SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

SEATTLE
HANFORD
FAIRBANKS
ANCHORAGE
BOSTON
SAINT LOUIS

September 27, 1994

Statewide Petroleum Service
6108 Petersburg Street
Anchorage, Alaska 99518

Attn: Mr. John Hillborn

RE: UST REMOVAL AT MOM AND POP CHEVRON, MILE 46.5 OLD GLENN HIGHWAY, PALMER, ALASKA Event 683

This report documents the results of the closure assessment conducted during the removal of two (2) underground storage tanks (USTs) at the Mom and Pop Chevron located at 46.5 Mile Old Glenn Highway, Palmer, Alaska. The subject USTs were two (2) 10,000 gallon gasoline tanks and were situated as shown in Figure 1. According to the owner, Mr. Randy Frank, the station only sold unleaded gasoline. Presented in this report are our on-site observations with respect to field monitoring the tank removals, soil sampling the UST excavations and potentially petroleum hydrocarbon impacted soils, our field evaluation or "screening" of soils, and characterization of the subsurface conditions and extent of petroleum hydrocarbon impact to the soil.

The subject site is located about 3 miles southeast of downtown, Palmer, Alaska, in Section 34, T18N, R2E, Anchorage (C-6) SW quadrangle, Seward Meridian. The Matanuska River is located about 400 feet to the west of the site. Tank closure activities were conducted in accordance with the Alaska Department of Environmental Conservation (ADEC) UST Regulations and Shannon & Wilson, Inc's ADEC approved Quality Assurance Project Plan (QAPP) with the exception that no analytical samples were collected or tested. This project was performed in accordance with our proposal for services dated September 6, 1994, and conversations with Mr. Mike Krieber of the ADEC. Verbal authorization to proceed with this project was received from Mr. John Hillborn of Statewide Petroleum Services.

Previous Field Work

In March, 1993, Terrasat Consultants conducted a UST Site Assessment at the above mentioned location. This assessment was conducted along with a product line repair at the station. During the repair, screening with a PID indicated the presence of volatile compounds. The excavation was also monitored for explosive atmosphere in addition to monitoring with the PID.

As a result of the conditions identified during the product line repair, three monitoring wells were placed. Soil samples were collected from the excavation for the installation of these wells and from beneath the product lines and were tested by an analytical laboratory. Concentrations of 8,300 ppm of gasoline range organics and total BTEX concentrations of 3,950 ppm with 100 ppm benzene, 1,300 ppm toluene, 350 ppm ethylbenzene, and 2,200 ppm xylene were detected at the site. Free product was noted in the downgradient monitoring well, Monitoring Well MW-2, that was installed at the site. Groundwater was noted at a depth of nine feet during assessment activities by Terrasat.

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Underground Storage Tank Removal Monitoring

On September 8 through September 9, 1994, the subject USTs were removed from the ground. The following is a description of the field assessment activities conducted at the site for the UST removal monitoring and excavation screening and sampling. Photographs of the UST removal project are included as Attachment A.

The gasoline tanks had been pumped of fuel prior to the start of field activities. After removing the soil overlying the USTs, as well as disconnecting or cutting away vent and fill pipes, all tanks were purged and inerted with forced air and dry ice. When the atmosphere inside the vessels was less than 10% of the lower explosive limit (LEL), each vessel was extracted from the ground. After removal of the tanks, the soils in the side walls of the excavation were screened using a Sensidyne Flame Ionization Detector (FID). The soil sample descriptions and locations are included as Table 1. The values of the headspace screening are presented in Table 2.

After removal from the ground, each vessel used to store fuel was breached by cutting the ends out of the tank using a welding torch. The insides of the tanks were wiped clean with polypropylene diapers. No water or sludge was encountered in the tank. The former USTs and the associated piping were disposed of at Alaska Metal Recycling, Anchorage. Disposal receipts from Alaska Metal Recycling are included in Attachment B.

Both of the USTs were 10,000-gallon single-wall, cylindrical, steel vessels measuring 8 feet in diameter by 28 feet in length. Both USTs were oriented with their long axis in the northeast-southwest direction as shown in Figures 1 and 2. The tops of the USTs were found about 4.0 feet below grade. Each tank had a 4-inch fuel port near the southwest end of the tank, and 2-inch vent pipe and fuel delivery lines located near the northeast end of each tank. A CAT EL200B tracked excavator was used to excavate and remove the vessels from the ground. The vent lines extended horizontally below grade to the southwest side of the building and rose vertically 10 feet along the southwest wall of the building. The fuel lines extended above the top of tanks to the dispensers that were located on top of the tanks as shown in Figures 1 and 2. Both USTs were held down by concrete ballast attached to steel chains that went around the tanks. The ballast was not excavated during removal activities. Each tank showed little sign of corrosion and no holes were observed. The size of the final UST excavation measured about 33 feet long by 32 feet wide by 10 feet deep.

