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Request for Conditional Closure

Site: St. George School underground storage tank (UST) site, also known as Two-Party Agreement (TPA) Site 22-1 and National Oceanic and Atmospheric (NOAA) Site 22. The site is referred to as the "site" herein.

Location: St. George Island, Alaska is approximately 800 miles southwest of Anchorage in the Bering Sea. On the island, the site is located in the eastern section of the City of St. George, approximately 620 feet (ft) south of the Bering Sea (56° 36' 8.87" N latitude, 169° 32' 38.98" W longitude; Figures 1 and 2).

Legal Property Description: The St. George School UST site is located in Tract 41 of Township 41 south, Range 129 west, Section 29 of the Seward Meridian, Alaska, as shown on the plat of rectangular net survey, officially filed February 15, 1985 (Figure 2). The federal government currently owns the surface and subsurface estate of this site.

Type of Release: Potential release mechanisms include diesel fuel spills associated with the filling of the school's UST and leaks associated with fuel storage in the UST.

History and Background:
The site was the former location of a 1,000-gallon diesel fuel UST, located immediately adjacent to the south side of the St. George School (Figure 3). Construction of the St. George School began in 1954 with completion of the brick section (main classroom area) in September 1955 (*Agent's 1955 Annual Report for St. George Island, Alaska for the year ending December 31, 1995* (submitted January 27, 1956)). The date of the UST installation is unknown but presumably occurred some time between the initiation of school construction and the early 1960s (Polarconsult 2002). The UST was used until the late 1970s (Polarconsult 2002). It was unregulated and did not have an Alaska Department of Environmental Conservation (ADEC) UST facility identification number. Prior to the UST removal, the tank was replaced by an aboveground storage tank (AST).

Summary of Site Investigations:
Under a grant from NOAA, the St. George Tanaq Corporation (Tanaq) retained Polarconsult Alaska, Inc. (Polarconsult) during 1996 and 1997 to conduct a St. George Island environmental site investigation (Polarconsult 1997a and 1997b). As such, Polarconsult conducted the St. George School site assessment and UST removal activities during the summer of 1997. Initial observations at the site indicated the presence of soil stains around the UST fill and vent pipes. During the UST removal, a light fuel odor and elevated field instrumentation readings indicated a fuel release had occurred. Observations and field measurements suggested that the release probably originated from the ground surface and was likely the result of over filling the tank. Superficially, the tank appeared in fair condition and exhibited moderate surface corrosion.

One excavation and sampling episode was conducted in an effort to remove the contaminated soil. The final extent of the excavation was the result of removing contaminated soil until further excavation was impracticable. Polarconsult noted that fuel contamination appeared to continue

under the school. Additionally, an immediately adjacent sewer line impeded further horizontal and vertical excavation (Figure 3). A total of approximately 10 cubic yards (CY) of soil was removed from this site.

Three soil samples were collected from the excavation sidewalls and bottom. Given the known use of diesel fuel at this site and the observed relationship of diesel-range organics (DRO) and benzene, toluene, ethylbenzene, and xylenes (BTEX) at other St. George Island sites, samples were only analyzed for DRO. Two of the three samples contained DRO at concentrations greater than the 1997 preliminary cleanup level of 200 milligrams/kilogram (mg/kg). Sample SS 052/145 contained 5,000 mg/kg DRO, and sample SS 053/146 contained 1,360 mg/kg DRO (Figure 3).

Polarconsult recommended further investigation to determine the horizontal and vertical extent of contamination and to determine a remediation approach. Polarconsult also recommended removing or relocating the sewer line before attempting further excavation.

One groundwater monitoring well, TPA22.1-MW-1, exists at the St. George School, near the school's northwest corner and roughly up gradient from the former UST location (Figure 4). It was sampled once in 2001, once in 2002, twice in 2003, and twice in 2004 (Tetra Tech 2003, Tech Tech 2004). DRO was detected in this well below the ADEC Table C (18 AAC 75.345) cleanup level of 1,500 µg/L. A maximum concentration of 860 µg/L was detected during the sampling events. GRO and benzene were not detected, and all other analytes, including volatile organic compounds, semivolatile organic compounds, and heavy metals, with the exception of cadmium, were either not detected or did not exceed Table C cleanup levels. Cadmium was detected above the Table C cleanup level of 5 µg/L during the January 2004 sampling event only. During the other five sampling events, cadmium was detected below the Table C cleanup level in the 2001 sample and was not detected in the remaining four samples.

