LIME VILLAGE ASSESSMENT

Iditarod Area School District
Lime Village, Alaska

LIME VILLAGE ASSESSMENT

1.0 INTRODUCTION

At the request of Mr. David Shelborne of the Iditarod Area School District (IASD), Environmental Health Sciences-Alaska, Inc. (EHS-Alaska) performed a surface and subsurface field investigation of the IASD's leasehold areas and improvements in Lime Village, Alaska (see Appendix A, Regional Map). Based on background information and an initial site inspection, EHS-Alaska devised a Scope of Work that provided the IASD with a cost-effective approach to determining the horizontal and vertical extent of possible contamination. The initial site inspection revealed five main areas that required further assessment. The following areas were inspected by EHS-Alaska personnel (see Appendix B, Photo Log).

1) The former aboveground tank and corresponding piping near the existing school building (next to the generator shack).

2) The existing aboveground storage tank that is without a containment liner or berm near the teacher's house.

3) The pipeline which runs upgrade from the airstrip to the existing aboveground storage tanks (the tanks are within a lined containment berm).

4) The pump house and storage tank near the airstrip.

5) The slough area near the pump house and pipeline.

6) The source water from the school.

2.0 FIELD PROCEDURES

All assessment, decon, and sampling procedures were conducted as specified in our Alaska Department of Environmental Conservation (ADEC) approved Quality Assurance Program Plan (QAPP). All samples were field screened and selectively submitted for laboratory analysis.

The assessment and sampling procedures conformed to the Interim Guidance for Non-UST Contaminated Soil Cleanup Levels (Guidance Number 001--Revision No. 1, July 1991) as specified by the ADEC. The field procedures which took place at the six locations mentioned above are discussed in the following paragraphs.

3.0 GENERATOR SHACK

EHS-Alaska personnel used a stainless steel AMS split core/auger sampler to take soil borings at the site. Hand-augering and power enhanced augering (drill) was used to provide soil sampling to a depth of ten feet in specific locations. The soil samples were taken at two foot intervals to the

full extent of the boring. The actual final depth of the boring was determined by soil consistency, field screening, and frozen soil zones. No water samples were able to be taken at the site as the natural recharge in the borings was very low. Monitoring wells would be required to properly sample groundwater conditions at the site.

In areas where visual staining was noted, grab samples were taken prior to boring operations. The augering equipment was thoroughly decontaminated with water and a non-phosphate detergent solution prior to a final rinse with deionized water (distilled). The stainless steel auger was bored into the soil and then removed from the boring once the soil reached the top of the auger. The soil was extracted from the auger at the surface using a geologist tool. Again, decon procedures were enacted to prevent cross-contamination. Upon achieving the desired sampling depth, the stainless steel split-spoon sampler was attached to the auger rods and lowered into the boring for sample extraction. The soil sample was then removed and placed into 4-8 oz. jars or resealable plastic bags. A portion of the sample was taken for field screening by head-space analysis with a Photoionization Detector (PID).

The highest PID reading from each boring was then kept for final selection and submittal of the sample for laboratory analysis. The samples were kept in a chilled cooler at 4 degrees Celsius and under chain-of-custody until arrival at Northern Testing Laboratories, Inc. (NTL) in Anchorage, Alaska.

3.1 Generator Shack Head-Space Sampling

A total of 23 soil borings were completed in the immediate vicinity of the school and generator shack. The parts per million or ppm results of the head-space field screening for this area are as follows (see Appendix C, Site Drawings):

HS	SB1	SB2	SB3	SB4	SB5	SB6	SB7	SB8	SB9
1		3.4			*180				
2	8.2	10.3	63	365	89	5.4	*710	30.2	210
3	8.8	12.9	27.5	301	39	5.4	524	23	164
4	8.9	15.5	19.8	101	37	9.8	R	38.2	*271 R
5	10.2	17.4	13.1	53.8	39	10.2		11.4	
6	8.2	20.2	8.6	34.9	24.6	12.7		19.4	

HS	SB10	SB11	SB12	SB13	SB14	SB15	SB16	SB17	SB18
1	62.1								
2	38.9	*53.5	119	960	8	34	4	291	18.2
3	*106 R	43.5	52.1	*1,123	2.8	15.4	7.8	*304	8.1
4		34 R	53.5 R	991	8.6	*91	3.6	155	9.7
5				967	3.8 W	15.6 W	8.4	95.6	5.6
6				480 R	4.1	3.8	4.2	38.2	2.7

