

**RELEASE INVESTIGATION
JACK'S SERVICE, FACILITY #1776
DELTA JUNCTION, ALASKA**

January 1998

*Jacks Service
P.O. Box 587
Delta Junction, Alaska*

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CONSERVATION
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SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

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1.0 PROJECT DESCRIPTION

1.1 Purpose and Scope

This report summarizes our release investigation of the underground storage tank (UST) system at Jack's Service in Delta Junction, Alaska. This project was funded in part by the Alaska Department of Environmental Conservation (ADEC) Financial Assistance Program, Grant # 15177621. The grant was awarded by the ADEC Underground Storage Tanks Financial Assistance Program on May 16, 1997. The objective of this release investigation was to delineate the extent of soil contamination associated with the former UST system and characterize the contaminated soil stockpile located on the property, for the development of corrective action alternatives for ADEC approval.

Our work was performed in general accordance with ADEC regulations 18 AAC 78 and our Quality Assurance Program Plan for Underground Storage Tank Site Assessments on file with ADEC.

To achieve the stated objective Shannon & Wilson performed the following scope of work:

- We prepared a Work Plan which included a Sampling and Analysis Plan, a Quality Assurance Project Plan, and a Site Safety and Health Plan.
- We installed and sampled ten soil borings ranging in the depth from 20 to 31 feet. Two of the borings were completed as vapor recovery test wells. We collected soil samples at 5-foot intervals for field screening and possible laboratory analyses.
- We submitted 17 soil samples from the borings for analytical testing. The samples were analyzed for gasoline range organics (GRO), benzene, toluene, ethylbenzene and xylenes

*Soil / air
No HVOE
Data!*

(BTEX), and diesel range organics (DRO). Four samples from the borings were submitted for the analysis of Total Organic Carbon, Total Nitrogen, Nitrate, Total Kjeldahl Nitrogen, Phosphate, pH, Alkalinity, and Heterotrophic Bacteria/Hydrocarbon Degrading Bacteria to evaluate nutrient availability and potential effectiveness of bioremediation.

- This is the
only GW Data collected!*
- We excavated four test pits within the soil stockpile and collected samples for analytical testing. We submitted eight soil samples from the test pits for hydrocarbon analyses. Four samples from the stockpile were submitted for the analysis of Total Organic Carbon, Total Kjeldahl, Total Phosphate, pH, Alkalinity, Heterotrophic Bacteria/Hydrocarbon Degrading Bacteria.
 - We collected a sample from the on-site drinking water well and submitted it for analytical testing of volatile organic compounds. *N.D.*
 - We performed a vapor extraction pilot test on the vapor recovery test wells and the previously existing ventilation piping using a portable vacuum unit.
 - We prepared this report summarizing the results of our field work and presenting our conclusions and recommendations.

1.3 Site Description

Jack's Service, Facility No. 1776, is located at mile 266.5 Richardson Highway in Delta Junction, Alaska. The property is described as Lots 7, 9, and 10, USS-2770, and that portion of Lots 85 and 86 east of the Richardson Highway. The general property location is given as the northeast $\frac{1}{4}$ of the northwest $\frac{1}{4}$ of Section 23, Township 10 South, Range 10 East, Fairbanks Meridian, Alaska. Figures 1 and 2 show the property location and the site features.

Jack's Service is located on the east side of the Richardson Highway access road in Delta Junction, approximately 1,000 feet north of the junction with the Alaska Highway. The facility

includes an approximately 1,350-square-foot two-bay garage/office building. Two new USTs were installed in 1995 on the south side of the building. These include a single-compartment double-wall 12,000-gallon tank and a triple-compartment double-wall 12,000-gallon tank. Jack's Service dispenses regular unleaded gasoline, super unleaded gasoline, and diesel fuel. Two gasoline dispensers are located on a single island on the west side of the building, and a single dispenser overlying the tanks south of the building dispenses diesel fuel. The heating-oil tank is located at the northeast corner of the building. Water is supplied by a well which is located about 200 feet northeast of the building.

1.4 Background

Jack's Service has been a vehicle maintenance and a fuel storage/transfer facility since the 1940s. Jack Adams acquired the property in about 1968. According to the ADEC UST Database, the USTs at the site consisted of one 2,000-gallon diesel tank installed in 1961, one dual-compartment 12,300-gallon leaded and unleaded gasoline tank installed in 1969, and a 2,000-gallon diesel tank installed in 1969. At the time of the tank closure, two new 12,000-gallon gasoline tanks were installed and are currently in use. → solvents?
HVC's?

Oil Spill Technology, Inc. (OST), of Fairbanks, Alaska, conducted an Environmental Site Assessment (ESA) in August 1994. The results of soil samples collected from test pit excavations indicated contamination at the USTs and the dispenser island exceeded the ADEC cleanup levels.

In 1995 OST performed a UST closure site assessment that included removal of the tanks, excavation of contaminated soils, and construction of a contaminated soil stockpile on the property. Results of the site assessment indicate contamination exceeding the cleanup level at the base of the UST and dispenser island excavations. Approximately 2,200 cubic yards of petroleum hydrocarbon-contaminated soil were removed from a 75-foot by 30-foot by 17-foot deep excavation beneath the dispenser island, a 40-foot by 40-foot by 12-foot deep excavation at the USTs, and the piping trench joining the two areas. Figure 2 shows the former location of the

USTs and 1995 excavation limits. The results of sampling at the base of the UST excavation ranged from 69.9 mg/kg to 2,479.3 mg/kg DRO, 163.9 mg/kg to 9,099.3 mg/kg GRO, 0.1 mg/kg to 74.6 mg/kg benzene, and 18.3 mg/kg to 2,060.3 mg/kg total BTEX. The results of sampling at the base of the dispenser island excavation ranged from 380.2 mg/kg to 444.9 mg/kg DRO, 1,979.7 mg/kg to 2,377.2 mg/kg GRO, 0.6 mg/kg to 2.1 mg/kg benzene, and 95.8 mg/kg to 375.9 mg/kg total BTEX. These results indicated soil exceeding the anticipated ADEC cleanup for GRO, DRO, benzene, and BTEX was not completely removed prior to backfilling the excavations.

The excavated soil was placed in a bermed and lined stockpile measuring approximately 90 feet by 90 feet by 8 feet thick. Horizontal ventilation piping which is perforated along its entire length was placed within the pile approximately 2 feet above the base of the pile; fertilizer in the form of urea was reportedly placed on top of each 2-foot lift placed in the stockpile.

Interim remediation measures included placing horizontal and vertical perforated piping within the dispenser island excavation prior to backfilling and at the base of the soil stockpile to promote natural attenuation. Figure 3 shows the location of the ventilation piping within the dispenser island excavation.

2.0 FIELD ACTIVITIES

2.1 Soil Borings

2.1.1 Drilling

To determine the extent of soil contamination associated with the operation of the former UST system, ten soil borings were drilled on July 14 and 15, 1997, under the supervision of Mark Lockwood, a geologist with our firm. The borings were advanced using Shannon & Wilson's truck-mounted Mobile B-61 drilling rig equipped with hollow-stem auger (4¼-inch and 6-inch I.D.). The borings were located as follows: five soil borings at the former location of the USTs, two soil borings adjacent to the former underground piping, and three soil borings in the area of the former dispenser island. The approximate boring locations are shown in Figure 4. The depth of the borings ranged from 20 to 31 feet below the ground surface. Descriptive logs of the borings are presented in Figures 6 to 15.

2.1.2 Soil Sampling

Soil samples were collected at 5-foot intervals from each boring by driving a split-spoon sampler into the soil and retrieving the sampler from the drill auger. The drive samples were collected ahead of the auger as drilling progressed, following modified Standard Penetration Test (SPT) procedures (similar to ASTM D 1586-84, but using a 3-inch O.D., split-spoon sampler and a 300-pound drop hammer). Borings through clean backfilled areas were advanced without sampling until undisturbed native soils were reached. While every attempt was made to obtain sufficient soil volume within the split-spoon sampler to collect analytical samples and headspace screening samples, the coarse nature of the subsurface soils precluded sufficient recovery at each sample interval.

A portion of the soil sample from the split spoon was promptly placed in the appropriate glass jar for laboratory analysis and a resealable plastic bag for headspace screening. The samples were recovered with a minimum of agitation from the center portion of soil in the split-spoon sampler,

excluding potentially disturbed soils at the top and bottom of the sampler. Sample jars were filled using a clean stainless steel spoon. For AK 101 samples (GRO and BTEX) approximately 25 grams of soil were placed in a pre-weighted 4-ounce wide-mouth jar supplied by the laboratory. The sample was preserved in the field by adding 25 milliliters of pre-measured methanol from a vial to completely cover the sample with the liquid. Samples for DRO and bioremediation parameters were placed in laboratory-supplied 4-ounce glass jars and filled completely without headspace. The analytical samples were placed into a cooler with an ice substitute and maintained at a temperature between 2°C to 6°C.

2.1.3 Headspace Screening

A Photovac MicroTip HL-2000 photoionization detector (PID) was used to measure total volatile compounds present in the headspace, as a semiquantitative indication of petroleum hydrocarbon concentration and to aid in the selection of samples for analytical testing. The PID was calibrated daily to an isobutylene standard. The headspace samples were warmed by placing them in the sun for at least 15 minutes, and were agitated for approximately 15 seconds prior to opening the headspace bag enough to insert the Teflon probe of the PID. The maximum value of PID reading was recorded. The PID readings are shown on the boring logs.

2.1.4 Drill cuttings

Drill cuttings were returned to the borehole upon completion of drilling and sampling. Drill cuttings that could not be placed in the borehole were placed in the soil stockpile. Clean gravel fill was used to backfill the vapor recovery wells.

2.1.5 Decontamination

The split spoon was decontaminated between each sample event to reduce the potential for cross contamination. Prior to each sampling attempt, the stainless steel spoons, split-spoon samplers, and any other nondisposable sampling equipment were scrubbed with a low-sudsing laboratory-grade detergent and rinsed with potable water and distilled water. The augers, drill rods, and any

other downhole equipment used in each soil boring during the drilling operation were cleaned prior to use with a high-pressure hot-water wash. In addition, the rear operating end of the drill rig was cleaned prior to the start of the project. Decontamination wash water was discharged to the ground surface in the area of the former USTs.

2.2 Vapor Recovery Test Wells

Two 4-inch vapor recovery test wells were completed at the location of the UST excavation (VE-6 and VE-7) for the purpose of performing an assessment of soil vapor extraction potential. The wells were completed with 0.020 machine-slotted PVC well screen from 5 feet below the ground surface to the bottom of the boring. The riser pipe from 5 feet to the ground surface was completed with solid pipe. A threaded end cap and top slip cap were used to complete the vapor test wells. A bentonite seal was placed above the well screen at a depth of 3 to 4 feet below the ground surface. A flush-mount well monument was placed over the vapor recovery test wells. The locations of these wells are shown in Figure 3.

2.3 Stockpile Test Pits

2.3.1 Excavations

Four test pits were excavated within the contaminated soil stockpile to characterize the contamination at various locations and depths within the soil pile. The location of the test pits and the sample numbers are shown in Figure 5. Test pits were excavated to a depth of 6 feet using a backhoe. The excavated soil was returned to the test pits.

2.4 Sample From Existing Water Well

A water sample was collected from the well that services Jack's Service and Jack's Liquor to determine the potential for groundwater contamination. The well, located in a well house, is equipped with a submersible pump and a pressure tank. Prior to collecting the water sample, approximately 300 gallons of water were purged and discharged to the ground surface. Water quality parameters including pH, temperature, conductivity, dissolved oxygen, and clarity were

doesn't
make
sense

How deep is well?
screened interval?

monitored during the purging. Collection of the groundwater sample was accomplished by reducing the flow rate from the well and filling three 40-ml vial preserved with hydrochloric acid with no headspace, directly from the spigot on the base of the pressure tank. The samples were placed in a cooler with an ice substitute and hand-carried to the CT&E Environmental Services Laboratory (CT&E) in Fairbanks.

2.5 Analysis

2.5.1 Soil

Soil samples from the borings were chosen for laboratory analysis based on field screening results and soil type. Seventeen samples from the borings were submitted to CT&E in Fairbanks for analytical testing. Nine samples of the silt collected at depths ranging from 5 to 15 feet below the ground surface, and eight samples from the underlying gravel at depths ranging from 20 to 25.5 feet below the ground surface, were chosen for analysis and tested by Alaska Method AK-101 for gasoline range organics (GRO) and aromatic volatile organics (BTEX: benzene, toluene, ethylbenzene, and xylenes) and by AK-102 for diesel range organics (DRO).

Four samples from borings B-3 and B-4 and four samples from test pits TP-1, TP-2, TP-3, and TP-4 were hand-delivered to Northern Testing Laboratory (NTL) in Fairbanks for bacterial counts and the analysis of soil nutrients to evaluate nutrient availability and potential effectiveness of bioremediation. Two of the samples from the boring were collected from the silt and two from the gravel. Four samples from borings B-3 and B-4 were analyzed for Total Organic Carbon (EPA 9060), Total Nitrogen (SM4500-N), Nitrate/Nitrite (EPA 300.0), Total Kjeldahl Nitrogen (EPA 351.3), Phosphate (MSA 24-5.3), pH (EPA 9045B) Alkalinity (SM2320-B), and Heterotrophic Bacteria/Hydrocarbon Degrading Bacteria (MPN/Sheen Screen). Four samples from the stockpile test pits were analyzed for Total Organic Carbon (EPA 9060), Total Kjeldahl (EPA 351.3), Total Phosphate (MSA 24-5.3), pH (EPA 9045B), Alkalinity (SM2320-B), and Heterotrophic Bacteria/Hydrocarbon Degrading Bacteria (MPN/ Sheen Screen).

In addition, four of the boring samples collected from borings B-1, B-4, B-5, and B-9 were tested for gradation (ASTM C136, C117 and D422) and moisture content (ASTM D-2216). These samples were hand-delivered to Arctic Alaska Testing Laboratory at the Shannon & Wilson Fairbanks office.

2.5.2 Groundwater

The water well that services Jack's Service and Jack's Liquor was sampled and tested for volatile organic compounds by EPA Method 524.2. The groundwater sample was submitted to CT&E; the analysis was subcontracted to NTL.

This tells us nothing!

3.0 RESULTS

3.1 Subsurface Conditions

The soil encountered in borings consisted of a 15.5- to 17.0-foot-thick layer of tan silt, underlain by gray, sandy, coarse gravel. The borings in the area of the dispenser island and to the east of the UST excavation encountered frozen ground at a depth between 7 and 11.5 feet below the ground surface. No groundwater was encountered in the borings.

3.2 Soil Samples

A summary of the analytical soil sample results from the borings, stockpile, and the bacteria/nutrient samples are presented in Tables 1, 2, and 3, respectively. The complete analytical laboratory reports are presented in Appendix A.

3.2.1 Petroleum Hydrocarbons

3.2.1.1 Pump Island

Six soil samples and one field duplicate were submitted for analysis from borings B-1, B-2, and B-3 in the area of the dispenser island. Four soil samples, plus a duplicate, were collected from 5 to 15 feet below the ground surface in silt, and two soil samples were collected at 20 feet below the ground surface in gravel.

Silt

The concentration of DRO detected in the five samples from the silt ranged from not above the practical quantification limit (PQL) to 984 mg/kg. Only one sample (848-0714-312) from boring B-3 at 10-11.5 feet contained concentrations of DRO exceeding the anticipated ADEC soil cleanup level of 200 mg/kg. It should be noted that the duplicate sample (848-0714-302) from this interval reported 78.8 mg/kg DRO.

The concentration of GRO ranged from 3.49 mg/kg to 10,100 mg/kg, benzene ranged from not above the PQL to 167 mg/kg, and the total of BTEX compounds ranged from 0.046 mg/kg to

3,130 mg/kg. Only one sample (848-0714-201) from boring B-2 at 5-6.5 feet contained concentrations of GRO, benzene, and total BTEX exceeding the anticipated ADEC soil cleanup level.

Gravel

Neither of the two samples collected at 20 feet from the gravel in the area of the dispenser contained concentrations of DRO, GRO, BTEX, or benzene exceeding the anticipated ADEC soil cleanup levels for these compounds. The concentration detected in the samples from these two borings were not above the PQL to 3.98 mg/kg DRO, 2.14 mg/kg to 2.91 mg/kg GRO, 0.110 mg/kg to 0.278 mg/kg total BTEX, nor above the PQL for benzene.

3.2.1.2 Piping Trench

Four soil samples were submitted for analysis from borings B-4 and B-5 in the area of the former piping trench. Two soil samples, plus a duplicate, were collected from 10 to 15 feet below the ground surface in silt, and two soil samples were collected at 20 feet below the ground surface in gravel.

Of the four samples analyzed from borings B-4 and B-5 in the area of the former piping trench, none exceeded the anticipated ADEC soil cleanup level for the analytes tested. The concentration of DRO detected in silt collected from between 10 and 15 feet ranged from below the PQL to 133 mg/kg, GRO ranged from 2.0 to 5.3 mg/kg, benzene ranged from not above the PQL to 0.104 mg/kg, and the total of BTEX compounds ranged from 0.101 mg/kg to 0.72 mg/kg. The concentration of DRO detected in gravel collected from 20 feet in borings B-4 and B-5 ranged from not above the PQL to 57.7 mg/kg, GRO ranged from below the PQL to 1.45 mg/kg, benzene was not above the PQL to 0.104 mg/kg, and the total of BTEX compounds ranged from 0.0309 mg/kg to 0.046 mg/kg.

3.2.1.3 UST Excavation

Seven samples and one field duplicate were submitted for analysis from borings B-6, B-7, B-8, B-9, and B-10 in the area of the UST excavation. Three soil samples, plus a duplicate, were

collected from 10 to 15 feet below the ground surface in silt; four soil samples were collected from 20 to 30 feet below the ground surface in gravel.

Silt

The concentration of DRO detected in the silt collected from 10 and 15 feet ranged from below the PQL to 899 mg/kg; only one sample (848-0715-802) from boring B-8 at 10-11.5 feet contained concentrations of DRO exceeding the ADEC cleanup level.

GRO ranged from 3.68 mg/kg to 11,900 mg/kg, benzene ranged from 0.167 mg/kg to 488 mg/kg, and the total of BTEX compounds ranged from 0.938 mg/kg to 4,943 mg/kg. Only one sample (848-0715-802) from boring B-8 at 10-11.5 feet contained concentrations of GRO, benzene, and BTEX exceeding the ADEC cleanup level. Sample 848-0714-903 from boring B-9 at 15 to 16.5 feet contained concentrations of benzene exceeding the ADEC cleanup level.

Gravel

The concentration of DRO detected in the gravel collected from between 20 and 30 feet in borings B-6, B-7, and B-8 ranged from below the PQL to 66 mg/kg. GRO ranged from 1.2 mg/kg to 1,810 mg/kg, benzene ranged from the PQL to 8.59 mg/kg, and the total of BTEX compounds ranged from 0.0336 mg/kg to 915.59 mg/kg. One sample (848-0715-0804) from boring B-8 at 20 to 21.25 feet contained concentrations of GRO, benzene, and BTEX exceeding the anticipated ADEC soil cleanup level. One sample (848-0715-603) from boring B-6 at 25-25.5 feet contained concentrations of GRO and BTEX exceeding the ADEC cleanup level.

3.2.1.4 Stockpile

The concentration of DRO detected in the soil samples collected in the stockpile test pits ranged from 54.2 mg/kg to 2040 mg/kg, GRO ranged from 109 mg/kg to 16,800 mg/kg, benzene ranged from 0.1 mg/kg to 201 mg/kg, and the total of BTEX compounds ranged from 29.9 mg/kg to 4328 mg/kg. Each of the eight samples from the stockpile exceeded the anticipated ADEC cleanup for GRO and BTEX; seven samples exceeded the ADEC cleanup level for benzene, and six samples exceeded the ADEC cleanup level for DRO.

3.2.2 Gradations

Soil gradation and moisture content were conducted by Arctic Alaska Testing Laboratories (AATL), a division of Shannon & Wilson. Gradations are included in Appendix B. For three gradation samples representing the silt between the surface and 17 feet, the samples had greater than 90 percent of the material passing the #60 sieve and between 47 percent to 66.7 percent passed the #200 sieve. The moisture content measured by AATL of the fine sandy silt ranged from 13.1 percent to 24.5 percent. The sandy gravel sample had 42 percent passing the 1.0 inch sieve, 10.7 percent passing the #20 sieve, and 0.3 passing the #200 sieve. The moisture content measured by AATL of the sandy gravel sample was 1.0 percent. Results of the moisture content performed by CT&E as part of their analytical testing indicate moisture content of the silt samples ranged between 8.7 percent to 24.5 percent, the sandy gravel samples ranged from 1.3 percent to 3.4 percent, and the stockpile samples ranged from 12.3 percent to 19.6 percent.

3.2.3 Bioremediation Parameters

3.2.3.1 Borings

Four samples were collected from borings B-3 and B-4 at various depths for nutrient and bacteria analysis to evaluate treatment effectiveness through natural attenuation or through enhanced bioremediation. Samples 848-0714-301 and 848-0714-402 are representative of silt at 10 feet, and samples 848-0714-304 and 848-0714-404 are representative of sandy gravel from 20 feet. These samples were tested for a series of parameters related to microbial counts and potential nutrient availability in the soils. Sample 848-0714-402 showed elevated levels of petroleum hydrocarbons while the other three samples did not.

A summary of the nutrient and bacteria count results are presented in Table 3. Nitrate was not detected in concentrations exceeding the detection limit of 0.3 mg/dry kg. Alkalinity ranged from 64 to 258 mg/ dry.kg. Total nitrogen ranged from not above 10 to 13 mg/dry kg. Total phosphate ranged from not above 0.10 to 0.24 mg/dry kg. Total organic carbon ranged from 11.6

to 470 mg/dry kg. The pH level ranged from 6.3 to 8.5. Heterotrophic bacteria counts ranged from 2,000 to 25,000,000 organisms per dry gram. Hydrocarbon-degrading bacteria counts indicated from 10 to 120 organisms per dry gram.

3.2.3.2 Stockpile

Four samples were collected from test pits TP-1 through TP-4 for bacteria and nutrient analysis. The samples were collected at various depths and consisted of silt containing elevated concentrations of petroleum-hydrocarbons. Kjeldahl nitrogen concentrations for the samples ranged from 380 to 9,000 mg/dry kg. Alkalinity ranged from 7 to 84 mg/dry kg. Total phosphate ranged from 0.4 to 1.42 mg/dry kg. Total organic carbon ranged from 4,930 to 11,000 mg/dry kg. The pH level ranged from 6.5 to 8.8. Heterotrophic bacteria counts ranged from 27,000 to 91,000,000 organisms per dry gram. Hydrocarbon-degrading bacteria counts indicated from 190 to 1,300 organisms per dry gram,

* 3.3 Water Sample

The groundwater sample collected from the on-site drinking water well contained measurable concentrations of methylene chloride and 1,2-dichloroethane. According to the NTL's laboratory chemist the methylene chloride is likely a laboratory contaminant. According to the laboratory chemist, the observed near detection limit values of 1,2-dichloroethane typically will not exhibit reproducible results. - It did in the duplicate!

3.4 Vapor Extraction Pilot Test

Test wells VE-6 and VE-7 and the previously installed ventilation piping, designated, VP-E and VP-W (Figure 3), were used for the vapor extraction pilot test. The wells consist of 4-inch PVC pipe with the slotted intervals extending from 5 to 25 feet. The previously installed piping consisted of 4-inch perforated septic piping. The horizontal portion of the piping was installed at a depth of approximately 16 feet below the ground surface within the backfill of the dispenser island excavation. The test was performed using a regenerative blower capable of a maximum air flow of 84 cubic feet per minute (cfm) and a maximum vacuum of approximately 140 inches of water. The pilot test of the individual wells consisted of applying a vacuum to the respective

test well, monitoring the distribution of the subsurface vacuum levels at the nearest monitoring point, and the chemistry of the exhaust air. Volatile organic compounds in the extracted air were monitored using a photoionization detector (PID) and Drager air sampling equipment; the oxygen content and lower-explosive-limit (LEL) were monitored using a combustible gas monitor (CGM).

