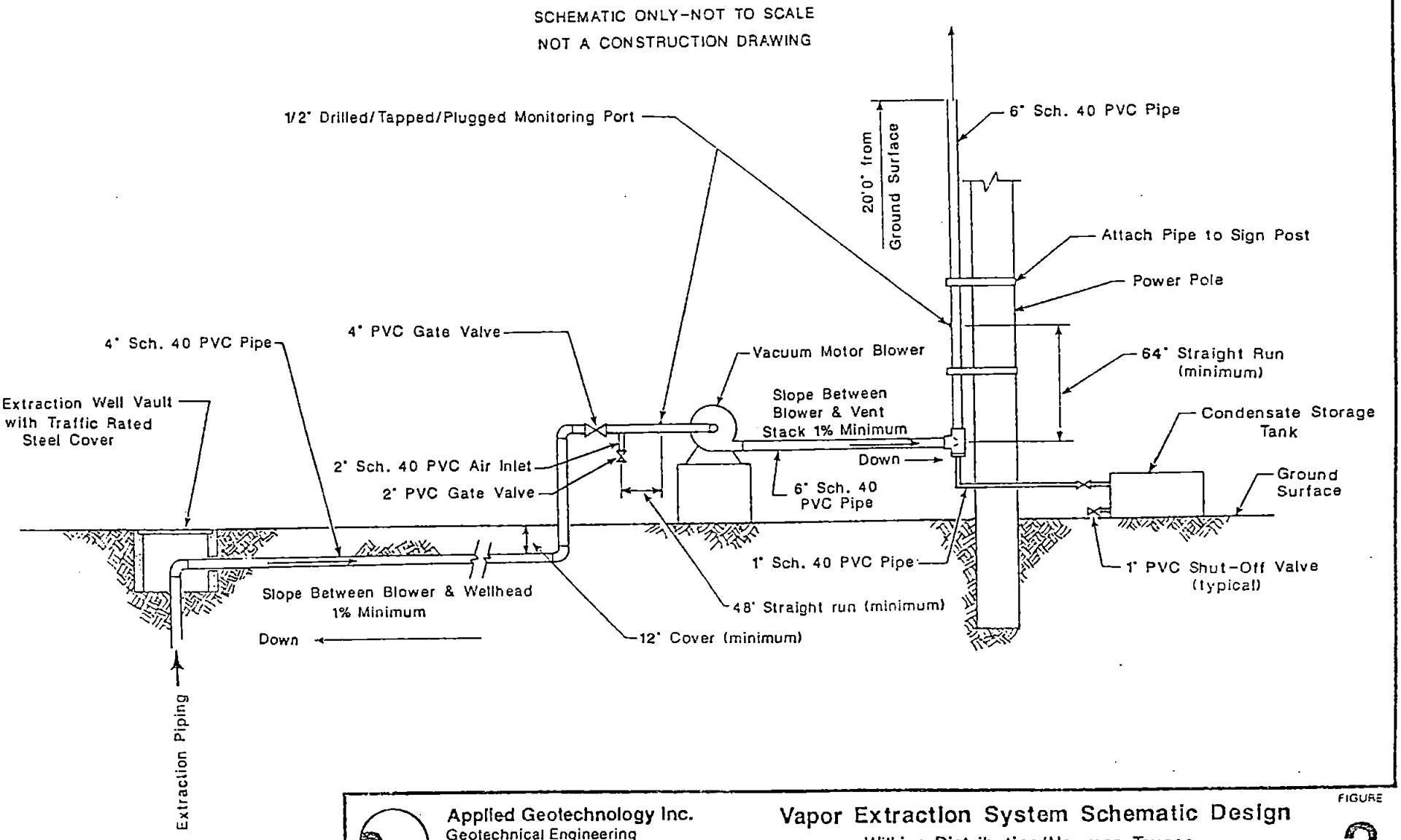
Site Plan

Wilkins Distributing/Newman Texaco
Bremerton, Washington

FIGURE 1

JOB NUMBER	DRAWN	APPROVED	DATE	REVISED	DATE
15,526.001	OFF	CHS	19 Sep. 90		

SCHEMATIC ONLY-NOT TO SCALE
NOT A CONSTRUCTION DRAWING



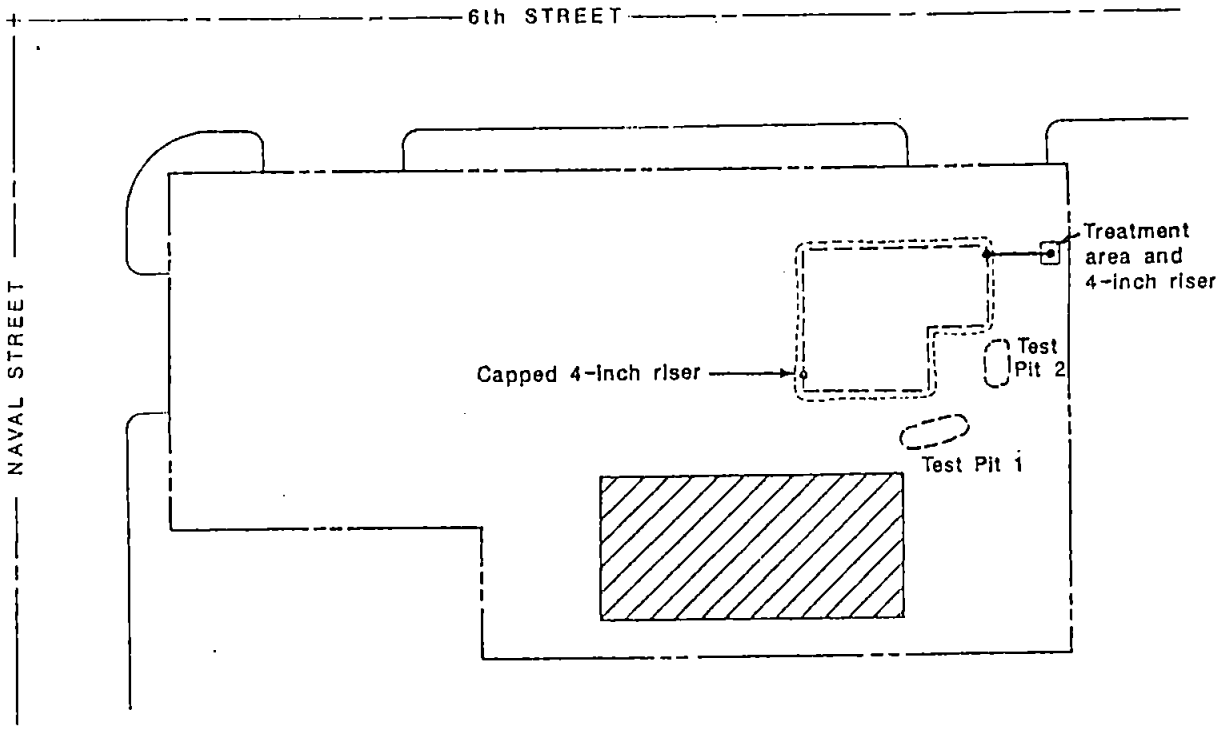
Applied Geotechnology Inc.
Geotechnical Engineering
Geology & Hydrogeology

Vapor Extraction System Schematic Design

Wilkins Distributing/Newman Texaco
Bremerton, Washington

FIGURE 2

JOB NUMBER	DRAWN	APPROVED	DATE	REVISED	DATE
15,526.001	DFF	CHS	19 Sep. 90		



LEGEND

- Property Boundary
- Building
- 4-inch PVC extraction piping, .050 slots, bedded in pea gravel
- Limits of excavation
- Solid 4-inch PVC piping

N

0 40 80

Scale in Feet

Applied Geotechnology Inc.
Geotechnical Engineering
Geology & Hydrogeology

Piping Diagram

Wilkins Distributing/Newman Texaco
Bremerton, Washington

FIGURE 3

JOB NUMBER	DRAWN	APPROVED	DATE	REVISED	DATE
15,526.001	DFF	CWS	19 Sep. 90		

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4630 PACIFIC HIGHWAY EAST, SUITE B-14, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: Applied Geotechnology Date: August 10, 1990

Report On: Analysis of Soil Lab No.: 12688

IDENTIFICATION:
Samples Received on 08-09-90
Project: 15518.001 Pac. Environ. Ser/Newman Texaco

ANALYSIS:

Lab Sample No.	RUSH 1	RUSH 2	RUSH 3
Client Identification	#1	#2	#3
Matrix/Units	Soil ppm	Soil ppm	Soil ppm
Total Petroleum Fuel Hydrocarbons by EPA SW-846 Modified Method 8015	< 10	57	< 10
TPH as		Gasoline	

SOUND ANALYTICAL SERVICES

C. LARRY ZURAW

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4630 PACIFIC HIGHWAY EAST, SUITE B-14, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

QUALITY CONTROL REPORT

DUPLICATES

Lab No: 12688
Date: August 10, 1990
Client: Applied Geotechnology

Client ID: #3
Matrix: Soil
Units: ppm

Compound	Sample(S)	Duplicate(D)	RPD*	
Total Petroleum Fuel Hydrocarbons	< 10	< 10	---	

*RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4630 PACIFIC HIGHWAY EAST, SUITE B-14, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: Applied Geotechnology

Date: August 14, 1990

Report On: Analysis of Soil

Lab No.: 12719

IDENTIFICATION:

Samples Received on 08-10-90

Project: 15578.001 Pacific Environ. Serv./Newman Texaco

ANALYSIS:

Lab Sample No.	Client ID	Total Petroleum Fuel Hydrocarbons, ppm*
1	A	10,230 as Gas
2	B	4,875 as Gas
3	C	245 as Aged Gas
4	5	< 10

*TPH by EPA SW-846 Modified Method 8015

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Applied Geotechnology
Project: 15578.001

Lab No. 12719
August 14, 1990

Lab Sample No. 5 Client ID: #6

Halogenated Volatiles Per EPA SW-846 Method 8010.

Contaminant	Concentration (mg/kg) (ppm)
Methylene chloride	< 0.05
1,1-dichloroethylene	< 0.05
1,1-dichloroethane	< 0.05
1,2-transdichloroethylene	< 0.05
1,2-dichloroethane	< 0.05
1,1,1-trichloroethane	< 0.05
Carbon Tetrachloride	< 0.05
1,2-dichloropropane	< 0.05
Trans-1,3-dichloropropene	< 0.05
Trichloroethylene	< 0.05
Cis-1,3-dichloropropene	< 0.05
1,1,2-trichloroethane	< 0.05
Tetrachloroethylene	< 0.05
1,1,2,2-tetrachloroethane	< 0.05
Chlorobenzene	< 0.05
1,2 Dichlorobenzene	< 0.05
1,3 Dichlorobenzene	< 0.05
1,4 Dichlorobenzene	< 0.05

Total Petroleum Hydrocarbons, ppm by EPA Method 418.1	40.4
Total Chromium, ppm	16.3
Total Copper, ppm	25.1
Total Lead, ppm	69.8

Continued. . . . .

SOUND ANALYTICAL SERVICES, INC.

Applied Geotechnology
Project: 15578.001

Lab No. 12719
August 14, 1990

Lab Sample No. 5 Client ID: #6

ORGANOCHLORINE PESTICIDES AND PCB - Method 8080

Compound	Conc., mg/kg	Detection Limit
Aldrin	0.03	0.01
a-BHC	ND	0.01
b-BHC	ND	0.01
g-BHC	0.15	0.01
y-BHC (Lindane)	ND	0.01
Chlordane (technical)	ND	0.1
4,4'-DDD	1.16	0.01
4,4'-DDE	0.37	0.01
4,4'-DDT	0.06	0.01
Dieldrin	ND	0.01
Endosulfan I	0.13	0.01
Endosulfan II	ND	0.01
Endosulfan sulfate	ND	0.01
Endrin	ND	0.01
Endrin aldehyde	ND	0.01
Heptachlor	ND	0.01
Heptachlor epoxide	ND	0.01
Methoxychlor	ND	0.02
Toxaphene	ND	0.1
PCB - Type	ND	
PCB	ND	0.1

ND = Not Detectable.