Due to the presence of free product in Monitoring Well MW-2 and on the standing water in the bottom of the excavation, as well as the high FID/PID readings obtained from the soil samples collected from the excavation during current and previous assessment work, no analytical testing was performed. Approximately 300 cubic yards of soil was generated during the removal of the USTs. These soils were temporarily stored on 10-mil reinforced plastic sheeting and then transferred to a long term treatment cell. The long term treatment cell was constructed with bermed sides covered with a 20-mil petroleum resistant liner. The cell measures about 80 feet by 40 feet. Two (2) sixty-foot sections of 4-inch I.D., 0.020-inch slotted PVC pipe were placed on the initial two foot layer of contaminated soil loaded into the cell and embedded in 0.5 foot of pea gravel. Another 2 foot layer of contaminated soil was then placed on top of these pipes to a total height of about 4 feet. The slotted pipe connects to a black plastic solid riser that is equipped with a chimney fan. As the soils were placed in the treatment cell they were mixed with nutrients with a nitrogen

(N): phosphorous (P): potassium (K) ratio of 5:5:5. After removal of the USTs, barricading was placed around the excavation. The barricading is scheduled to be removed soon and replaced with chain link fencing. The location of treatment cell is shown in Figure 1.

Conclusions and Recommendations

Based on the data presented herein and our interpretations of the conditions at the former UST site, elevated levels of gasoline type petroleum hydrocarbons are present in the soil remaining in-place. This site scores as a Level A site, and therefore has ADEC cleanup guidelines of 50 ppm GRO, 10 ppm total BTEX and 0.1 ppm benzene. An ADEC Matrix Score Sheet is included as Table 3. Because of the presence of free product in the excavation and down gradient monitoring wells, elevated FID readings, and previous studies conducted at the site, the analytical testing program was not conducted.

The stockpiled soils can remain in the treatment cell for up to two years. Prior to that time the soils will have to be analytically tested to demonstrate that clean up has been achieved or is progressing. The treatment cell should periodically be moistened with water to maintain moisture levels to enhance natural biodegradation of the hydrocarbons. The treatment cell should not be saturated or wetted to the point that run-off from the stockpile occurs.

The excavation was left open so that the gasoline type hydrocarbons that are present can volatilize and photodegrade. It is likely that the ADEC will request additional remediation be conducted at this site. There are several options available for treatment of this type and degree of contamination. We will be glad to assist you in any manner should you desire these services.

We have performed the above described sampling and testing procedures in accordance with Shannon & Wilson's ADEC approved QAPP and the ADEC UST Regulations of 18AAC78 concerning Site Assessments during Tank Closure with the exception that no analytical testing was performed. A completed Post Closure Information For Alaska Underground Storage Tank form is provided in Attachment C. We recommend that the owner follow the UST Regulations and submit a copy of this report to the ADEC for their review.

Closure/Limitations

This report was prepared for the exclusive use of our clients and their representatives in the study of this site. The findings we have presented within this report are based on limited research and on the sampling and analysis that we conducted at this site. They should not be construed as a definite conclusion regarding the soils and groundwater at this site. It is possible that our subsurface tests may have missed some higher levels of petroleum hydrocarbon constituents, although our intention was to sample areas likely to be impacted. As a result, the analysis and sampling performed can only provide you with our best judgement as to the environmental characteristics of this site, and in no way guarantees that an agency or its staff will reach the same conclusions as Shannon & Wilson, Inc. The data presented in this report should be considered representative of the time of our site assessment. Changes in the conditions of this site can occur with passage of time, whether they be due to natural processes or the works of man on this site. In addition, changes in Government Codes, regulations, or laws may occur. Due to such changes,

our observations and recommendations applicable to this site may need to be revised wholly or in part, due to changes beyond our control.

Shannon and Wilson has prepared the attachments in Attachment D "Important Information About Your Geotechnical Engineering/Subsurface Waste Management Report" to assist you and others in understanding the use and limitations of our reports.

You are advised that various state and federal agencies (ADEC, EPA, etc.) may require the reporting of this information. Shannon and Wilson does not assume the responsibility for reporting these findings and therefore, has not, and will not, disclose the results of this study.