Several other monitoring wells (*i.e.*, TPA24-MW-1 to MW-3) exist down gradient of the school (Figure 4). DRO and GRO were either not detected or detected below ADEC Table C cleanup levels in these wells.

The approximate water table elevation at well TPA22.1-MW-1 is 5.47 ft above mean sea level (Tetra Tech 2003). Based on a ground elevation of 43.46 ft above mean sea level (Tetra Tech 2003), groundwater is estimated to occur at approximately 38 ft below ground surface (bgs).

Summary of Applied Cleanup Levels:
NOAA employed ADEC Method Two cleanup criteria, discussed at 18 AAC 75.341(c) (ADEC 2000) when evaluating site conditions relative to the need for remedial action. Cleanup criteria were applied to the maximum extent practicable (18 AAC 75.325(f), 18 AAC 75.990).

Summary of Cleanup Actions:
One UST and approximately 10 CY of petroleum-contaminated soil (PCS) were removed from this site during the 1997 environmental site investigation (see Summary of Site Investigations section above). In 2002, NOAA retained St. George Chadux Corporation (Chadux) and its

subcontractor, Polarconsult, to remove additional PCS in the area of the former UST (Polarconsult 2002 and 2004).

The 2002 removal action utilized field screening and previous analytical results (Polarconsult 1997a) to delineate the extent of contamination. Field screening techniques included visual observations and the use of a photoionization detector (PID). Soil that clearly exceeded cleanup levels (*i.e.,* was saturated with petroleum) was transported to NOAA's ADEC-approved PCS stockpile without further analysis. Field samples with PID readings above background levels (residual threshold levels) resulted in the collection of samples for analytical analyses or transportation of the represented soil to the PCS stockpile.

Prior to excavation activities, the locations of buried utilities and previous samples were determined. Chadux initiated excavation on July 30, 2002, completing it on August 1, 2002. Other associated site activities continued through August 5, 2002. Chadux removed previously placed backfill and placed it on a liner. Excavation then continued in the vicinity of former sample locations SS 052/145 and SS 053/146 to remove visibly contaminated soil exhibiting a strong diesel odor (Figure 3). During separate incidences, the water and sewer lines traversing the excavation were breached. Both were cut and removed from the excavation and reinstalled following excavation activities (NOAA 2002a, 2002b, 2002c). Removal of the former UST fuel lines was also performed. Previously, the two 1/2-inch diameter copper supply and return fuel lines had been disconnected at both ends, drained, and sealed by crimping and folding. When uncovered in 2002, both lines were intact and in good condition with minor surface patina. There was no visual or olfactory evidence of any release, and seven samples from along the approximately 65 ft fuel line length did not indicate any contamination when field screened using a PID.

Soil excavation was conducted downward and outward until soil exceeding site cleanup levels was no longer evident or until the building foundation or refusal (*i.e.,* competent scoria) was encountered. A total volume of 29 CY of PCS was removed. Final excavation depth at refusal was 9 ft bgs. According to Polarconsult observations, contamination continued vertically downward into the competent scoria and horizontally under the building foundation where it could not be removed with the available equipment.

Soil that was obviously contaminated was transported directly to the ADEC-approved PCS stockpile (Figure 1). This soil was sampled and analyzed, in accordance with the sampling requirements and procedures presented in the site's corrective action plan (CAP; Polarconsult 2002) and master quality assurance plan (QAP; IT Alaska, Inc. 2001), to verify its suitability for enhanced thermal conduction (ETC) remediation. Two samples were collected for fixed-laboratory analyses (NOAA 2002c, Polarconsult 2004).

At times, this project required staging of excavated soil prior to reuse as backfill material or transport to the ADEC-approved PCS stockpile. Chadux stockpiled 129 CY of soil on-site adjacent to the excavation (Figure 5). All soil was placed onto impermeable plastic membrane in accordance with the requirements presented in the CAP (Polarconsult 2002). The pile was sampled and analyzed consistent with the CAP (Polarconsult 2002) and the QAP (IT Alaska, Inc.

2001). Four soil samples were collected for fixed-laboratory analyses. Sample results were used to determine whether stockpile soil was suitable for use as backfill material.