PESTICIDE SURROGATE RECOVERY	
2,4,5,6-Tetrachloro-m-xylene	101
Decachlorobiphenyl	103

SOUND ANALYTICAL SERVICES

C. LARRY ZURAW

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS
4630 PACIFIC HIGHWAY EAST, SUITE B-14, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: Applied Geotechnology Date: August 20, 1990

Report On: Analysis of Soil Lab No.: 12754

RECEIVED
AUG 22 1990
APPLIED GEOTECHNOLOGY INC

IDENTIFICATION:
Samples Received on 08-13-90
Project: 15,518.001 PAL Env/Newman Texaco

ANALYSIS:

Lab Sample No.	Client ID	*Total Petroleum Fuel Hydrocarbons, ppm
1	N	346 as Gasoline
2	W	1,550 as Aged Gas, Mineral Spirits, & Diesel
3	E	< 10

*TPH by EPA SW-846 Modified Method 8015

SOUND ANALYTICAL SERVICES

C. LARRY ZURAW

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4630 PACIFIC HIGHWAY EAST, SUITE B-14, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922- 5047

QUALITY CONTROL REPORT

DUPLICATES

Lab No: 12754
Date: August 20, 1990
Client: Applied Geotechnology

Client ID: N
Matrix: Soil
Units: ppm

Compound	Sample(S)	Duplicate(D)	RPD*	
Total Petroleum Fuel Hydrocarbons	346	287	18.6	

*RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4630 PACIFIC HIGHWAY EAST, SUITE B-14, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922- 5047

Report To: Applied Geotechnology Date: August 30, 1990

Report On: Analysis of Soil Lab No.: 13069

IDENTIFICATION:
Samples Received on 08-29-90
Project: 15518.001 PES/Newman Texaco

ANALYSIS:

Lab Sample No.	Client ID	Total Petroleum Fuel Hydrocarbons, ppm
RUSH 1	Pit-1-13.8	634 as, Gas
RUSH 2	Pit-2-13.0	41 as, Gas

*TPH by EPA SW-846 Modified Method 8015

SOUND ANALYTICAL SERVICES

C. LARRY ZURAW

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4630 PACIFIC HIGHWAY EAST, SUITE B-14, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922- 5047

QUALITY CONTROL REPORT

DUPLICATES

Lab No: 13069
Date: August 30, 1990
Client: Applied Geotechnology

Client ID: Pit-2-13.0
Matrix: Soil
Units: ppm

Compound	Sample(S)	Duplicate(D)	RPD*	
Total Petroleum Fuel Hydrocarbons	41	41	----	

*RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

DISTRIBUTION

3 Copies

Mr. Roger Jensen
Wilkins Distributing Company
Post Office Box 147
Port Orchard, Washington 98366

Quality Assurance/Technical Review by:

Gary L. Laakso
Remediation Services Manager

CHS/JEN/cgl

ATTACHMENT B

Standard Field Operating Procedures and Exploration Logs

STANDARD FIELD OPERATING PROCEDURES

A-1 SITE SAFETY AND OPERATIONS PLAN (SSOP)

As part of the field investigation, GSM employees and contractors followed the Site-specific Safety and Operations Plan (SSOP) prepared in accordance with Chapter 296-62 of the Washington Administrative Code (WAC) and 20 Code of Federal Regulations (CFR) 1910.120. The SSOP identified potential physical and chemical hazards associated with the investigation, and specified personal protection and safety monitoring requirements. A copy of the SSOP was provided to on-site WGR and subcontractor personnel for review and discussion prior to field activities. On-site personnel associated with the field activities were required to be familiar with and comply with provisions as stated in the SSOP. Site safety meetings were conducted at the beginning of each work day to review aspects of the SSOP, and provide an opportunity for workers to discuss health and safety issues, as appropriate.

A-2 UTILITY LOCATE

Prior to beginning drilling or excavation activities, GSM notified One-Call Underground Utilities Alert Service of our intent to conduct the work. One-Call notified appropriate agencies or companies with underground utilities in the area. These agencies, companies, or their authorized representatives then marked the locations of their utilities along right-of-ways and easements adjacent to the property.

A-3 STRATAPROBE BORINGS AND SOIL SAMPLING

On September 15, 2000, Transglobal Environmental Geosciences Northwest, Inc. (TEG), under contract to GSM, advanced 8 strataprobe exploration borings at the locations shown on Figure 2. Strataprobes were advanced to approximately 9 to 11 feet below ground surface (bgs) using 1 1/2-inch diameter rods and a split-barrel sampler. Soil samples were collected at each of the strataprobe boring locations to characterize the subsurface lithology, and obtain soil samples for chemical analysis. Samples were retrieved using a three-foot long, 1 1/2-inch diameter split barrel sampler attached to the end of the rods. The sampling tools were advanced using a 90-lb. hydraulic hammer and the weight of the strataprobe truck. The rods were then removed from the hole and the sampler detached and opened to allow collection of the soil sample. Samples were placed immediately in laboratory-prepared glass jars and placed in a chilled cooler and transported to TEG under chain of custody protocols for chemical analyses. Soil sample intervals and descriptive information were recorded on the exploration logs included in this Attachment.

Groundwater samples were collected from a number of the strataprobe locations to assess groundwater quality. A temporary stainless steel well screen was attached to the strataprobe rods and installed to a depth of approximately 7 to 9 feet bgs. Approximately ¼- to ½-gallon of water was purged from the wellbore using a peristaltic pump, and the well allowed to recover for several minutes before a groundwater sample was collected. A peristaltic pump was used to obtain water sufficient to fill two 40 ml volatile organic analysis (VOA) vials. After collection, the groundwater samples were taken to TEG's on analytical laboratory, under chain-of-custody, for chemical analyses.

A-4 FIELD SCREENING FOR ORGANIC VAPORS

Field tests consisted of portable photoionization detector (PID) measurements for the presence of volatile organic vapors in each recovered soil sample. An Environmental Instruments Model 580B OVM, calibrated daily to 100 ppm isobutylene was used to obtain these measurements. Typically, a small hole is made into a sealable plastic bag in which the soil has been placed and allowed to stand for approximately 15 to 30 minutes. The maximum reading on the PID indicates the relative concentration of volatile hydrocarbons in that soil sample. This screening equipment was also used for health and safety air quality monitoring in the breathing zone during drilling operations. The purpose of the field tests was to determine the relative magnitude of volatile organic vapors, if any, in the soil samples, to qualitatively compare samples, and to assist in sample selection for chemical analysis. Field screening with a PID is a subjective analysis affected by, among other influences, weather (e.g., temperature and humidity), soil type and conditions, instrument calibration, and operation.

A-5 SAMPLE JARS, SAMPLE HANDLING, AND CHAIN-OF-CUSTODY

Discrete soil and groundwater samples were submitted in laboratory-prepared glass containers. Sample jars were obtained specifically for use on this project, and consisted of glass jars with Teflon lid inserts or septum caps. Samples were collected, labeled, and placed immediately into a chilled cooler for transport to the analytical laboratory. Chain-of-custody records were maintained recording sample number, project and location, sample depth, client, type of preservative (if any), and handling procedures. Completed chain-of-custody records are attached to the laboratory reports included in Attachment B.

A-6 EQUIPMENT DECONTAMINATION

All sampling equipment (split barrel samplers, sampling spoons and implements) were thoroughly cleaned between each use using a laboratory-grade soap, tap water and a stiff-bristle brush, and rinsed thoroughly with distilled water. Strataprobe sampling equipment was cleaned between each use with laboratory-grade soap, a stiff-bristle brush, and a tap water rinse.

GeoScience Management, Inc. *Environmental Consulting Services* 18608 89th Avenue N.E. Bothell, WA 98011	Geologist: HW Small	Date Began: 9/15/00	Boring No.: ***B-1***
	Driller: TEG NW, Inc.	Date End: 9/15/00	Casing Elevation: N/A
	Drill Rig: Strataprobe	Total Depth: 15 Feet	Depth to Water: N/A Feet

Graphic Log	*Classification*	*Soil Description*	Depth	*Sampled Interval*	*Blow Counts*	*Sample Number*	*PID*	*Completion*
	Concrete	CONCRETE						
	SP	Damp, brown SAND (Fill)			N/A	S-1	<1	
	ML	Moist to wet, gray, brown, and oxidized brown fine sandy SILT to CLAYEY SILT	5		N/A	S-2	<1	
		No groundwater encountered.			N/A	S-3	<1	
			10		N/A	S-4	<1	
					N/A	S-5	<1	
			15					

Completion Notes:

Boring grouted from bottom to 6 inches with hydrated bentonite chips, and completed with concrete at the surface.

SITE:

Newman's Chevron
2021 6th Street
Bremerton, WA

Project No.:	Page: 1

GeoScience Management, Inc. *Environmental Consulting Services* 18608 89th Avenue N.E. Bothell, WA 98011	Geologist: HW Small	Date Began: 9/15/00	Boring No.: **B-2**
	Driller: TEG NW, Inc.	Date End: 9/15/00	Casing Elevation: N/A
	Drill Rig: Strataprobe	Total Depth: 15 Feet	Depth to Water: N/A Feet

Graphic Log	Classification	Soil Description	Depth	Sampled Interval	Blow Counts	Sample Number	PID	Completion
	Concrete	CONCRETE						
	SP	Damp, brown SAND (Fill)			N/A	S-1	<1	
	ML	Moist to wet, gray, brown, and oxidized brown fine sandy SILT to CLAYEY SILT No groundwater encountered.	5		N/A	S-2	<1	
					N/A	S-3	10	
			10		N/A	S-4	7	
					N/A	S-5	10	
			15					

Completion Notes:

Boring grouted from bottom to 6 inches with hydrated bentonite chips, and completed with concrete at the surface.

SITE:

Newman's Chevron
2021 6th Street
Bremerton, WA

Project No.:

Page: 1

GeoScience Management, Inc. *Environmental Consulting Services* 18608 89th Avenue N.E. Bothell, WA 98011	Geologist: HW Small	Date Began: 9/15/00	Boring No.: ***B-3***
	Driller: TEG NW, Inc.	Date End: 9/15/00	Casing Elevation: N/A
	Drill Rig: Strataprobe	Total Depth: 15 Feet	Depth to Water: N/A Feet

Graphic Log	*Classification*	*Soil Description*	*Depth*	*Sampled Interval*	*Blow Counts*	*Sample Number*	*PID*	*Completion*
	Concrete	CONCRETE						
	SP	Damp, brown SAND (Fill)						
	ML	Moist to wet, gray, brown, and oxidized brown fine sandy SILT to CLAYEY SILT. No groundwater encountered.	5		N/A	S-1	<1	
					N/A	S-2	10	
			10		N/A	S-3	10	
					N/A	S-4	25	
			15					

Completion Notes:

Boring grouted from bottom to 6 inches with hydrated bentonite chips, and completed with concrete at the surface.

SITE:

Newman's Chevron
2021 6th Street
Bremerton, WA

Project No.:

Page: 1

GeoScience Management, Inc. *Environmental Consulting Services* 18608 89th Avenue N.E. Bothell, WA 98011	Geologist: HW Small	Date Began: 9/15/00	Boring No.: ***B-4***
	Driller: TEG NW, Inc.	Date End: 9/15/00	Casing Elevation: N/A
	Drill Rig: Strataprobe	Total Depth: 15 Feet	Depth to Water: N/A Feet

Graphic Log	Classification	Soil Description	Depth	Sampled Interval	Blow Counts	Sample Number	PID	Completion
	Concrete	CONCRETE						
	SP	Damp, brown SAND (Fill)						
	ML	Moist to wet, gray, brown, and oxidized brown fine sandy SILT to CLAYEY SILT. No groundwater encountered.	5		N/A	S-1	<1	
					N/A	S-2	<1	
			10		N/A	S-3	13	
					N/A	S-4	15	
			15					

Completion Notes:

Boring grouted from bottom to 6 inches with hydrated bentonite chips, and completed with concrete at the surface.

SITE:

Newman's Chevron
2021 6th Street
Bremerton, WA

Project No.:

Page: 1

GeoScience Management, Inc. *Environmental Consulting Services* 18608 89th Avenue N.E. Bothell, WA 98011	Geologist: HW Small	Date Began: 9/15/00	Boring No.: **B-5**
	Driller: TEG NW, Inc.	Date End: 9/15/00	Casing Elevation: N/A
	Drill Rig: Strataprobe	Total Depth: 15 Feet	Depth to Water: N/A Feet

Graphic Log	Classification	Soil Description	Depth	Sampled Interval	Blow Counts	Sample Number	PID	Completion
	Concrete	CONCRETE						
	GP	PEA GRAVEL (Fill).	5					
	GP	Moist to wet, mixed PEA GRAVEL and SILT (fill)						
	ML	Moist to wet, gray, brown, and oxidized brown fine sandy SILT to CLAYEY SILT.	10		N/A	S-1	260	
		No groundwater encounterd.			N/A	S-2	160	
			15					

Completion Notes:

Boring grouted from bottom to 6 inches with hydrated bentonite chips, and completed with concrete at the surface.