We appreciate this opportunity to be of service. Please call the undersigned with any questions or comments concerning the contents of this report.

Sincerely,

SHANNON & WILSON, INC.

Prepared By:

Curtis C. Conner

Curtis C. Conner
Geologist

Approved By:

Fred R. Brown

Fred R. Brown, P.E.
Vice President

Encl: Table 1 and Table 2
Figure 1 and Figure 2
Attachment A - Photographs of UST Removal/Closure Activities
Attachment B - Disposal Receipts From Alaska Metal Recycling
Attachment C - ADEC Post Closure Notice
Attachment D - "Important Information About Your Geotechnical/Subsurface Waste Management Report"

TABLE 1 - SAMPLE LOCATIONS AND DESCRIPTIONS

Sample No.	Date	Sample Location (See Figure 2 and Table 2)	Depth (ft.)	Sample Classification
UST Excavation				
S1	9/9/94	End of Tank, Northeast Wall of Excavation	4.5 - 5.0	Brownish gray, sandy, Gravel w/abundant cobbles and trace silt
S2	9/9/94	End of Tank, Northeast Wall of Excavation	4.5 - 5.0	Brownish gray, sandy, Gravel w/abundant cobbles and trace silt
S3	9/9/94	Southeast Wall of Excavation	4.5 - 5.0	Brownish gray, sandy, Gravel w/abundant cobbles and trace silt
S4	9/9/94	Southeast Wall of Excavation	4.5 - 5.0	Brownish gray, sandy, Gravel w/abundant cobbles and trace silt
S5	9/9/94	End of Tank, Southwest Wall of Excavation	4.5 - 5.0	Brownish gray, sandy, Gravel w/abundant cobbles and trace silt
S6	9/9/94	End of Tank, Southwest Wall of Excavation	4.5 - 5.0	Brownish gray, sandy, Gravel w/abundant cobbles and trace silt
S7	9/9/94	Northwest Wall of Excavation	4.5 - 5.0	Brownish gray, sandy, Gravel w/abundant cobbles and trace silt
S8	9/9/94	Northwest Wall of Excavation	4.5 - 5.0	Brownish gray, sandy, Gravel w/abundant cobbles and trace silt