The pilot test at each of the respective test wells was conducted for a sufficient period of time to allow the vacuum levels at the test well and monitoring points to stabilize, or until a maximum safety threshold was reached. The pilot test was performed using a vacuum of between 5 and 18.5 inches of water at the test well, which corresponded to an approximate air extraction rate of 70 and 80 cfm. For safety reasons, the test was halted if the concentration of explosive vapors approached 50 percent of the LEL.

The results of the pilot test are summarized in the following table:

Well	VOLATILE ORGANIC COMPOUNDS (mg/kg)	Oxygen (percent)	LEL (percent)	Vacuum (inches of water)	Benzene (mg/kg)	Response in closest observation well
VE-6	2,000+	15.6	41+	3 -5	200+	None
VE-7	680 - 810	11.2	11	18	-	None
VP-E	2,000+	16.5	15	4.5	-	None
VP-W	2,000+	10	48+	4.5	-	None

The PID measurements of the extracted air from VE-6, VP-E, and VP-W exceeded the capacity of the instrument. The Drager tube sampling from VE-6 exceeded the capacity of the instrument, indicating an excess of 200 mg/kg benzene may be present. The LEL of the extracted air at VE-6 and VP-W was measured in excess of 40 percent, and the oxygen content of the extracted air at all the wells ranged from 10 to 16.5 percent.

Although a vacuum response between the soil borings and the ventilation system was not observed, results of the tests indicate a high potential for removal of volatile organic compounds in the soil at a relatively low vacuum. The tests were terminated at VE-6 and VP-W because of the obtained high LEL measurements.

A vapor extraction pilot test was not conducted on the piping in the soil stockpile. The configuration of the piping at the base of the stockpile does not allow for testing to determine if vapor extraction is viable through the thickness of the soil pile. Vacuum tests would only be meaningful between adjacent horizontal pipes.

4.0 QUALITY ASSURANCE/QUALITY CONTROL

Quality assurance (QA) and quality control (QC) are important components of an environmental site investigation. QA is the integrated program for measuring the reliability of the data. QC is the routine use of specific procedures which are set forth so that defined standards of sampling and analysis are met. Work on this project was performed in accordance with our document entitled *Work Plan, Release Investigation, Jack's Service, Facility #1776, Delta Junction, Alaska*, dated June 1997. The laboratory performed QA analyses in accordance with their in-house Quality Assurance Program Plan (QAPP).

QA procedures used to validate the analytical results included the collection of field duplicate samples at a frequency of 10 percent. Field duplicate samples are collected to evaluate the measure of analytical precision (measured in relative percent difference, or RPD). An evaluation of analytical precision can be performed only if the results of analyses of both the original sample and its field duplicate are reported above the method detection limit.

Field duplicate analyses for the soil samples indicate that the RPD is within the acceptable range for all but the DRO portion of the sample pair, 848-0714-302/312. This discrepancy may be due to the incomplete homogenization of the frozen, fine-grained soil. The RPD for the water sample and its duplicate did not meet QC objectives for 1,2-dichloroethane or methylene chloride, the only analytes detected by the 524.2 analysis. According to NTL's laboratory chemist, the observed near detection limit values of 1,2-dichloroethane typically will not exhibit reproducible results. He also concluded that the methylene chloride detected in the original sample and not in the duplicate was a laboratory contaminant.

According to the laboratory QA report, the data presented were in conformance with their QAPP, except where noted. The surrogate recoveries for five soil boring samples and all of the stockpile samples were out of the acceptable range established by the laboratory's QC plan. According to the laboratory chemist, this is due to the dilution of the samples containing high concentrations

of hydrocarbons along with matrix interference and should in no way affect the overall quality of the data.

5.0 DISCUSSION

Using the available information and reasonable assumptions about the site, an ADEC Matrix Score of 35 points is derived, which is Cleanup Category B. Cleanup levels for Category B are:

Gasoline Range Organics	100 mg/kg
Diesel Range Organics	200 mg/kg
Benzene	0.5 mg/kg
Total BTEX	15.0 mg/kg

Based on the results of the soil sampling conducted during the UST closure site assessment and the results of our sampling, soil containing concentrations of petroleum hydrocarbons exceeding the anticipated ADEC cleanup levels is present in the area of the dispenser island and the UST excavation.

Boring B-1 installed in the dispenser island excavation did not encounter contaminated soils exceeding the cleanup levels. Analytical results of soil samples collected from borings B-2 and B-3 indicate that contamination west of the dispenser island is restricted to silt. PID and analytical results suggest contamination does not extend below a depth of 10 feet. According to the laboratory chemist, the chromatograms of DRO present in the samples from the area of the dispenser are consistent with weathered GRO rather than a diesel product. Results of previous sampling conducted during the closure site assessment and the results of the vapor recovery pilot test indicate that the gravel below the dispensers has been impacted. Due to access limitations in the area of the dispenser island, we were unable to evaluate the extent of contamination directly beneath the dispenser or the building.

The analytical results of soil samples collected from our borings in the area of the UST excavation indicate the contamination has penetrated the silt and impacted the underlying gravel to a depth of at least 25 feet. The PID results from B-8 suggest that the contamination does not likely extend below 25 feet. Samples from B-7 did not exceed the cleanup levels for the analytes

tested. The sample from B-9 only exceeded the cleanup level for benzene, suggesting that the horizontal extent of contamination in the area of B-8 may be limited to an area within about 15 feet of the boring. According to the laboratory chemist, the chromatograms of the DRO detected in the samples from Borings B-6, B-7, and B-8 at 20 feet (848-0715-804) and B-9 are consistent with weathered GRO rather than a diesel product, although the chromatograms of the DRO detected in sample 848-0715-802 and the duplicate from boring B-8 at 10 feet are consistent with a diesel product.

The soil in the stockpile contains petroleum hydrocarbons exceeding the anticipated ADEC cleanup levels. The analytical results indicate the presence of DRO, but according to the laboratory chemist the chromatograms are consistent with weathered GRO and middle distillates. The concentration of benzene in the samples collected from 1.5 feet below the surface of the stockpile was lower compared to the deeper samples, implying some volatilization may be occurring.

A vacuum response between soil borings and the piping ventilation system was not observed from the vapor recovery pilot test. This implies that the radius of influence is limited for this technology. However, discharge air monitoring indicated a high potential for removal of volatile organic compounds. Low rate vapor extraction or bioventing may be effective in reducing the concentration petroleum hydrocarbons from in situ soils at the site.

In general, the numbers of heterotrophic bacteria and, in particular, hydrocarbon-degrading bacteria are low at this site. No direct relationship between the bacteria populations, soil contaminant concentration, nutrient level, or depth can readily be distinguished. The analyses of alkalinity, pH, and total organic carbon (TOC) did not indicate any specific condition which might adversely affect microbial activity, and while nutrient conditions are considered low, the levels are not considered to be depressing microbial populations to the extent observed. The bacteria counts from the stockpiled soils are generally higher than in situ soils at the UST excavation area. This may be due to the addition of urea fertilizer during the construction of the

soil stockpile and the availability of oxygen and moisture. The data suggest that existing site conditions are not suitable for natural attenuation by biodegradation to be effective, although the addition of oxygen and nutrients to the subsurface environment may accentuate the biodegradation of the hydrocarbons.

The federal maximum contaminant level (MCL) for 1,2-dichloroethane is 5 $\mu\text{g/l}$. The concentration of 1,2-dichloroethane detected in the sample from the drinking water well at Jack's Service and the field duplicate ranged from 0.23 $\mu\text{g/l}$ to 0.43 $\mu\text{g/l}$. Groundwater was not encountered in any of the soil borings. Soil contamination appears to be limited to a depth of about 25 feet. The depth to groundwater is assumed to be 50 to 90 feet below the ground surface, and the flow direction is assumed to be north-northeast. The source of the 1,2-dichloroethane is not known, and there may be no relation to the operation of the USTs.

6.0 RECOMMENDATIONS

Based on the results of this release investigation and our observations, we recommend a multiphased remediation program consisting of in situ vapor extraction for contaminated soils under the dispenser island and soils at the UST excavation, and landspreading the stockpiled soils in shallow lifts within a treatment cell constructed adjacent to the existing stockpile. This section summarizes the recommended corrective action. These recommendations have been presented to ADEC in a request for continued cleanup funding for FY-98. Our scope and opinion of probable costs are detailed in our letter to ADEC dated October 31, 1997. why?

6.1 Vapor Extraction

Pilot tests were performed to assess the potential for soil vapor extraction as a remediation alternative for in situ soils. Monitoring of the discharge air and results of the tests indicate applying a low vacuum on subsurface piping will result in the removal of high concentrations of volatile organic compounds. Specific system design criteria based on site conditions observed from the release investigation and vapor recovery pilot test will include evaluation of the radius of influence for various well configurations and optimum well spacing, as well as air flow rates and blower sizing. We anticipate low-rate vapor extraction or bioventing will be suitable for the site soils. Installation considerations will include location of underground utilities, appropriate location to install the blower, and establishing power. Following installation, the remediation system will be monitored and maintained to provide optimum performance.

6.2 Landspread Treatment

It is our opinion that the soil stockpile configuration is not suitable for in situ vapor extraction, and treatment of soils by natural attenuation for the 8-foot-thick stockpile will not effectively reduce contaminant concentrations. If horizontal perforated piping had initially been installed throughout the height of the stockpile, additional corrective action would likely not be required. To effectively treat the stockpiled soils, mechanical aeration of soil in thin lifts is considered to be most effective.

A lined treatment cell measuring approximately 100 feet by 100 feet meeting ADEC requirements for landfarming will be constructed adjacent to the existing contaminated soil stockpile. Contaminated soil from the existing stockpile will be spread over the new treatment cell to an approximate depth of 18 inches. Nutrients to promote biological activity will be mixed within the soil, both in the new cell as well as the upper 18 inches of the existing stockpile, by tilling, discing, or other means. When the results of analytical testing indicate remediation effectiveness meeting level A cleanup, the treated soil will be removed and a new lift placed in the cell. Treated soils will be used as general fill on other portions of the site.

6.3 Groundwater Monitoring

Due to the presence of detectable concentrations of 1,2-dichloroethane in the drinking water supply well, we recommend collecting additional water samples. Groundwater should be monitored at least quarterly for one year to assess the potential for groundwater contamination exceeding applicable cleanup levels.

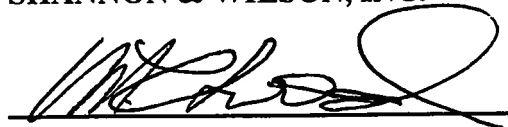
7.0 LIMITATIONS

This report presents the results of a limited number of soil and groundwater samples. The samples were intended to evaluate the presence or absence of hydrocarbon-affected media at the locations selected. It was not the intent of our assessment to detect the presence of soil affected by contaminants other than those for which laboratory analyses were performed. No conclusions can be drawn on the presence or absence of other contaminants.

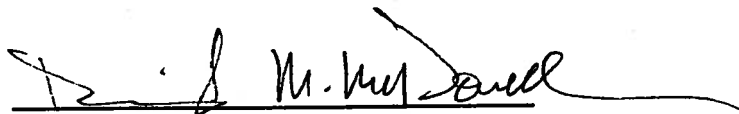
The data presented in this letter report should be considered representative of the time of our site observations and sample collection. In addition, there can be no assurance that a regulatory agency or its staff will reach the same conclusions as Shannon & Wilson.

This report was prepared for the exclusive use of Bill Adams and his representatives in the assessment of site conditions and in accordance with the approved scope of work. If it is made available to others, it should be for information on factual data only and not as a warranty of subsurface conditions, such as those interpreted from the discussions of subsurface conditions included in this report.

SHANNON & WILSON, INC.



Mark S. Lockwood
Senior Geologist



David M. McDowell
Senior Associate

TABLE 1.
Summary of Analytical Sample Results
 Jack's Service - Release Investigation
 (Results in mg/kg)

Boring								
Location	Number	Sample Number	Depth (feet)	Soil Type	DRO	GRO	Benzene	BTEX
Dispenser Island	B-1	848-0714-103	15-16.5	Silt	ND (5.05)	3.49	ND (0.05)	0.431
		848-0714-104	20-21	Gravel	ND (4.03)	2.14	ND (0.03)	0.11
	B-2	848-0714-201	5-6.5	Silt	180	10,100	167	3,130
		848-0714-203	15-15.5	Silt	24.9	5.64	0.07	1,355
	B-3	848-0714-302	10-11.5	Silt	78.8	6.7	0.105	1,242
848-0714-312		Duplicate of 302	Silt	984	6.03	0.129	1,013	
848-0714-304		20-21	Gravel	3.98	2.91	ND (0.04)	0.278	
Piping Trench	B-4	848-0714-402	10-11.5	Silt	133	5.33	0.104	0.722
	848-0714-404	20-21	Gravel	57.7	1.45	ND (0.032)	0.046	
	B-5	848-0715-503	15-16.5	Silt	ND (4.79)	2.0	ND (0.045)	0.101
848-0715-504		20-21	Gravel	ND (3.73)	ND (0.955)	ND (0.0239)	0.0309	
UST Excavation	B-6	848-0715-603	25-25.5	Gravel	85.7	370	ND (0.231)	104.42
		848-0715-604	30-31	Gravel	ND (3.86)	1.68	0.0307	0.358
	B-7	848-0715-702	20-20.5	Gravel	8.06	1.2	ND (0.0275)	0.0336
	B-8	848-0715-802	10-11.5	Silt	899	11,900	488	4,943
		848-0714-812	Duplicate of 802	Silt	692	9,910	403	4,438
		848-0715-804	20-21.25	Gravel	66	1,810	8.59	915.59
	B-9	848-0715-905	15-16.5	Silt	60.9	22.3	2.46	11.994
B-10	848-0715-1003	15-16.5	Silt	ND (3.99)	3.68	0.167	0.938	

TABLE 2.
Summary of Stockpile Sample Results
Jack's Service - Release Investigation
 (Results in mg/kg)

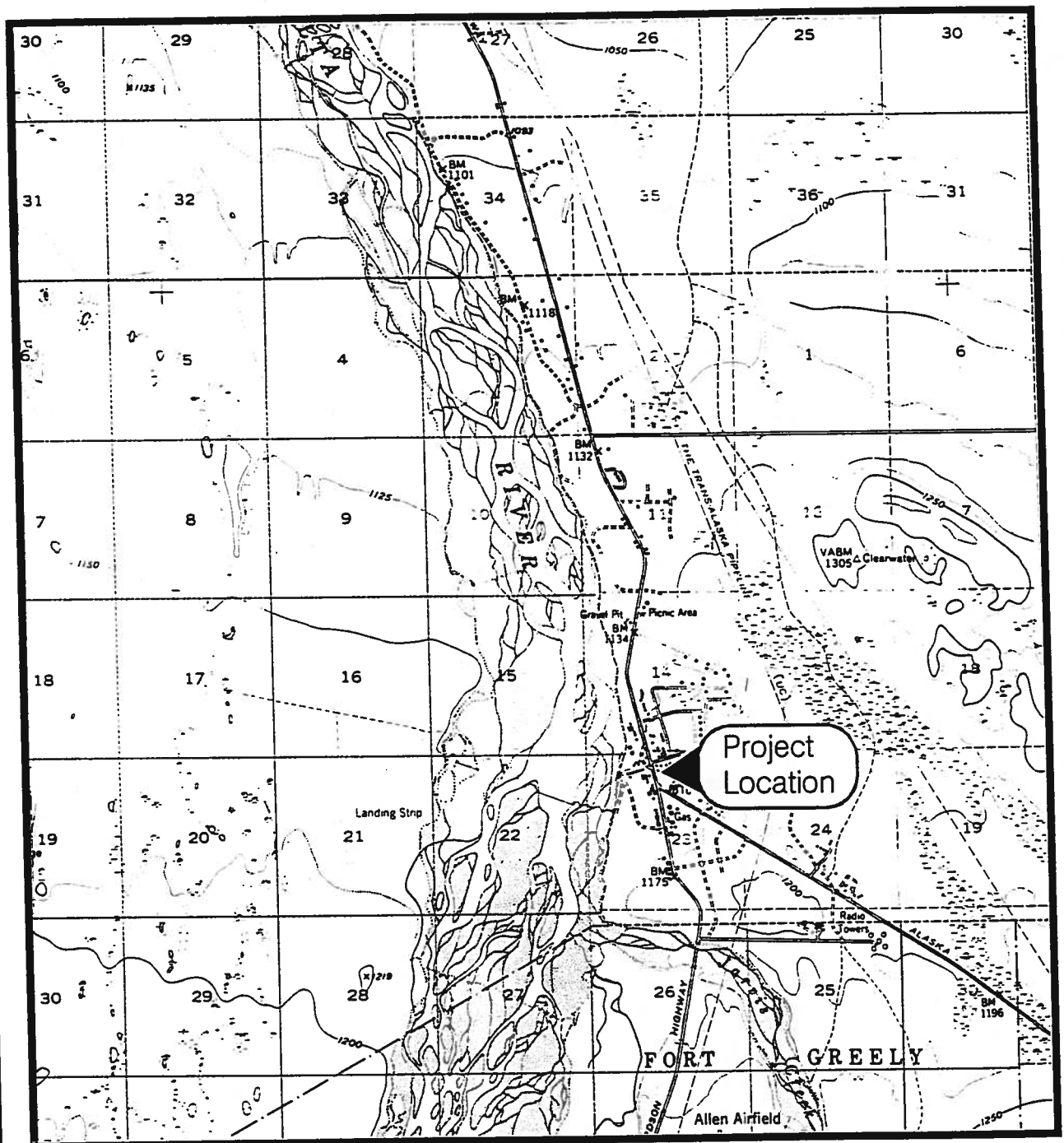
Sample Number	Depth (feet)	Soil Type	DRO	GRO	Benzene	BTEX
848-1001- 11	1.5	silt	54.2	109	0.19	43.53
848-1001- 12	5	silt	154	1730	23.1	433.3
848-1001- 21	1.5	silt	468	2140	1.36	81.7
848-1001- 51	Duplicate of 21	silt	1070	1580	0.676J*	29.98
848-1001- 22			1690	16800	201	5566
848-1001- 31	1.5	silt	2040	10700	18.1	2463.3
848-1001- 32	6	silt	1480	13700	82.4	4328.4
848-1001- 41	1.5	silt	233	626	0.955	99.415
848-1001- 42	6	silt	1020	7060	44.7	2547.7

* - J - indicates an estimated value that falls below the practical quantification limit,
 but greater than the minimum detection limit

TABLE 3.
Summary of Bacteria and Nutrient Analysis
Jack's Service - Release Investigation

Boring Number	Sample Number	Soil Type and Depth (ft)	Heterotrophic Plate Count (#/dry gram)	Sheen Screen (#/dry gram)	Total Organic Carbon (mg/dry kg)	Total Nitrogen (mg/dry kg)	Kjeldahl Nitrogen (mg/dry kg)	NO ₃ (mg/dry kg)	NO ₄ (mg/dry kg)	Phosphate (mg/dry kg)	pH	Alkalinity as CaCO ₃ (mg/dry kg)	Percent Solids
B-3	848-0714-301	Silt (10-11.5)	2.0E+03	27	11.9	13	13	<0.4	<0.4	0.24	6.3	64	84.1
	848-0714-304	Gravel (20-21)	2.5E+07	10	54.8	<10	<10	<0.3	<0.3	<0.10	8.3	258	96.9
B-4	848-0714-402	Silt (10-11.5)	1.9E+05	27	470	<12	<12	<0.4	<0.4	0.14	6.9	87	84.7
	848-0714-404	Gravel (20-21)	5.6E+06	120	12.6	<10	<10	<0.3	<0.3	<0.10	8.5	201	97.7
TP-1	848-1001-11	Silt (1.5)	4.0E+04	190	10000	-	9000	-	-	1.42	8.8	84	87.7
TP-2	848-1001-22	Silt (5)	2.7E+04	1300	11000	-	1400	-	-	0.25	7.2	8	85.2
TP-3	848-1001-31	Silt (1.5)	3.2E+07	720	4930	-	440	-	-	0.4	6.5	7	76.6
TP-4	848-1001-42	Silt (6)	9.1E+07	1300	4660	-	380	-	-	0.16	7.3	10	88

"-" - Not analyzed



Base Map: USGS Big Delta (A-4), Alaska 1950, photorevised 1975

Scale: 1 inch = 1 mile



Jack's Service Station
Release Investigation
Delta Junction, Alaska

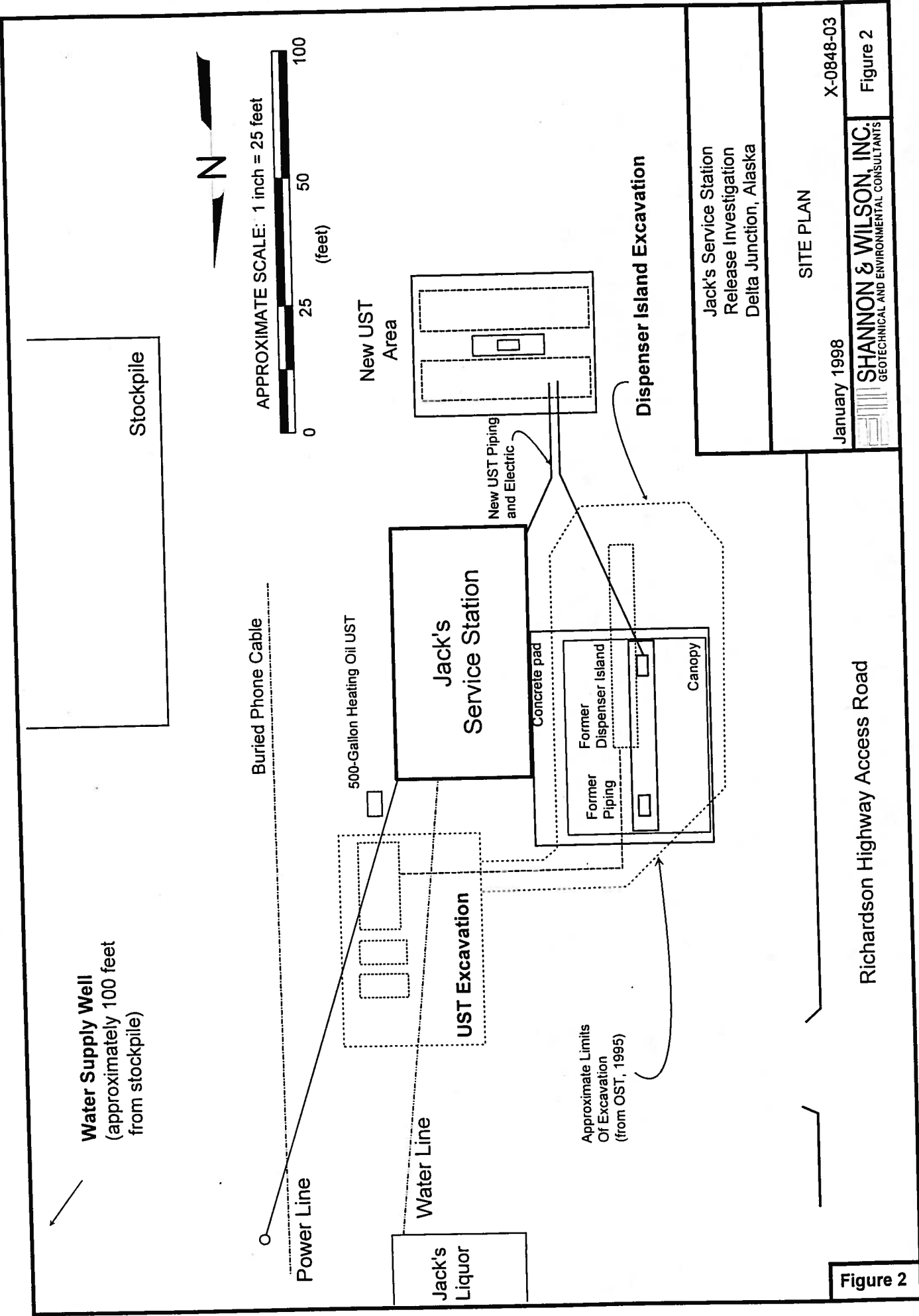
SITE LOCATION MAP

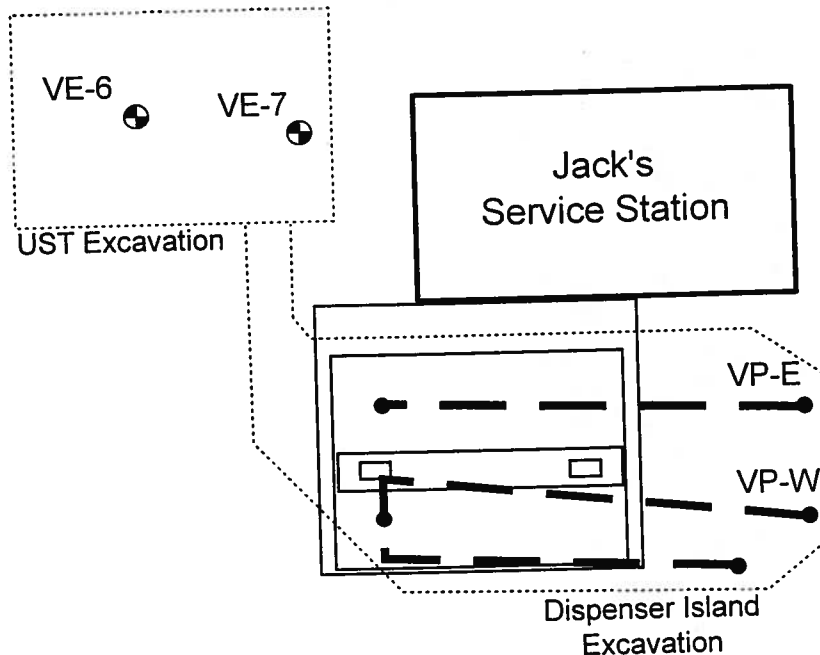
January 1998

X-0848-03



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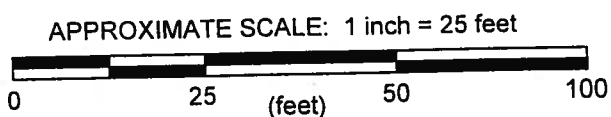
Figure 1