SITE:

Newman's Chevron
2021 6th Street
Bremerton, WA

Project No.:

Page: 1

GeoScience Management, Inc. *Environmental Consulting Services* 18608 89th Avenue N.E. Bothell, WA 98011	Geologist: HW Small	Date Began: 9/1500	Boring No.: **B-6**
	Driller: TEG NW, Inc.	Date End: 9/15/00	Casing Elevation: N/A
	Drill Rig: Strataprobe	Total Depth: 15 Feet	Depth to Water: N/A Feet

Graphic Log	Classification	Soil Description	Depth	Sampled Interval	Blow Counts	Sample Number	PID	Completion
	Concrete	CONCRETE						
	SP	Damp, brown SAND (Fill)			N/A	S-1	<1	
	ML	Moist to wet, gray, brown, and oxidized brown fine sandy SILT to CLAYEY SILT.	5		N/A	S-2	<1	
		No groundwater encountered.			N/A	S-3	<1	
			10		N/A	S-4	<1	
					N/A	S-5	<1	
			15					

Completion Notes:

Boring grouted from bottom to 6 inches with hydrated bentonite chips, and completed with concrete at the surface.

SITE:

Newman's Chevron
2021 6th Street
Bremerton, WA

Project No.:

Page: 1

GeoScience Management, Inc. *Environmental Consulting Services* 18608 89th Avenue N.E. Bothell, WA 98011	Geologist: HW Small	Date Began: 9/15/00	Boring No.: **B-7**
	Driller: TEG NW, Inc.	Date End: 9/15/00	Casing Elevation: N/A
	Drill Rig: Strataprobe	Total Depth: 15 Feet	Depth to Water: N/A Feet

Graphic Log	Classification	Soil Description	Depth	Sampled Interval	Blow Counts	Sample Number	PID	Completion
	Concrete	CONCRETE						
	SP	Damp, brown SAND (Fill)						
	GP	PEA GRAVEL (Fill) Possible Fill in AGI's 1990 Test Pit #1?)	5 10					
	ML	Moist to wet, gray, brown, and oxidized brown fine sandy SILT to CLAYEY SILT. No groundwater encountered.	15		N/A	S-1	95	

Completion Notes:

Boring grouted from bottom to 6 inches with hydrated bentonite chips, and completed with concrete at the surface.

SITE:

Newman's Chevron
2021 6th Street
Bremerton, WA

Project No.:

Page: 1

ATTACHMENT C

Laboratory Reports

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

800 Sleater-Kinney SE, PMB #262
Lacey, Washington 98503-1127

FILE COPY

Mobile Environmental Laboratories
Environmental Sampling Services

Telephone: 360-459-4670
Fax: 360-459-3432

October 3, 2000

Howard Small
GeoScience Management, Inc.
18608 89th Ave. NE
Bothell, WA 98011

Dear Mr. Small:

Please find enclosed the analytical data report for the Newman's Chevron Project in Bremerton, Washington. Soil samples were analyzed for Gasoline by NWTPH-Gx, BTEX by Method 8021B, and Pb by Method 7420 on September 18 & 24, 2000.

The results of these analyses are summarized in the attached table. All soil values are reported on a dry weight basis. Applicable detection limits and QA/QC data are included. An invoice for this analytical work is also enclosed.

TEG Northwest appreciates the opportunity to have provided analytical services to GeoScience Management, Inc. for this project. It was a pleasure working with you, and we are looking forward to the next opportunity to work together.

Sincerely,

Michael A. Korosec
President

TEG NW SEATTLE CHEMISTRY LABORATORY
(425) 957-9872, fax (425) 957-9904

TEG Job Number:	S00918-5
Client:	GEOSCIENCE MANAGEMENT
Client Job Name:	NEWMAN'S CHEVRON
Client Job Number:	NA

Analytical Results

NWTPH-Gx / BTEX		MTH BLK	LCS	B1-S4	B2-S4	B2-S5
Matrix	Soil	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	09/18/00	09/18/00	09/18/00	09/18/00	09/18/00
Date analyzed	Limits	09/18/00	09/18/00	09/18/00	09/18/00	09/18/00
Moisture, %						15%
NWTPH-Gx, mg/kg						
Mineral spirits/Stoddard solvent	5.0	nd		nd	nd	nd
Gasoline	5.0	nd		nd	nd	7.1
BTEX , µg/kg						
Benzene	50	nd	71%	nd	nd	nd
Toluene	50	nd	78%	nd	nd	nd
Ethylbenzene	50	nd		nd	nd	nd
Xylenes	50	nd		nd	nd	120
Surrogate recoveries:						
Trifluorotoluene		87%	84%	86%	89%	84%
Bromofluorobenzene		98%	97%	98%	102%	98%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits
na - not analyzed
C - coelution with sample peaks
M - matrix interference
J - estimated value
Results reported on dry-weight basis
Acceptable Recovery limits: 65% TO 135%
Acceptable RPD limit: 35%

TEG NW SEATTLE CHEMISTRY LABORATORY
(425) 957-9872, fax (425) 957-9904

TEG Job Number:	S00918-5
Client:	GEOSCIENCE MANAGEMENT
Client Job Name:	NEWMAN'S CHEVRON
Client Job Number:	NA

Analytical Results

NWTPH-Gx / BTEX		B3-S4	B4-S4	B5-S1	B5-S2	B6-S4
Matrix	Soil	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	09/18/00	09/18/00	09/18/00	09/18/00	09/18/00
Date analyzed	Limits	09/18/00	09/18/00	09/18/00	09/18/00	09/18/00
Moisture, %			15%	15%	15%	
NWTPH-Gx, mg/kg						
Mineral spirits/Stoddard solvent	5.0	nd	nd	nd	nd	nd
Gasoline	5.0	nd	11	8,700	160	nd
BTEX , µg/kg						
Benzene	50	nd	nd	24,000	260	nd
Toluene	50	nd	nd	19,000	3,200	nd
Ethylbenzene	50	nd	nd	42,000	1,200	nd
Xylenes	50	nd	1,100	500,000	15,000	nd
Surrogate recoveries:						
Trifluorotoluene		81%	88%	C	94%	87%
Bromofluorobenzene		101%	92%	C	C	94%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits
na - not analyzed
C - coelution with sample peaks
M - matrix interference
J - estimated value
Results reported on dry-weight basis
Acceptable Recovery limits: 65% TO 135%
Acceptable RPD limit: 35%

TEG NW SEATTLE CHEMISTRY LABORATORY
(425) 957-9872, fax (425) 957-9904

TEG Job Number:	S00918-5
Client:	GEOSCIENCE MANAGEMENT
Client Job Name:	NEWMAN'S CHEVRON
Client Job Number:	NA

Analytical Results		DUPL
NWTPH-Gx / BTEX		**B6-S4**
Matrix	Soil	Soil
Date extracted	Reporting	09/18/00
Date analyzed	Limits	09/18/00
Moisture, %		
NWTPH-Gx, mg/kg		
Mineral spirits/Stoddard solvent	5.0	nd
Gasoline	5.0	nd
BTEX , µg/kg		
Benzene	50	nd
Toluene	50	nd
Ethylbenzene	50	nd
Xylenes	50	nd
Surrogate recoveries:		
Trifluorotoluene		101%
Bromofluorobenzene		94%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits
na - not analyzed
C - coelution with sample peaks
M - matrix interference
J - estimated value
Results reported on dry-weight basis
Acceptable Recovery limits: 65% TO 135%
Acceptable RPD limit: 35%

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

NEWMANS CHEVRON PROJECT
Bremerton, Washington
GeoScience Management, Inc.

Heavy Metals in Soil by EPA-7000 Series

Sample Number	Date Analyzed	Lead (Pb) EPA 7420 (mg/kg)
Method Blank	9/24/00	nd
B-5,S-1	9/24/00	13
Method Detection Limits		5

"nd" Indicates not detected at listed detection limits.

ANALYSES PERFORMED BY: Sherry Chilcutt

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

NEWMANS CHEVRON PROJECT
Bremerton, Washington
GeoScience Management, Inc.

QA/QC Data - Total Metals EPA-7000 Series Analyses

Sample Number: Harrington #4 Soil							
	Matrix Spike			Matrix Spike Duplicate			RPD
	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)	(%)
Lead	125	118	94	125	124	99	4.96

Laboratory Control Sample			
	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)
Lead	125	117	94

ACCEPTABLE RECOVERY LIMITS FOR MATRIX SPIKES: 65%-135%
ACCEPTABLE RPD IS 20%

ANALYSES PERFORMED BY: Sherry Chilcutt

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES

SOC918-3

CHAIN-OF-CUSTODY RECORD

CLIENT: GeoScience Management, Inc.

ADDRESS: 18608 89TH AVE NE, Bothell, WA. 98011

PHONE: 425 481-4538 FAX:

CLIENT PROJECT #: PROJECT MANAGER: Jim Smail

DATE: 9/18/00 PAGE 1 OF 2

PROJECT NAME: Newmans Chevron

LOCATION: Bremerton WA

COLLECTOR: Jim Smail DATE OF COLLECTION 9/18/00

Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES: VOA 8010/8021B	VOA 8021B BTEX	VOA 8260	SEMI VOL 8270	TPH - HCID	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (d & o)	PAH 8100	PCBs 8082	Pesticides 8081	TOTAL LEAD	pH	NWTPH-Gx BTEX	NOTES	Total Number of Containers	Laboratory Note Number
1. B-1, S-1																				1	
2. B-1, S-2																			Hold		
3. B-1, S-3																					
4. B-1, S-4																		X X	May Run VPH		
5. B-2, S-1																					
6. B-2, S-2																			Hold		
7. B-2, S-3																					
8. B-2, S-4																		X X	May Run VPH		
9. B-2, S-5																		X X			
10. B-3, S-1																					
11. B-3 S-2																			Hold		
12. B-3 S-3																					
13. B-3 S-4																		X X	May Run VPH		
14. B-4, S-1																					
15. B-4 S-2																			Hold		
16. B-4 S-3																					
17. B-4 S-4																		X X	May Run VPH		
18.																					

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME
Jim Smail	9/18/00 1:35PM	[illegible]	9/18/00 15
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME

SAMPLE DISPOSAL INSTRUCTIONS

☐ TEG DISPOSAL @ $2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	
NOTES:	

LABORATORY NOTES:

Please fax results when completed

Turn Around Time: 5 days

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES

CHAIN-OF-CUSTODY RECORD

CLIENT: GeoScience Management, Inc.
ADDRESS:
PHONE: 425 481 4538 FAX:
CLIENT PROJECT #: PROJECT MANAGER:

DATE: 9/18/01 PAGE 2 OF 2
PROJECT NAME: Newmans Chevron
LOCATION: Bremerton WA.
COLLECTOR: H. Small DATE OF COLLECTION 9/15/01

Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES: VOA 8010/8021B	VOA 8021B BTEX	VOA 8260	SEMI VOL 8270	TPH - HCID	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (d & o)	PAH 8100	PCBs 8082	Pesticides 8081	TOTAL LEAD	pH	NWTPH-Gx BTEX	NOTES	Total Number of Containers	Laboratory Note Number
1. B-5, S-1																	X	X	May Run VPH	2	
2. B-5, S-2																	X	X		2	
3. B-6, S-1																			Hold	1	
4. B-6 S-2																				1	
5. B-6 S-3																				1	
6. B-6 S-4																	X	X	May Run VPH	2	
7. B-7, S-1																	X	X		1	
8.																					
9.																					
10.																					
11.																					
12.																					
13.																					
14.																					
15.																					
16.																					
17.																					
18.																					