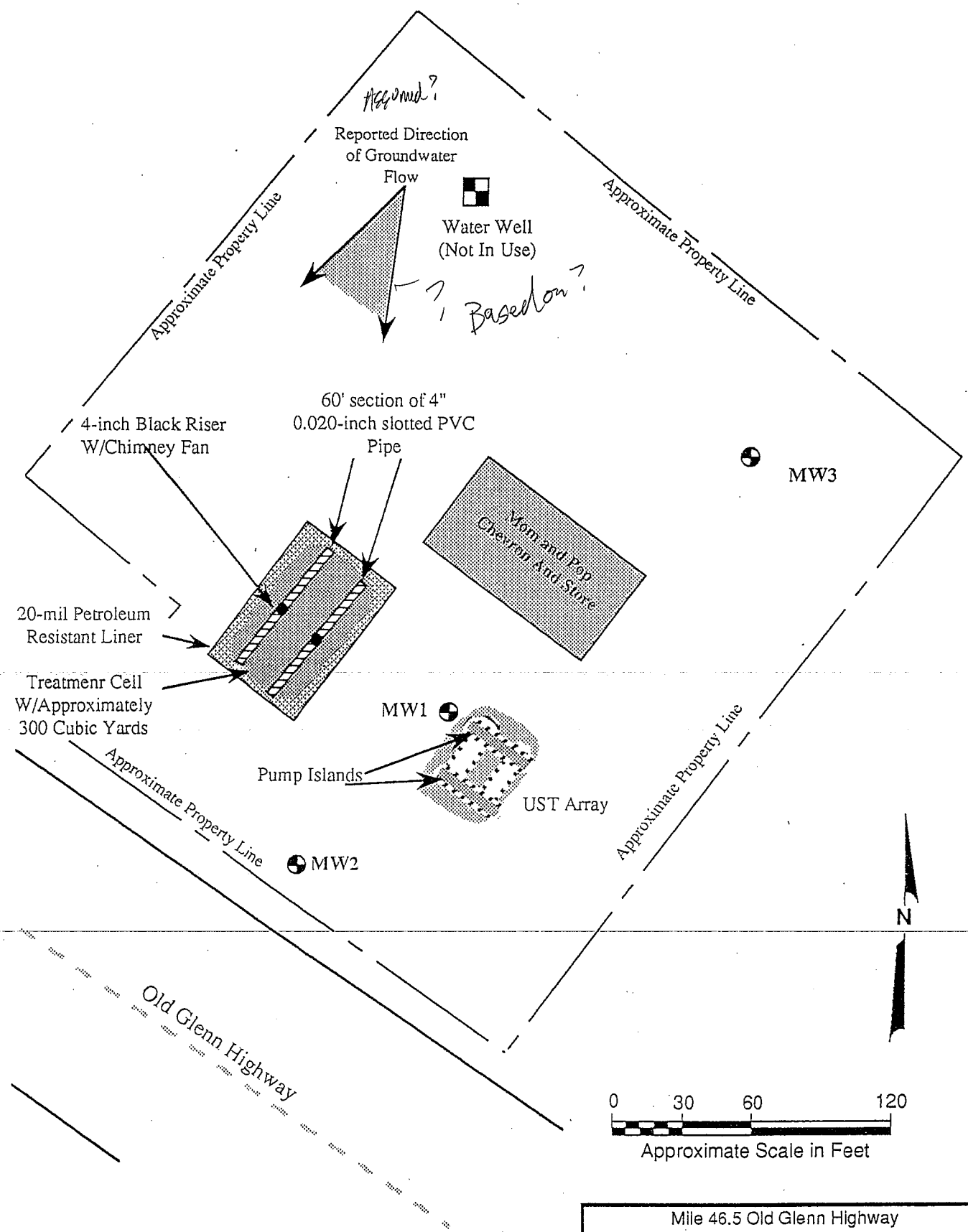
TABLE 2 - HEADSPACE SCREENING RESULTS

		Sample Number (See Table 1 and Figure 2)							
Parameter	Method	S1	S2	S3	S4	S5	S6	S7	S8
FID Headspace Reading - ppm	Sensidyne FID	850	1100	1,450	6,500	>10,000	>10,000	4,100	2,000

TABLE 3 - ADEC MATRIX SCORE SHEET

1. Depth to Subsurface Water		
< 5 feet	[10]	**10**
5-15 feet	[8]	
15-25 feet	[6]	
25-50 feet	[4]	
> 50 feet	[1]	
2. Mean Annual Precipitation		
>40 inches	[10]	
25-40 inches	[5]	
15-25 inches	[3]	**3**
<15 inches	[1]	
3. Soil Type (Unified Soil Classification)		
Clean, coarse-grained soils	[10]	
Coarse-grained soils with fines	[8]	**8**
Fine-grained soils (low OC)	[3]	
Fine-grained soils (high OC)	[1]	
4. Potential Receptors		
Public well within 1000 feet, or		
Private well(s) within 500 feet	[15]	
Municipal/priv well w/i 1/2 mi	[12]	**12**
Municipal/priv well w/i 1 mile	[8]	
No known well within 1/2 mile	[6]	
No known well within 1 mile	[4]	
Non-potable groundwater	[1]	
5. Volume of Contaminated Soil		
>500 cubic yards	[10]	**10**
100-500 cubic yards	[8]	
25-100 cubic yards	[5]	
>De Minimis-25 cubic yards	[2]	
De Minimis	[0]	

Matrix Score 43	Cleanup Level in mg/kg			
	Diesel	Gasoline/unknown		
	diesel range petroleum hydrocarbons	gasoline range petroleum hydrocarbons	Benzene	BETX
Level A >40	100	50	0.1	10
Level B 27-40	200	100	0.5	15
Level C 21-26	1000	500	0.5	50
Level D <20	2000	1000	0.5	100