LEGEND:

-  - Horizontal ventilation piping installed during 1995 UST closure activities
-  - Vertical vapor extraction well installed during 1997 Release Investigation



Jack's Service Station
Release Investigation
Delta Junction, Alaska

SUBSURFACE VENTILATION PIPING

January 1998

X-0848-03

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Figure 3

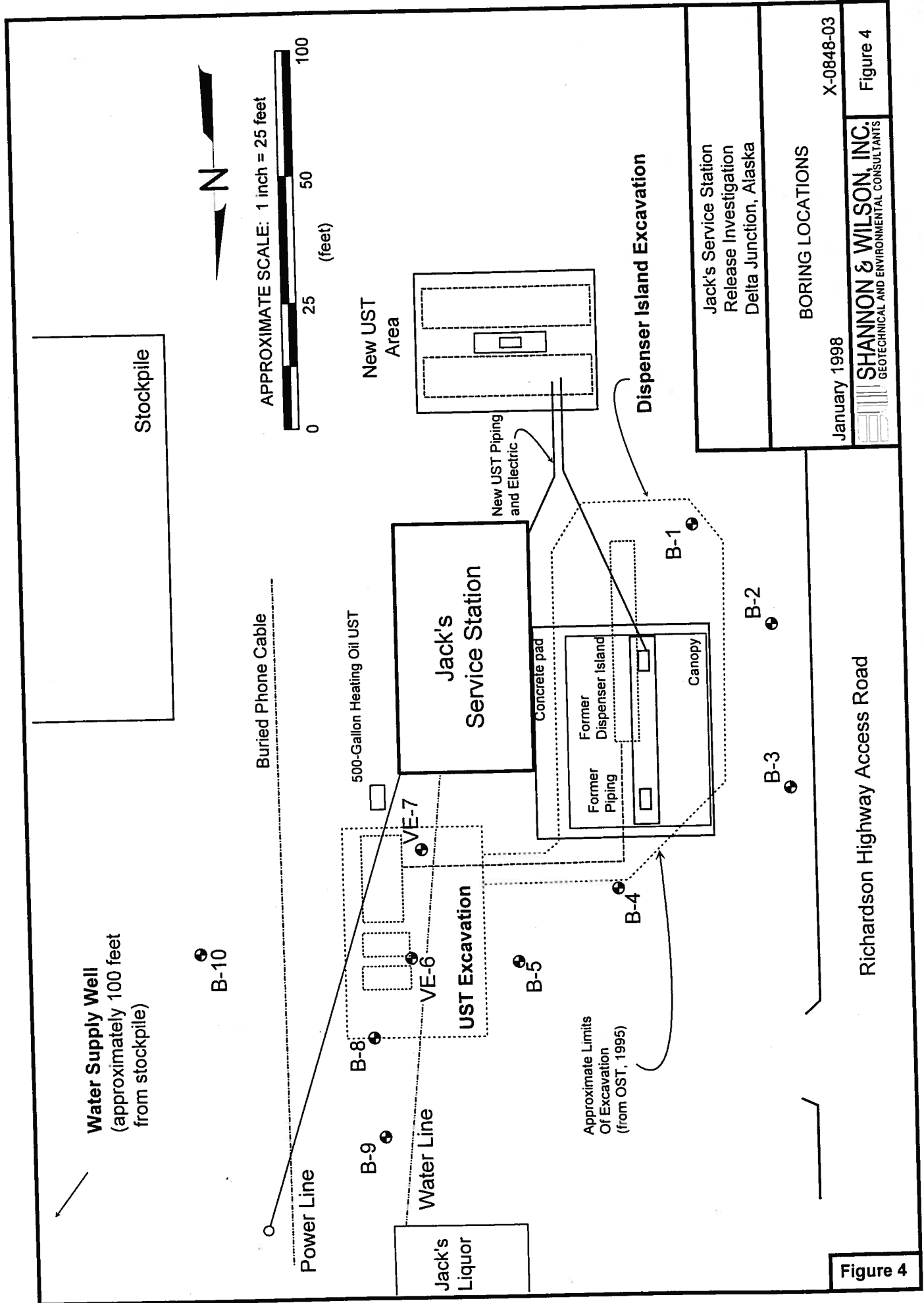
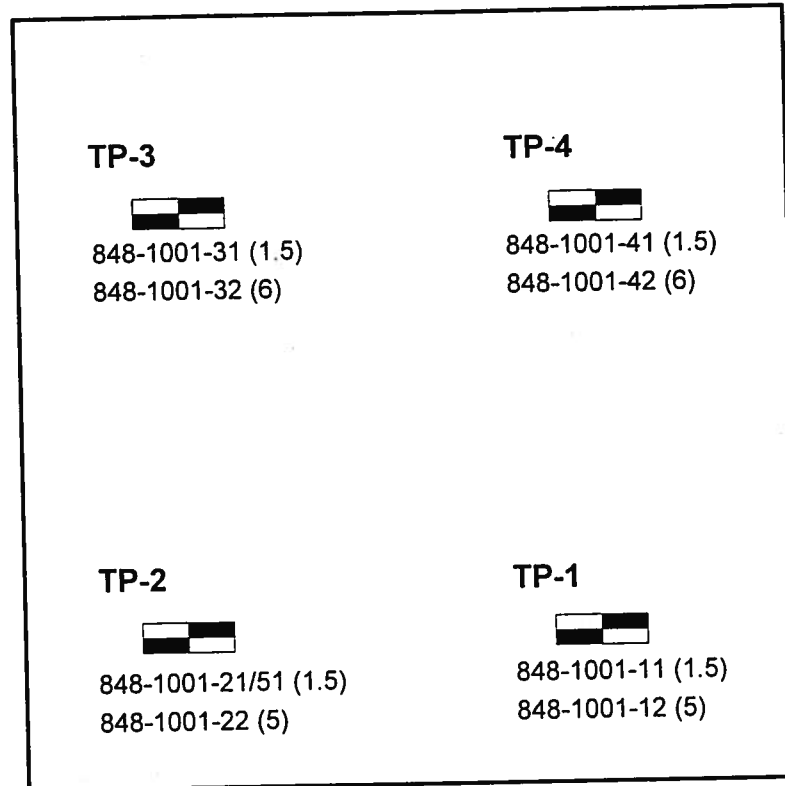



Figure 4

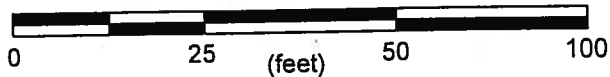


LEGEND:

TP-3
 - Test Pit Location
 848-1001-31 (1.5) [Sample Number (Depth in feet)]



APPROXIMATE SCALE: 1 inch = 25 feet



Jack's Service Station
 Release Investigation
 Delta Junction, Alaska

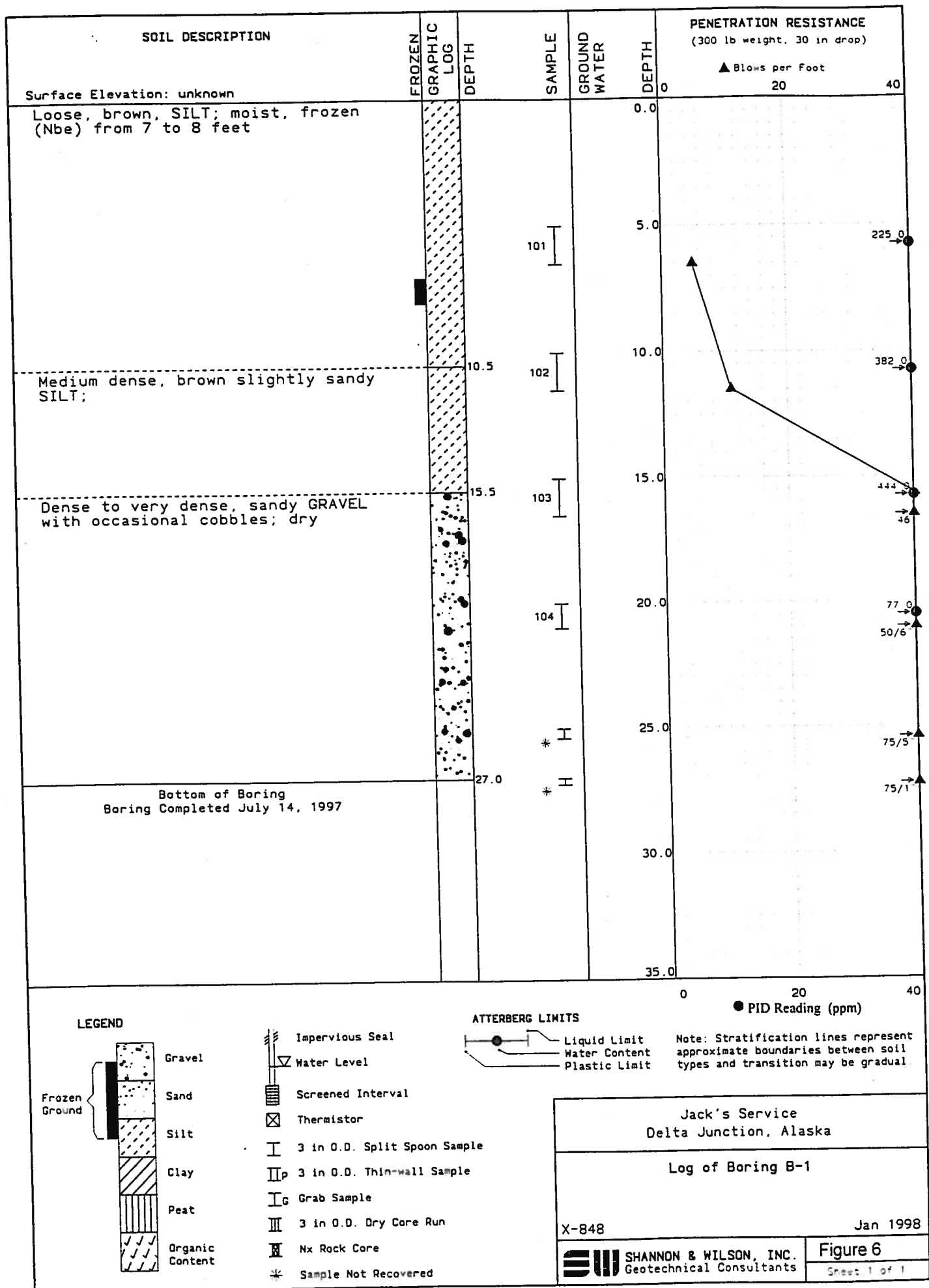
STOCKPILE TEST PIT LOCATIONS

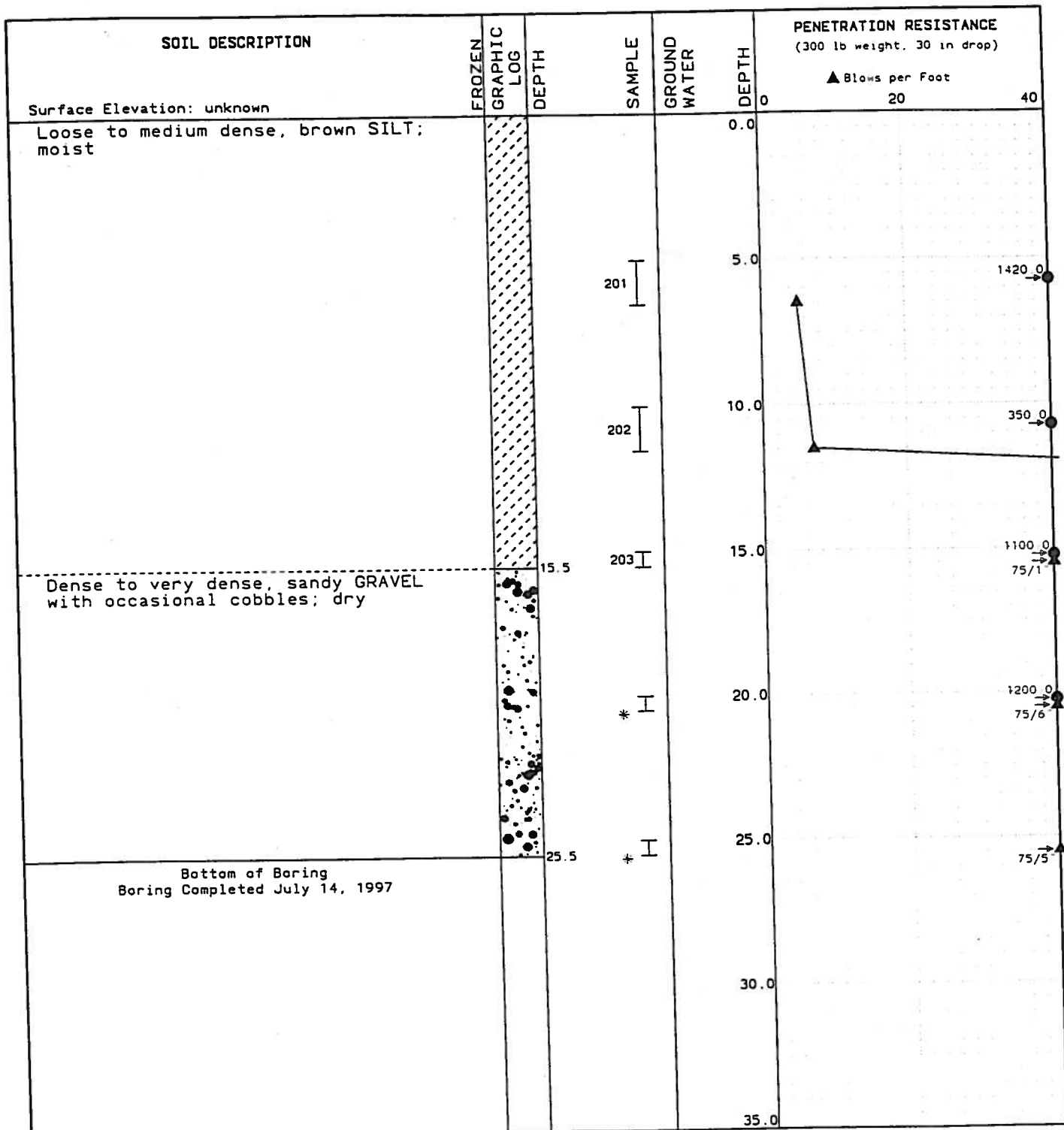
January 1998

X-0848-03

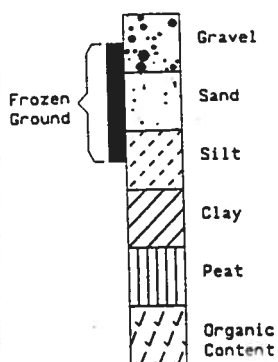
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Figure 5





LEGEND



- Impervious Seal
- Water Level
- Screened Interval
- Thermistor
- 3 in O.D. Split Spoon Sample
- 3 in O.D. Thin-wall Sample
- Grab Sample
- 3 in O.D. Dry Core Run
- Nx Rock Core
- Sample Not Recovered

ATTERBERG LIMITS



Note: Stratification lines represent approximate boundaries between soil types and transition may be gradual.