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME
H. Small	9/18/01 1315	V. Vivas	9/18/01 1325
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME

SAMPLE DISPOSAL INSTRUCTIONS

☐ TEG DISPOSAL @ $2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	
NOTES:	

LABORATORY NOTES:

Turn Around Time: 5 days

nca™
www.ncalabs.com

Spokane 425.420.9200 fax 425.420.9210
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Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
503.906.9200 fax 503.906.9210
Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
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Geo Science Management, Inc.	Project: Newman's Chevron	
18608 89th Avenue NE	Project Number: NA	**Reported:**
Bothell WA, 98011	Project Manager: Howard Small	12/29/00 16:38

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Bottom-14.5	B0L0629-01	Soil	12/28/00 12:00	12/28/00 09:15
SE Wall-11.5	B0L0629-02	Soil	12/28/00 12:00	12/28/00 09:15
NE Wall-11.5	B0L0629-03	Soil	12/28/00 12:00	12/28/00 09:15

North Creek Analytical - Bothell

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Geo Science Management, Inc.	Project: Newman's Chevron	
18608 89th Avenue NE	Project Number: NA	**Reported:**
Bothell WA, 98011	Project Manager: Howard Small	12/29/00 16:38

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Bottom-14.5 (B0L0629-01) Soil	**Sampled: 12/28/00 12:00**	**Received: 12/28/00 09:15**							
Gasoline Range Hydrocarbons	**179**	5.00	mg/kg dry	1	0L27025	12/27/00	12/29/00	NWTPH-Gx/8021B	
Benzene	**0.178**	0.0500	"	"	"	"	"	"	
Toluene	**4.18**	0.0500	"	"	"	"	"	"	
Ethylbenzene	**1.68**	0.0500	"	"	"	"	"	"	
Xylenes (total)	**12.3**	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*123 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*97.7 %*	*50-150*			"	"	"	"	
SE Wall-11.5 (B0L0629-02) Soil	**Sampled: 12/28/00 12:00**	**Received: 12/28/00 09:15**							
Gasoline Range Hydrocarbons	**19.4**	5.00	mg/kg dry	1	0L27025	12/27/00	12/29/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	**0.337**	0.0500	"	"	"	"	"	"	
Ethylbenzene	**0.0799**	0.0500	"	"	"	"	"	"	
Xylenes (total)	**0.465**	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*92.5 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*91.6 %*	*50-150*			"	"	"	"	
NE Wall-11.5 (B0L0629-03) Soil	**Sampled: 12/28/00 12:00**	**Received: 12/28/00 09:15**							
Gasoline Range Hydrocarbons	**18.7**	5.00	mg/kg dry	1	0L27025	12/27/00	12/29/00	NWTPH-Gx/8021B	
Benzene	ND	0.0500	"	"	"	"	"	"	
Toluene	**0.137**	0.0500	"	"	"	"	"	"	
Ethylbenzene	**0.0792**	0.0500	"	"	"	"	"	"	
Xylenes (total)	**0.257**	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*90.7 %*	*50-150*			"	"	"	"	
Surrogate: 4-BFB (PID)	*94.5 %*	*50-150*			"	"	"	"	

North Creek Analytical - Bothell

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Geo Science Management, Inc.	Project: Newman's Chevron	
18608 89th Avenue NE	Project Number: NA	**Reported:**
Bothell WA, 98011	Project Manager: Howard Small	12/29/00 16:38

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Bottom-14.5 (B0L0629-01) Soil Sampled: 12/28/00 12:00 Received: 12/28/00 09:15									
Dry Weight	78.1	1.00	%	1	0L28015	12/28/00	12/29/00	BSOPSPL003R07	
SE Wall-11.5 (B0L0629-02) Soil Sampled: 12/28/00 12:00 Received: 12/28/00 09:15									
Dry Weight	73.3	1.00	%	1	0L28015	12/28/00	12/29/00	BSOPSPL003R07	
NE Wall-11.5 (B0L0629-03) Soil Sampled: 12/28/00 12:00 Received: 12/28/00 09:15									
Dry Weight	71.4	1.00	%	1	0L28015	12/28/00	12/29/00	BSOPSPL003R07	

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Geo Science Management, Inc.	Project: Newman's Chevron	
18608 89th Avenue NE	Project Number: NA	**Reported:**
Bothell WA. 98011	Project Manager: Howard Small	12/29/00 16:38

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0L27025: Prepared 12/27/00 Using EPA 5030B (MeOH)										
Blank (0L27025-BLK1)										
Gasoline Range Hydrocarbons	ND	5.00	mg/kg wet							
Benzene	ND	0.0500	"							
Toluene	ND	0.0500	"							
Ethylbenzene	ND	0.0500	"							
Xylenes (total)	ND	0.100	"							
Surrogate: 4-BFB (FID)	*4.37*		"	*4.00*		*109*	*50-150*			
Surrogate: 4-BFB (PID)	*4.82*		"	*4.00*		*121*	*50-150*			
LCS (0L27025-BS1)										
Gasoline Range Hydrocarbons	21.7	5.00	mg/kg wet	25.0		86.8	70-130			
Surrogate: 4-BFB (FID)	*4.19*		"	*4.00*		*105*	*50-150*			
Duplicate (0L27025-DUP1)					Source: B0L0491-01					
Gasoline Range Hydrocarbons	344	20.0	mg/kg dry		407			16.8	50	
Surrogate: 4-BFB (FID)	*7.72*		"	*4.68*		*165*	*50-150*			*S-04*
Matrix Spike (0L27025-MS1)					Source: B0L0509-27					
Benzene	0.575	0.0500	mg/kg dry	0.585	ND	95.6	60-140			
Toluene	0.601	0.0500	"	0.585	ND	99.6	60-140			
Ethylbenzene	0.631	0.0500	"	0.585	ND	108	60-140			
Xylenes (total)	1.91	0.100	"	1.75	ND	107	60-140			
Surrogate: 4-BFB (PID)	*5.10*		"	*4.68*		*109*	*50-150*			
Matrix Spike Dup (0L27025-MSD1)					Source: B0L0509-27					
Benzene	0.588	0.0500	mg/kg dry	0.585	ND	98.2	60-140	2.58	20	
Toluene	0.613	0.0500	"	0.585	ND	102	60-140	1.98	20	
Ethylbenzene	0.631	0.0500	"	0.585	ND	108	60-140	0	20	
Xylenes (total)	1.91	0.100	"	1.75	ND	107	60-140	0	20	
Surrogate: 4-BFB (PID)	*4.97*		"	*4.68*		*106*	*50-150*			

North Creek Analytical - Bothell

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Geo Science Management, Inc.	Project: Newman's Chevron	
18608 89th Avenue NE	Project Number: NA	**Reported:**
Bothell WA, 98011	Project Manager: Howard Small	12/29/00 16:38

Physical Parameters by APHA/ASTM/EPA Methods - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0L28015: Prepared 12/28/00 Using Dry Weight										
Blank (0L28015-BLK1)										
Dry Weight	100	1.00	%							

North Creek Analytical - Bothell

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Geo Science Management, Inc.	Project: Newman's Chevron	
18608 89th Avenue NE	Project Number: NA	**Reported:**
Bothell WA, 98011	Project Manager: Howard Small	12/29/00 16:38

Notes and Definitions

S-04	The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
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
RPD	Relative Percent Difference

Robert Green For Paul Lawrence Miller, Jr., Project Manager

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CHAIN OF CUSTODY REPORT

Work Order #: B0L0029

CLIENT: Nordic Properties Inc. / GeoScience Management Inc.

REPORT TO: Howard W. Small

ADDRESS: 18608 89th AVE NE Bothell WA 98011

PHONE: 425 481-4538 FAX: 425 481-4538

INVOICE TO: NORDIC PROPERTIES INC. PO Box 84 Port Orchard, WA 98366

P.O. NUMBER:

PROJECT NAME: Newman's Chevron

PROJECT NUMBER:

SAMPLED BY: HW Small

TURNAROUND REQUEST in Business Days*

Organic & Inorganic Analyses: 10 | 7 | 5 | 4 | 3 | 2 | 1 | <1 (STD.)

Petroleum Hydrocarbon Analyses: NV | 5 | 4 | 3 | 2 | 1 | <1 (STD.)

OTHER — Please Specify

*Turnaround Requests less than standard may incur Rush Charges.

REQUESTED ANALYSES: NWTPH-Gx/BTEX

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NWTPH-Gx/BTEX													MATRIX (W, S, O)	# OF CONT.	COMMENTS	NCA WO ID
1. Bottom - 14.5	12/27/00	X													S	2	24-HR	01
2. SE Wall - 11.5	12/27/00	X													S	2	24-HR	02
3. ~~[illegible]~~																		
4. NE Wall - 11.5	12/27/00	X													S	2	24-HR	03
5.																		
6.																		
7.																		
8.																		
9.																		
10.																		
11.																		
12.																		
13.																		
14.																		
15.																		

RELINQUISHED BY: HW Small	FIRM: GSM	DATE: 12/28/00	TIME: 9:15 A	RECEIVED BY: Cathy Nichols	FIRM: NCA	DATE: 12/28	TIME: 9:1[illegible]
PRINT NAME: HW Small				PRINT NAME: C Nichols			
RELINQUISHED BY:	FIRM:	DATE:	TIME:	RECEIVED BY:	FIRM:	DATE:	TIME:
PRINT NAME:				PRINT NAME:			

ADDITIONAL REMARKS: Please call w/results

W/U TEMP: 5.6° PAGE OF

COC REV 3/99

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GeoScience Management, Inc.
18608 89th Avenue N.E.
Bothell, WA 98011

Project: Soil Samples
Project Number: [none]
Project Manager: Howard Small

Newmans Chevron

Reported:
10/05/00 15:13

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B7-S1	B0J0041-01	Soil	09/15/00 12:00	10/03/00 14:20

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GeoScience Management, Inc.
18608 89th Avenue N.E.
Bothell, WA 98011

Project: Soil Samples
Project Number: [none]
Project Manager: Howard Small

Reported:
10/05/00 15:13

Gasoline Range Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
B7-S1 (B0J0041-01) Soil Sampled: 09/15/00 12:00 Received: 10/03/00 14:20									
Gasoline Range Hydrocarbons	**130**	5.00	mg/kg dry	1	0J04013	10/04/00	10/04/00	WTPH-G/8021B	I-02
Benzene	ND	0.0500	"	"	"	"	"	"	I-02
Toluene	ND	0.0500	"	"	"	"	"	"	I-02
Ethylbenzene	ND	0.461	"	"	"	"	"	"	I-02,R-03
Xylenes (total)	ND	0.292	"	"	"	"	"	"	I-02,R-03
Surrogate: 4-BFB (FID)	*127 %*	*50-150*			"	"	"	"	*I-02*
Surrogate: 4-BFB (PID)	*91.6 %*	*50-150*			"	"	"	"	*I-02*

North Creek Analytical - Bothell

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GeoScience Management, Inc. 18608 89th Avenue N.E. Bothell, WA 98011	Project: Soil Samples Project Number: [none] Project Manager: Howard Small	**Reported:** 10/05/00 15:13

Volatile Petroleum Hydrocarbons by modified WDOE Interim TPH Policy Method

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
B7-S1 (B0J0041-01) Soil	**Sampled: 09/15/00 12:00**	**Received: 10/03/00 14:20**							
C5-C6 Aliphatics	ND	5.00	mg/kg dry	1	0J04013	10/04/00	10/04/00	WA MTCA-VPH	I-02
C6-C8 Aliphatics	ND	5.00	"	"	"	"	"	"	I-02
C8-C10 Aliphatics	**17.2**	5.00	"	"	"	"	"	"	I-02
C10-C12 Aliphatics	**18.5**	5.00	"	"	"	"	"	"	I-02
C8-C10 Aromatics	ND	5.00	"	"	"	"	"	"	I-02
C10-C12 Aromatics	**9.91**	5.00	"	"	"	"	"	"	I-02
C12-C13 Aromatics	**25.1**	5.00	"	"	"	"	"	"	I-02
Total VPH (TVPH)	**70.7**	5.00	"	"	"	"	"	"	I-02
Surrogate: 4-BFB (FID)	*114 %*	*60-140*			"	"	"	"	*I-02*
Surrogate: 4-BFB (PID)	*96.2 %*	*60-140*			"	"	"	"	*I-02*

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GeoScience Management, Inc.
18608 89th Avenue N.E.
Bothell, WA 98011