Approximate Size and Location of Former UST

MW3 Groundwater Monitoring Well Placed By Terrasat, March, 1993

Mile 46.5 Old Glenn Highway
Palmer, Alaska

SITE PLAN

September 1994 Y-5397

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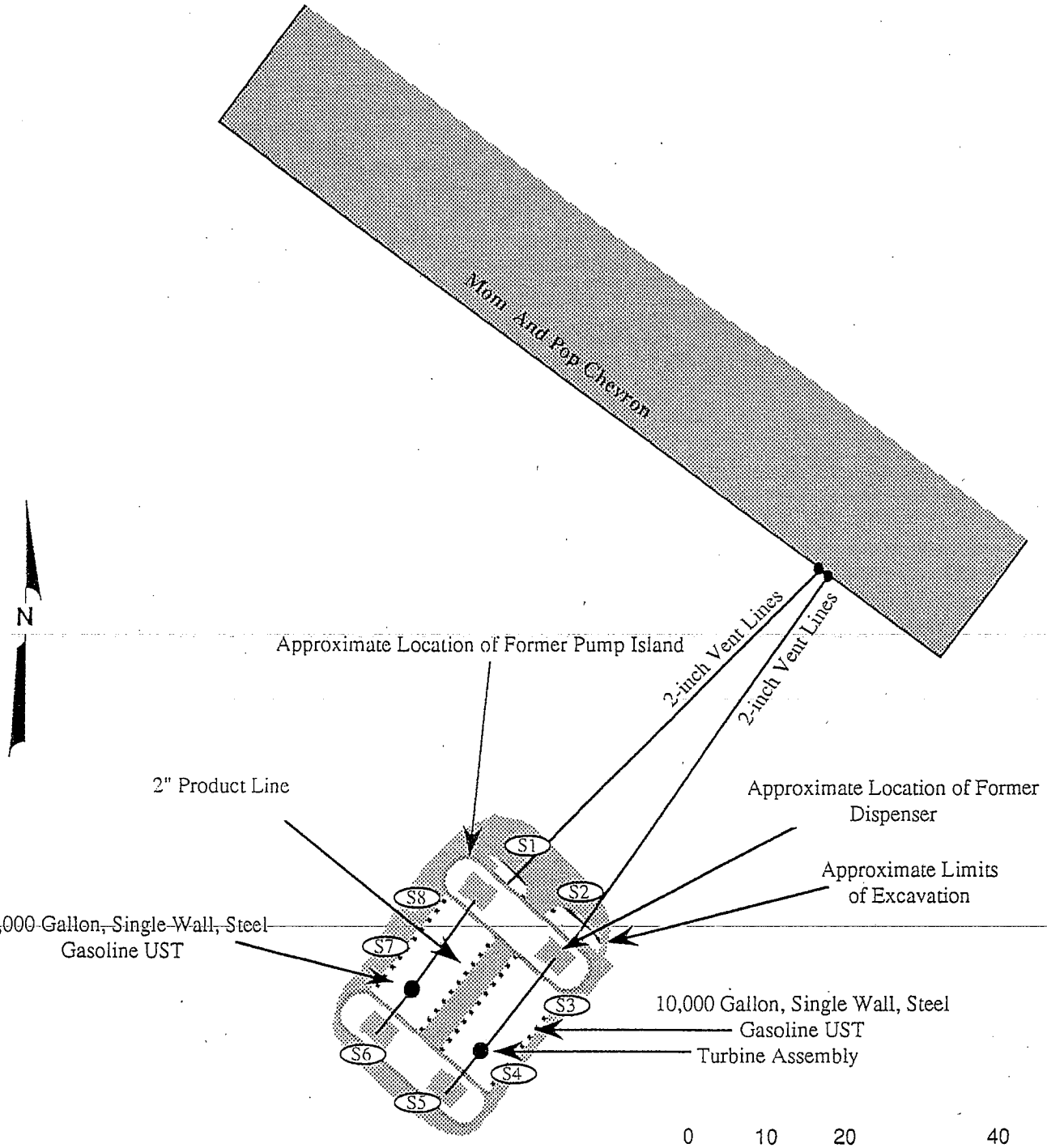
FIG. 1