Following removal of the contaminated soil from the site, confirmation samples were collected from the extent of the excavation for off-site laboratory analyses to verify that the remaining soil did not exceed ADEC Method Two cleanup levels. Ten soil samples were first field-screened using a PID to determine, in accordance with the soil sample selection protocol described the corrective action report (Polarconsult 2004), which should be submitted for fixed-laboratory analyses. Six samples were submitted as confirmation samples (Figure 5). The number of samples required for the confirmation analyses followed the CAP (Polarconsult 2002).

[Note: The collection of samples involved a modified approach that deviated from the method described in the QAP (IT Alaska, Inc. 2001, Polarconsult 2004). The QAP calls for the collection of samples from a minimum depth of 18 inches for an excavation surface that has been exposed for more than one hour. Based on the difficulty of collecting samples from the volcanic materials, a request was made to the ADEC to allow the removal of 6 inches of surface material, followed by the collection of laboratory samples. The ADEC project manager approved the request (ADEC 2002). Picks and electric chisels were used to chip away the first 6 inches of surface material. The remaining material was collected from the bottom of each hole with stainless-steel sampling spoons.]

Site confirmation and stockpile characterization sample locations were recorded using survey-grade, Trimble Real-Time Kinematic (RTK) 5700 global positioning system (GPS) equipment or a Nikon DTM-430 transit.

Soil samples were analyzed at SGS-CTE Environmental Services, Inc. (SGS-CTE), an ADEC-approved analytical laboratory, for gasoline-range organics (GRO) and BTEX using Method AK101 and for DRO using Method AK102.

The analytical data for confirmation samples collected from the final extent of excavation indicated that DRO remained at one location (Table 2, Figure 5). Sample SG-22.1-004-0.5, collected at refusal, in scoria at the bottom of the excavation (8.6 ft bgs), contained 551 mg/kg DRO. GRO and BTEX constituents were not detected in any excavation confirmation samples.

The analytical data for the samples collected from the soil stockpiled on-site were compared to the ADEC Method Two cleanup levels and found not to exceed cleanup levels (Table 1). Subsequently, this soil was used as backfill material at another TPA site (NOAA 2002b).

Laboratory results for the two samples collected from soils transported to the ADEC-approved PCS stockpile indicated that GRO and BTEX were not detected in either sample. DRO was detected in one sample, with a concentration of 37.9 mg/kg. As a result of the commingling of various TPA sites' soils at the PCS stockpile, it is uncertain whether the soil from TPA 22-1 was treated in the ETC system or if it remains stockpiled, awaiting final disposition.

The excavation was backfilled with ETC-treated soil followed by a scoria cover (NOAA 2002b). Final site grading was completed in accordance with the corrective action plan (Polarconsult

2002). Site revegetation was not pursued due to school district plans to renovate the school in 2003.

Recommended Action:

In accordance with paragraph 59 of the Two Party Agreement (NOAA 1996), NOAA requests written confirmation that NOAA completed all appropriate corrective action, to the maximum extent practicable, at the St. George School UST site, TPA Site 22-1/Site 22 in accordance with the Agreement and that ADEC grant a conditional closure not requiring further remedial action from NOAA. NOAA understands ADEC will/may require additional containment, investigation, or cleanup if subsequent information indicates that the level of contamination that remains does not protect human health, safety, or welfare, or the environment.

References:

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IT Alaska, Inc. 2001. *Master Quality Assurance Plan, Pribilof Islands Site Restoration, St. George and St. Paul Islands, Alaska.* Prepared for the National Oceanic and Atmospheric Administration, Pribilof Project Office, Seattle, WA.

National Oceanic and Atmospheric Administration (NOAA). 1996. Pribilof Islands Environmental Restoration Two-Party Agreement, Attorney General's Office File No. 66 1-95-0126. National Oceanic and Atmospheric Administration. January 26.

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NOAA. 2002b. *Daily Log, St. George Island, Alaska, 2 August 2002.* Prepared by D. Winandy.

NOAA. 2002c. *Daily Log, St. George Island, Alaska, 5 August 2002.* Prepared by D. Winandy.

Polarconsult Alaska, Inc. (Polarconsult). 1997a. *Environmental Site Investigation, St. George Debris Cleanup and UST Decommissioning, Pribilof Islands Environmental Restoration Project, Volumes I and II*. November.

Polarconsult. 1997b. *Environmental Site Investigation, St. George Debris Removal Report, Pribilof Islands Environmental Restoration Project, Volume III.* December.

Polarconsult. 2002. *Corrective Action Plan, Remedial Corrective Action Project, School UST Site, TPA Site 22-1, St. George Island, Alaska.* August 23.