Project: Soil Samples
Project Number: [none]
Project Manager: Howard Small

Reported:
10/05/00 15:13

Volatile Organic Compounds by EPA Method 8260B
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
B7-S1 (B0J0041-01) Soil	**Sampled: 09/15/00 12:00**	**Received: 10/03/00 14:20**							**B-08**
Methyl tert-butyl ether	ND	5.00	mg/kg dry	1	0J04020	10/03/00	10/03/00	EPA 8260B	
Benzene	ND	0.100	"	"	"	"	"	"	
1,2-Dibromoethane	ND	0.100	"	"	"	"	"	"	
Ethylbenzene	ND	0.100	"	"	"	"	"	"	
Naphthalene	ND	0.100	"	"	"	"	"	"	
Toluene	ND	0.100	"	"	"	"	"	"	
m,p-Xylene	ND	0.200	"	"	"	"	"	"	
o-Xylene	ND	0.100	"	"	"	"	"	"	
Surrogate: 1,2-DCA-d4	*95.5 %*	*70-130*			"	"	"	"	
Surrogate: Toluene-d8	*95.9 %*	*70-130*			"	"	"	"	
Surrogate: 4-BFB	*93.2 %*	*70-130*			"	"	"	"	

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GeoScience Management, Inc. 18608 89th Avenue N.E. Bothell, WA 98011	Project: Soil Samples Project Number: [none] Project Manager: Howard Small	**Reported:** 10/05/00 15:13

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
B7-S1 (B0J0041-01) Soil Sampled: 09/15/00 12:00 Received: 10/03/00 14:20									
Dry Weight	**90.3**	1.00	%	1	0J04048	10/04/00	10/05/00	BSOPSPL003R07	

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GeoScience Management, Inc. 18608 89th Avenue N.E. Bothell, WA 98011	Project: Soil Samples Project Number: [none] Project Manager: Howard Small	**Reported:** 10/05/00 15:13

Gasoline Range Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8021B - Quality Control

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0J04013: Prepared 10/04/00 Using EPA 5030B (MeOH)										
Blank (0J04013-BLK1)										
Gasoline Range Hydrocarbons	ND	5.00	mg/kg wet							
Benzene	ND	0.0500	"							
Toluene	ND	0.0500	"							
Ethylbenzene	ND	0.0500	"							
Xylenes (total)	ND	0.100	"							
Surrogate: 4-BFB (FID)	*3.82*		"	*4.00*		*95.5*	*50-150*			
Surrogate: 4-BFB (PID)	*3.78*		"	*4.00*		*94.5*	*50-150*			
LCS (0J04013-BS1)										
Gasoline Range Hydrocarbons	23.8	5.00	mg/kg wet	25.0		95.2	70-130			
Surrogate: 4-BFB (FID)	*4.12*		"	*4.00*		*103*	*50-150*			
Duplicate (0J04013-DUP1)					**Source: B010518-14**					
Gasoline Range Hydrocarbons	3530	100	mg/kg dry		3410			3.46	50	
Surrogate: 4-BFB (FID)	*42.5*		"	*5.45*		*780*	*50-150*			*S-02*
Matrix Spike (0J04013-MS1)					**Source: B0J0041-01**					
Benzene	0.494	0.0500	mg/kg dry	0.554	ND	88.1	60-140			
Toluene	0.487	0.0500	"	0.554	ND	79.7	60-140			
Ethylbenzene	0.504	0.0500	"	0.554	0.460	7.94	60-140			Q-02
Xylenes (total)	1.59	0.100	"	1.66	0.291	78.3	60-140			
Surrogate: 4-BFB (PID)	*3.88*		"	*4.43*		*87.6*	*50-150*			
Matrix Spike Dup (0J04013-MSD1)					**Source: B0J0041-01**					
Benzene	0.493	0.0500	mg/kg dry	0.554	ND	88.0	60-140	0.203	20	
Toluene	0.483	0.0500	"	0.554	ND	79.0	60-140	0.825	20	
Ethylbenzene	0.502	0.0500	"	0.554	0.460	7.58	60-140	0.398	20	Q-02
Xylenes (total)	1.58	0.100	"	1.66	0.291	77.7	60-140	0.631	20	
Surrogate: 4-BFB (PID)	*3.86*		"	*4.43*		*87.1*	*50-150*			

North Creek Analytical - Bothell

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GeoScience Management, Inc.
18608 89th Avenue N.E.
Bothell, WA 98011

Project: Soil Samples
Project Number: [none]
Project Manager: Howard Small

Reported:
10/05/00 15:13

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0J04013: Prepared 10/04/00 Using EPA 5030B (MeOH)										
Blank (0J04013-BLK1)										
C5-C6 Aliphatics	ND	5.00	mg/kg wet							
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	"							
Total VPH (TVPH)	ND	5.00	"							
Surrogate: 4-BFB (FID)	*3.77*		"	*4.00*		*94.2*	*60-140*			
Surrogate: 4-BFB (PID)	*4.00*		"	*4.00*		*100*	*60-140*			
LCS (0J04013-BS2)										
Total VPH (TVPH)	11.2	5.00	mg/kg wet	12.0		93.3	70-130			
Surrogate: 4-BFB (FID)	*3.86*		"	*4.00*		*96.5*	*60-140*			
Surrogate: 4-BFB (PID)	*4.06*		"	*4.00*		*101*	*60-140*			
Duplicate (0J04013-DUP1)					**Source: B0I0518-14**					
C5-C6 Aliphatics	ND	100	mg/kg dry		ND				25	
C6-C8 Aliphatics	192	100	"		ND			135	25	Q-13
C8-C10 Aliphatics	192	100	"		139			32.0	25	Q-13
C10-C12 Aliphatics	753	100	"		1090			36.6	25	Q-13
C8-C10 Aromatics	ND	100	"		ND			30.4	25	Q-13
C10-C12 Aromatics	236	100	"		206			13.6	25	
C12-C13 Aromatics	1970	100	"		2130			7.80	25	
Total VPH (TVPH)	3350	100	"		3560			6.08	25	
Surrogate: 4-BFB (FID)	*48.0*		"	*5.45*		*881*	*60-140*			*S-02*
Surrogate: 4-BFB (PID)	*9.78*		"	*5.45*		*179*	*60-140*			*S-02*

North Creek Analytical - Bothell

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GeoScience Management, Inc.
18608 89th Avenue N.E.
Bothell, WA 98011

Project: Soil Samples
Project Number: [none]
Project Manager: Howard Small

Reported:
10/05/00 15:13

Volatile Organic Compounds by EPA Method 8260B - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0J04020: Prepared 10/03/00 Using EPA 5030B [P/T]										
Blank (0J04020-BLK1)										
Methyl tert-butyl ether	ND	5.00	mg/kg wet							
Benzene	ND	0.100	"							
Chlorobenzene	ND	0.100	"							
1,2-Dibromoethane	ND	0.100	"							
1,1-Dichloroethene	ND	0.100	"							
Ethylbenzene	ND	0.100	"							
Naphthalene	ND	0.100	"							
Toluene	ND	0.100	"							
Trichloroethene	ND	0.100	"							
m,p-Xylene	ND	0.200	"							
o-Xylene	ND	0.100	"							
Surrogate: 1,2-DCA-d4	*1.99*		"	*2.00*		*99.5*	*70-130*			
Surrogate: Toluene-d8	*2.06*		"	*2.00*		*103*	*70-130*			
Surrogate: 4-BFB	*2.05*		"	*2.00*		*102*	*70-130*			
LCS (0J04020-BS1)										
Benzene	0.992	0.100	mg/kg wet	1.00		99.2	70-130			
Chlorobenzene	1.02	0.100	"	1.00		102	70-130			
1,1-Dichloroethene	0.940	0.100	"	1.00		94.0	70-130			
Toluene	1.06	0.100	"	1.00		106	70-130			
Trichloroethene	0.956	0.100	"	1.00		95.6	70-130			
Surrogate: 1,2-DCA-d4	*2.04*		"	*2.00*		*102*	*70-130*			
Surrogate: Toluene-d8	*2.14*		"	*2.00*		*107*	*70-130*			
Surrogate: 4-BFB	*2.09*		"	*2.00*		*104*	*70-130*			

North Creek Analytical - Bothell

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GeoScience Management, Inc. 18608 89th Avenue N.E. Bothell, WA 98011	Project: Soil Samples Project Number: [none] Project Manager: Howard Small	**Reported:** 10/05/00 15:13

Physical Parameters by APHA/ASTM/EPA Methods - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0J04048: Prepared 10/04/00 Using Dry Weight										
Blank (0J04048-BLK1)										
Dry Weight	99.8	1.00	%							

North Creek Analytical - Bothell

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GeoScience Management, Inc. 18608 89th Avenue N.E. Bothell, WA 98011	Project: Soil Samples Project Number: [none] Project Manager: Howard Small	**Reported:** 10/05/00 15:13

Notes and Definitions

B-08	These samples were out of hold time at the time of receipt. Therefore, results are inconclusive and may represent false negatives or positives.
I-02	This sample was analyzed outside of the recommended holding time.
Q-02	The spike recovery for this QC sample is outside of NCA established control limits due to sample matrix interference.
Q-13	Multiple analyses indicate the percent recovery is outside the control limits due to a matrix effect.
R-03	The reporting limit for this analyte has been raised to account for interference from coeluting organic compounds present in the sample.
S-02	The surrogate recovery for this sample cannot be accurately quantified 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
RPD	Relative Percent Difference

North Creek Analytical - Bothell

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CHAIN OF CUSTODY REPORT

Work Order #: B0J0041

CLIENT: GSM / NORDIC PROPERTIES
REPORT TO: GSM
ADDRESS:
PHONE: 425 481-4538 FAX:

INVOICE TO: NORDIC Roger Jensen
P.O. NUMBER:

TURNAROUND REQUEST in Business Days*
Organic & Inorganic Analyses: 10 7 5 4 3 2 1 <1 (STD.)
Petroleum Hydrocarbon Analyses: 5 4 3 2 1 <1 (circled: <1) (STD.)
OTHER Please Specify
*Turnaround Requests less than standard may incur Rush Charges.

PROJECT NAME:
PROJECT NUMBER:
SAMPLED BY:

REQUESTED ANALYSES

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	VPH	+ Targets	+ TPH-G									MATRIX (W, S, O)	# OF CONT.	COMMENTS	NCA WO ID
1. B7-S1	9/15/00	X	X	X									S	1	B0J0041	-01
2.																
3.																
4.															nordic	
5.																
6.																
7.																
8.																
9.																
10.							10/4/00									
11.																
12.																
13.															FAXED	
14.																
15.																

RELINQUISHED BY: [signature] PRINT NAME: H W Small FIRM: GSM DATE: 10/3/00 TIME: 2:20pm
RECEIVED BY: [signature] PRINT NAME: Kirk Jenden FIRM: NCA DATE: 10-3-00 TIME: 2:20 Pm

RELINQUISHED BY: PRINT NAME: FIRM: DATE: TIME:
RECEIVED BY: PRINT NAME: FIRM: DATE: TIME:

ADDITIONAL REMARKS: TEMP: PAGE OF

COC REV 3/99

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3 October, 2000

Howard Small

GeoScience Management, Inc.
18608 89th Avenue N.E.
Bothell, WA 98011

RE: Newman's Chevron

Enclosed are the results of analyses for samples received by the laboratory on 09/29/00 11:20. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Paul Lawrence Miller, Jr.
Project Manager

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GeoScience Management, Inc.
18608 89th Avenue N.E.
Bothell, WA 98011

Project: Newman's Chevron
Project Number: NA
Project Manager: Howard Small

Reported:
10/03/00 16:31

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B-5,S-1	B0I0803-01	Soil	09/15/00 23:59	09/29/00 11:20
B-5,S-2	B0I0803-02	Soil	09/15/00 23:59	09/29/00 11:20

North Creek Analytical - Bothell

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GeoScience Management, Inc. 18608 89th Avenue N.E. Bothell, WA 98011	Project: Newman's Chevron Project Number: NA Project Manager: Howard Small	**Reported:** 10/03/00 16:31

Gasoline Range Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
B-5,S-1 (B0I0803-01) Soil Sampled: 09/15/00 23:59 Received: 09/29/00 11:20									
Gasoline Range Hydrocarbons	**4750**	250	mg/kg dry	50	0129032	09/29/00	09/30/00	WTPH-G/8021B	
Benzene	**7.81**	2.50	"	"	"	"	"	"	
Toluene	**20.6**	2.50	"	"	"	"	"	"	
Ethylbenzene	**27.7**	2.50	"	"	"	"	"	"	
Xylenes (total)	**222**	5.00	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*%*	*50-150*			"	"	"	"	*S-01*
Surrogate: 4-BFB (PID)	*305 %*	*50-150*			"	"	"	"	*S-06*
B-5,S-2 (B0I0803-02) Soil Sampled: 09/15/00 23:59 Received: 09/29/00 11:20									
Gasoline Range Hydrocarbons	**5300**	250	mg/kg dry	50	0129032	09/29/00	09/30/00	WTPH-G/8021B	
Benzene	**12.3**	2.50	"	"	"	"	"	"	
Toluene	**63.1**	2.50	"	"	"	"	"	"	
Ethylbenzene	**41.4**	2.50	"	"	"	"	"	"	
Xylenes (total)	**256**	5.00	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*939 %*	*50-150*			"	"	"	"	*S-06*
Surrogate: 4-BFB (PID)	*323 %*	*50-150*			"	"	"	"	*S-06*