Jack's Service
Delta Junction, Alaska

Log of Boring B-2

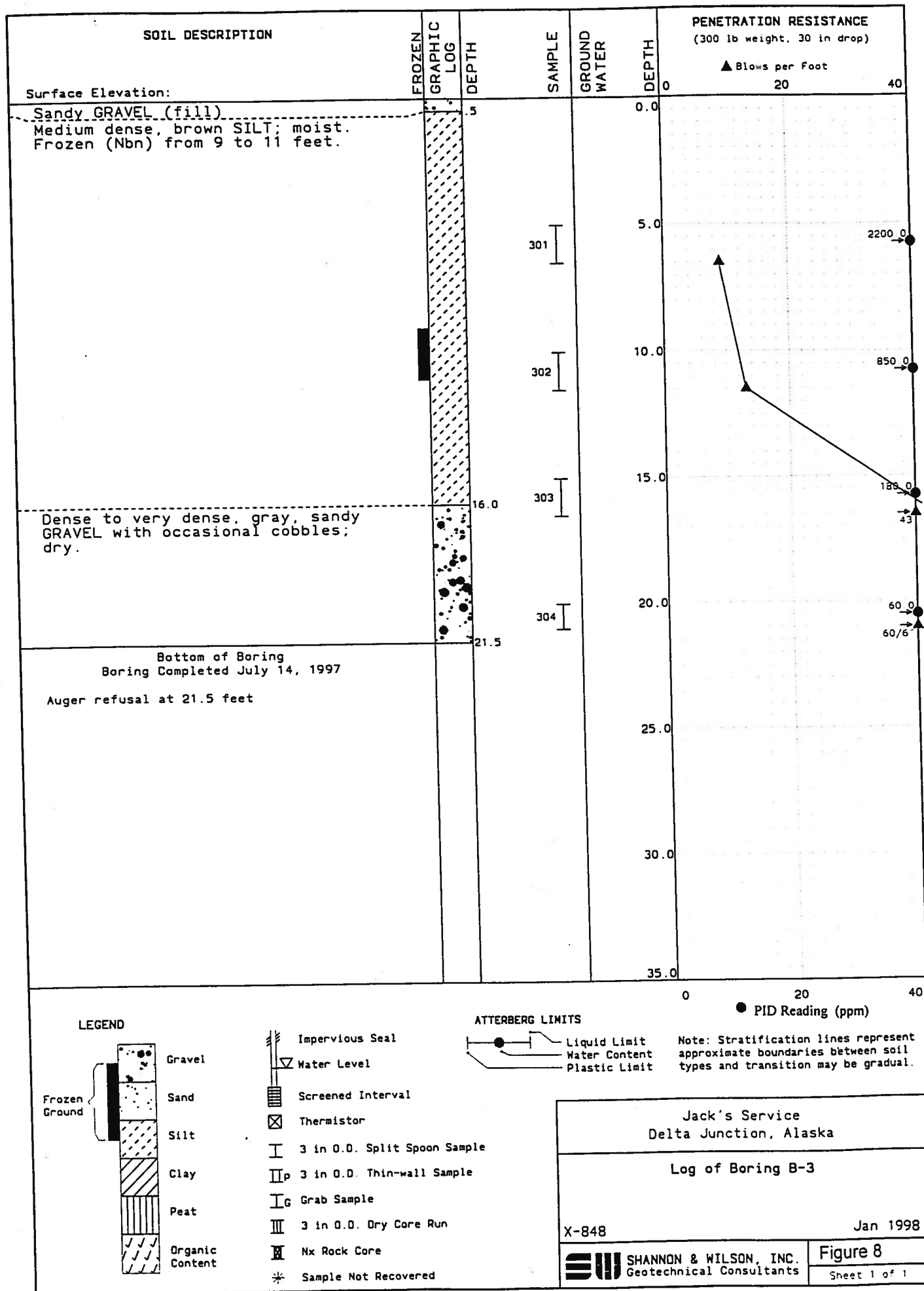
X-848

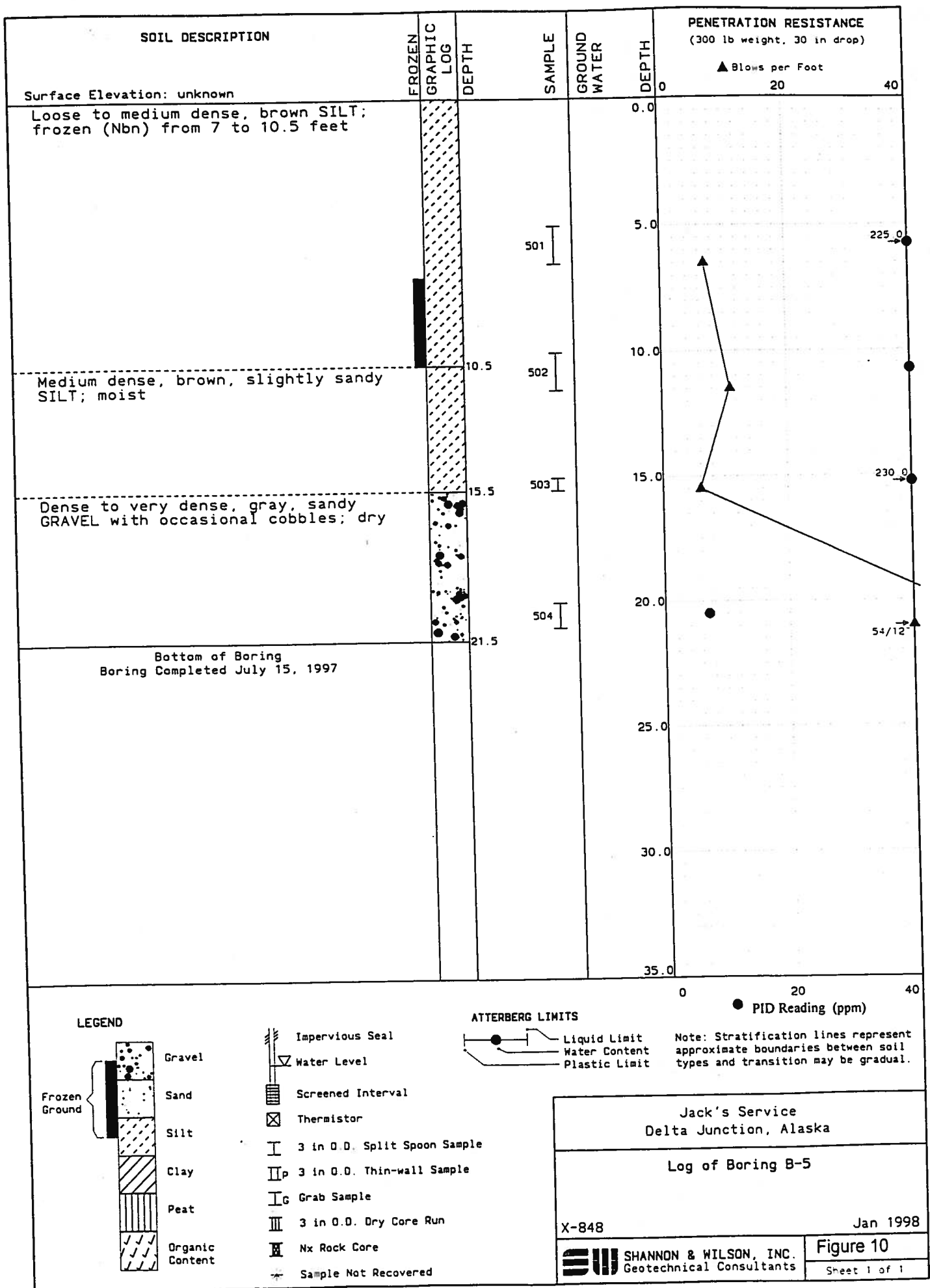
Jan 1998

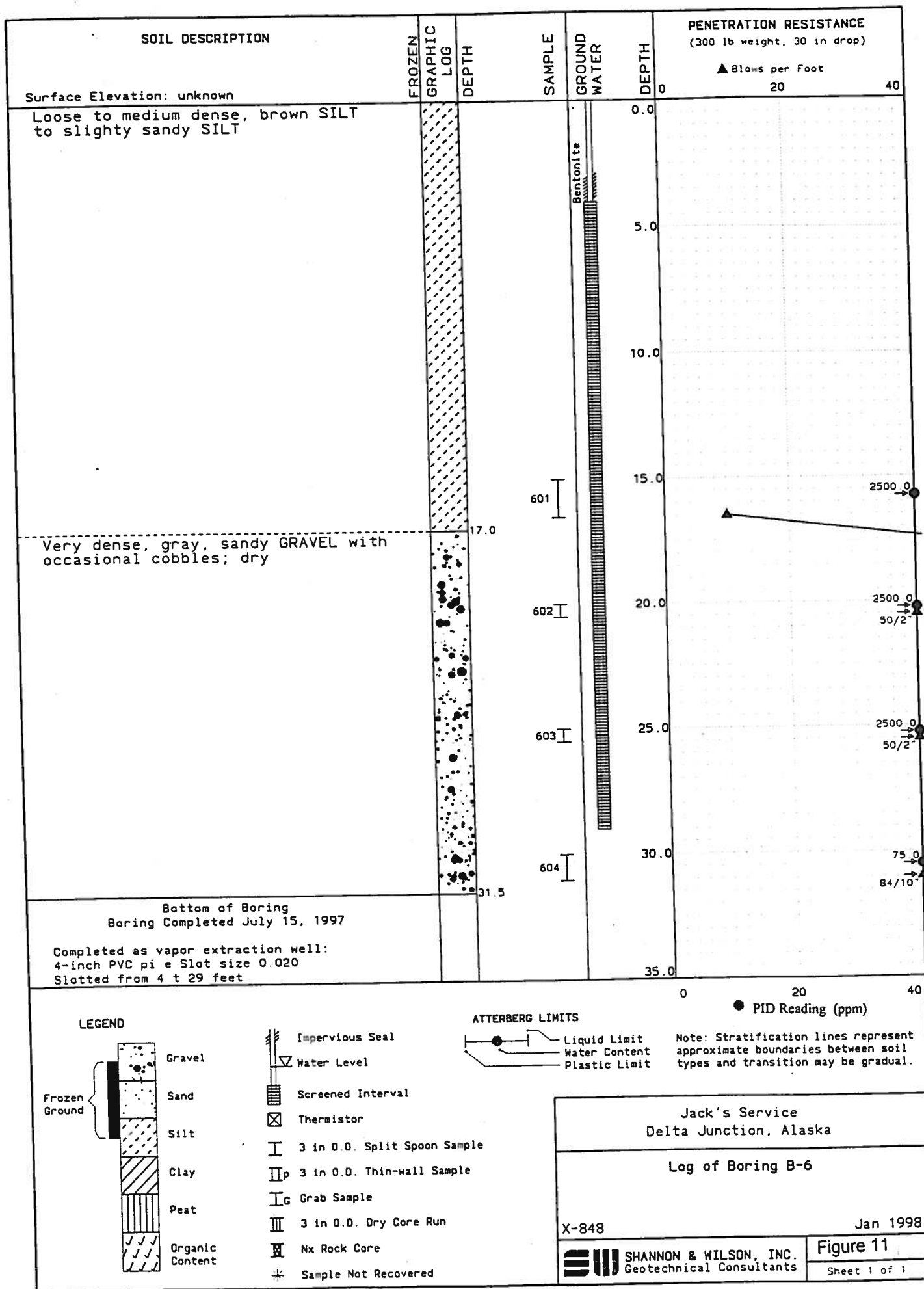
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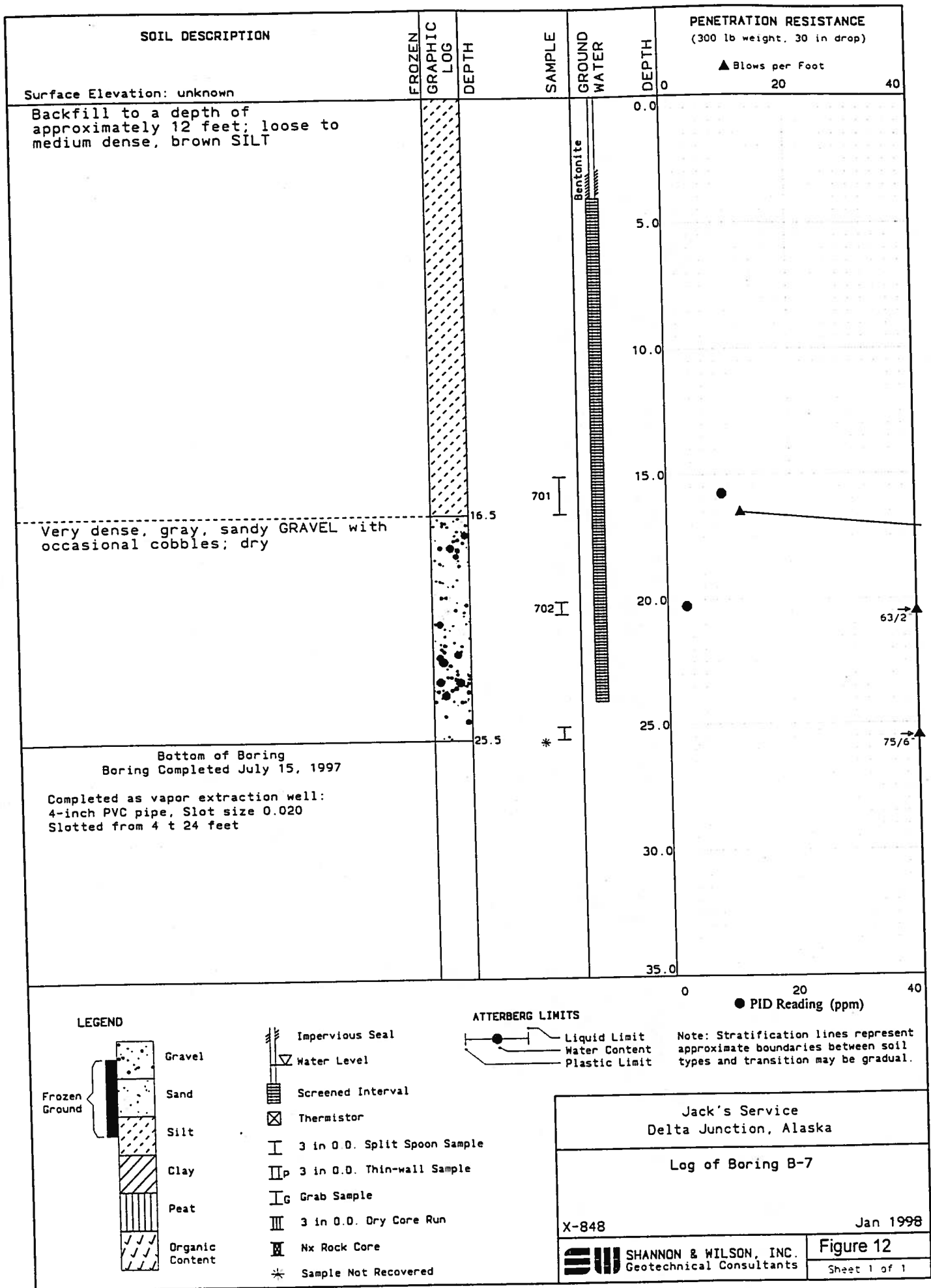
Figure 7

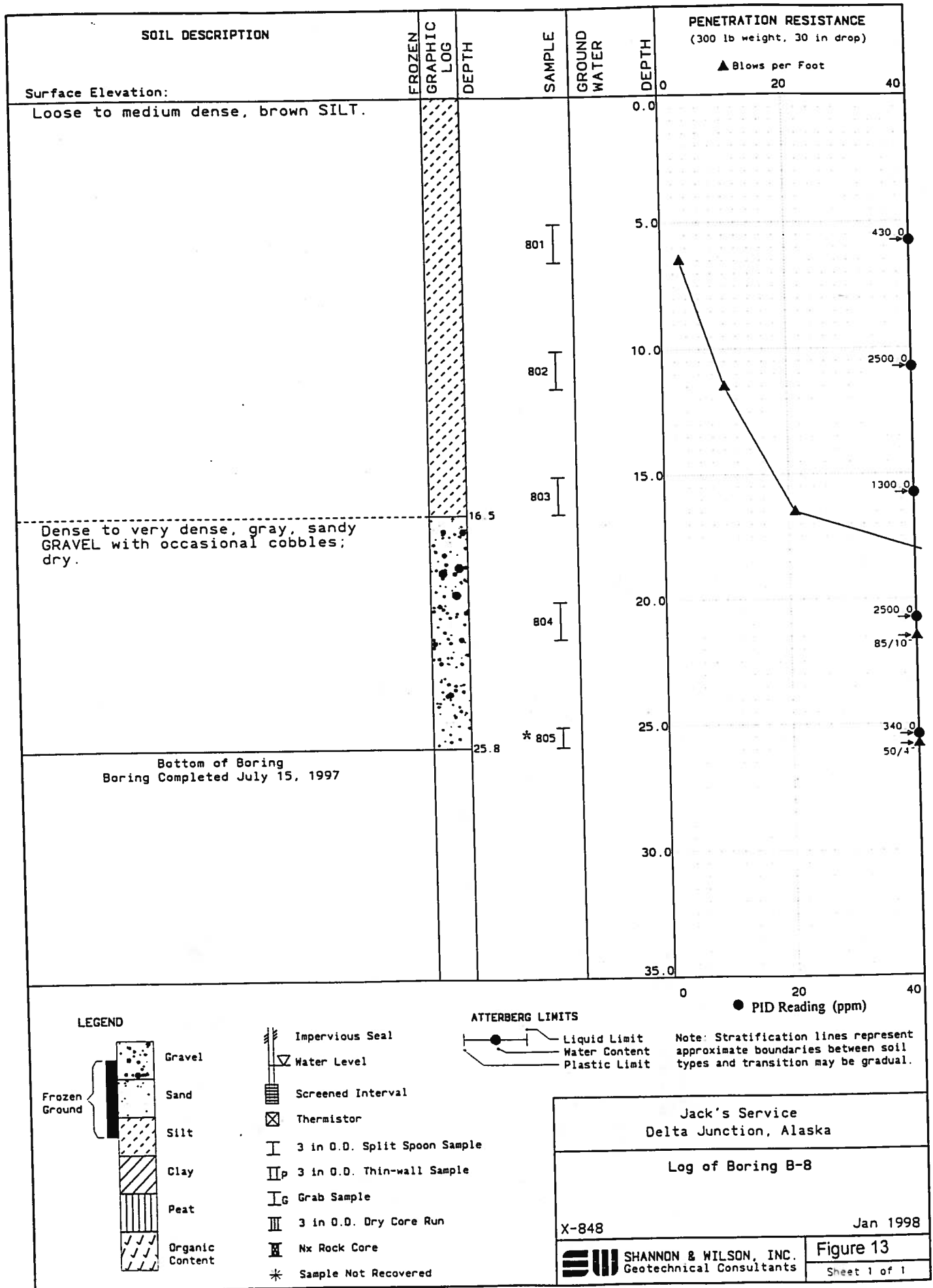
Sheet 1 of 1

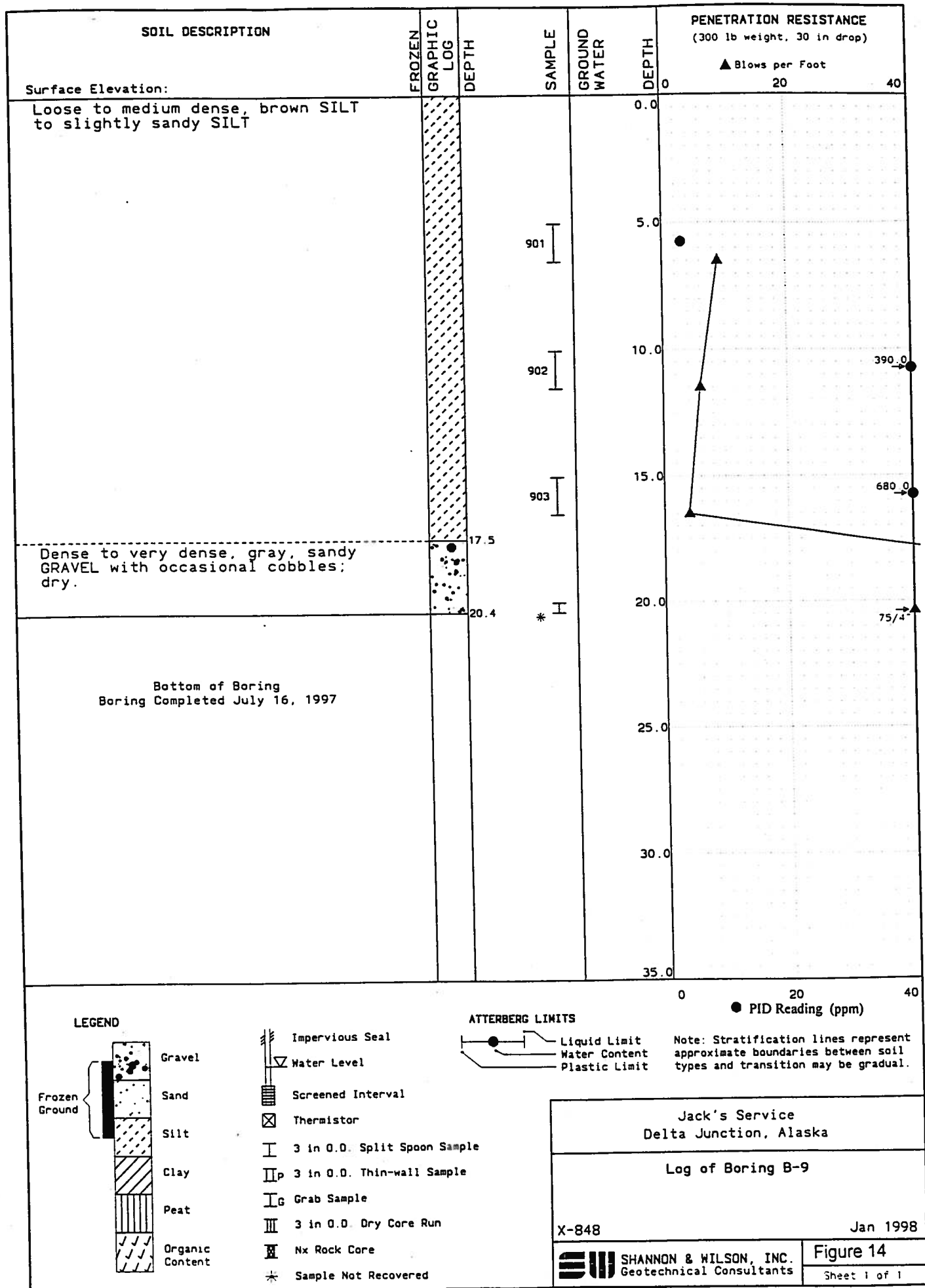


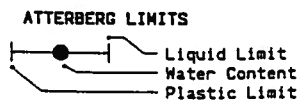
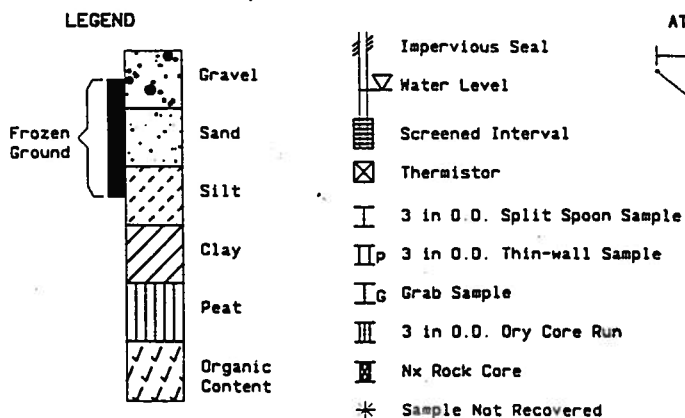
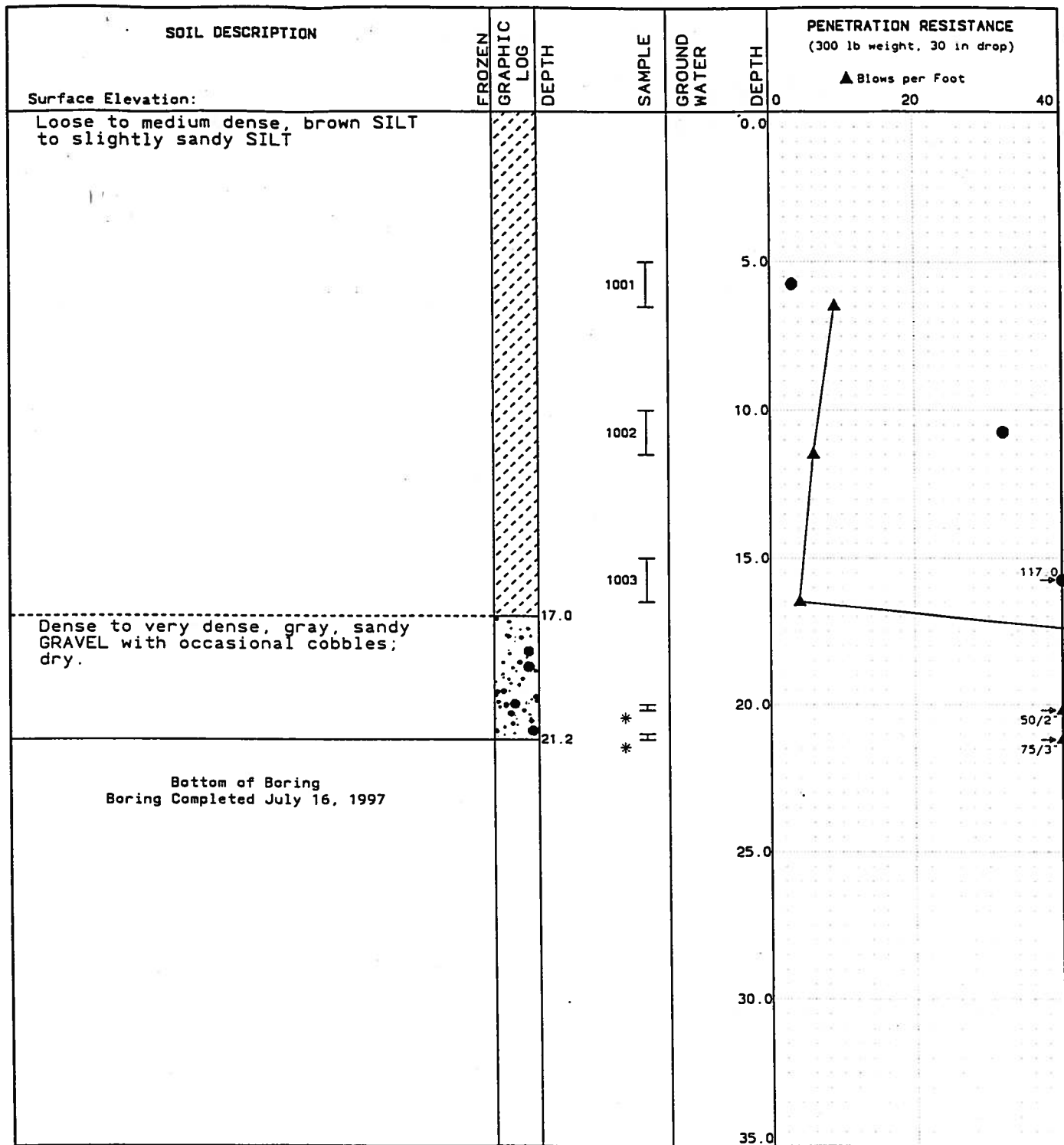












Note: Stratification lines represent approximate boundaries between soil types and transition may be gradual.

Jack's Service
Delta Junction, Alaska

Log of Boring B-10

X-848

Jan 1998

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Figure 15

Sheet 1 of 1



CT&E Environmental Services Inc.

Laboratory Division

Laboratory Analysis Report

July 29, 1997

Mark Lockwood
Shannon & Wilson-Fairbanks
2055 Hill Road
Fairbanks, AK 99707

Client Name	Shannon & Wilson-Fairbanks
Project ID	Jack's [973742]
Printed	July 29, 1997

Enclosed are the analytical results associated with the above project.

As required by the state of Alaska and the USEPA, a formal Quality Assurance/Quality Control Program is maintained by CT&E. A copy of our Quality Control Manual that outlines this program is available at your request.

Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth in our Quality Assurance Program Plan.

If you have any questions regarding this report or if we can be of any other assistance, please call your CT&E Project Manager at (907) 562-2343.

The following descriptors may be found on your report which will serve to further qualify the data.