Polarconsult. 2004. *Final Corrective Action Report, School UST Site, TPA Site 22-1, Remedial Corrective Action Project, St. George Island, Alaska.* Volumes 1 & 2. April 14.

Tetra Tech EM Inc. (Tetra Tech). 2003. *Draft Field Investigation Report. Pribilof Islands Environmental Restoration Project, St. George Island, Alaska.* May 6.

Tech Tech. 2004. *Initial Draft, Field Investigation Report, St. George Island, Alaska, Pribilof Islands Environmental Restoration Project, St. George Island, Alaska.* August 11. In review, draft and final pending.

For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

1/31/05
Date

Approvals: In accordance with Paragraph 59 of the Two Party Agreement, this is to confirm that all corrective action has been completed to the maximum extent practicable at the St. George School UST site, TPA Site 22-1/Site 22 in accordance with the Agreement and that no further remedial action is required as a part of this conditional closure granted by ADEC.

For the Alaska Department of Environmental Conservation

Louis Howard
Alaska Department of Environmental Conservation
Remedial Project Manager

2-1-05
Date

Tables and Figures

Table 1. Soil Analytical Results, Excavation Confirmation Samples								
Sample ID	Date Collected	Depth (ft bgs)	GRO	VOC, EPA 8010				DRO
			AK101	Benzene	Toluene	Ethylbenzene	Xylene, Total	AK102
SG-22.1-001-0.5	01-Aug-02	7.5	1.82 (U)	0.00908 (U)	0.0363 (U)	0.0363 (U)	0.0726 (U)	23.0 (U)
SG-22.1-002-0.5	01-Aug-02	9.0	1.67 (U)	0.00833 (U)	0.0333 (U)	0.0333 (U)	0.0666 (U)	23.5 (U)
SG-22.1-003-0.5	01-Aug-02	5.4	1.89 (U)	0.00946 (U)	0.0378 (U)	0.0378 (U)	0.0756 (U)	24.4 (U)
SG-22.1-004-0.5	01-Aug-02	8.6	1.88 (U)	0.00940 (U)	0.0376 (U)	0.0376 (U)	0.0752 (U)	**551**
SG-22.1-005-0.5	01-Aug-02	6.7	1.88 (U)	0.00939 (U)	0.0376 (U)	0.0376 (U)	0.0752 (U)	23.1 (U)
SG-22.1-006-0.5	01-Aug-02	7.1	1.72 (U)	0.00859 (U)	0.0344 (U)	0.0344 (U)	0.0688 (U)	23.2 (U)

NOTES
Units shown in mg/kg except as noted.
Result in **red** (bold) type exceeds ADEC Method Two cleanup levels.
bgs below ground surface
DRO diesel-range organics
GRO gasoline-range organics
VOC volatile organic compound
U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

Table 2. Soil Analytical Results, On-Site Stockpile Characterization Samples								
			GRO	VOC, EPA 8010				DRO
Sample ID	Date Collected	Depth (ft bgs)	AK101	Benzene	Toluene	Ethylbenzene	Xylene, Total	AK102
SG-22.1-007-2.0	02-Aug-02	1.5	1.82 (U)	0.00912 (U)	0.0365 (U)	0.0365 (U)	0.0730 (U)	23.6 (U)
SG-22.1-008-1.5	02-Aug-02	1.5	1.71 (U)	0.00853 (U)	0.0341 (U)	0.0341 (U)	0.0682 (U)	22.3 (U)
SG-22.1-009-1.5	02-Aug-02	1.5	1.91 (U)	0.00953 (U)	0.0381 (U)	0.0381 (U)	0.0762 (U)	22.5 (U)
SG-22.1-009-1.5D	02-Aug-02	1.5	1.62 (U)	0.00812 (U)	0.0325 (U)	0.0325 (U)	0.0650 (U)	22.2 (U)
SG-22.1-010-1.5	02-Aug-02	1.5	1.89 (U)	0.00945 (U)	0.0378 (U)	0.0378 (U)	0.0756 (U)	24.2 (U)
SG-22.1-FB	02-Aug-02	-	2.53 (U)	0.0126 (U)	0.0505 (U)	0.0505 (U)	0.101 (U)	-
SG-22.1-TB	02-Aug-02	-	2.57 (U)	0.0129 (U)	0.0515 (U)	0.0515 (U)	0.103 (U)	-