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GeoScience Management, Inc. 18608 89th Avenue N.E. Bothell, WA 98011	Project: Newman's Chevron Project Number: NA Project Manager: Howard Small	**Reported:** 10/03/00 16:31

Volatile Petroleum Hydrocarbons by modified WDOE Interim TPH Policy Method

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
B-5,S-1 (B0I0803-01) Soil Sampled: 09/15/00 23:59 Received: 09/29/00 11:20									
C5-C6 Aliphatics	ND	250	mg/kg dry	50	0129032	09/29/00	09/30/00	WA MTCA-VPH	
C6-C8 Aliphatics	**936**	250	"	"	"	"	"	"	
C8-C10 Aliphatics	**482**	250	"	"	"	"	"	"	
C10-C12 Aliphatics	**309**	250	"	"	"	"	"	"	
C8-C10 Aromatics	**326**	250	"	"	"	"	"	"	
C10-C12 Aromatics	**599**	250	"	"	"	"	"	"	
C12-C13 Aromatics	**501**	250	"	"	"	"	"	"	
Total VPH (TVPH)	**3150**	250	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*431 %*	*60-140*			"	"	"	"	*S-06*
Surrogate: 4-BFB (PID)	*266 %*	*60-140*			"	"	"	"	*S-06*
B-5,S-2 (B0I0803-02) Soil Sampled: 09/15/00 23:59 Received: 09/29/00 11:20									
C5-C6 Aliphatics	**318**	250	mg/kg dry	50	0129032	09/29/00	09/30/00	WA MTCA-VPH	
C6-C8 Aliphatics	**809**	250	"	"	"	"	"	"	
C8-C10 Aliphatics	**453**	250	"	"	"	"	"	"	
C10-C12 Aliphatics	**437**	250	"	"	"	"	"	"	
C8-C10 Aromatics	**334**	250	"	"	"	"	"	"	
C10-C12 Aromatics	**368**	250	"	"	"	"	"	"	
C12-C13 Aromatics	**392**	250	"	"	"	"	"	"	
Total VPH (TVPH)	**3110**	250	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*695 %*	*60-140*			"	"	"	"	*S-06*
Surrogate: 4-BFB (PID)	*354 %*	*60-140*			"	"	"	"	*S-06*

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GeoScience Management, Inc. 18608 89th Avenue N.E. Bothell, WA 98011	Project: Newman's Chevron Project Number: NA Project Manager: Howard Small	**Reported:** 10/03/00 16:31

Volatile Organic Compounds by EPA Method 8260B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
B-5,S-1 (B0I0803-01) Soil Sampled: 09/15/00 23:59 Received: 09/29/00 11:20									
Methyl tert-butyl ether	ND	50.0	mg/kg dry	10	0I29031	09/29/00	09/29/00	EPA 8260B	
Benzene	ND	1.00	"	"	"	"	"	"	
1,2-Dibromoethane	ND	1.00	"	"	"	"	"	"	
Ethylbenzene	**64.1**	1.00	"	"	"	"	"	"	
Naphthalene	**25.6**	1.00	"	"	"	"	"	"	
Toluene	**40.8**	1.00	"	"	"	"	"	"	
m,p-Xylene	**499**	20.0	"	100	"	"	09/29/00	"	
o-Xylene	**212**	10.0	"	"	"	"	"	"	
Surrogate: 1,2-DCA-d4	*118 %*	*70-130*			"	"	*09/29/00*	"	
Surrogate: Toluene-d8	*112 %*	*70-130*			"	"	"	"	
Surrogate: 4-BFB	*114 %*	*70-130*			"	"	"	"	
B-5,S-2 (B0I0803-02) Soil Sampled: 09/15/00 23:59 Received: 09/29/00 11:20									
Methyl tert-butyl ether	ND	100	mg/kg dry	20	0I29031	09/29/00	09/29/00	EPA 8260B	
Benzene	ND	2.00	"	"	"	"	"	"	
Ethylbenzene	**83.0**	2.00	"	"	"	"	"	"	
Naphthalene	**56.8**	2.00	"	"	"	"	"	"	
Toluene	**152**	10.0	"	100	"	"	09/29/00	"	
m,p-Xylene	**518**	20.0	"	"	"	"	"	"	
o-Xylene	**191**	10.0	"	"	"	"	"	"	
Surrogate: 1,2-DCA-d4	*105 %*	*70-130*			"	"	*09/29/00*	"	
Surrogate: Toluene-d8	*109 %*	*70-130*			"	"	"	"	
Surrogate: 4-BFB	*107 %*	*70-130*			"	"	"	"	

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GeoScience Management, Inc. 18608 89th Avenue N.E. Bothell, WA 98011	Project: Newman's Chevron Project Number: NA Project Manager: Howard Small	**Reported:** 10/03/00 16:31

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
B-5,S-1 (B010803-01) Soil	**Sampled: 09/15/00 23:59**	**Received: 09/29/00 11:20**							
Dry Weight	**74.3**	1.00	%	1	0129045	09/29/00	10/02/00	BSOPSPL003R07	
B-5,S-2 (B010803-02) Soil	**Sampled: 09/15/00 23:59**	**Received: 09/29/00 11:20**							
Dry Weight	**81.2**	1.00	%	1	0129045	09/29/00	10/02/00	BSOPSPL003R07	

Paul Lawrence Miller, Jr., Project Manager

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GeoScience Management, Inc. 18608 89th Avenue N.E. Bothell, WA 98011	Project: Newman's Chevron Project Number: NA Project Manager: Howard Small	**Reported:** 10/03/00 16:31

Gasoline Range Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8021B - Quality Control

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0I29032: Prepared 09/29/00 Using EPA 5030B (MeOH)										
Blank (0I29032-BLK1)										
Gasoline Range Hydrocarbons	ND	5.00	mg/kg wet							
Benzene	ND	0.0500	"							
Toluene	ND	0.0500	"							
Ethylbenzene	ND	0.0500	"							
Xylenes (total)	ND	0.100	"							
Surrogate: 4-BFB (FID)	*4.00*		"	*4.00*		*100*	*50-150*			
Surrogate: 4-BFB (PID)	*3.95*		"	*4.00*		*98.8*	*50-150*			
LCS (0I29032-BS1)										
Benzene	0.990	0.0500	mg/kg wet	1.00		99.0	50-150			
Toluene	1.00	0.0500	"	1.00		100	50-150			
Ethylbenzene	1.03	0.0500	"	1.00		103	50-150			
Xylenes (total)	3.31	0.100	"	3.00		110	50-150			
Surrogate: 4-BFB (PID)	*3.96*		"	*4.00*		*99.0*	*50-150*			
Duplicate (0I29032-DUP1)					**Source: B0I0803-01**					
Gasoline Range Hydrocarbons	4760	250	mg/kg dry		4750			0.210	50	
Surrogate: 4-BFB (FID)	*39.7*		"	*5.38*		*738*	*50-150*			*S-06*

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GeoScience Management, Inc. 18608 89th Avenue N.E. Bothell, WA 98011	Project: Newman's Chevron Project Number: NA Project Manager: Howard Small	**Reported:** 10/03/00 16:31

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0I29032: Prepared 09/29/00 Using EPA 5030B (MeOH)										
Blank (0I29032-BLK1)										
C5-C6 Aliphatics	ND	5.00	mg/kg wet							
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	"							
Total VPH (TVPH)	ND	5.00	"							
Surrogate: 4-BFB (FID)	*3.98*		"	*4.00*		*99.5*	*60-140*			
Surrogate: 4-BFB (PID)	*4.22*		"	*4.00*		*105*	*60-140*			
LCS (0I29032-BS1)										
Total VPH (TVPH)	11.7	5.00	mg/kg wet	12.0		97.5	70-130			
Surrogate: 4-BFB (FID)	*3.90*		"	*4.00*		*97.5*	*60-140*			
Surrogate: 4-BFB (PID)	*4.26*		"	*4.00*		*107*	*60-140*			
Duplicate (0I29032-DUP1)					**Source: B0I0803-01**					
C5-C6 Aliphatics	ND	250	mg/kg dry		ND			3.05	25	
C6-C8 Aliphatics	863	250	"		936			8.12	25	
C8-C10 Aliphatics	447	250	"		482			7.53	25	
C10-C12 Aliphatics	285	250	"		309			8.08	25	
C8-C10 Aromatics	324	250	"		326			0.615	25	
C10-C12 Aromatics	611	250	"		599			1.98	25	
C12-C13 Aromatics	541	250	"		501			7.68	25	
Total VPH (TVPH)	3070	250	"		3150			2.57	25	
Surrogate: 4-BFB (FID)	*21.9*		"	*5.38*		*407*	*60-140*			*S-06*
Surrogate: 4-BFB (PID)	*22.4*		"	*5.38*		*416*	*60-140*			*S-06*

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GeoScience Management, Inc. 18608 89th Avenue N.E. Bothell, WA 98011	Project: Newman's Chevron Project Number: NA Project Manager: Howard Small	**Reported:** 10/03/00 16:31

Volatile Organic Compounds by EPA Method 8260B - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0I29031: Prepared 09/29/00 Using EPA 5030B [P/T]										
Blank (0I29031-BLK1)										
Methyl tert-butyl ether	ND	5.00	mg/kg wet							
Acetone	ND	1.00	"							
Benzene	ND	0.100	"							
Bromobenzene	ND	0.100	"							
Bromochloromethane	ND	0.100	"							
Bromodichloromethane	ND	0.100	"							
Bromoform	ND	0.100	"							
Bromomethane	ND	0.100	"							
2-Butanone	ND	1.00	"							
n-Butylbenzene	ND	0.100	"							
sec-Butylbenzene	ND	0.100	"							
tert-Butylbenzene	ND	0.100	"							
Carbon disulfide	ND	0.100	"							
Carbon tetrachloride	ND	0.100	"							
Chlorobenzene	ND	0.100	"							
Chloroethane	ND	0.100	"							
Chloroform	ND	0.100	"							
Chloromethane	ND	0.500	"							
2-Chlorotoluene	ND	0.100	"							
4-Chlorotoluene	ND	0.100	"							
Dibromochloromethane	ND	0.100	"							
1,2-Dibromo-3-chloropropane	ND	0.500	"							
1,2-Dibromoethane	ND	0.100	"							
Dibromomethane	ND	0.100	"							
1,2-Dichlorobenzene	ND	0.100	"							
1,3-Dichlorobenzene	ND	0.100	"							
1,4-Dichlorobenzene	ND	0.100	"							
Dichlorodifluoromethane	ND	0.100	"							
1,1-Dichloroethane	ND	0.100	"							
1,2-Dichloroethane	ND	0.100	"							
1,1-Dichloroethene	ND	0.100	"							
cis-1,2-Dichloroethene	ND	0.100	"							
trans-1,2-Dichloroethene	ND	0.100	"							
1,2-Dichloropropane	ND	0.100	"							

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GeoScience Management, Inc.
18608 89th Avenue N.E.
Bothell, WA 98011