- U - Indicates the compound was analyzed for but not detected.
- J - Indicates an estimated value that falls below PQL, but is greater than the MDL.
- B - Indicates the analyte is found in the blank associated with the sample.
- * - The analyte has exceeded allowable limits.
- GT - Greater Than
- D - Secondary Dilution
- LT - Less Than
- ! - Surrogate out of range



CT&E Ref.# 973742001
Client Name Shannon & Wilson-Fairbanks
Project Name/# Jack's
Client Sample ID 848-0714-103
Matrix Soil
Ordered By
PWSID

Client PO#
Printed Date/Time 07/29/97 19:42
Collected Date/Time 07/14/97 11:30
Received Date/Time 07/18/97 13:05
Technical Director: Stephen C. Ede

Released By *Sharon Peterson*

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	75.5		%	SM18 2540G			07/08/97	EWS
GRO/8020 Combo								
Gasoline Range Organics	3.49	2.08	mg/Kg	AK101/8020		07/14/97	07/23/97	MTT
Benzene	0.0519 U	0.0519	mg/Kg	AK101/8020		07/14/97	07/23/97	MTT
Toluene	0.0737	0.0519	mg/Kg	AK101/8020		07/14/97	07/23/97	MTT
Ethylbenzene	0.0519 U	0.0519	mg/Kg	AK101/8020		07/14/97	07/23/97	MTT
P & M -Xylene	0.158	0.0519	mg/Kg	AK101/8020		07/14/97	07/23/97	MTT
o-Xylene	0.199	0.0519	mg/Kg	AK101/8020		07/14/97	07/23/97	MTT
Surrogates								
4-Bromofluorobenzene <Surr>	90.5		%	AK101/8020	(50-150)	07/14/97	07/23/97	
1,4-Difluorobenzene <Surr>	96.5		%	AK101/8020	(50-150)	07/14/97	07/23/97	
AK102								
Diesel Range Organics	5.05 U	5.05	mg/Kg	AK102 DRO		07/18/97	07/19/97	ZDR



CT&E Ref.# 973742002
Client Name Shannon & Wilson-Fairbanks
Project Name/# Jack's
Client Sample ID 848-0714-104
Matrix Soil
Ordered By
PWSID

Client PO#
Printed Date/Time 07/29/97 19:42
Collected Date/Time 07/14/97 11:45
Received Date/Time 07/18/97 13:05
Technical Director: Stephen C. Ede

Released By *Stephen Ede*

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	96.6		%	SM18 2540G			07/08/97	EWS
GRO/8020 Combo								
Gasoline Range Organics	2.14	1.38	mg/Kg	AK101/8020		07/14/97	07/23/97	MTT
Benzene	0.0344 U	0.0344	mg/Kg	AK101/8020		07/14/97	07/23/97	MTT
Toluene	0.0644	0.0344	mg/Kg	AK101/8020		07/14/97	07/23/97	MTT
Ethylbenzene	0.0344 U	0.0344	mg/Kg	AK101/8020		07/14/97	07/23/97	MTT
P & M -Xylene	0.0458	0.0344	mg/Kg	AK101/8020		07/14/97	07/23/97	MTT
o-Xylene	0.0344 U	0.0344	mg/Kg	AK101/8020		07/14/97	07/23/97	MTT
Surrogates								
4-Bromofluorobenzene <Surr>	105		%	AK101/8020	(50-150)	07/14/97	07/23/97	
1,4-Difluorobenzene <Surr>	98.8		%	AK101/8020	(50-150)	07/14/97	07/23/97	
AK102								
Diesel Range Organics	4.03 U	4.03	mg/Kg	AK102 DRO		07/18/97	07/19/97	ZDR



CT&E Ref.# 973742003
Client Name Shannon & Wilson-Fairbanks
Project Name/# Jack's
Client Sample ID 848-0714-201
Matrix Soil
Ordered By
PWSID

Client PO#
Printed Date/Time 07/29/97 19:42
Collected Date/Time 07/14/97 12:55
Received Date/Time 07/18/97 13:05
Technical Director: Stephen C. Ede

Released By *Sharon Proctor*

Sample Remarks:

DRO-Pattern is consistent with weathered gasoline.
GRO/BTEX-Sample is too dilute to quantify surrogate

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	82.2		%	SM18 2540G			07/08/97	EWS
GRO/8020 Combo								
Gasoline Range Organics	10100	1080	mg/Kg	AK101/8020		07/14/97	07/27/97	MTT
Benzene	167	26.9	mg/Kg	AK101/8020		07/14/97	07/27/97	MTT
Toluene	1630	26.9	mg/Kg	AK101/8020		07/14/97	07/27/97	MTT
Ethylbenzene	257	26.9	mg/Kg	AK101/8020		07/14/97	07/27/97	MTT
P & M -Xylene	811	26.9	mg/Kg	AK101/8020		07/14/97	07/27/97	MTT
o-Xylene	265	26.9	mg/Kg	AK101/8020		07/14/97	07/27/97	MTT
Surrogates								
4-Bromofluorobenzene <Surr>	0		%	AK101/8020	(50-150)	07/14/97	07/27/97	
1,4-Difluorobenzene <Surr>	0		%	AK101/8020	(50-150)	07/14/97	07/27/97	
AK102								
Diesel Range Organics	180	4.34	mg/Kg	AK102 DRO		07/18/97	07/19/97	ZDR



CT&E Environmental Services Inc.

CT&E Ref.# 973742004
Client Name Shannon & Wilson-Fairbanks
Project Name/# Jack's
Client Sample ID 848-0714-203
Matrix Soil
Ordered By
PWSID

Client PO#
Printed Date/Time 07/29/97 19:42
Collected Date/Time 07/14/97 13:10
Received Date/Time 07/18/97 13:05
Technical Director: Stephen C. Ede

Released By *Shawn Patton*

Sample Remarks:

Heavier hydrocarbons contributing to diesel range quantitation.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	91.3		%	SM18 2540G			07/08/97	EWS
GRO/8020 Combo								
Gasoline Range Organics	5.64	1.99	mg/Kg	AK101/8020		07/14/97	07/26/97	MTT
Benzene	0.0738	0.0498	mg/Kg	AK101/8020		07/14/97	07/26/97	MTT
Toluene	0.373	0.0498	mg/Kg	AK101/8020		07/14/97	07/26/97	MTT
Ethylbenzene	0.0498 U	0.0498	mg/Kg	AK101/8020		07/14/97	07/26/97	MTT
P & M -Xylene	0.518	0.0498	mg/Kg	AK101/8020		07/14/97	07/26/97	MTT
o-Xylene	0.390	0.0498	mg/Kg	AK101/8020		07/14/97	07/26/97	MTT
Surrogates								
4-Bromofluorobenzene <Surr>	87.3		%	AK101/8020	(50-150)	07/14/97	07/26/97	
1,4-Difluorobenzene <Surr>	106		%	AK101/8020	(50-150)	07/14/97	07/26/97	
AK102								
Diesel Range Organics	24.9	4.10	mg/Kg	AK102 DRO		07/18/97	07/19/97	ZDR



CT&E Ref.# 973742005
Client Name Shannon & Wilson-Fairbanks
Project Name/# Jack's
Client Sample ID 848-0714-302
Matrix Soil
Ordered By
PWSID

Client PO#
Printed Date/Time 07/29/97 19:42
Collected Date/Time 07/14/97 15:20
Received Date/Time 07/18/97 13:05
Technical Director: Stephen C. Ede

Released By

Sharon Patton

Sample Remarks:

DRO-Pattern is consistant with weathered gasoline.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	81.8		%	SM18 2540G			07/08/97	EWS
GRO/8020 Combo								
Gasoline Range Organics	6.70	2.83	mg/Kg	AK101/8020		07/14/97	07/23/97	MTT
Benzene	0.105	0.0708	mg/Kg	AK101/8020		07/14/97	07/23/97	MTT
Toluene	0.423	0.0708	mg/Kg	AK101/8020		07/14/97	07/23/97	MTT
Ethylbenzene	0.104	0.0708	mg/Kg	AK101/8020		07/14/97	07/23/97	MTT
P & M -Xylene	0.374	0.0708	mg/Kg	AK101/8020		07/14/97	07/23/97	MTT
o-Xylene	0.236	0.0708	mg/Kg	AK101/8020		07/14/97	07/23/97	MTT
Surrogates								
4-Bromofluorobenzene <Surr>	112		%	AK101/8020	(50-150)	07/14/97	07/23/97	
1,4-Difluorobenzene <Surr>	97.3		%	AK101/8020	(50-150)	07/14/97	07/23/97	
AK102								
Diesel Range Organics	78.8	4.28	mg/Kg	AK102 DRO		07/18/97	07/19/97	ZDR



CT&E Environmental Services Inc.

CT&E Ref.# 973742006
Client Name Shannon & Wilson-Fairbanks
Project Name/# Jack's
Client Sample ID 848-0714-304
Matrix Soil
Ordered By
PWSID

Client PO#
Printed Date/Time 07/29/97 19:42
Collected Date/Time 07/14/97 15:40
Received Date/Time 07/18/97 13:05
Technical Director: Stephen C. Ede

Released By *Sharon Patton*

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	98.7		%	SM18 2540G			07/08/97 EWS	
GRO/8020 Combo								
Gasoline Range Organics	2.91	1.46	mg/Kg	AK101/8020		07/14/97	07/23/97 MTT	
Benzene	0.0364 U	0.0364	mg/Kg	AK101/8020		07/14/97	07/23/97 MTT	
Toluene	0.0903	0.0364	mg/Kg	AK101/8020		07/14/97	07/23/97 MTT	
Ethylbenzene	0.0364 U	0.0364	mg/Kg	AK101/8020		07/14/97	07/23/97 MTT	
P & M -Xylene	0.122	0.0364	mg/Kg	AK101/8020		07/14/97	07/23/97 MTT	
o-Xylene	0.0654	0.0364	mg/Kg	AK101/8020		07/14/97	07/23/97 MTT	
Surrogates								
4-Bromofluorobenzene <Surr>	109		%	AK101/8020	(50-150)	07/14/97	07/23/97	
1,4-Difluorobenzene <Surr>	93.3		%	AK101/8020	(50-150)	07/14/97	07/23/97	
AK102								
Diesel Range Organics	3.98	3.72	mg/Kg	AK102 DRO		07/18/97	07/19/97 ZDR	



CT&E Ref.# 973742007
Client Name Shannon & Wilson-Fairbanks
Project Name/# Jack's
Client Sample ID 848-0714-312
Matrix Soil
Ordered By
PWSID

Client PO#
Printed Date/Time 07/29/97 19:42
Collected Date/Time 07/14/97 15:41
Received Date/Time 07/18/97 13:05
Technical Director: Stephen C. Ede

Released By *Sharon Proctor*

Sample Remarks:

DRO-Pattern is consistent with weathered gasoline.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	83.5		%	SM18 2540G			07/08/97	EWS
GRO/8020 Combo								
Gasoline Range Organics	6.03	2.23	mg/Kg	AK101/8020		07/14/97	07/26/97	MTT
Benzene	0.129	0.0558	mg/Kg	AK101/8020		07/14/97	07/26/97	MTT
Toluene	0.380	0.0558	mg/Kg	AK101/8020		07/14/97	07/26/97	MTT
Ethylbenzene	0.0581	0.0558	mg/Kg	AK101/8020		07/14/97	07/26/97	MTT
P & M -Xylene	0.290	0.0558	mg/Kg	AK101/8020		07/14/97	07/26/97	MTT
o-Xylene	0.156	0.0558	mg/Kg	AK101/8020		07/14/97	07/26/97	MTT
Surrogates								
4-Bromofluorobenzene <Surr>	98.8		%	AK101/8020	(50-150)	07/14/97	07/26/97	
1,4-Difluorobenzene <Surr>	100		%	AK101/8020	(50-150)	07/14/97	07/26/97	
AK102								
Diesel Range Organics	984	46.6	mg/Kg	AK102 DRO		07/18/97	07/19/97	ZDR



CT&E Ref.# 973742008
Client Name Shannon & Wilson-Fairbanks
Project Name/# Jack's
Client Sample ID 848-0714-402
Matrix Soil
Ordered By
PWSID

Client PO#
Printed Date/Time 07/29/97 19:42
Collected Date/Time 07/14/97 16:30
Received Date/Time 07/18/97 13:05
Technical Director: Stephen C. Ede

Released By *Sharon Proton*

Sample Remarks:

DRO-Pattern is consistant with weathered gasoline.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	90.6		%	SM18 2540G			07/08/97	EWS
GRO/8020 Combo								
Gasoline Range Organics	5.33	1.86	mg/Kg	AK101/8020		07/14/97	07/26/97	MTT
Benzene	0.104	0.0465	mg/Kg	AK101/8020		07/14/97	07/26/97	MTT
Toluene	0.0927	0.0465	mg/Kg	AK101/8020		07/14/97	07/26/97	MTT
Ethylbenzene	0.0465 U	0.0465	mg/Kg	AK101/8020		07/14/97	07/26/97	MTT
P & M -Xylene	0.254	0.0465	mg/Kg	AK101/8020		07/14/97	07/26/97	MTT
o-Xylene	0.271	0.0465	mg/Kg	AK101/8020		07/14/97	07/26/97	MTT
Surrogates								
4-Bromofluorobenzene <Surr>	100		%	AK101/8020	(50-150)	07/14/97	07/26/97	
1,4-Difluorobenzene <Surr>	98.8		%	AK101/8020	(50-150)	07/14/97	07/26/97	
AK102								
Diesel Range Organics	133	3.99	mg/Kg	AK102 DRO		07/18/97	07/19/97	ZDR



CT&E Ref.# 973742009
Client Name Shannon & Wilson-Fairbanks
Project Name/# Jack's
Client Sample ID 848-0714-404
Matrix Soil
Ordered By
PWSID

Client PO#
Printed Date/Time 07/29/97 19:42
Collected Date/Time 07/14/97 16:45
Received Date/Time 07/18/97 13:05
Technical Director: Stephen C. Ede

Released By *Shane Proton*

Sample Remarks:

DRO-Pattern is consistant with weathered gasoline.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	97.0		%	SM18 2540G			07/08/97	EWS
GRO/8020 Combo								
Gasoline Range Organics	1.45	1.29	mg/Kg	AK101/8020		07/14/97	07/27/97	MTT
Benzene	0.0322 U	0.0322	mg/Kg	AK101/8020		07/14/97	07/27/97	MTT
Toluene	0.0460	0.0322	mg/Kg	AK101/8020		07/14/97	07/27/97	MTT
Ethylbenzene	0.0322 U	0.0322	mg/Kg	AK101/8020		07/14/97	07/27/97	MTT
P & M -Xylene	0.0322 U	0.0322	mg/Kg	AK101/8020		07/14/97	07/27/97	MTT
o-Xylene	0.0322 U	0.0322	mg/Kg	AK101/8020		07/14/97	07/27/97	MTT
		0.0322	mg/Kg	AK101/8020		07/14/97	07/27/97	MTT
Surrogates								
4-Bromofluorobenzene <Surr>	102		%	AK101/8020	(50-150)	07/14/97	07/27/97	
1,4-Difluorobenzene <Surr>	108		%	AK101/8020	(50-150)	07/14/97	07/27/97	
AK102								
Diesel Range Organics	57.7	3.87	mg/Kg	AK102 DRO		07/18/97	07/19/97	ZDR



CT&E Ref.# 973742010
Client Name Shannon & Wilson-Fairbanks
Project Name/# Jack's
Client Sample ID 848-0715-503
Matrix Soil
Ordered By
PWSID

Client PO#
Printed Date/Time 07/29/97 19:42
Collected Date/Time 07/15/97 09:01
Received Date/Time 07/18/97 13:05
Technical Director: Stephen C. Ede

Released By *Shannon Patton*

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	75.5		%	SM18 2540G			07/08/97	EWS
GRO/8020 Combo								
Gasoline Range Organics	2.00	1.81	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
Benzene	0.0452 U	0.0452	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
Toluene	0.0540	0.0452	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
Ethylbenzene	0.0452 U	0.0452	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
P & M -Xylene	0.0452 U	0.0452	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
o-Xylene	0.0469	0.0452	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
Surrogates								
4-Bromofluorobenzene <Surr>	70		%	AK101/8020	(50-150)	07/15/97	07/27/97	
1,4-Difluorobenzene <Surr>	107		%	AK101/8020	(50-150)	07/15/97	07/27/97	
AK102								
Diesel Range Organics	4.79 U	4.79	mg/Kg	AK102 DRO		07/18/97	07/19/97	ZDR



CT&E Ref.# 973742011
Client Name Shannon & Wilson-Fairbanks
Project Name/# Jack's
Client Sample ID 848-0715-504
Matrix Soil
Ordered By
PWSID

Client PO#
Printed Date/Time 07/29/97 19:42
Collected Date/Time 07/15/97 09:10
Received Date/Time 07/18/97 13:05
Technical Director: Stephen C. Ede

Released By *Sharon Patton*

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	98.0		%	SM18 2540G			07/08/97	EWS
GRO/8020 Combo								
Gasoline Range Organics	0.955 U	0.955	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
Benzene	0.0239 U	0.0239	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
Toluene	0.0309	0.0239	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
Ethylbenzene	0.0239 U	0.0239	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
P & M -Xylene	0.0239 U	0.0239	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
o-Xylene	0.0239 U	0.0239	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
Surrogates								
4-Bromofluorobenzene <Surr>	102		%	AK101/8020	(50-150)	07/15/97	07/27/97	
1,4-Difluorobenzene <Surr>	110		%	AK101/8020	(50-150)	07/15/97	07/27/97	
AK102								
Diesel Range Organics	3.73 U	3.73	mg/Kg	AK102 DRO		07/18/97	07/19/97	ZDR



CT&E Ref.# 973742012
Client Name Shannon & Wilson-Fairbanks
Project Name/# Jack's
Client Sample ID 848-0715-603
Matrix Soil
Ordered By
PWSID

Client PO#
Printed Date/Time 07/29/97 19:42
Collected Date/Time 07/15/97 11:10
Received Date/Time 07/18/97 13:05
Technical Director: Stephen C. Ede

Released By *Sharon Patton*

Sample Remarks:

DRO-Pattern is consistent with weathered gasoline.
GRO/BTEX-Benzene detection limit increased due to dilution factor.
GRO/BTEX-Surrogate recovery outside acceptable range due to matrix interference.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	97.9		%	SM18 2540G			07/08/97	EWS
GRO/8020 Combo								
Gasoline Range Organics	370	9.23	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
Benzene	0.231 U	0.231	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
Toluene	9.82	0.231	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
Ethylbenzene	11.7	0.231	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
P & M -Xylene	54.0	0.231	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
o-Xylene	28.9	0.231	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
Surrogates								
4-Bromofluorobenzene <Surr>	711	%		AK101/8020	(50-150)	07/15/97	07/27/97	
1,4-Difluorobenzene <Surr>	33	%		AK101/8020	(50-150)	07/15/97	07/27/97	
AK102								
Diesel Range Organics	85.7	3.90	mg/Kg	AK102 DRO		07/18/97	07/19/97	ZDR



CT&E Ref.# 973742013
Client Name Shannon & Wilson-Fairbanks
Project Name/# Jack's
Client Sample ID 848-0715-604
Matrix Soil
Ordered By
PWSID

Client PO#
Printed Date/Time 07/29/97 19:42
Collected Date/Time 07/15/97 11:42
Received Date/Time 07/18/97 13:05
Technical Director: Stephen C. Ede

Released By

Shannon Fairbanks

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	96.6		%	SM18 2540G			07/08/97	EWS
GRO/8020 Combo								
Gasoline Range Organics	1.68	0.956	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
Benzene	0.0307	0.0239	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
Toluene	0.110	0.0239	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
Ethylbenzene	0.0270	0.0239	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
P & M -Xylene	0.127	0.0239	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
o-Xylene	0.0632	0.0239	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
Surrogates								
4-Bromofluorobenzene <Surr>	101		%	AK101/8020	(50-150)	07/15/97	07/27/97	
1,4-Difluorobenzene <Surr>	108		%	AK101/8020	(50-150)	07/15/97	07/27/97	
AK102								
Diesel Range Organics	3.86 U	3.86	mg/Kg	AK102 DRO		07/18/97	07/19/97	ZDR



CT&E Ref.# 973742014
Client Name Shannon & Wilson-Fairbanks
Project Name/# Jack's
Client Sample ID 848-0715-702
Matrix Soil
Ordered By
PWSID

Client PO#
Printed Date/Time 07/29/97 19:42
Collected Date/Time 07/15/97 15:10
Received Date/Time 07/18/97 13:05
Technical Director: Stephen C. Ede

Released By *Sharon Proton*

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	97.6		%	SM18 2540G			07/08/97	EWS
GRO/8020 Combo								
Gasoline Range Organics	1.20	1.10	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
Benzene	0.0275 U	0.0275	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
Toluene	0.0336	0.0275	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
Ethylbenzene	0.0275 U	0.0275	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
P & M -Xylene	0.0275 U	0.0275	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
o-Xylene	0.0275 U	0.0275	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
Surrogates								
4-Bromofluorobenzene <Surr>	95.9		%	AK101/8020	(50-150)	07/15/97	07/27/97	
1,4-Difluorobenzene <Surr>	107		%	AK101/8020	(50-150)	07/15/97	07/27/97	
AK102								
Diesel Range Organics	8.06	3.89	mg/Kg	AK102 DRO		07/18/97	07/19/97	ZDR



CT&E Ref.# 973742015
Client Name Shannon & Wilson-Fairbanks
Project Name/# Jack's
Client Sample ID 848-0715-802
Matrix Soil
Ordered By
PWSID

Client PO#
Printed Date/Time 07/29/97 19:42
Collected Date/Time 07/15/97 17:46
Received Date/Time 07/18/97 13:05
Technical Director: Stephen C. Ede

Released By *Sharon P. Ede*

Sample Remarks:

Typical pattern for diesel.

GRO/BTEX-Sample too dilute to quantify surrogate.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	87.8		%	SM18 2540G			07/08/97	EWS
GRO/8020 Combo								
Gasoline Range Organics	11900	932	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
Benzene	488	23.3	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
Toluene	2140	23.3	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
Ethylbenzene	253	23.3	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
P & M -Xylene	1460	23.3	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
o-Xylene	602	23.3	mg/Kg	AK101/8020		07/15/97	07/27/97	MTT
Surrogates								
4-Bromofluorobenzene <Surr>	0		%	AK101/8020	(50-150)	07/15/97	07/27/97	
1,4-Difluorobenzene <Surr>	0		%	AK101/8020	(50-150)	07/15/97	07/27/97	
AK102								
Diesel Range Organics	899	40.7	mg/Kg	AK102 DRO		07/18/97	07/19/97	ZDR



CT&E Ref.# 973742016
Client Name Shannon & Wilson-Fairbanks
Project Name/# Jack's
Client Sample ID 848-0715-804
Matrix Soil
Ordered By
PWSID

Client PO#
Printed Date/Time 07/29/97 19:42
Collected Date/Time 07/15/97 18:05
Received Date/Time 07/18/97 13:05
Technical Director: Stephen C. Ede

Released By

Sharon Patten

Sample Remarks:

DRO-Pattern is consistant with weathered gasoline.
GRO/BTEX-Sample too dilute to quantify surrogate.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	97.0		%	SM18 2540G			07/21/97 EWS	
GRO/8020 Combo								
Gasoline Range Organics	1810	104	mg/Kg	AK101/8020		07/15/97	07/28/97 MTT	
Benzene	8.59	2.59	mg/Kg	AK101/8020		07/15/97	07/28/97 MTT	
Toluene	192	2.59	mg/Kg	AK101/8020		07/15/97	07/28/97 MTT	
Ethylbenzene	109	2.59	mg/Kg	AK101/8020		07/15/97	07/28/97 MTT	
P & M -Xylene	426	2.59	mg/Kg	AK101/8020		07/15/97	07/28/97 MTT	
o-Xylene	180	2.59	mg/Kg	AK101/8020		07/15/97	07/28/97 MTT	
Surrogates								
4-Bromofluorobenzene <Surr>	0		%	AK101/8020	(50-150)	07/15/97	07/28/97	
1,4-Difluorobenzene <Surr>	0		%	AK101/8020	(50-150)	07/15/97	07/28/97	
AK102								
Diesel Range Organics	66.0	3.90	mg/Kg	AK102 DRO		07/21/97	07/22/97 MTT	



CT&E Ref.# 973742017
Client Name Shannon & Wilson-Fairbanks
Project Name/# Jack's
Client Sample ID 848-0715-812
Matrix Soil
Ordered By
PWSID

Client PO#
Printed Date/Time 07/29/97 19:42
Collected Date/Time 07/15/97 18:06
Received Date/Time 07/18/97 13:05
Technical Director: Stephen C. Ede

Released By *Sharon Peterson*

Sample Remarks:

Typical pattern for diesel.