NOTES
Units shown in mg/kg except as noted.
Result in **red** (bold) type exceeds ADEC Method Two cleanup levels.
bgs below ground surface
DRO diesel-range organics
GRO gasoline-range organics
VOC volatile organic compound
D Following sample ID indicates duplicate sample.
FB Following Sample ID indicates field blank sample.
TB Following Sample ID indicates trip blank sample.
U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

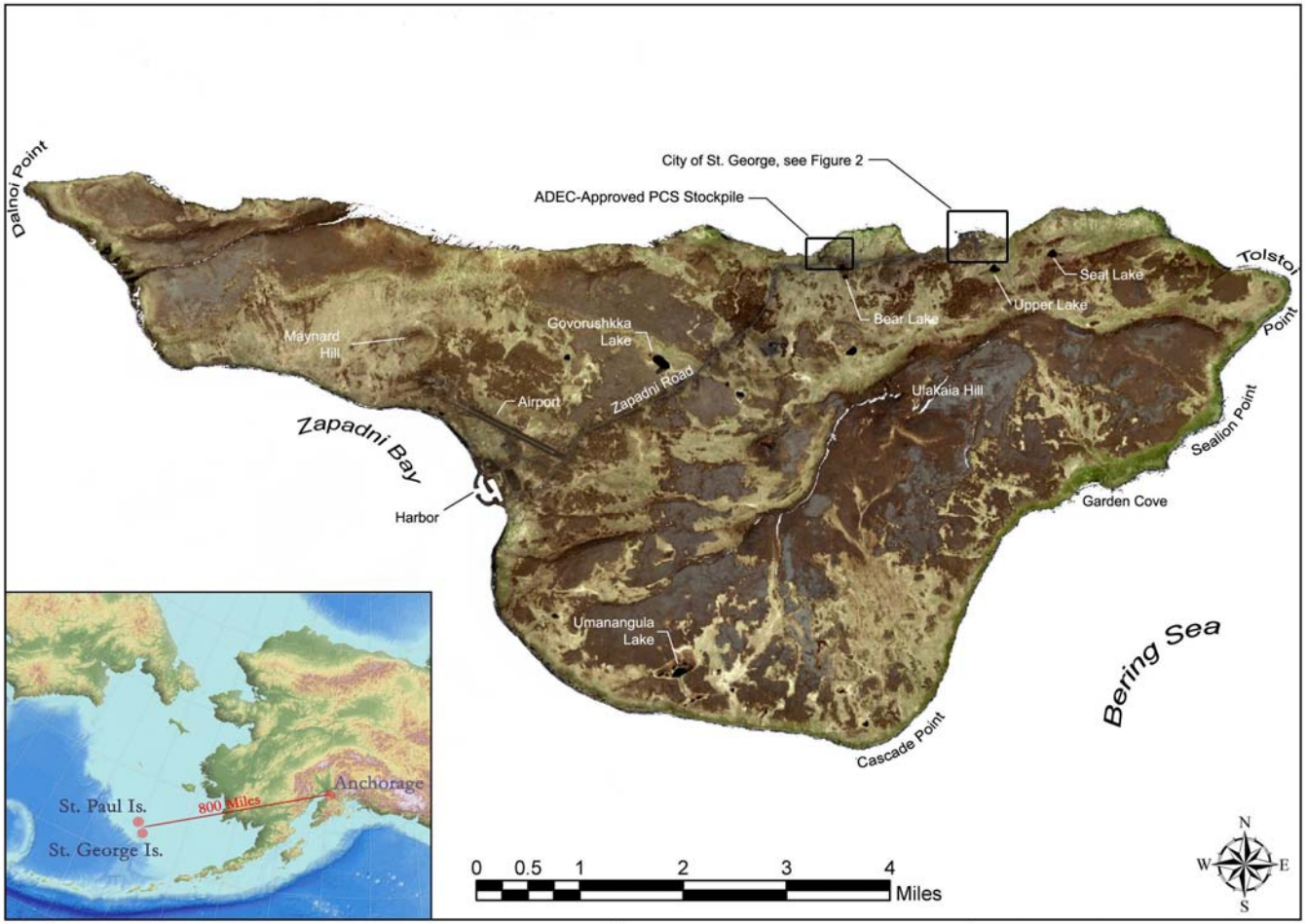

Figure 1	**Island and Vicinity Map St. George Island, Alaska**	Source: Ikonos 2001 Satellite Image