LEGEND

(S6) Screen Sample Number and location collected by Shannon and Wilson

Mile 46.5 Old Glenn Highway
Palmer, Alaska

DETAILED SITE PLAN

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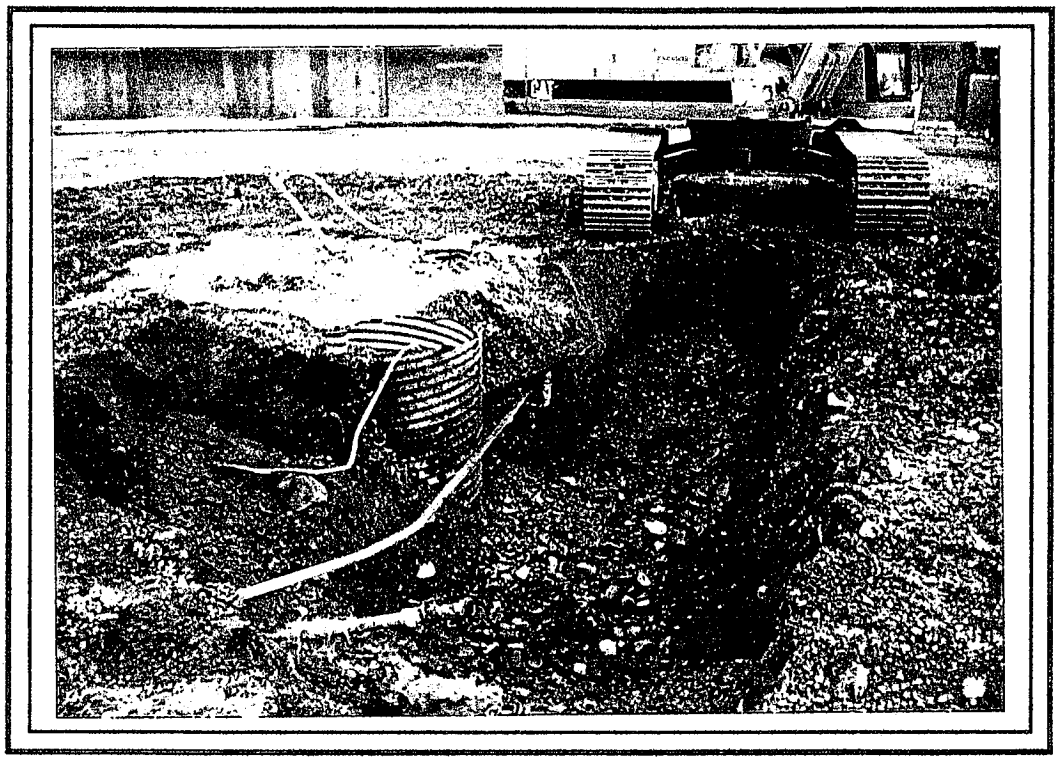
FIG. 2