GRO/BTEX-Sample too dilute to quantify surrogate.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	86.4		%	SM18 2540G			07/21/97	EWS
GRO/8020 Combo								
Gasoline Range Organics	9910	820	mg/Kg	AK101/8020		07/15/97	07/28/97	MTT
Benzene	403	20.5	mg/Kg	AK101/8020		07/15/97	07/28/97	MTT
Toluene	1910	20.5	mg/Kg	AK101/8020		07/15/97	07/28/97	MTT
Ethylbenzene	234	20.5	mg/Kg	AK101/8020		07/15/97	07/28/97	MTT
P & M -Xylene	1340	20.5	mg/Kg	AK101/8020		07/15/97	07/28/97	MTT
o-Xylene	551	20.5	mg/Kg	AK101/8020		07/15/97	07/28/97	MTT
Surrogates								
4-Bromofluorobenzene <Surr>	0		%	AK101/8020	(50-150)	07/15/97	07/28/97	
1,4-Difluorobenzene <Surr>	0		%	AK101/8020	(50-150)	07/15/97	07/28/97	
AK102								
Diesel Range Organics	692	45.6	mg/Kg	AK102 DRO		07/21/97	07/22/97	MTT



CT&E Environmental Services Inc.

CT&E Ref.# 973742018
 Client Name Shannon & Wilson-Fairbanks
 Project Name/# Jack's
 Client Sample ID 848-0716-903
 Matrix Soil
 Ordered By
 PWSID

Client PO#
 Printed Date/Time 01/16/98 11:00
 Collected Date/Time 07/16/97 08:30
 Received Date/Time 07/18/97 13:05
 Technical Director: Stephen C. Ede

Released By *Sharon Paton*

Sample Remarks:

DRO-Pattern is consistent with weathered gasoline.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	76.2		%	SM18 2540G			07/21/97 EWS	
GRO/8020 Combo								
Gasoline Range Organics	22.3	1.65	mg/Kg	AK101/8020		07/16/97	07/27/97 MTT	
Benzene	2.46	0.0413	mg/Kg	AK101/8020		07/16/97	07/27/97 MTT	
Toluene	4.68	0.0413	mg/Kg	AK101/8020		07/16/97	07/27/97 MTT	
Ethylbenzene	0.444	0.0413	mg/Kg	AK101/8020		07/16/97	07/27/97 MTT	
P & M -Xylene	2.76	0.0413	mg/Kg	AK101/8020		07/16/97	07/27/97 MTT	
o-Xylene	1.65	0.0413	mg/Kg	AK101/8020		07/16/97	07/27/97 MTT	
Surrogates								
4-Bromofluorobenzene <Surr>	89.8		%	AK101/8020	(50-150)	07/16/97	07/27/97	
1,4-Difluorobenzene <Surr>	112		%	AK101/8020	(50-150)	07/16/97	07/27/97	
AK102								
Diesel Range Organics	60.9	4.55	mg/Kg	AK102 DRO		07/21/97	07/22/97 MTT	



CT&E Ref.# 973742019
Client Name Shannon & Wilson-Fairbanks
Project Name/# Jack's
Client Sample ID 848-0716-1003
Matrix Soil
Ordered By
PWSID

Client PO#
Printed Date/Time 07/29/97 19:42
Collected Date/Time 07/16/97 09:40
Received Date/Time 07/18/97 13:05
Technical Director: Stephen C. Ede

Released By

Sharon P. Ede

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	87.8		%	SM18 2540G			07/21/97	EWS
GRO/8020 Combo								
Gasoline Range Organics	3.68	2.18	mg/Kg	AK101/8020		07/16/97	07/27/97	MTT
Benzene	0.167	0.0546	mg/Kg	AK101/8020		07/16/97	07/27/97	MTT
Toluene	0.461	0.0546	mg/Kg	AK101/8020		07/16/97	07/27/97	MTT
Ethylbenzene	0.0546 U	0.0546	mg/Kg	AK101/8020		07/16/97	07/27/97	MTT
P & M -Xylene	0.179	0.0546	mg/Kg	AK101/8020		07/16/97	07/27/97	MTT
o-Xylene	0.131	0.0546	mg/Kg	AK101/8020		07/16/97	07/27/97	MTT
Surrogates								
4-Bromofluorobenzene <Surr>	89.5		%	AK101/8020	(50-150)	07/16/97	07/27/97	
1,4-Difluorobenzene <Surr>	106		%	AK101/8020	(50-150)	07/16/97	07/27/97	
AK102								
Diesel Range Organics	3.99 U	3.99	mg/Kg	AK102 DRO		07/21/97	07/22/97	MTT



CT&E Ref.# 973742020
Client Name Shannon & Wilson-Fairbanks
Project Name/# Jack's
Client Sample ID Travel Blank
Matrix Soil
Ordered By
PWSID

Client PO#
Printed Date/Time 07/29/97 19:42
Collected Date/Time 07/14/97 00:00
Received Date/Time 07/18/97 13:05
Technical Director: Stephen C. Ede

Released By *Shawn Paton*

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	100		%	SM18 2540G			07/24/97	EWS
GRO/8020 Combo								
Gasoline Range Organics	3.65	2.05	mg/Kg	AK101/8020		07/02/97	07/27/97	MTT
Benzene	0.0577	0.0512	mg/Kg	AK101/8020		07/02/97	07/27/97	MTT
Toluene	0.163	0.0512	mg/Kg	AK101/8020		07/02/97	07/27/97	MTT
Ethylbenzene	0.0512 U	0.0512	mg/Kg	AK101/8020		07/02/97	07/27/97	MTT
P & M -Xylene	0.119	0.0512	mg/Kg	AK101/8020		07/02/97	07/27/97	MTT
o-Xylene	0.0619	0.0512	mg/Kg	AK101/8020		07/02/97	07/27/97	MTT
Surrogates								
4-Bromofluorobenzene <Surr>	99.4		%	AK101/8020	(50-150)	07/02/97	07/27/97	
1,4-Difluorobenzene <Surr>	104		%	AK101/8020	(50-150)	07/02/97	07/27/97	

Shannon & Wilson, Inc.

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 433-8000

2005 14th Road
Falmouth, AK 99707
(907) 478-0800

Chain of Custody Reco

97.3742

Analyte Param

(include preservative if used)

option

Page 2 of 2
Laboratory CTE
Attn: Jucelle

Sample Identity	Lab No.	Time	Date	Sampled	Container	Analysis	Total Number of Containers	Remarks/Matrix
848-0715-504	11	9:10a	7-15-97	X	X	X	2	See
848-0715-603	12	11:10a		X	X	X	2	
848-0715-604	13	11:42a		X	X	X	2	
848-0715-702	14	3:10p		X	X	X	2	
848-0715-802	15	5:46p		X	X	X	2	
848-0715-804	16	6:05p		X	X	X	2	
848-0715-812	17	6:26p		X	X	X	2	
848-0716-905	18	8:30a	7-16-97	X	X	X	2	
848-0716-1003	19	9:40a		X	X	X	2	
TRAIL-BLANK	20			X	X	X	1	

Project Number: X-0848072	Total Number of Containers	Project Name: Jack's	COC Seal/Inlet? Y/N/A	Contact: Mark Lockwood	Received Good Cond/Cold	Ongoing Project? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Delivery Method:	Sampler: MSL	Instructions:
	1959				1976				
Requested Turn Around Time:									
Special Instructions:									

Received By: 1	Received By: 2	Received By: 3
Signature: [Signature]	Signature: [Signature]	Signature: [Signature]
Printed Name: [Name]	Printed Name: [Name]	Printed Name: [Name]
Date: 7-15-97	Date: [Date]	Date: [Date]
Company: [Company]	Company: [Company]	Company: [Company]

Received By: 1	Received By: 2	Received By: 3
Signature: [Signature]	Signature: [Signature]	Signature: [Signature]
Printed Name: [Name]	Printed Name: [Name]	Printed Name: [Name]
Date: 7-15-97	Date: [Date]	Date: [Date]
Company: [Company]	Company: [Company]	Company: [Company]

Distribution: White - shipment - returned to Shannon & Wilson w/ Laboratory report
Yellow - shipment - for container files
Pink - Shannon & Wilson - Job File

Shannon & Wilson, Inc.

Chain of Custody Recoil

97.3742

Page 1 of 2
Laboratory CTE
Aim McCall

400 N. 34th Street, Suite 100
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St. Louis, MO 63141
(314) 872-8170

6400 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 661-2120

Analyte Parameters

Alon

(If ... measure is used)

Sample Identity	Lab No.	Date Sampled	Comp.	Grab	Remarks/Notes
BAB-0714-103	01	11:30a	X	X	Soil
BAB-0714-104	02	11:45a	X	X	
BAB-0714-201	03	12:55p	X	X	
BAB-0714-203	04	1:10p	X	X	
BAB-0714-302	05	3:20p	X	X	
BAB-0714-304	06	3:40p	X	X	
BAB-0714-312	07	3:41p	X	X	
BAB-0714-402	08	4:30p	X	X	
BAB-0714-404	08	4:45p	X	X	
BAB-0715-503	10	9:01a	X	X	

Project Information		Sample Receipt	
Project Number: K08AB-02	Total Number of Containers: 10	Received By: [Signature]	Time: 12:30
Project Name: Jack's	COC Seal/Incert V/MNA	Printed Name: [Signature]	Date: 5/18/97
Contact: Mark Lattin	Received Good Cond./Cold	Printed Name: [Signature]	Date: 5/18/97
Ongoing Project: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Delivery Method: HC	Company: [Signature]	Company: [Signature]
Sampler: MSL	(attach shipping bill, if any)	Received By: 1	Time: 1305
Requested Turn Around Time: 72 HOURS		Signature: [Signature]	Time: 1305
Special Instructions: P.O. 403707		Printed Name: [Signature]	Date: 5/18/97
Distribution: White - shipment - returned to Shannon & Wilson w/ Laboratory report		Printed Name: [Signature]	Date: 5/18/97
Yellow - shipment - for consignee files		Printed Name: [Signature]	Date: 5/18/97
Pink - Shannon & Wilson - Job File		Printed Name: [Signature]	Date: 5/18/97



CT&E Environmental Services Inc.

Laboratory Division

Laboratory Analysis Report

October 17, 1997

Mark Lockwood
Shannon & Wilson-Fairbanks
2055 Hill Road
Fairbanks, AK 99707

Client Name	Shannon & Wilson-Fairbanks
Project ID	Jack's X-0848 [975764]
Printed	October 17, 1997

Enclosed are the analytical results associated with the above project.

As required by the state of Alaska and the USEPA, a formal Quality Assurance/Quality Control Program is maintained by CT&E. A copy of our Quality Control Manual that outlines this program is available at your request.

Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth in our Quality Assurance Program Plan.

If you have any questions regarding this report or if we can be of any other assistance, please call your CT&E Project Manager at (907) 562-2343.

The following descriptors may be found on your report which will serve to further qualify the data.

- U - Indicates the compound was analyzed for but not detected.
- J - Indicates an estimated value that falls below PQL, but is greater than the MDL.
- B - Indicates the analyte is found in the blank associated with the sample.
- * - The analyte has exceeded allowable limits.
- GT - Greater Than
- D - Secondary Dilution
- LT - Less Than
- ! - Surrogate out of range



CT&E Ref.# 975764001
 Client Name Shannon & Wilson-Fairbanks
 Project Name/# Jack's X-0848
 Client Sample ID 848-1001-11
 Matrix Soil
 Ordered By
 PWSID

Client PO# 403757
 Printed Date/Time 10/17/97 11:14
 Collected Date/Time 10/01/97 13:10
 Received Date/Time 10/03/97 11:35
 Technical Director: Stephen C. Ede

Released By *Shane Paton*

Sample Remarks:

DRO - Pattern consistent with weathered middle distillate.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	87.7		%	SM18 2540G			10/06/97	WDW
GRO/8020 Combo								
Gasoline Range Organics	109	3.98	mg/Kg	AK101/8020		10/01/97	10/08/97	GSM
Benzene	0.190	0.0996	mg/Kg	AK101/8020		10/01/97	10/08/97	GSM
Toluene	5.23	0.0996	mg/Kg	AK101/8020		10/01/97	10/08/97	GSM
Ethylbenzene	2.91	0.0996	mg/Kg	AK101/8020		10/01/97	10/08/97	GSM
P & M -Xylene	23.5	0.0996	mg/Kg	AK101/8020		10/01/97	10/08/97	GSM
o-Xylene	11.7	0.0996	mg/Kg	AK101/8020		10/01/97	10/08/97	GSM
Surrogates								
4-Bromofluorobenzene <Surr>	196		%	AK101/8020	(50-150)	10/01/97	10/08/97	
1,4-Difluorobenzene <Surr>	126		%	AK101/8020	(50-150)	10/01/97	10/08/97	
AK102								
Diesel Range Organics	54.2	4.47	mg/Kg	AK102 DRO		10/07/97	10/08/97	WAA
Surrogates								
5a Androstane <surr>	61		%	AK102 DRO	(50-150)	10/07/97	10/08/97	



CT&E Ref.# 975764002
 Client Name Shannon & Wilson-Fairbanks
 Project Name/# Jack's X-0848
 Client Sample ID 848-1001-12
 Matrix Soil
 Ordered By
 PWSID

Client PO# 403757
 Printed Date/Time 10/17/97 11:15
 Collected Date/Time 10/01/97 13:15
 Received Date/Time 10/03/97 11:35
 Technical Director: Stephen C. Ede

Released By *Shane Proctor*

Sample Remarks:

DRO - Pattern consistent with weathered gasoline.

GRO/BTEX Surrogates do not meet QC goals due to matrix interference and/or dilution.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	80.4		%	SM18 2540G			10/06/97 WDW	
GRO/8020 Combo								
Gasoline Range Organics	1730	63.8	mg/Kg	AK101/8020		10/01/97	10/08/97 GSM	
Benzene	23.1	1.60	mg/Kg	AK101/8020		10/01/97	10/08/97 GSM	
Toluene	171	1.60	mg/Kg	AK101/8020		10/01/97	10/08/97 GSM	
Ethylbenzene	17.5	1.60	mg/Kg	AK101/8020		10/01/97	10/08/97 GSM	
P & M -Xylene	159	1.60	mg/Kg	AK101/8020		10/01/97	10/08/97 GSM	
o-Xylene	62.7	1.60	mg/Kg	AK101/8020		10/01/97	10/08/97 GSM	
Surrogates								
4-Bromofluorobenzene <Surr>	! 1350		%	AK101/8020	(50-150)	10/01/97	10/08/97	
1,4-Difluorobenzene <Surr>	! 320		%	AK101/8020	(50-150)	10/01/97	10/08/97	
AK102								
Diesel Range Organics	154	4.92	mg/Kg	AK102 DRO		10/07/97	10/08/97 WAA	
Surrogates								
5a Androstane <surr>	71.7		%	AK102 DRO	(50-150)	10/07/97	10/08/97	



CT&E Ref.# 975764003
Client Name Shannon & Wilson-Fairbanks
Project Name/# Jack's X-0848
Client Sample ID 848-1001-21
Matrix Soil
Ordered By
PWSID

Client PO# 403757
Printed Date/Time 10/17/97 11:15
Collected Date/Time 10/01/97 13:20
Received Date/Time 10/03/97 11:35
Technical Director: Stephen C. Ede

Released By *Sharon Patton*

Sample Remarks:

DRO - Pattern consistent with weathered middle distillate.

GRO/BTEX Surrogates do not meet QC goals due to matrix interference and/or dilution.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	85.8		%	SM18 2540G			10/06/97	WDW
GRO/8020 Combo								
Gasoline Range Organics	2140	49.6	mg/Kg	AK101/8020		10/01/97	10/07/97	GSM
Benzene	1.36	1.24	mg/Kg	AK101/8020		10/01/97	10/07/97	GSM
Toluene	4.89	1.24	mg/Kg	AK101/8020		10/01/97	10/07/97	GSM
Ethylbenzene	5.40	1.24	mg/Kg	AK101/8020		10/01/97	10/07/97	GSM
P & M -Xylene	14.9	1.24	mg/Kg	AK101/8020		10/01/97	10/07/97	GSM
o-Xylene	56.5	1.24	mg/Kg	AK101/8020		10/01/97	10/07/97	GSM
Surrogates								
4-Bromofluorobenzene <Surr>	5170		%	AK101/8020	(50-150)	10/01/97	10/07/97	
1,4-Difluorobenzene <Surr>	157		%	AK101/8020	(50-150)	10/01/97	10/07/97	
AK102								
Diesel Range Organics	468	4.63	mg/Kg	AK102 DRO		10/07/97	10/08/97	WAA
Surrogates								
5a Androstane <surr>	81.1		%	AK102 DRO	(50-150)	10/07/97	10/08/97	



CT&E Ref.# 975764004
Client Name Shannon & Wilson-Fairbanks
Project Name/# Jack's X-0848
Client Sample ID 848-1001-22
Matrix Soil
Ordered By
PWSID

Client PO# 403757
Printed Date/Time 10/17/97 11:15
Collected Date/Time 10/01/97 13:25
Received Date/Time 10/03/97 11:35
Technical Director: Stephen C. Ede

Released By *Shane Poston*

Sample Remarks:

DRO - Pattern consistent with weathered gasoline.

GRO/BTEX Surrogates do not meet QC goals due to matrix interference and/or dilution.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	85.0		%	SM18 2540G			10/06/97	WDW
GRO/8020 Combo								
Gasoline Range Organics	16800	1080	mg/Kg	AK101/8020		10/01/97	10/08/97	GSM
Benzene	201	26.9	mg/Kg	AK101/8020		10/01/97	10/08/97	GSM
Toluene	1930	26.9	mg/Kg	AK101/8020		10/01/97	10/08/97	GSM
Ethylbenzene	462	26.9	mg/Kg	AK101/8020		10/01/97	10/08/97	GSM
P & M -Xylene	2130	26.9	mg/Kg	AK101/8020		10/01/97	10/08/97	GSM
o-Xylene	843	26.9	mg/Kg	AK101/8020		10/01/97	10/08/97	GSM
Surrogates								
4-Bromofluorobenzene <Surr>	! 8480		%	AK101/8020	(50-150)	10/01/97	10/08/97	
1,4-Difluorobenzene <Surr>	! 1350		%	AK101/8020	(50-150)	10/01/97	10/08/97	
AK102								
Diesel Range Organics	1690	46.8	mg/Kg	AK102 DRO		10/07/97	10/08/97	WAA
Surrogates								
5a Androstane <surr>	81.9		%	AK102 DRO	(50-150)	10/07/97	10/08/97	



CT&E Environmental Services Inc.

CT&E Ref.# 975764005
Client Name Shannon & Wilson-Fairbanks
Project Name/# Jack's X-0848
Client Sample ID 848-1001-31
Matrix Soil
Ordered By
PWSID

Client PO# 403757
Printed Date/Time 10/17/97 11:15
Collected Date/Time 10/01/97 13:30
Received Date/Time 10/03/97 11:35
Technical Director: Stephen C. Ede

Released By *Sharon Patton*

Sample Remarks:

DRO - Pattern consistent with weathered gasoline.

GRO/BTEX Surrogates do not meet QC goals due to matrix interference and/or dilution.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	84.4		%	SM18 2540G			10/06/97 WDW	
GRO/8020 Combo								
Gasoline Range Organics	10700	352	mg/Kg	AK101/8020		10/01/97	10/08/97 GSM	
Benzene	18.1	8.80	mg/Kg	AK101/8020		10/01/97	10/08/97 GSM	
Toluene	83.3	8.80	mg/Kg	AK101/8020		10/01/97	10/08/97 GSM	
Ethylbenzene	90.9	8.80	mg/Kg	AK101/8020		10/01/97	10/08/97 GSM	
P & M -Xylene	1460	8.80	mg/Kg	AK101/8020		10/01/97	10/08/97 GSM	
o-Xylene	811	8.80	mg/Kg	AK101/8020		10/01/97	10/08/97 GSM	
Surrogates								
4-Bromofluorobenzene <Surr>	13100		%	AK101/8020	(50-150)	10/01/97	10/08/97	
1,4-Difluorobenzene <Surr>	461		%	AK101/8020	(50-150)	10/01/97	10/08/97	
AK102								
Diesel Range Organics	2040	47.3	mg/Kg	AK102 DRO		10/07/97	10/08/97 WAA	
Surrogates								
5a Androstane <surr>	70.4		%	AK102 DRO	(50-150)	10/07/97	10/08/97	



CT&E Ref.# 975764006
Client Name Shannon & Wilson-Fairbanks
Project Name/# Jack's X-0848
Client Sample ID 848-1001-32
Matrix Soil
Ordered By
PWSID

Client PO# 403757
Printed Date/Time 10/17/97 11:15
Collected Date/Time 10/01/97 13:35
Received Date/Time 10/03/97 11:35
Technical Director: Stephen C. Ede

Released By *Sharon Proton*

Sample Remarks:

DRO - Pattern consistent with weathered gasoline.

DRO - Pattern consistent with weathered middle distillate.

GRO/BTEX Surrogates do not meet QC goals due to matrix interference and/or dilution.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	84.3		%	SM18 2540G			10/06/97	WDW
GRO/8020 Combo								
Gasoline Range Organics	13700	245	mg/Kg	AK101/8020		10/01/97	10/08/97	GSM
Benzene	82.4	6.13	mg/Kg	AK101/8020		10/01/97	10/08/97	GSM
Toluene	1360	6.13	mg/Kg	AK101/8020		10/01/97	10/08/97	GSM
Ethylbenzene	322	6.13	mg/Kg	AK101/8020		10/01/97	10/08/97	GSM
P & M -Xylene	1840	6.13	mg/Kg	AK101/8020		10/01/97	10/08/97	GSM
o-Xylene	724	6.13	mg/Kg	AK101/8020		10/01/97	10/08/97	GSM
Surrogates								
4-Bromofluorobenzene <Surr>	! 7280		%	AK101/8020	(50-150)	10/01/97	10/08/97	
1,4-Difluorobenzene <Surr>	! 3450		%	AK101/8020	(50-150)	10/01/97	10/08/97	
AK102								
Diesel Range Organics	1480	46.4	mg/Kg	AK102 DRO		10/07/97	10/08/97	WAA
Surrogates								
5a Androstane <surr>	73.8		%	AK102 DRO	(50-150)	10/07/97	10/08/97	



CT&E Ref.# 975764007
Client Name Shannon & Wilson-Fairbanks
Project Name/# Jack's X-0848
Client Sample ID 848-1001-41
Matrix Soil
Ordered By
PWSID

Client PO# 403757
Printed Date/Time 10/17/97 11:15
Collected Date/Time 10/01/97 13:40
Received Date/Time 10/03/97 11:35
Technical Director: Stephen C. Ede

Released By *Sharon Proton*

Sample Remarks:

DRO - Pattern consistent with weathered middle distillate.
GRO/BTEX Surrogates do not meet QC goals due to matrix interference and/or dilution.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	83.9		%	SM18 2540G			10/06/97 WDW	
GRO/8020 Combo								
Gasoline Range Organics	626	33.7	mg/Kg	AK101/8020		10/01/97	10/07/97 GSM	
Benzene	0.955	0.842	mg/Kg	AK101/8020		10/01/97	10/07/97 GSM	
Toluene	7.65	0.842	mg/Kg	AK101/8020		10/01/97	10/07/97 GSM	
Ethylbenzene	5.11	0.842	mg/Kg	AK101/8020		10/01/97	10/07/97 GSM	
P & M -Xylene	44.2	0.842	mg/Kg	AK101/8020		10/01/97	10/07/97 GSM	
o-Xylene	41.5	0.842	mg/Kg	AK101/8020		10/01/97	10/07/97 GSM	
Surrogates								
4-Bromofluorobenzene <Surr>	I 1860	%		AK101/8020	(50-150)	10/01/97	10/07/97	
1,4-Difluorobenzene <Surr>	I 166	%		AK101/8020	(50-150)	10/01/97	10/07/97	
AK102								
Diesel Range Organics	233	4.73	mg/Kg	AK102 DRO		10/07/97	10/08/97 MMP	
Surrogates								
5a Androstane <surr>	76.6	%		AK102 DRO	(50-150)	10/07/97	10/08/97	



CT&E Ref.# 975764008
Client Name Shannon & Wilson-Fairbanks
Project Name/# Jack's X-0848
Client Sample ID 848-1001-42
Matrix Soil
Ordered By
PWSID

Client PO# 403757
Printed Date/Time 10/17/97 11:15
Collected Date/Time 10/01/97 13:45
Received Date/Time 10/03/97 11:35
Technical Director: Stephen C. Ede

Released By *Shane Proton*

Sample Remarks:

DRO - Pattern consistent with weathered middle distillate.