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Figure 2	**Legal Property Description Map School UST TPA Site 22-1/Site 22 St. George Island, Alaska**	Source: AeroMap U.S. 9/28/96 Aerial Photograph; Bureau of Land Management Land Survey Filed Febuary 15, 1985

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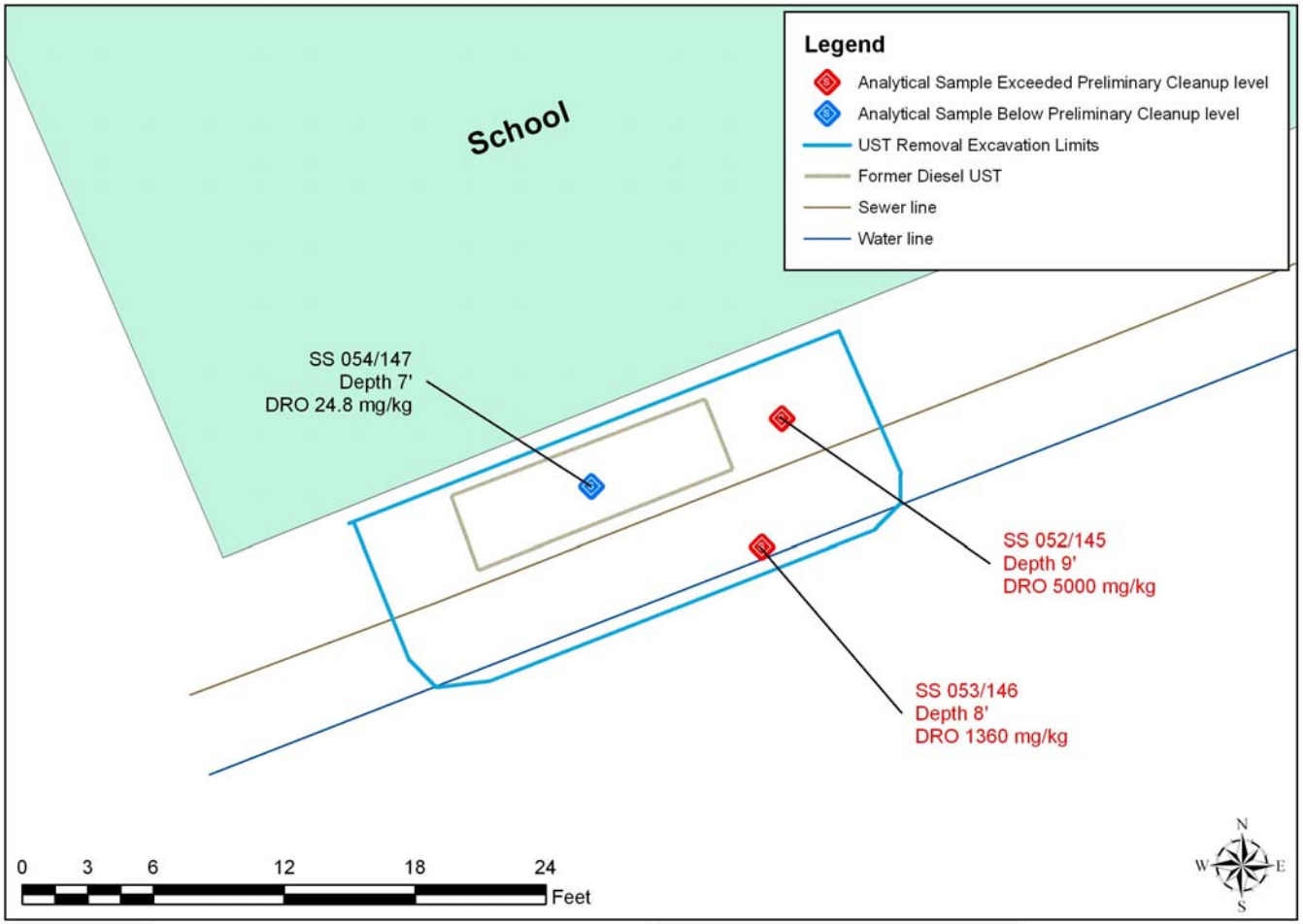

Figure 3	**UST Removal** **Polarconsult 1997** **School UST** **TPA Site 22-1/Site 22** **St. George Island, Alaska**	Source: Environmental Site Investigation, St. George Debris Cleanup & UST Decommissioning Volume 1, 11/02/97