Project: Newman's Chevron
Project Number: NA
Project Manager: Howard Small

Reported:
10/03/00 16:31

Volatile Organic Compounds by EPA Method 8260B - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0I29031: Prepared 09/29/00 Using EPA 5030B [P/T]										
Blank (0I29031-BLK1)										
1,3-Dichloropropane	ND	0.100	mg/kg wet							
2,2-Dichloropropane	ND	0.100	"							
1,1-Dichloropropene	ND	0.100	"							
cis-1,3-Dichloropropene	ND	0.100	"							
trans-1,3-Dichloropropene	ND	0.100	"							
Ethylbenzene	ND	0.100	"							
Hexachlorobutadiene	ND	0.100	"							
2-Hexanone	ND	1.00	"							
Isopropylbenzene	ND	0.100	"							
p-Isopropyltoluene	ND	0.100	"							
Methylene chloride	ND	1.00	"							
4-Methyl-2-pentanone	ND	1.00	"							
Naphthalene	ND	0.100	"							
n-Propylbenzene	ND	0.100	"							
Styrene	ND	0.100	"							
1,1,1,2-Tetrachloroethane	ND	0.100	"							
1,1,2,2-Tetrachloroethane	ND	0.100	"							
Tetrachloroethene	ND	0.100	"							
Toluene	ND	0.100	"							
1,2,3-Trichlorobenzene	ND	0.100	"							
1,2,4-Trichlorobenzene	ND	0.100	"							
1,1,1-Trichloroethane	ND	0.100	"							
1,1,2-Trichloroethane	ND	0.100	"							
Trichloroethene	ND	0.100	"							
Trichlorofluoromethane	ND	0.100	"							
1,2,3-Trichloropropane	ND	0.100	"							
1,2,4-Trimethylbenzene	ND	0.100	"							
1,3,5-Trimethylbenzene	ND	0.100	"							
Vinyl chloride	ND	0.100	"							
m,p-Xylene	ND	0.200	"							
o-Xylene	ND	0.100	"							
Surrogate: 1,2-DCA-d4	*3.90*		"	*4.00*		*97.5*	*70-130*			
Surrogate: Toluene-d8	*3.65*		"	*4.00*		*91.3*	*70-130*			
Surrogate: 4-BFB	*3.73*		"	*4.00*		*93.3*	*70-130*			

North Creek Analytical - Bothell

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

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GeoScience Management, Inc. 18608 89th Avenue N.E. Bothell, WA 98011	Project: Newman's Chevron Project Number: NA Project Manager: Howard Small	**Reported:** 10/03/00 16:31

Volatile Organic Compounds by EPA Method 8260B - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0I29031: Prepared 09/29/00 Using EPA 5030B [P/T]										
LCS (0I29031-BS1)										
Benzene	1.15	0.100	mg/kg wet	1.00		115	70-130			
Chlorobenzene	1.06	0.100	"	1.00		106	70-130			
1,1-Dichloroethene	0.989	0.100	"	1.00		98.9	70-130			
Toluene	1.06	0.100	"	1.00		106	70-130			
Trichloroethene	1.12	0.100	"	1.00		112	70-130			
Surrogate: 1,2-DCA-d4	*4.20*		"	*4.00*		*105*	*70-130*			
Surrogate: Toluene-d8	*3.97*		"	*4.00*		*99.3*	*70-130*			
Surrogate: 4-BFB	*4.11*		"	*4.00*		*103*	*70-130*			
Matrix Spike (0I29031-MS1)					**Source: B0I0638-20**					
Benzene	1.06	0.100	mg/kg dry	1.07	ND	99.1	70-130			
Chlorobenzene	1.03	0.100	"	1.07	ND	96.3	70-130			
1,1-Dichloroethene	0.877	0.100	"	1.07	ND	82.0	70-130			
Toluene	1.05	0.100	"	1.07	ND	98.1	70-130			
Trichloroethene	1.03	0.100	"	1.07	ND	96.3	70-130			
Surrogate: 1,2-DCA-d4	*1.97*		"	*2.15*		*91.6*	*70-130*			
Surrogate: Toluene-d8	*1.95*		"	*2.15*		*90.7*	*70-130*			
Surrogate: 4-BFB	*2.04*		"	*2.15*		*94.9*	*70-130*			
Matrix Spike Dup (0I29031-MSD1)					**Source: B0I0638-20**					
Benzene	1.00	0.100	mg/kg dry	1.07	ND	93.5	70-130	5.83	15	
Chlorobenzene	1.00	0.100	"	1.07	ND	93.5	70-130	2.96	15	
1,1-Dichloroethene	0.833	0.100	"	1.07	ND	77.9	70-130	5.15	15	
Toluene	1.02	0.100	"	1.07	ND	95.3	70-130	2.90	15	
Trichloroethene	0.998	0.100	"	1.07	ND	93.3	70-130	3.16	15	
Surrogate: 1,2-DCA-d4	*1.93*		"	*2.15*		*89.8*	*70-130*			
Surrogate: Toluene-d8	*2.03*		"	*2.15*		*94.4*	*70-130*			
Surrogate: 4-BFB	*2.08*		"	*2.15*		*96.7*	*70-130*			

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GeoScience Management, Inc. 18608 89th Avenue N.E. Bothell, WA 98011	Project: Newman's Chevron Project Number: NA Project Manager: Howard Small	**Reported:** 10/03/00 16:31

Physical Parameters by APHA/ASTM/EPA Methods - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0I29045: Prepared 09/29/00 Using Dry Weight										
Blank (0I29045-BLK1)										
Dry Weight	100	1.00	%							

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GeoScience Management, Inc. 18608 89th Avenue N.E. Bothell, WA 98011	Project: Newman's Chevron Project Number: NA Project Manager: Howard Small	**Reported:** 10/03/00 16:31

Notes and Definitions

S-01	The surrogate recovery for this sample is not available due to sample dilution required from high analyte concentration and/or matrix interferences.
S-06	The recovery of this surrogate is outside control limits due to sample dilution required from high analyte concentration and/or matrix interferences.
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
RPD	Relative Percent Difference

Paul Lawrence Miller, Jr., Project Manager

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20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 (541) 383-9310 FAX 382-7588

B0I0803

CHAIN OF CUSTODY REPORT

Work Order #: B0I0803

CLIENT: GeoScience Mgmt / Nordic Properties
REPORT TO: GSM
ADDRESS: Bothell WA
PHONE: 425 481-4538 FAX:

INVOICE TO: Nordic Properties
Port Orchard, WA.

P.O. NUMBER:

PROJECT NAME: Newmans Chevron
PROJECT NUMBER:
SAMPLED BY: HWSmall

TURNAROUND REQUEST in Business Days*
Organic & Inorganic Analyses: 10 | 7 | 5 | 4 | 3 | 2 | 1 | < 1
STD. Petroleum Hydrocarbon Analyses: 5 | 4 | 3 | 2 | 1 | < 1
STD. OTHER Please Specify
*Turnaround Requests less than standard may incur Rush Charges.

REQUESTED ANALYSES

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	VPH	MTBE/EDB/NAPHALENE	MATRIX (W, S, O)	# OF CONT.	COMMENTS	NCA WO ID
1. B-5,S-1	9/15/00	X	X	S	1	B0I0803-01	
2. B-5,S-2	9/15/00	X	X	S	1	-02	
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							
11.							
12.							
13.							
14.							
15.							

RELINQUISHED BY: PRINT NAME: HWSmall FIRM: GSM DATE: 9/29/00 TIME: 11:20 AM
RECEIVED BY: PRINT NAME: S. Takamatsu FIRM: NCA DATE: 9-29-0 TIME: 11:20
RELINQUISHED BY: PRINT NAME: FIRM: DATE: TIME:
RECEIVED BY: PRINT NAME: FIRM: 23.6° DATE: TIME:

ADDITIONAL REMARKS: Need results by next Thursday Oct. 5 2000

TEMP: 23.6°

ATTACHMENT D

Interim TPH Calculations

EVALUATION OF TPH FOR SOIL CLEANUP LEVEL

Newman's Chevron, 2021 6th Street, Bremerton, WA

INTRODUCTION

To develop a Method B total petroleum hydrocarbon (TPH) soil cleanup level for the Newman's Chevron, the Washington State Department of Ecology's (Ecology) Interim TPH Policy (Ecology, 1997) was applied. The policy utilizes the concentrations, chemical properties, and toxicity information for individual compounds and petroleum hydrocarbon fractions that comprise TPH to determine if soil TPH concentrations meet soil and groundwater cleanup standards. Specific analytical methods that identify the TPH carbon-range fractions present in soil were developed in association with the Interim TPH Cleanup Policy. The fractionation analyses quantify the concentrations of specific carbon-range aliphatic and aromatic TPH components. Based on a review of TPH results and chromatograms for samples collected at the subject property, samples were analyzed for Volatile Petroleum Hydrocarbons (VPHs) and BTEX (benzene, toluene, ethyl benzene, and xylenes) .

IDENTIFICATION OF TPH PRODUCT TYPES

Over the course of the project a series of soil samples were collected and analyzed for gasoline range TPHs using Washington State Test Method NWTPH-G, some samples were also analyzed for benzene, toluene, ethyl benzene, and xylenes. Two samples from the data set (from here on known as the "representative samples") were also analyzed for VPHs using Ecology's VPH Method. VPH results indicated those soil samples (B-5-S1and B-5-S2) contained gasoline range VPHs. The representative samples reflect the type of petroleum product present at the site and the highest gasoline TPH concentrations discovered at the site. The TPH concentrations for the representative samples are as follows:

Representative Sample Number	Sample Date	TPH (mg/kg)	Product Type
B-5-S1	9/15/00	4,750	Gasoline
B-5-S2	9/15/00	5,300	Gasoline

A review of TPH chromatograms identified the primary products in soils as weathered gasoline. Chromatograms for representative samples are presented in Figures 1C and 2C. A copy of the laboratory analytical reports is available in Attachment C It should be noted that petroleum contaminated soil associated with samples B-5-S1 and B-5-S2 were excavated in December of 2000

INTERIM TPH POLICY CLEANUP CRITERIA

Under the Interim TPH (ITPH) Policy, the impact of TPHs on human health via direct soil contact is determined by assessing the risk that individual fractions of TPHs pose to human health and groundwater quality. The risk to human health is evaluated by calculating the hazard quotient (HQ) of a group's aliphatic and aromatic fractions reported from the VPH analysis. Ecology defines the HQ as follows:

> "The ratio of the dose of a single hazardous substance over a specified exposure period to a reference dose for the substance for a similar exposure period".

For the ITPH Policy, the Hazard Index (HI) is derived from the sum of the HQ for each group of fractions comprising the TPHs. Under MTCA Method B cleanup standards, if the HI is less than or equal to one, the concentration of TPHs in the sample does not pose a risk to human health via direct soil contact.

To determine if the concentrations of TPHs in soil are a threat to groundwater quality, the ITPH Policy provides a model to predict the concentration of TPHs in groundwater. The model uses the proportion of each aliphatic and aromatic fraction in soil, the chemical properties of each fraction, and assumptions regarding the dilution of each fraction in the groundwater below the source area to estimate the groundwater TPH concentration. Under ITPH Policy, the cleanup level for TPHs in the groundwater is equivalent to the MTCA Method A TPH groundwater cleanup level of 1 mg/L.

ANALYTICAL RESULTS

VPH vs. TPH

A review of the sample chromatograms indicates the dominant petroleum product in the two representative samples, and other samples collected at the site, is weathered gasoline. The total concentrations of VPH aliphatic and aromatic fractions in the representative samples were as follows:

Representative Sample Number	Aliphatic Fractions (mg/kg)	Aromatic Fractions (mg/kg)	Total VPH(1) (mg/kg)	TPH as NWTPH (mg/kg)
B-5-S1	1,727	1,467	3,194	4,750
B-5-S2	2,017	1,246	3,263	5,300

For the two representative samples, total VPH and TPH results differ by factors of 1.5 (B-5-S1) and 1.6 (B-5-S2). The factor differences are primarily attributed to differences in the VPH and TPH analytical methods, and the presence of non-petroleum organic compounds in gasoline; sample heterogeneity may also play a small role. Professional experience has shown that VPH and TPH results for pure standards of petroleum products eluting in the gasoline range can typically differ by a factor of two.

EVALUATION OF ON-SITE TPH CONTAMINATED SOIL

The Interim TPH Policy evaluates compliance with cleanup requirements based on the following:

- Non-carcinogenic evaluation of human health hazards, based on direct soil contact;
- Carcinogenic evaluation of human health risk, based on direct soil contact; and
- Protection of groundwater, based on contaminant transport from soil to groundwater through leaching.

EVALUATION OF NON-CARCINOGENIC HUMAN HEALTH - DIRECT SOIL CONTACT

For the two samples analyzed for VPHs, concentrations were 3,194 and 3,263 mg/kg. The highest total VPH concentration was associated with sample B-5-S2 (associated TPH of 5,300 mg/kg). The calculated HIs for the samples B-5-S1 to B-5-S2 were 0.41 and 0.65, respectively. HIs for the representative samples are less than the cleanup criteria (HI = 1). Results from the evaluation of non-carcinogenic health effects are presented in Tables 1C and 2C.