DRO - Pattern consistent with weathered gasoline.

GRO/BTEX Surrogates do not meet QC goals due to matrix interference and/or dilution.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	85.3		%	SM18 2540G			10/06/97	WDW
GRO/8020 Combo								
Gasoline Range Organics	7060	281	mg/Kg	AK101/8020		10/01/97	10/08/97	GSM
Benzene	44.7	7.03	mg/Kg	AK101/8020		10/01/97	10/08/97	GSM
Toluene	836	7.03	mg/Kg	AK101/8020		10/01/97	10/08/97	GSM
Ethylbenzene	180	7.03	mg/Kg	AK101/8020		10/01/97	10/08/97	GSM
P & M -Xylene	1080	7.03	mg/Kg	AK101/8020		10/01/97	10/08/97	GSM
o-Xylene	407	7.03	mg/Kg	AK101/8020		10/01/97	10/08/97	GSM
Surrogates								
4-Bromofluorobenzene <Surr>	!	3110	%	AK101/8020	(50-150)	10/01/97	10/08/97	
1,4-Difluorobenzene <Surr>	!	407	%	AK101/8020	(50-150)	10/01/97	10/08/97	
AK102								
Diesel Range Organics	1020	23.2	mg/Kg	AK102 DRO		10/07/97	10/08/97	WAA
Surrogates								
5a Androstane <surr>	82.1		%	AK102 DRO	(50-150)	10/07/97	10/08/97	



CT&E Ref.# 975764009
 Client Name Shannon & Wilson-Fairbanks
 Project Name/# Jack's X-0848
 Client Sample ID 848-1001-51
 Matrix Soil
 Ordered By
 PWSID

Client PO# 403757
 Printed Date/Time 10/17/97 11:15
 Collected Date/Time 10/01/97 13:21
 Received Date/Time 10/03/97 11:35
 Technical Director: Stephen C. Ede

Released By *Sharon Peterson*

Sample Remarks:

DRO - Pattern consistent with weathered middle distillate.
 GRO/BTEX Surrogates do not meet QC goals due to matrix interference and/or dilution.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	85.5		%	SM18 2540G			10/09/97	WDW
GRO/8020 Combo								
Gasoline Range Organics	1580	30.2	mg/Kg	AK101/8020		10/01/97	10/07/97	GSM
Benzene	0.676 J	0.754	mg/Kg	AK101/8020		10/01/97	10/07/97	GSM
Toluene	3.59	0.754	mg/Kg	AK101/8020		10/01/97	10/07/97	GSM
Ethylbenzene	2.80	0.754	mg/Kg	AK101/8020		10/01/97	10/07/97	GSM
P & M -Xylene	8.12	0.754	mg/Kg	AK101/8020		10/01/97	10/07/97	GSM
o-Xylene	14.8	0.754	mg/Kg	AK101/8020		10/01/97	10/07/97	GSM
Surrogates								
4-Bromofluorobenzene <Surr>	5600	%		AK101/8020	(50-150)	10/01/97	10/07/97	
1,4-Difluorobenzene <Surr>	146	%		AK101/8020	(50-150)	10/01/97	10/07/97	
AK102								
Diesel Range Organics	1070	9.19	mg/Kg	AK102 DRO		10/07/97	10/08/97	WAA
Surrogates								
5a Androstane <surr>	77	%		AK102 DRO	(50-150)	10/07/97	10/08/97	



CT&E Environmental Services Inc.

CT&E Ref.# 975764010
Client Name Shannon & Wilson-Fairbanks
Project Name/# Jack's X-0848
Client Sample ID Trip Blank
Matrix Soil
Ordered By
PWSID

Client PO# 403757
Printed Date/Time 10/17/97 11:15
Collected Date/Time
Received Date/Time 10/03/97 11:35
Technical Director: Stephen C. Ede

Released By *Shane Peterson*

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	100		%	SM18 2540G			10/06/97	WDW
GRO/8020 Combo								
Gasoline Range Organics	1.88 U	1.88	mg/Kg	AK101/8020		10/09/97	10/07/97	GSM
Benzene	0.0470 U	0.0470	mg/Kg	AK101/8020		10/09/97	10/07/97	GSM
Toluene	0.0470 U	0.0470	mg/Kg	AK101/8020		10/09/97	10/07/97	GSM
Ethylbenzene	0.0470 U	0.0470	mg/Kg	AK101/8020		10/09/97	10/07/97	GSM
P & M -Xylene	0.0470 U	0.0470	mg/Kg	AK101/8020		10/09/97	10/07/97	GSM
o-Xylene	0.0470 U	0.0470	mg/Kg	AK101/8020		10/09/97	10/07/97	GSM
Surrogates								
4-Bromofluorobenzene <Surr>	103		%	AK101/8020	(50-150)	10/09/97	10/07/97	
1,4-Difluorobenzene <Surr>	92.7		%	AK101/8020	(50-150)	10/09/97	10/07/97	



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CT&E Environmental Services, Inc.
200 W. Potter Dr.
Anchorage, AK 99518

Report Date: 10/15/97
Date Arrived: 10/10/97
Date Sampled: 10/01/97
Time Sampled: 1530
Collected By:

Attn: Heather Hall

Our Lab #: A152668
Location/Project: 848-1001-W1
Your Sample ID: 97.5764-11
Sample Matrix: Water
Comments:

**** Definitions ****
B = Present in Blank
H = Above Regulatory Max
E = Estimated Value
M = Matrix Interference
D = Lost to Dilution
MDL = Method Detection Limit

Lab Number	Method	Parameter	Units	Result *	MDL	Date Prepared	Date Analyzed
A152668	EPA 524.2	Benzene	ug/L	<MDL	0.20		10/13/97
		Bromobenzene	ug/L	<MDL	0.20		
		Bromochloromethane	ug/L	<MDL	0.20		
		Bromodichloromethane	ug/L	<MDL	0.20		
		Bromoform	ug/L	<MDL	0.50		
		Bromomethane	ug/L	<MDL	1.00		
		n-Butylbenzene	ug/L	<MDL	0.20		
		sec-Butylbenzene	ug/L	<MDL	0.20		
		tert-Butylbenzene	ug/L	<MDL	0.20		
		Carbon Tetrachloride	ug/L	<MDL	0.20		
		Chlorobenzene	ug/L	<MDL	0.20		
		Chloroethane	ug/L	<MDL	1.00		
		Chloroform	ug/L	<MDL	0.30		
		Chloromethane	ug/L	<MDL	0.50		
		2-Chlorotoluene	ug/L	<MDL	0.20		
		4-Chlorotoluene	ug/L	<MDL	0.20		
		Dibromochloromethane	ug/L	<MDL	0.20		
		Dibromomethane	ug/L	<MDL	0.20		
		1,2-Dichlorobenzene	ug/L	<MDL	0.20		
		1,3-Dichlorobenzene	ug/L	<MDL	0.20		
		1,4-Dichlorobenzene	ug/L	<MDL	0.20		
		Dichlorodifluoromethane	ug/L	<MDL	0.50		
		1,1-Dichloroethane	ug/L	<MDL	0.20		
		1,2-Dichloroethane	ug/L	0.23	0.20		
		1,1-Dichloroethene	ug/L	<MDL	0.20		
		cis-1,2-Dichloroethene	ug/L	<MDL	0.20		
		trans-1,2-Dichloroethene	ug/L	<MDL	0.20		
		1,2-Dichloropropane	ug/L	<MDL	0.20		
		1,3-Dichloropropane	ug/L	<MDL	0.20		
		2,2-Dichloropropane	ug/L	<MDL	0.20		
		1,1-Dichloropropene	ug/L	<MDL	0.20		

Reported By: Jorma K. Kuusisto
Chemistry Supervisor



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Lab Number	Method	Parameter	Units	Result *	MDL	Date Prepared	Date Analyzed
A152668	EPA 524.2	cis-1,3-Dichloropropene	ug/L	<MDL	0.20		10/13/97
		trans-1,3-Dichloropropene	ug/L	<MDL	0.20		
		Ethylbenzene	ug/L	<MDL	0.20		
		Hexachlorobutadiene	ug/L	<MDL	0.20		
		Isopropylbenzene	ug/L	<MDL	0.20		
		4-Isopropyltoluene	ug/L	<MDL	0.20		
		Methylene Chloride	ug/L	<MDL	0.50		
		Naphthalene	ug/L	<MDL	0.20		
		n-Propylbenzene	ug/L	<MDL	0.20		
		Styrene	ug/L	<MDL	0.20		
		1,1,1,2-Tetrachloroethane	ug/L	<MDL	0.20		
		1,1,2,2-Tetrachloroethane	ug/L	<MDL	0.20		
		Tetrachloroethene	ug/L	<MDL	0.20		
		Toluene	ug/L	<MDL	0.30		
		1,2,3-Trichlorobenzene	ug/L	<MDL	0.20		
		1,2,4-Trichlorobenzene	ug/L	<MDL	0.20		
		1,1,1-Trichloroethane	ug/L	<MDL	0.20		
		1,1,2-Trichloroethane	ug/L	<MDL	0.20		
		Trichloroethene	ug/L	<MDL	0.20		
		Trichlorofluoromethane	ug/L	<MDL	0.20		
		1,2,3-Trichloropropane	ug/L	<MDL	0.20		
		1,2,4-Trimethylbenzene	ug/L	<MDL	0.20		
		1,3,5-Trimethylbenzene	ug/L	<MDL	0.20		
		Vinyl Chloride	ug/L	<MDL	0.50		
		p,m - Xylene	ug/L	<MDL	0.20		
		o - Xylene	ug/L	<MDL	0.20		
		Total Trihalomethanes	ug/L	<MDL	1.00		
		4-Bromofluorobenzene (Surr)	%Recovery	95			
		1,2-Dichlorobenzene-d4 (Surr)	%Recovery	89			

Reported By: Jorma K. Kuusisto
Chemistry Supervisor



NORTHERN TESTING LABORATORIES, INC.

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(907) 349-1000 • FAX 349-1016

CT&E Environmental Services, Inc.
200 W. Potter Dr.
Anchorage, AK 99518

Report Date: 10/15/97
Date Arrived: 10/10/97
Date Sampled: 10/01/97
Time Sampled: 1535
Collected By:

Attn: Heather Hall

Our Lab #: A152669
Location/Project: 848-1001-W2
Your Sample ID: 97.5764-12
Sample Matrix: Water
Comments:

**** Definitions ****
B = Present in Blank
H = Above Regulatory Max
E = Estimated Value
M = Matrix Interference
D = Lost to Dilution
MDL = Method Detection Limit

Lab Number	Method	Parameter	Units	Result *	MDL	Date Prepared	Date Analyzed
A152669	EPA 524.2	Benzene	ug/L	<MDL	0.20		10/13/97
		Bromobenzene	ug/L	<MDL	0.20		
		Bromochloromethane	ug/L	<MDL	0.20		
		Bromodichloromethane	ug/L	<MDL	0.20		
		Bromoform	ug/L	<MDL	0.50		
		Bromomethane	ug/L	<MDL	1.00		
		n-Butylbenzene	ug/L	<MDL	0.20		
		sec-Butylbenzene	ug/L	<MDL	0.20		
		tert-Butylbenzene	ug/L	<MDL	0.20		
		Carbon Tetrachloride	ug/L	<MDL	0.20		
		Chlorobenzene	ug/L	<MDL	0.20		
		Chloroethane	ug/L	<MDL	1.00		
		Chloroform	ug/L	<MDL	0.30		
		Chloromethane	ug/L	<MDL	0.50		
		2-Chlorotoluene	ug/L	<MDL	0.20		
		4-Chlorotoluene	ug/L	<MDL	0.20		
		Dibromochloromethane	ug/L	<MDL	0.20		
		Dibromomethane	ug/L	<MDL	0.20		
		1,2-Dichlorobenzene	ug/L	<MDL	0.20		
		1,3-Dichlorobenzene	ug/L	<MDL	0.20		
		1,4-Dichlorobenzene	ug/L	<MDL	0.20		
		Dichlorodifluoromethane	ug/L	<MDL	0.50		
		1,1-Dichloroethane	ug/L	<MDL	0.20		
		1,2-Dichloroethane	ug/L	0.46	0.20		
		1,1-Dichloroethene	ug/L	<MDL	0.20		
		cis-1,2-Dichloroethene	ug/L	<MDL	0.20		
		trans-1,2-Dichloroethene	ug/L	<MDL	0.20		
		1,2-Dichloropropane	ug/L	<MDL	0.20		
		1,3-Dichloropropane	ug/L	<MDL	0.20		
		2,2-Dichloropropane	ug/L	<MDL	0.20		
		1,1-Dichloropropene	ug/L	<MDL	0.20		

Reported By: Jorma K. Kuusisto
Chemistry Supervisor



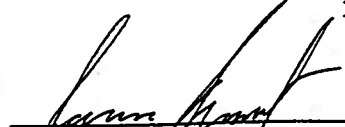
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Lab Number	Method	Parameter	Units	Result *	MDL	Date Prepared	Date Analyzed
A152669	EPA 524.2	cis-1,3-Dichloropropene	ug/L	<MDL	0.20		10/13/97
		trans-1,3-Dichloropropene	ug/L	<MDL	0.20		
		Ethylbenzene	ug/L	<MDL	0.20		
		Hexachlorobutadiene	ug/L	<MDL	0.20		
		Isopropylbenzene	ug/L	<MDL	0.20		
		4-Isopropyltoluene	ug/L	<MDL	0.20		
		Methylene Chloride	ug/L	0.54	0.50		
		Naphthalene	ug/L	<MDL	0.20		
		n-Propylbenzene	ug/L	<MDL	0.20		
		Styrene	ug/L	<MDL	0.20		
		1,1,1,2-Tetrachloroethane	ug/L	<MDL	0.20		
		1,1,2,2-Tetrachloroethane	ug/L	<MDL	0.20		
		Tetrachloroethene	ug/L	<MDL	0.20		
		Toluene	ug/L	<MDL	0.30		
		1,2,3-Trichlorobenzene	ug/L	<MDL	0.20		
		1,2,4-Trichlorobenzene	ug/L	<MDL	0.20		
		1,1,1-Trichloroethane	ug/L	<MDL	0.20		
		1,1,2-Trichloroethane	ug/L	<MDL	0.20		
		Trichloroethene	ug/L	<MDL	0.20		
		Trichlorofluoromethane	ug/L	<MDL	0.20		
		1,2,3-Trichloropropane	ug/L	<MDL	0.20		
		1,2,4-Trimethylbenzene	ug/L	<MDL	0.20		
		1,3,5-Trimethylbenzene	ug/L	<MDL	0.20		
		Vinyl Chloride	ug/L	<MDL	0.50		
		p,m - Xylene	ug/L	<MDL	0.20		
		o - Xylene	ug/L	<MDL	0.20		
		Total Trihalomethanes	ug/L	<MDL	1.00		
		4-Bromofluorobenzene (Surr)	%Recovery	96			
		1,2-Dichlorobenzene-d4 (Surr)	%Recovery	89			


Reported By: Jorma K. Kuusisto
Chemistry Supervisor



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CT&E Environmental Services, Inc.
200 W. Potter Dr.
Anchorage, AK 99518

Report Date: 10/15/97
Date Arrived: 10/10/97
Date Sampled: 10/01/97
Time Sampled:
Collected By:

Attn: Heather Hall

Our Lab #: A152670
Location/Project: Trip Blank
Your Sample ID: 97.5764-13
Sample Matrix: Water
Comments:

**** Definitions ****
B = Present in Blank
H = Above Regulatory Max
E = Estimated Value
M = Matrix Interference
D = Lost to Dilution
MDL = Method Detection Limit

Lab Number	Method	Parameter	Units	Result *	MDL	Date Prepared	Date Analyzed
A152670	EPA 524.2	Benzene	ug/L	<MDL	0.20		10/13/97
		Bromobenzene	ug/L	<MDL	0.20		
		Bromochloromethane	ug/L	<MDL	0.20		
		Bromodichloromethane	ug/L	<MDL	0.20		
		Bromoform	ug/L	<MDL	0.20		
		Bromomethane	ug/L	<MDL	0.50		
		n-Butylbenzene	ug/L	<MDL	1.00		
		sec-Butylbenzene	ug/L	<MDL	0.20		
		tert-Butylbenzene	ug/L	<MDL	0.20		
		Carbon Tetrachloride	ug/L	<MDL	0.20		
		Chlorobenzene	ug/L	<MDL	0.20		
		Chloroethane	ug/L	<MDL	0.20		
		Chloroform	ug/L	<MDL	1.00		
		Chloromethane	ug/L	<MDL	0.30		
		2-Chlorotoluene	ug/L	<MDL	0.50		
		4-Chlorotoluene	ug/L	<MDL	0.20		
		Dibromochloromethane	ug/L	<MDL	0.20		
		Dibromomethane	ug/L	<MDL	0.20		
		1,2-Dichlorobenzene	ug/L	<MDL	0.20		
		1,3-Dichlorobenzene	ug/L	<MDL	0.20		
		1,4-Dichlorobenzene	ug/L	<MDL	0.20		
		Dichlorodifluoromethane	ug/L	<MDL	0.20		
		1,1-Dichloroethane	ug/L	<MDL	0.50		
		1,2-Dichloroethane	ug/L	<MDL	0.20		
		1,1-Dichloroethene	ug/L	<MDL	0.20		
		cis-1,2-Dichloroethene	ug/L	<MDL	0.20		
		trans-1,2-Dichloroethene	ug/L	<MDL	0.20		
		1,2-Dichloropropane	ug/L	<MDL	0.20		
		1,3-Dichloropropane	ug/L	<MDL	0.20		
		2,2-Dichloropropane	ug/L	<MDL	0.20		
		1,1-Dichloropropene	ug/L	<MDL	0.20		

Reported By: Jorma K. Kuusisto
Chemistry Supervisor



NORTHERN TESTING LABORATORIES, INC.


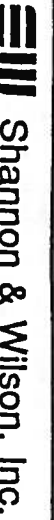
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Lab Number	Method	Parameter	Units	Result *	MDL	Date Prepared	Date Analyzed
A152670	EPA 524.2	cis-1,3-Dichloropropene	ug/L	<MDL	0.20		10/13/97
		trans-1,3-Dichloropropene	ug/L	<MDL	0.20		
		Ethylbenzene	ug/L	<MDL	0.20		
		Hexachlorobutadiene	ug/L	<MDL	0.20		
		Isopropylbenzene	ug/L	<MDL	0.20		
		4-Isopropyltoluene	ug/L	<MDL	0.20		
		Methylene Chloride	ug/L	<MDL	0.50		
		Naphthalene	ug/L	<MDL	0.20		
		n-Propylbenzene	ug/L	<MDL	0.20		
		Styrene	ug/L	<MDL	0.20		
		1,1,1,2-Tetrachloroethane	ug/L	<MDL	0.20		
		1,1,2,2-Tetrachloroethane	ug/L	<MDL	0.20		
		Tetrachloroethene	ug/L	<MDL	0.20		
		Toluene	ug/L	<MDL	0.30		
		1,2,3-Trichlorobenzene	ug/L	<MDL	0.20		
		1,2,4-Trichlorobenzene	ug/L	<MDL	0.20		
		1,1,1-Trichloroethane	ug/L	<MDL	0.20		
		1,1,2-Trichloroethane	ug/L	<MDL	0.20		
		Trichloroethene	ug/L	<MDL	0.20		
		Trichlorofluoromethane	ug/L	<MDL	0.20		
		1,2,3-Trichloropropane	ug/L	<MDL	0.20		
		1,2,4-Trimethylbenzene	ug/L	<MDL	0.20		
		1,3,5-Trimethylbenzene	ug/L	<MDL	0.20		
		Vinyl Chloride	ug/L	<MDL	0.50		
		p,m - Xylene	ug/L	<MDL	0.20		
		o - Xylene	ug/L	<MDL	0.20		
		Total Trihalomethanes	ug/L	<MDL	1.00		
		4-Bromofluorobenzene (Surr)	%Recovery	93			
		1,2-Dichlorobenzene-d4 (Surr)	%Recovery	88			

Reported By: Jorma K. Kuusisto
Chemistry Supervisor

 Shannon & Wilson, Inc.

400 N. 34th Street, Suite 100 11500 Olive Blvd., Suite 276
Seattle, WA 98103 St. Louis, MO 63141
(206) 632-8020 (314) 872-8170

2055 Hill Road
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5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120

Chain of Custody Reco...

97.5764

Page 2 of 2
Laboratory 54E
Attn: 420DA

Analysis Parameters/Sample Container Description

(Include preservative if used)

[illegible]

Shannon & Wilson, Inc.

Chain of Custody Record

97.5764

Page 1 of 1
Laboratory CTE
Attn: LEWDA

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020
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St. Louis, MO 63141
(314) 872-8170
6430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120

Analyte Parameters/Sample Container Description
(Include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp. Grab		Total Number of Containers	Remarks/Matrix
				AK 101	AK 102		
BAB-1001-11	①	13:10	X	X	2	Soil	
BAB-1001-12	②	13:15	X	X	2	AK 101	
BAB-1001-21	③	13:20	X	X	2	093094 MS	
BAB-1001-22	④	13:25	X	X	2		
BAB-1001-31	⑤	13:30	X	X	2		
BAB-1001-32	⑥	13:35	X	X	2		
BAB-1001-41	⑦	13:40	X	X	2		
BAB-1001-42	⑧	13:45	X	X	2		
BAB-1001-51	⑨	13:21	X	X	1	Temp = 41°C	
TRIP Blank	⑩						

Project Information		Sample Receipt	
Project Number: <u>SKC</u>	Total Number of Containers	Signature: <u>[Signature]</u>	Time: <u>11:35</u>
Project Name: <u>X-02483</u>	COC Seal/Infect V/N/A	Printed Name: <u>[Signature]</u>	Date: <u>10-3-97</u>
Contact: <u>MKT-1001-02</u>	Received Good Cond./Cold	Printed Name: <u>Lina Handberg</u>	Date: <u>10/3/97</u>
Ongoing Project? Yes <input type="checkbox"/> No <input type="checkbox"/>	Delivery Method: <u>HC</u>	Company: <u>CTE</u>	
Sampler: <u>MSL</u>	(attach shipping bill, if any)		

Instructions			
Requested Turn Around Time: <u>Grandpa</u>			
Special Instructions: <u>PO# 403757</u>			

Relinquished By: 1.		Relinquished By: 2.		Relinquished By: 3.	
Signature: <u>[Signature]</u>	Time: <u>11:35</u>	Signature: <u>[Signature]</u>	Time: <u>11:30</u>	Signature: _____	Time: _____
Printed Name: <u>[Signature]</u>	Date: <u>10-3-97</u>	Printed Name: <u>Lina Handberg</u>	Date: <u>10/3/97</u>	Printed Name: _____	Date: _____
Company: <u>CTE</u>		Company: <u>CTE</u>		Company: _____	

Received By: 1.		Received By: 2.		Received By: 3.	
Signature: <u>[Signature]</u>	Time: <u>11:35</u>	Signature: <u>[Signature]</u>	Time: <u>11:30</u>	Signature: _____	Time: _____
Printed Name: <u>[Signature]</u>	Date: <u>10-3-97</u>	Printed Name: <u>Lina Handberg</u>	Date: <u>10/3/97</u>	Printed Name: _____	Date: _____
Company: <u>CTE</u>		Company: <u>CTE</u>		Company: _____	



NORTHERN TESTING LABORATORIES, INC.