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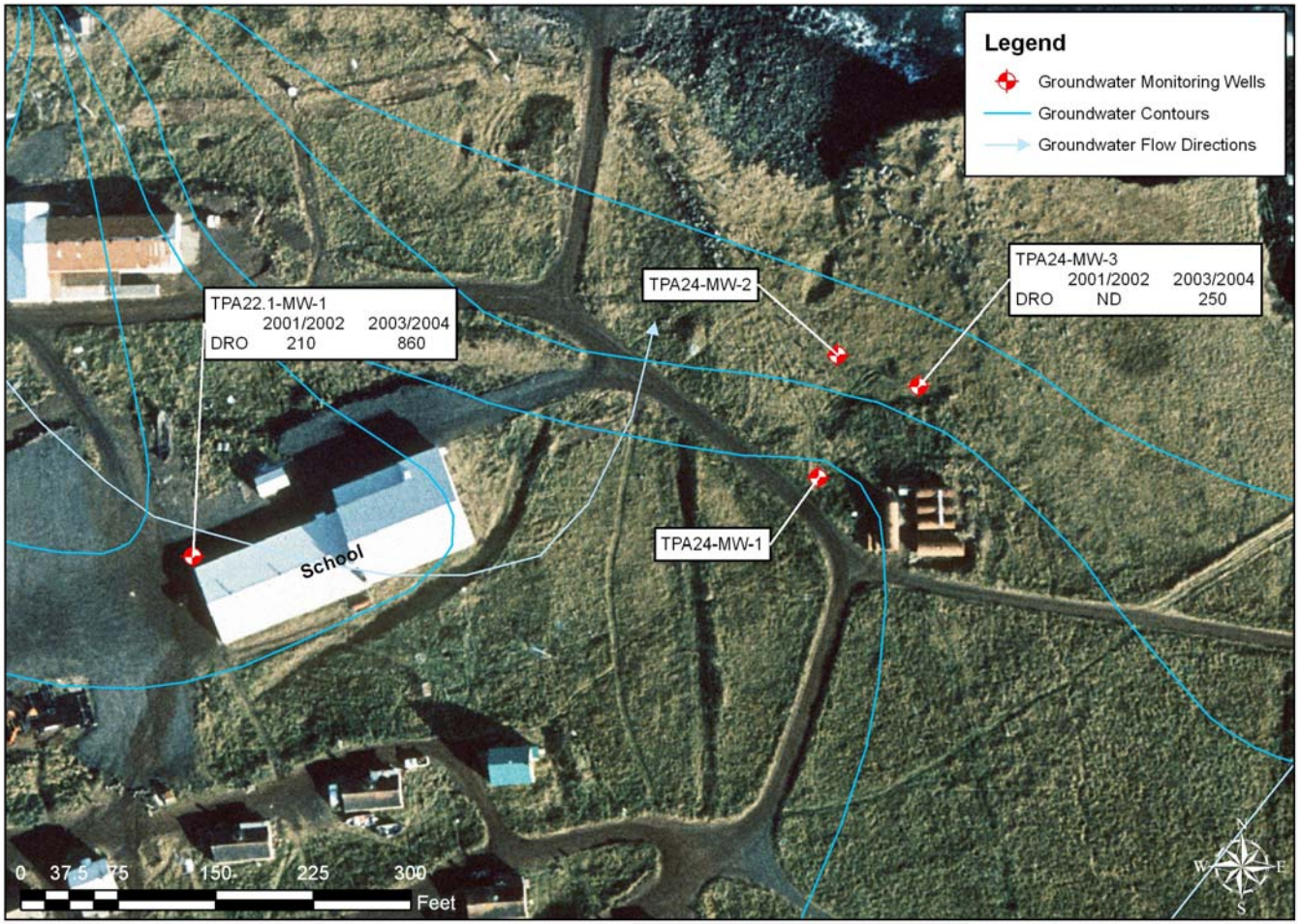

Figure 4	**Groundwater Sampling Results for Petroleum Hydrocarbons School UST TPA Site 22-1/Site 22 St. George Island, Alaska**	Source: TTEMI Initial Draft Field Investiagtion Report St. George Island, Alaska August 11, 2004;AeroMap U.S. 9/28/96 Aerial Photograph Note: Results in µg/L (Microgram per liter); ND (analyte was analyzed for but was not detected); Resluts presented represent the maximum detection for the sampling cycle. Where no results are listed, DRO, GRO & BTEX were not detected.