Table 1C and Table

Using the VPH results for sample B-5-S1, a Method B TPH soil cleanup level was calculated for the subject property. The cleanup level was derived by back-calculating Ecology's direct contact exposure model. Using this procedure, a total VPH concentration of 4,786 mg/kg was estimated to result in an HI equal to one (see Table 3C for calculations). Using a factor difference of 1.26, the factor difference between VPH and TPH results for sample B-5-S1, a total VPH concentration of 4,786 mg/kg is equivalent to a TPH concentration of 7,719 mg/kg. This TPH concentration is protective of human health via the direct soil contact pathway. However, given the fact that a gasoline range TPH concentration of 7,719 mg/kg may exceed the residual saturation concentrations for gasoline in soil, a conservative cleanup number for the site of 2,000 mg/kg gasoline range TPHs is proposed. The cleanup level assumes there is no detectable benzene present in the samples and the proportions the various aromatic and aliphatic fractions remain similar to that of samples B-5-S1 to B-5-S2.

EVALUATION OF CARCINOGENIC HUMAN HEALTH RISK

Benzene was not detected in samples B-5-S1 and B-5-S2. These findings are based on result for samples analyzed using EPA Test Method 8260B. It should be noted that benzene was detected in the samples when analyzed using EPA Test Method 8021B. However, in discussions with the laboratory it was determined that the compound identified as benzene using EPA Test Method 8021B was probably not benzene but heptene which has a similar retention time as benzene. This conclusion is based on a review of GC chromatograms and mass spectrometer ion chromatograms.

SOIL TO GROUNDWATER TRANSPORT PATHWAY

The impact of TPHs in representative soil samples on groundwater quality was evaluated using a soil to groundwater pathway model presented in the ITPH Policy. The model was run using Ecology's recommended default input parameters. For the representative samples, the model predicted groundwater TPH concentrations ranging from 1.12 and 2.26 for samples B-5-S1 and B-5-S2, respectively. The predicted concentrations exceed the groundwater cleanup level of 1 mg/l. A review of the soil to groundwater pathway result indicates that toluene (B-5-S1 and B-5-S2 were 40.8 and 152 mg/kg, respectively) is the primary compound causing the predicted groundwater concentrations to exceed the cleanup level. Substituting a toluene concentration of 20 mg/kg into soil-groundwater pathway model for samples B-5-S1 and B-5-S2 leads to a predicted groundwater concentrations of less than 1 mg/l.

These findings indicate a soil TPH cleanup level of 2,000 mg/kg is protective of groundwater quality based on the groundwater cleanup of 1 mg/l TPHs. In addition, the cleanup level assumes samples contain less than or equal to 20 mg/kg toluene, no detectable benzene, and a similar distribution of aromatic and aliphatic fractions as found in samples B-5-S1 and B-5-S2.

REFERENCES

U.S. Environmental Protection Agency. Semi-Volatile Organic Compounds Test Method 8270b.SW846, Third Edition. Olympia, Washington, 1995.

Washington State Department of Ecology. The Model Toxics Control Act Cleanup Regulations, Chapter 173-340 WAC. Olympia, Washington, 1996.

Washington State Department of Ecology. The Model Toxics Control Act Cleanup Levels and Risk Calculations (CLARC II) Update. Olympia, Washington, 1996.

Washington State Department of Ecology. Interim TPH Policy Statement: Cleanup of Total Petroleum Hydrocarbons. Olympia, Washington, 1997.

Washington State Department of Ecology. Update 5 to the Interim TPH Policy Statement: Cleanup of Total Petroleum Hydrocarbons. Olympia, Washington, 1998.

Washington State Department of Ecology. Method for the Determination of Volatile Petroleum Hydrocarbons. Olympia, Washington, 1998.

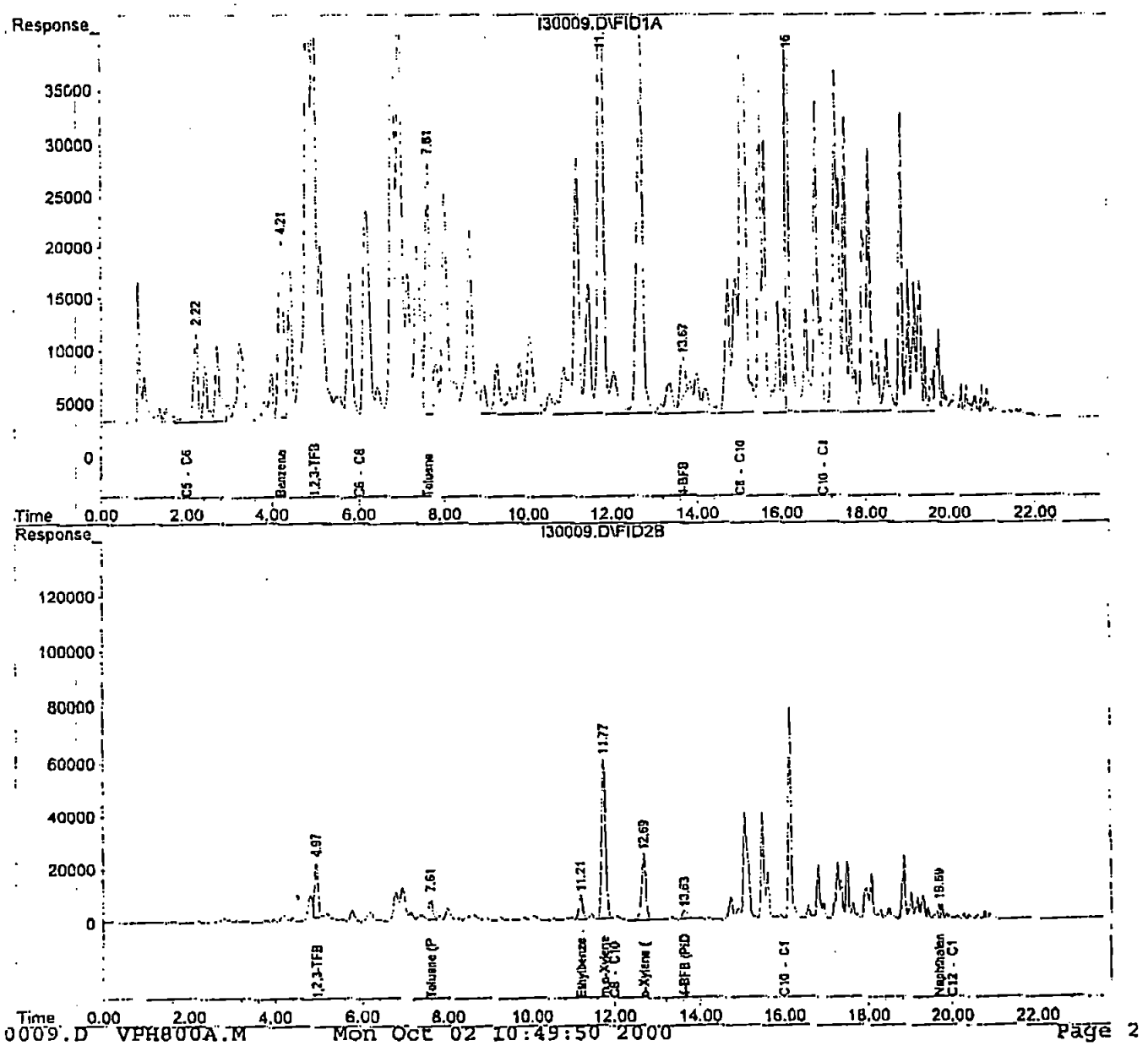

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Figure 1C
Chromatogram for Sample B-5-S1

NEWMAN CHEVRON
2021 SIXTH STREET
BREMERTON, WASHINGTON

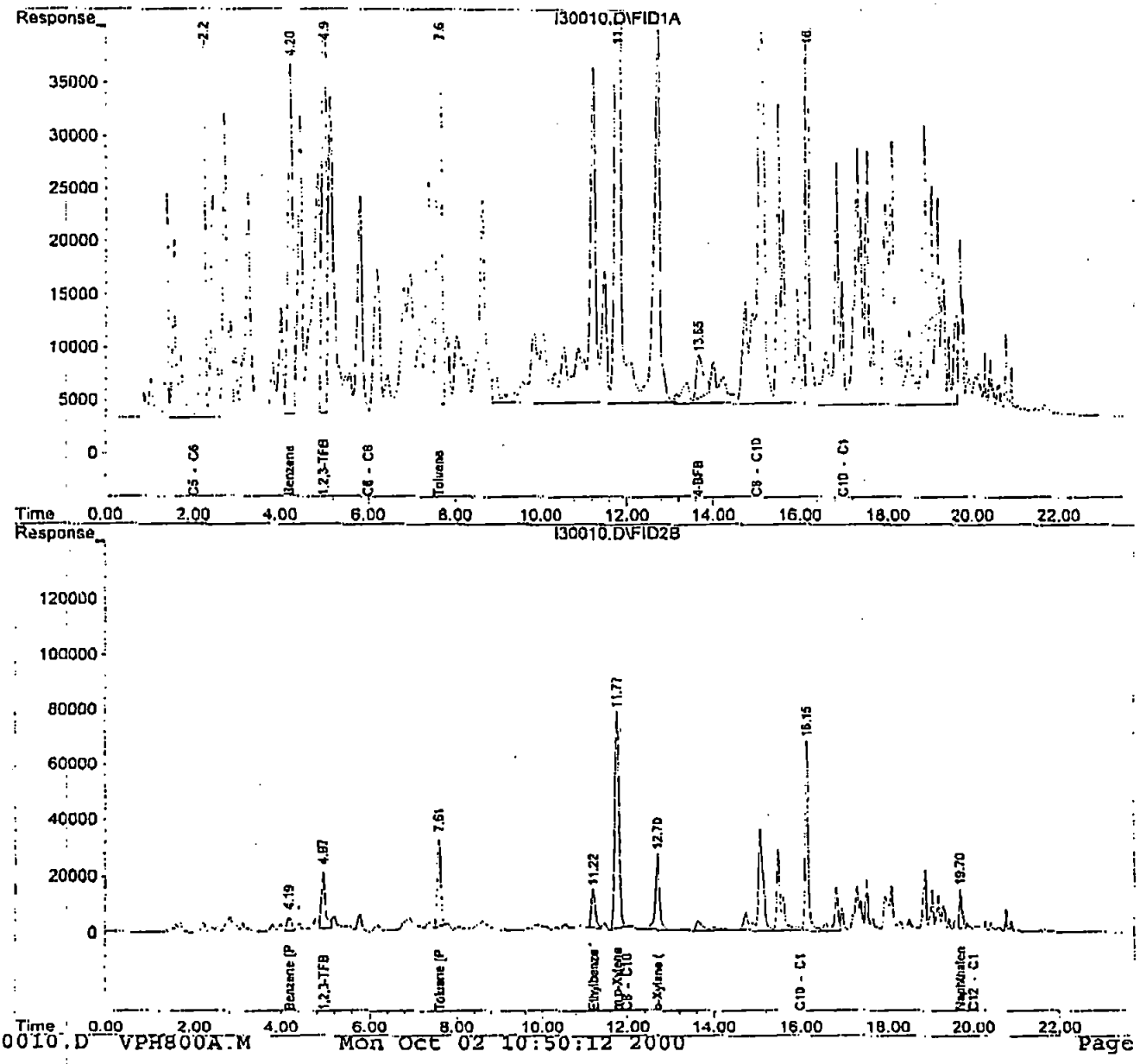

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Figure 2C
Chromatogram for Sample B-5-S2

NEWMAN CHEVRON
2021 SIXTH STREET
BREMERTON, WASHINGTON

ATTACHMENT E

Waste Disposal Documentation

WASTE MANAGEMENT

OLYMPIC VIEW SANITARY LANDFILL

PERMIT # 2000-194

PERMIT TO DISPOSE OF NON-HAZARDOUS/ NON-DANGEROUS MATERIALS

EXPIRES: 3/27/01

GENERATOR: NORDIC PROPERTIES, INC.

DESCRIPTION:*PCS - GASOLINE AND DIESEL, CLASS IV*		TONS:*30*
LOCATION: *BREMERTON, WASHINGTON*		
CONTACT: *HOWARD SMALL*		PHONE: *425-508-5020*
BILLING: **wilkins distribution aka nordic properties**	PO#:	JOB#:

We accept business checks, cash or charge (with prior approval)

SPECIAL HANDLING : *NONE:*

APPROVED: KQ Kristin Castner DATE: *12/27/00 7:23:20 AM*

A COPY OF THIS PERMIT MUST BE SHOWN BY EACH DRIVER

HAZARDOUS/DANGEROUS WASTE IS STRICTLY PROHIBITED