3330 INDUSTRIAL AVENUE
8005 SCHOON STREET

FAIRBANKS, ALASKA 99701
ANCHORAGE, ALASKA 99518

(907) 456-3116 • FAX 456-3125
(907) 349-1000 • FAX 349-1016

Shannon & Wilson, Inc.
2055 Hill Road
Fairbanks AK 99701

Attn: Mark Lockwood

Report Date: 08/18/97

Date Arrived: 07/15/97

Date Sampled: 07/14/97

Time Sampled: 1509

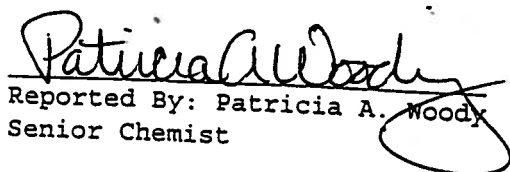
Collected By: MSL

MDL = Method Detection
Limit

Our Lab #: F172261
Location/Project: X-0848 Jack's
Your Sample ID: 848-0714-301
Sample Matrix: Soil
Comments:

* Flag Definitions
B = Below Regulatory Min.
H = Above Regulatory Max.

Lab#	Method	Parameter	Units	Results *	MDL	Date Prepared	Date Analyzed
F172261	EPA 300.0	Nitrate-N	mg/dry kg	<MDL	0.4		07/15/97
		Nitrite-N	mg/dry kg	<MDL	0.4		07/16/97
	EPA 351.3	Total Kjeldahl Nitrogen	mg/dry kg	13	12		07/31/97
	EPA 9045B	pH	Unit	6.3			07/15/97
	EPA 9060	Total Organic Carbon	mg/dry kg	323	11.9		07/17/97
	MPN	Heterotrophic Bacteria	#/dry g	2.0 x 10 ³			07/25/97
	MSA 24-5.3	Phosphate-P	mg/dry kg	0.24	0.12		07/28/97
	Sheen Screen	Hydrocarbon-Degrading Bacteria	#/dry g	27			07/25/97
	SM2320-B	Alkalinity as CaCO ₃	mg/dry kg	64	12		07/18/97
	SM2540-B	Solids	%	84.1	1.0		07/15/97
	SM4500-N	Total Nitrogen	mg/dry kg	13	12		07/31/97


Reported By: Patricia A. Woody
Senior Chemist



NORTHERN TESTING LABORATORIES, INC.

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Shannon & Wilson, Inc.
2055 Hill Road
Fairbanks AK 99701

Attn: Mark Lockwood

Report Date: 08/18/97

Date Arrived: 07/15/97

Date Sampled: 07/14/97

Time Sampled: 1540

Collected By: MSL

MDL = Method Detection
Limit

Our Lab #: F172262
Location/Project: X-0848 Jack's
Your Sample ID: 848-0714-304
Sample Matrix: Soil
Comments:

* Flag Definitions
B = Below Regulatory Min.
H = Above Regulatory Max.

Lab#	Method	Parameter	Units	Results *	MDL	Date Prepared	Date Analyzed
F172262	EPA 300.0	Nitrate-N	mg/dry kg	<MDL	0.3		07/15/97
		Nitrite-N	mg/dry kg	<MDL	0.3		07/16/97
	EPA 351.3	Total Kjeldahl Nitrogen	mg/dry kg	<MDL	10		07/31/97
	EPA 9045B	pH	Unit	8.3			07/15/97
	EPA 9060	Total Organic Carbon	mg/dry kg	54.8	5.2		07/17/97
	MPN	Heterotrophic Bacteria	#/dry g	2.5 x 10 ⁷			07/25/97
	MSA 24-5.3	Phosphate-P	mg/dry kg	<MDL	0.10		07/28/97
	Sheen Screen	Hydrocarbon-Degrading Bacteria	#/dry g	10			07/25/97
	SM2320-B	Alkalinity as CaCO ₃	mg/dry kg	258	10		07/18/97
	SM2540-B	Solids	%	96.9	1.0		07/15/97
	SM4500-N	Total Nitrogen	mg/dry kg	<MDL	10		07/31/97

Patricia A. Woody
Reported By: Patricia A. Woody
Senior Chemist



NORTHERN TESTING LABORATORIES, INC.

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Shannon & Wilson, Inc.
2055 Hill Road
Fairbanks AK 99701

Attn: Mark Lockwood

Report Date: 08/18/97

Date Arrived: 07/15/97

Date Sampled: 07/14/97

Time Sampled: 1630

Collected By: MSL

MDL = Method Detection
Limit

Our Lab #: F172263
Location/Project: X-0848 Jack's
Your Sample ID: 848-0714-402
Sample Matrix: Soil
Comments:

* Flag Definitions
B = Below Regulatory Min.
H = Above Regulatory Max.

Lab#	Method	Parameter	Units	Results *	Date MDL	Date Prepared	Date Analyzed
F172263	EPA 300.0	Nitrate-N	mg/dry kg	<MDL	0.4		07/15/97
		Nitrite-N	mg/dry kg	<MDL	0.4		07/16/97
	EPA 351.3	Total Kjeldahl Nitrogen	mg/dry kg	<MDL	12		07/31/97
	EPA 9045B	pH	Unit	6.9			07/15/97
	EPA 9060	Total Organic Carbon	mg/dry kg	470	11.7		07/17/97
	MPN	Heterotrophic Bacteria	#/dry g	1.9 x 10 ⁵			07/25/97
	MSA 24-5.3	Phosphate-P	mg/dry kg	0.14	0.12		07/28/97
	Sheen Screen	Hydrocarbon-Degrading Bacteria	#/dry g	27			07/25/97
	SM2320-B	Alkalinity as CaCO ₃	mg/dry kg	87	12		07/18/97
	SM2540-B	Solids	%	84.7	1.0		07/15/97
	SM4500-N	Total Nitrogen	mg/dry kg	<MDL	12		07/31/97

Patricia A. Woody
Reported By: Patricia A. Woody
Senior Chemist



NORTHERN TESTING LABORATORIES, INC.

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Shannon & Wilson, Inc.
2055 Hill Road
Fairbanks AK 99701

Report Date: 08/18/97

Date Arrived: 07/15/97
Date Sampled: 07/14/97
Time Sampled: 1645
Collected By: MSL

Attn: Mark Lockwood

MDL = Method Detection
Limit

Our Lab #: F172264
Location/Project: X-0848 Jack's
Your Sample ID: 848-0714-404
Sample Matrix: Soil
Comments:

* Flag Definitions
B = Below Regulatory Min.
H = Above Regulatory Max.

Lab#	Method	Parameter	Units	Results *	Date MDL Prepared	Date Analyzed
F172264	EPA 300.0	Nitrate-N	mg/dry kg	<MDL	0.3	07/15/97
		Nitrite-N	mg/dry kg	<MDL	0.3	07/16/97
	EPA 351.3	Total Kjeldahl Nitrogen	mg/dry kg	<MDL	10	07/31/97
	EPA 9045B	pH	Unit	8.5		07/15/97
	EPA 9060	Total Organic Carbon	mg/dry kg	12.6	5.1	07/17/97
	MPN	Heterotrophic Bacteria	#/dry g	5.6 x 10 ⁶		07/25/97
	MSA 24-5.3	Phosphate-P	mg/dry kg	<MDL	0.10	07/28/97
	Sheen Screen	Hydrocarbon-Degrading Bacteria	#/dry g	120		07/25/97
	SM2320-B	Alkalinity as CaCO ₃	mg/dry kg	201	10	07/18/97
	SM2540-B	Solids	%	97.7	1.0	07/15/97
	SM4500-N	Total Nitrogen	mg/dry kg	<MDL	10	07/31/97

Patricia A. Woody
Reported By: Patricia A. Woody
Senior Chemist



NORTHERN TESTING LABORATORIES, INC.

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Shannon & Wilson, Inc.
2055 Hill Road
Fairbanks AK 99701

Attn: Mark Lockwood

Report Date: 12/16/97

Date Arrived: 10/03/97

Date Sampled: 10/01/97

Time Sampled: 1310

Collected By: MSL

MDL = Method Detection
Limit

Our Lab #: F174313
Location/Project: Jacks/X-0848-2
Your Sample ID: 848-1001-11
Sample Matrix: Soil
Comments:

* Flag Definitions
B = Below Regulatory Min.
H = Above Regulatory Max.

Lab#	Method	Parameter	Units	Results *	Date MDL Prepared	Date Analyzed
F174313	EPA 351.3	Total Kjeldahl Nitrogen	mg/dry kg	9000	114	11/20/97
	EPA 415 Mod	Total Organic Carbon	mg/kg	10000	1000	12/09/97
	EPA 9045B	pH	Unit	8.8		10/04/97
	MPN	Heterotrophic Bacteria	#/dry gr	4.0 x 10 ⁴		10/03/97
	MSA 24-5.3	Phosphate-P	mg/dry kg	1.42	0.11	10/23/97
	Sheen Screen	Hydrocarbon-Degrading Bacteria	#/dry g	190		10/03/97
	SM2320-B	Alkalinity as CaCO ₃	mg/dry kg	84	1	10/20/97
	SM2540-B	Solids	%	87.7	1.0	10/15/97

Patricia A. Woody
Reported By: Patricia A. Woody
Senior Chemist



NORTHERN TESTING LABORATORIES, INC.

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8005 SCHOON STREET

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(907) 349-1000 • FAX 349-1016

Shannon & Wilson, Inc.
2055 Hill Road
Fairbanks AK 99701

Attn: Mark Lockwood

Report Date: 12/16/97

Date Arrived: 10/03/97

Date Sampled: 10/01/97

Time Sampled: 1325

Collected By: MSL

MDL = Method Detection
Limit

Our Lab #: F174314
Location/Project: Jacks/X-0848-2
Your Sample ID: 848-1001-22
Sample Matrix: Soil
Comments:

* Flag Definitions
B = Below Regulatory Min.
H = Above Regulatory Max.

Lab#	Method	Parameter	Units	Results *	Date MDL Prepared	Date Analyzed
F174314	EPA 351.3	Total Kjeldahl Nitrogen	mg/dry kg	1400	117	11/20/97
	EPA 415 Mod	Total Organic Carbon	mg/kg	11000	1000	12/09/97
	EPA 9045B	pH	Unit	7.2		10/04/97
	MPN	Heterotrophic Bacteria	#/dry gr	2.7×10^4		10/03/97
	MSA 24-5.3	Phosphate-P	mg/dry kg	0.25	0.12	10/23/97
	Sheen Screen	Hydrocarbon-Degrading Bacteria	#/dry g	1.3×10^3		10/03/97
	SM2320-B	Alkalinity as CaCO ₃	mg/dry kg	8	1	10/20/97
	SM2540-B	Solids	%	85.2	1.0	10/15/97

Patricia A. Woody
Reported By: Patricia A. Woody
Senior Chemist



NORTHERN TESTING LABORATORIES, INC.

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8005 SCHOON STREET

FAIRBANKS, ALASKA 99701
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Shannon & Wilson, Inc.
2055 Hill Road
Fairbanks AK 99701

Attn: Mark Lockwood

Report Date: 12/16/97

Date Arrived: 10/03/97

Date Sampled: 10/01/97

Time Sampled: 1330

Collected By: MSL

MDL = Method Detection
Limit

Our Lab #: F174315
Location/Project: Jacks/X-0848-2
Your Sample ID: 848-1001-31
Sample Matrix: Soil
Comments:

* Flag Definitions
B = Below Regulatory Min.
H = Above Regulatory Max.

Lab#	Method	Parameter	Units	Results *	MDL	Date Prepared	Date Analyzed
F174315	EPA 351.3	Total Kjeldahl Nitrogen	mg/dry kg	440	131		11/21/97
	EPA 415 Mod	Total Organic Carbon	mg/kg	4930	1000		12/09/97
	EPA 9045B	pH	Unit	6.5			10/04/97
	MPN	Heterotrophic Bacteria	#/dry gr	3.2×10^7			10/03/97
	MSA 24-5.3	Phosphate-P	mg/dry kg	0.40	0.13		10/23/97
	Sheen Screen	Hydrocarbon-Degrading Bacteria	#/dry g	720			10/03/97
	SM2320-B	Alkalinity as CaCO ₃	mg/dry kg	7	1		10/20/97
	SM2540-B	Solids	%	76.6	1.0		10/15/97

Patricia A. Woody

Reported By: Patricia A. Woody
Senior Chemist



NORTHERN TESTING LABORATORIES, INC.

3330 INDUSTRIAL AVENUE
8005 SCHOON STREET

FAIRBANKS, ALASKA 99701
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(907) 349-1000 • FAX 349-1016

Shannon & Wilson, Inc.
2055 Hill Road
Fairbanks AK 99701

Attn: Mark Lockwood

Report Date: 12/16/97

Date Arrived: 10/03/97
Date Sampled: 10/01/97
Time Sampled: 1345
Collected By: MSL

MDL = Method Detection
Limit

Our Lab #: F174316
Location/Project: Jacks/X-0848-2
Your Sample ID: 848-1001-42
Sample Matrix: Soil
Comments:

* Flag Definitions
B = Below Regulatory Min.
H = Above Regulatory Max.

Lab#	Method	Parameter	Units	Results *	MDL	Date Prepared	Date Analyzed
F174316	EPA 351.3	Total Kjeldahl Nitrogen	mg/dry kg	380	114		11/21/97
	EPA 415 Mod	Total Organic Carbon	mg/kg	4660	1000		12/09/97
	EPA 9045B	pH	Unit	7.3			10/04/97
	MPN	Heterotrophic Bacteria	#/dry gr	$>9.1 \times 10^8$			10/03/97
	MSA 24-5.3	Phosphate-P	mg/dry kg	0.16	0.11		10/23/97
	Sheen Screen	Hydrocarbon-Degrading Bacteria	#/dry g	1.3×10^3			10/03/97
	SM2320-B	Alkalinity as CaCO ₃	mg/dry kg	10	1		10/20/97
	SM2540-B	Solids	%	88.0	1.0		10/15/97

Patricia A. Woody

Reported By: Patricia A. Woody
Senior Chemist



Shannon & Wilson, Inc.

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(907) 561-2120

Chain of Custody Record

Analysis Parameters/Sample Container Description
(Include preservative if used)

Page 1 of 1
Laboratory NTL
Attn: _____

Sample Identity

Lab No.

Time

Date Sampled

Comp. Grab

Total Number of Containers

Remarks/Matrix

TOC (365.2)
P (365.2)
TK (365.2)
PH (365.2)
ALK (310.5)
Hardness (310.5)
MnS (365.2)
Fe (365.2)

248-1001-11	F171318	13:10	10-1	X	X	X	X	X	1	SOL
248-1001-22	F174314	13:25		X	X	X	X	X	1	
248-1001-31	F174315	13:30		X	X	X	X	X	1	
248-1001-42	F174316	13:45		X	X	X	X	X	1	

Project Information

Sample Receipt

Project Number: X-0848-2	Total Number of Containers: 4
Project Name: JACTS	COC Seals/Inlet? Y/N/A: N/A
Contact: Mark Letwood	Received Good Cond./Cold: SC
Ongoing Project? Yes <input type="checkbox"/> No <input type="checkbox"/>	Delivery Method: _____
Sampler: MSL	(attach shipping bill, if any)

Instructions

Requested Turn Around Time: STANDARD

Special Instructions: Post 403756

Distribution:

White - w/shipment - returned to Shannon & Wilson w/ Laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

Relinquished By: 1

Relinquished By: 2

Relinquished By: 3

Signature: _____	Time: 11:25	Signature: _____	Time: _____	Signature: _____	Time: _____
Printed Name: _____	Date: 10-23-93	Printed Name: _____	Date: _____	Printed Name: _____	Date: _____
Company: _____		Company: _____		Company: _____	

Received By: 1

Received By: 2

Received By: 3

Signature: _____	Time: 11:25	Signature: _____	Time: _____	Signature: _____	Time: _____
Printed Name: _____	Date: 10/23/93	Printed Name: _____	Date: _____	Printed Name: _____	Date: _____
Company: _____		Company: _____		Company: _____	

NTL FBIS



SHANNON & WILSON, INC.

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

2055 HILL ROAD • P.O. BOX 70843 • FAIRBANKS, ALASKA 99707 • 0843

COOLER RECEIPT FORM

(Please fill out and return with the signed chain-of-custody)

Project: Jack's X-0848

Cooler received on 7/15/97 and opened on 7/15/97 by Marci L. Shurin

Firm NTL

Marci L. Shurin
Signature

1. Were custody seals on the outside of cooler? ☒ YES ☐ NO
If YES, how many and where? 1 - across opening of cooler
Were signature and date correct? ☒ YES ☐ NO
2. Were custody papers taped to lid inside cooler? ☒ YES ☐ NO
3. Were custody papers properly filled out? (ink, signed, etc.) ☒ YES ☐ NO
4. Did you sign custody papers in the appropriate place? ☒ YES ☐ NO
5. Did you attach shipper's packing slip to this form YES ☐ NO NA
hand del.
6. What kind of packing material was used? Bubble wrap
7. Was sufficient ice used (if appropriate)? ☒ YES ☐ NO
8. Sample temperature?
9. Were all bottles sealed in separate plastic bags? ☒ YES ☐ NO
10. Did all bottles arrive in good condition (unbroken)? ☒ YES ☐ NO
11. Were all bottle labels complete (No., date, signed, anal., pres.) ☒ YES ☐ NO
12. Did all bottle labels and tags agree with custody papers? YES ☐ NO
13. Were correct bottles used for the test indicated? ☒ YES ☐ NO
14. Were VOA vials checked for absence of air bubbles and noted if found? . YES ☐ NO NA
15. Was sufficient amount of sample sent in each bottle? ☒ YES ☐ NO

Explain any discrepancies:



Chain of Custody Record

Page 1 of 1
Laboratory NTL
Attn: _____

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5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120

Analysis Parameters/Sample Container Description
(Include preservative if used)

Remarks/Matrix

Total Number of Containers

Comp. Grab

Date Sampled

Time

Lab No.

Sample Identity

848-0714-301	3:07p	7-14	X	X	X	X	2	50.1 F172261
848-0714-304	3:40p	7-14	X	X	X	X	2	262
848-0714-402	4:30p	7-14	X	X	X	X	2	243
848-0714-404	4:45p	7-14	X	X	X	X	2	261

8 total

Project Information

Project Number: K-0848

Project Name: Sack's

Contact: MEL LOCKWOOD

Ongoing Project? Yes ☒ No ☐

Sampler: WEL

Delivery Method: (attach shipping bill, if any)

Requested Turn Around Time: _____

Special Instructions: _____

Relinquished By: 1

Signature: _____ Time: 6:13

Printed Name: MEL LOCKWOOD Date: 7-14-97

Company: WEL

Relinquished By: 2

Signature: _____ Time: 10:00

Printed Name: MEL LOCKWOOD Date: _____

Company: _____

Relinquished By: 3

Signature: _____ Time: _____

Printed Name: _____ Date: _____

Company: _____

Distribution: White - w/shipment - returned to Shannon & Wilson w/ Laboratory report

Yellow - w/shipment - for consignee files

Pink - Shannon & Wilson - Job File

ARCTIC ALASKA TESTING LABORATORIES

A DIVISION of SHANNON & WILSON GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS

2055 HILL RD FAIRBANKS AK 99709, PHONE: (907) 479-0600 FAX: (907) 479-5691

7/25/97

X-848-02

PROJECT: Jack's Service

RE: REPORT OF GRAIN SIZE DISTRIBUTION ASTMs C 136, C 117, D 422

DATE RECIEVED: 7/23/97

P.O. NUMBER:

SAMPLED BY:

DATE SAMPLED:

SAMPLED FROM:

CLIENTS SAMP. ID: B1-15/16.5

LAB SAMPLE #: 344

DESIGNATION:

REMARKS:

OTHER DATA:

TEST WEIGHT: 173.2

SIEVES	% PASS	SPECS.
3 IN.	100.0%	
2 IN.	100.0%	
1.5 IN.	100.0%	
1.0 IN.	100.0%	
3/4 IN.	100.0%	
1/2 IN.	100.0%	
3/8 IN.	100.0%	
#4	100.0%	
#10	96.3%	
#20	96.1%	
#40	95.8%	
#60	95.2%	
#100	89.9%	
#200	66.7%	


Randall K. Fletcher C.E.T.

Laboratory Supervisor

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7/25/97

X-848-02

PROJECT: Jack's Service

RE: REPORT OF GRAIN SIZE DISTRIBUTION ASTMs C 136, C 117, D 422

DATE RECIEVED: 7/23/97

P.O. NUMBER:

SAMPLED BY:

DATE SAMPLED:

SAMPLED FROM:

CLIENTS SAMP. ID: B4-15/16.5

LAB SAMPLE #: 344

DESIGNATION:

REMARKS:

OTHER DATA:

TEST WEIGHT: 217.2

SIEVES	% PASS	SPECS.
3 IN.	100.0%	
2 IN.	100.0%	
1.5 IN.	100.0%	
1.0 IN.	100.0%	
3/4 IN.	100.0%	
1/2 IN.	100.0%	
3/8 IN.	100.0%	
#4	100.0%	
#10	100.0%	
#20	99.8%	
#40	99.2%	
#60	94.4%	
#100	78.4%	
#200	47.1%	


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7/25/97

X-848-02

PROJECT: Jack's Service

RE: REPORT OF GRAIN SIZE DISTRIBUTION ASTMs C 136, C 117, D 422

DATE RECIEVED: 7/23/97

P.O. NUMBER:

SAMPLED BY:

DATE SAMPLED:

SAMPLED FROM:

CLIENTS SAMP. ID: B5-20/21

LAB SAMPLE #: 344

DESIGNATION:

REMARKS:

OTHER DATA:

TEST WEIGHT: 703.8

SIEVES	% PASS	SPECS.
3 IN.	100.0%	
2 IN.	100.0%	
1.5 IN.	72.0%	
1.0 IN.	42.0%	
3/4 IN.	32.9%	
1/2 IN.	31.6%	
3/8 IN.	27.2%	
#4	20.6%	
#10	14.7%	
#20	10.7%	
#40	7.0%	
#60	4.0%	
#100	2.0%	
#200	0.3%	


Randall K. Fletcher C.E.T.

Laboratory Supervisor

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7/25/97

X-848-02

PROJECT: Jack's Service

RE: REPORT OF GRAIN SIZE DISTRIBUTION ASTMs C 136, C 117, D 422

DATE RECEIVED: 7/23/97

P.O. NUMBER:

SAMPLED BY:

DATE SAMPLED:

SAMPLED FROM:

CLIENTS SAMP. ID: B9-15/16.5

LAB SAMPLE #: 344

DESIGNATION:

REMARKS:

OTHER DATA:

TEST WEIGHT: 238.8

SIEVES	% PASS	SPECS.
3 IN.	100.0%	
2 IN.	100.0%	
1.5 IN.	100.0%	
1.0 IN.	100.0%	
3/4 IN.	100.0%	
1/2 IN.	100.0%	
3/8 IN.	100.0%	
#4	100.0%	
#10	99.5%	
#20	99.4%	
#40	98.7%	
#60	93.2%	
#100	85.5%	
#200	52.7%	



Randall K. Fletcher C.E.T.

Laboratory Supervisor

ARCTIC ALASKA TESTING LABORATORIES
MOISTURE CONTENT REPORT
ASTMs D-2216 / D-4959

JOB #: X-848-02
DATE: 7/25/97

PROJECT: Jack's Service
TECH: RW

ID	%M	SOIL
B1-15/16.5	24.5%	578.2
B4-15/16.5	20.2%	477.8
B5-20/21	1.0%	703.5
B9-15/16.5	13.1%	883.9

ID	%M	SOIL
----	----	------

ID	%M	SOIL
----	----	------

ID	%M	SOIL
----	----	------