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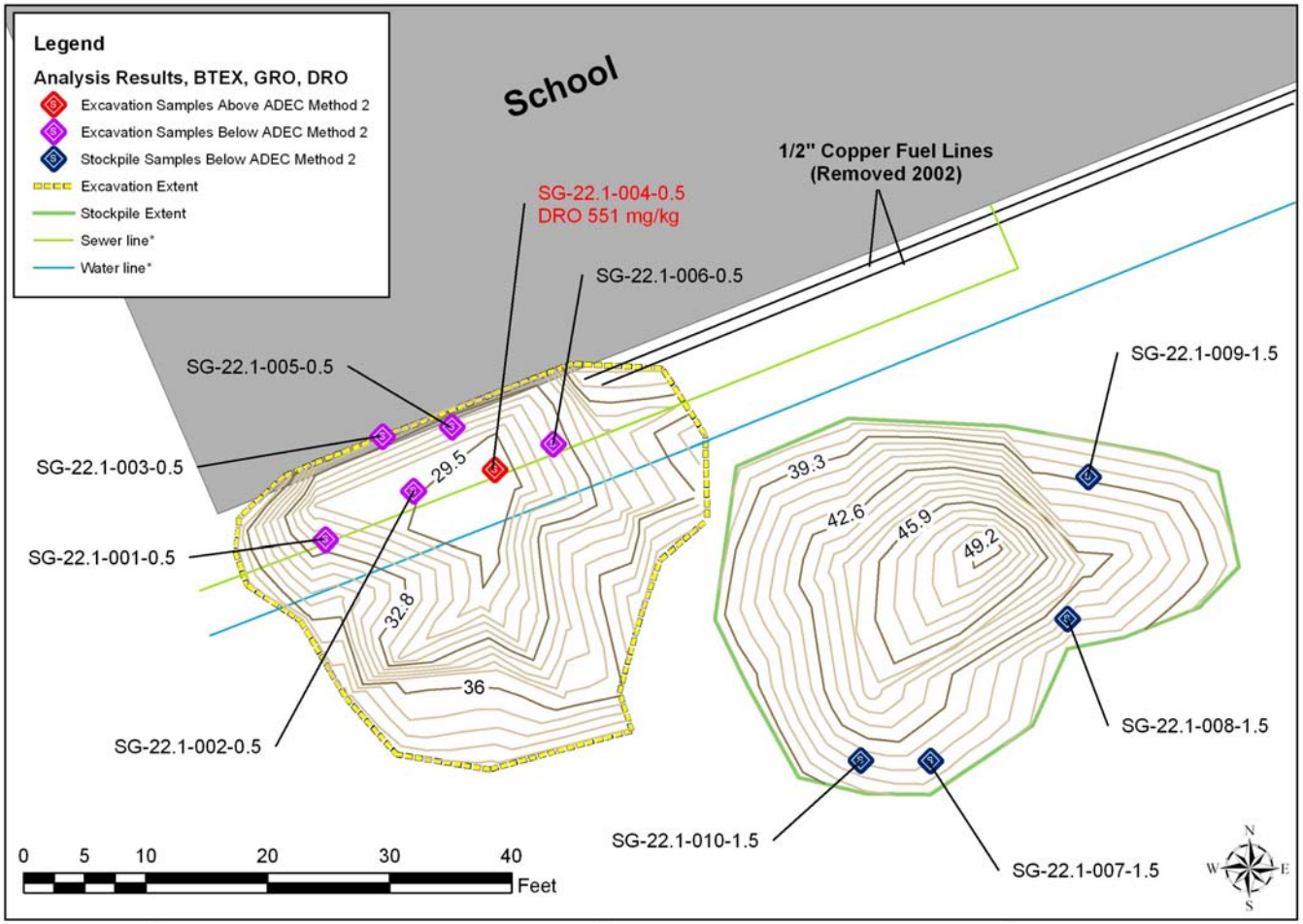

Figure 5	**Excavation and Sample Location Plan School UST TPA Site 22-1/Site 22 St. George Island, Alaska**	Source:Pribilof Project Database Note: Samples without results shown did not exceed cleanup levels; Contours in feet above mean sea level; * UICC rerouted water and sewer lines in 2003. Parts of former lines have been capped & abandoned in place.

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