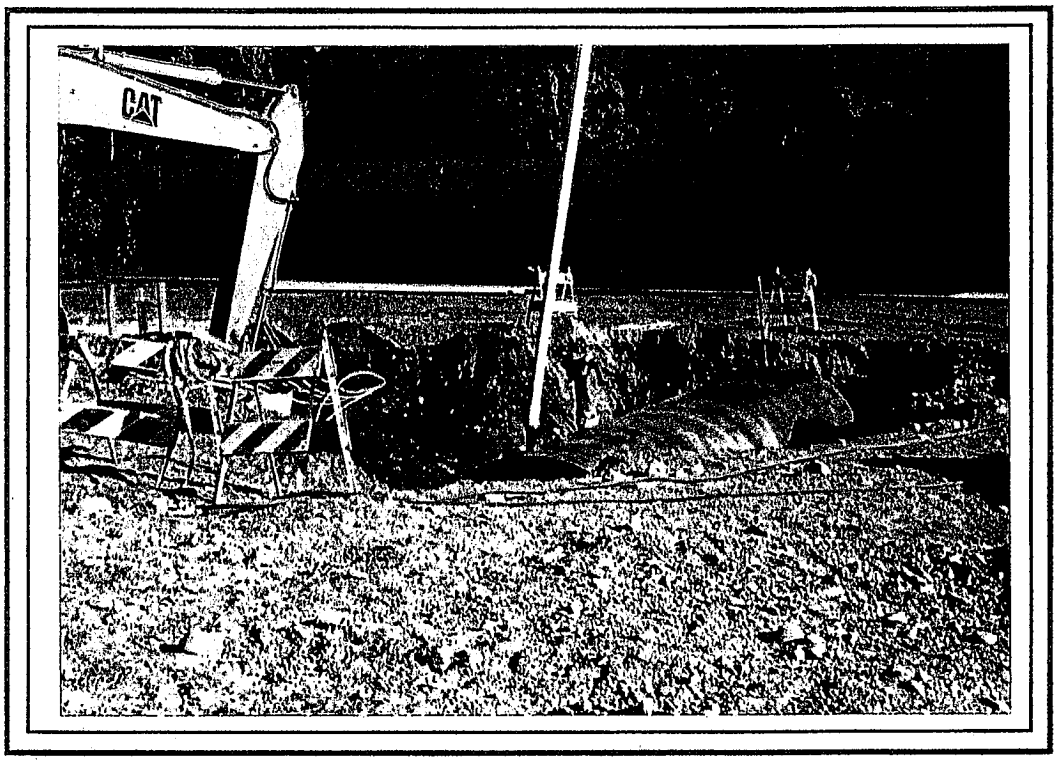
ATTACHMENT A

PHOTOGRAPHS OF UST REMOVAL/CLOSURE ACTIVITIES

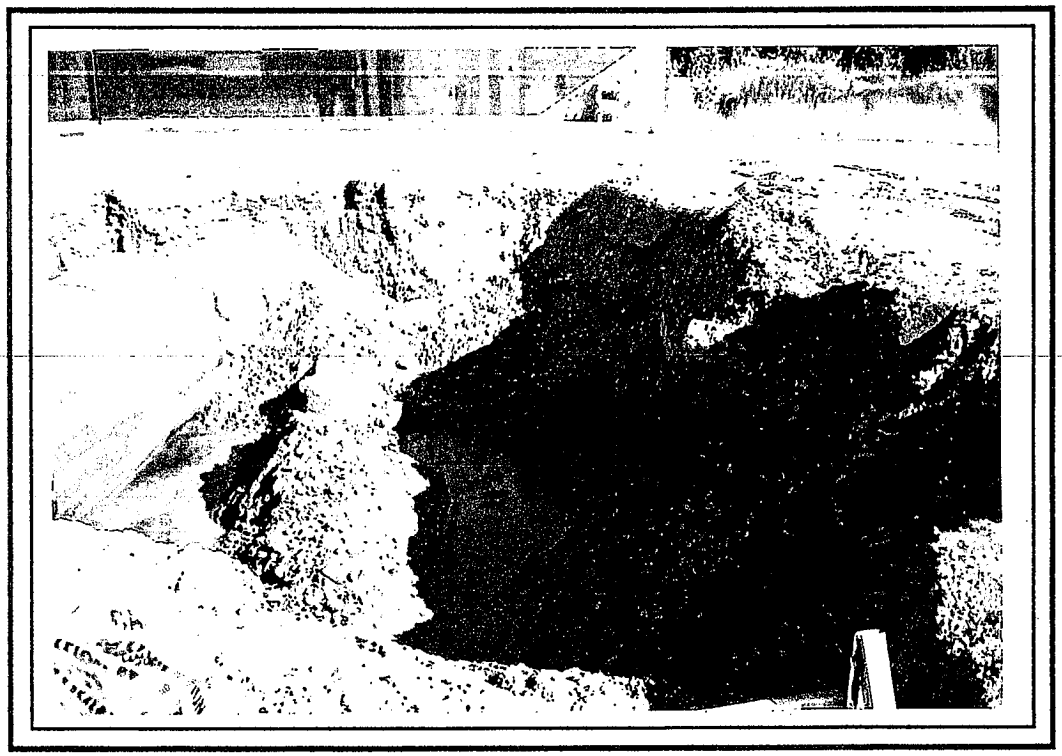


1. Product Lines at Mom and Pop Chevron, Mile 46.5 Old Glenn Highway, Palmer, Alaska

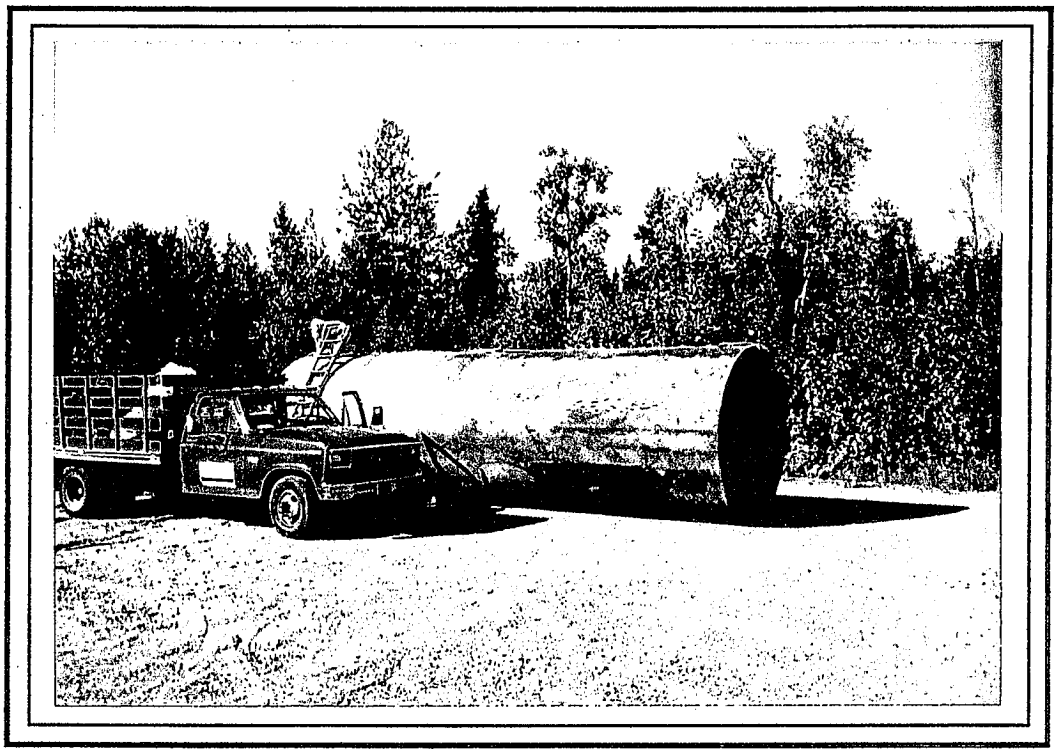
2. Stockpile and UST Excavation at Mom and Pop Chevron, Mile 46.5 Old Glenn Highway, Palmer, Alaska



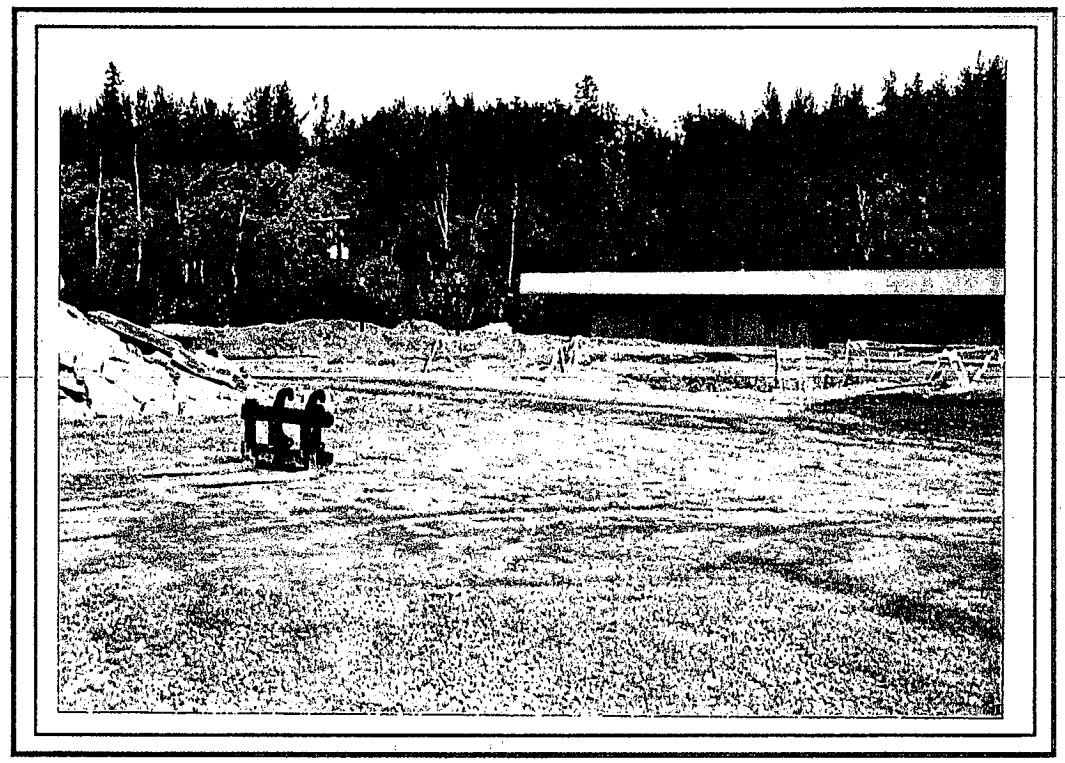
3. Inerting of Gasoilne UST at Mom and Pop Chevron, Mile 46.5 Old Glenn Highway, Palmer, Alaska



4. Water W/Sheen at Mom and Pop Chevron, Mile 46.5 Old Glenn Highway, Palmer, Alaska



5. Extraction of 10,000 gallon Gasoline UST at Mom and Pop Chevron, Mile 46.5 Old Glenn Highway, Palmer, Alaska



6. Construction of Long Term Treatment Cell at Mom and Pop Chevron, Mile 46.5 Old Glenn Highway, Palmer, Alaska

ATTACHMENT B

DISPOSAL RECEIPTS FROM ALASKA METAL RECYCLING