HS	SB19	SB20	SB21	SB22	SB23
1					
2	324	348	*309	8.6	*633
3	375	373	146	5.6	150
4		*483	160	12.6	87.5
5		329	210	*16.5	90.5
6		60.2	12.2	15.5	90.3

HS1 = surface; HS2 = 2 feet; HS3 = 4 feet; HS4 = 6 feet; HS5 = 8 feet; HS6 = 10 feet.
HS = Head-space; SB = Soil boring
R = Refusal by ice layers or frozen soil
W = Water lens/Wet soil
* = Submitted for laboratory analysis
Head-space results are in parts per million (ppm) concentrations
mg/dry kg = ppm
BGS or background sample level = 14.3 ppm

The soil strata throughout the site primarily consisted of the following:

4 distinct soil formations
0-5 feet -- gray silty sand
5-6 feet -- brown silty sand
6-8 feet -- silty sands mixed with clay
8-10 feet -- silty clay

3.2 Generator Shack Laboratory Results

Soil samples were submitted under chain-of-custody to NTL for laboratory analysis. The samples were analyzed for the following parameters (see Appendix D, Laboratory Results.):

1) Method AK 102 or EPA Method 3550/8100 for Diesel Range Organics (DROs).
2) EPA Method 5030/8020 for Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX).

The laboratory results for the selected soil samples are as follows:

	SB-5	SB-7	SB-9	SB-10	SB-11	SB-13	SB-15
DRO	4,580	10,600	1,500	118	156	77,900	31.5
Benzene	--	--	--	--	--	--	--
Ethyl	--	--	--	--	--	--	--
Toluene	0.36	2.60	0.29	0.16	0.15	--	0.04
Xylenes	7.10	6.44	3.96	1.00	0.92	365	0.06

	SB-17/2A	SB-17/2B	SB-20	SB-21	SB-22	SB-23
DRO	4,950	4,550	4,040	6,210	19.8	--
Benzene	--	--	--	--	--	0.02
Ethyl	--	--	--	--	--	--
Toluene	0.12	0.23	0.23	0.32	--	0.04
Xylenes	8.47	8.88	4.97	13	--	0.05

SB = Soil boring; DRO = Diesel Range Organics; Ethyl = Ethylbenzene
Results in ppm (mg/dry kg = ppm)
-- = <Method Detection Limit (MDL)
SB-17/2A and SB-17/2B are duplicates
Please refer to drawing no. S-1 (cross reference)
BGS or background sample level = 14.3 ppm

3.3 Generator Shack ADEC Cleanup Matrix

As provided in ADEC's "Interim Guidance for Non-UST Contaminated Soil Cleanup Levels, Guidance Number 001, Revision Number 1, July 17, 1991", a cleanup matrix score sheet is provided to determine the regulatory cleanup levels for the site. Estimate score sheet No.1 in Appendix E reveals a score of 37 which means the cleanup levels for this area would be the following:

Matrix Score = 37 (Level B) DRO = 200 ppm Benzene = 0.5 ppm BTEX = 15 ppm

Based on a cross reference of head-space samples and corresponding laboratory analyses, it appears from the lab results that head-space levels that exist above 75 ppm for the field screening would suggest levels that would exceed regulatory cleanup guidelines. Therefore, approximately 100 to 350 cubic yards of soil appears to be contaminated at levels that exceed ADEC regulatory guidelines.

4.0 ABOVEGROUND STORAGE TANK NEAR TEACHER'S HOUSE

The augering and sampling procedures described earlier in Section 3.0 are similar to the field actions which took place in vicinity of the aboveground storage tank (AST) near the teacher's house. The only change which took place in this region was the lesser depth of the borings required for the field screening process. The borings were placed to a depth of 4 feet below grade. All sampling procedures were performed to the guidelines specified in our ADEC approved QAPP. Field head-space screening took place by using a PID. The PID was re-calibrated on a daily basis.

A total of eight hand-augered borings were placed to a depth of 4 feet in immediate vicinity of the tank. Please refer to drawing No. 2 which reveals the locations of the borings.

4.1 Aboveground Storage Tank Head-Space Sampling

The parts per million or ppm results of the head-space field screening for this area are as follows:

HS	TS-1	TS-2	TS-3	TS-4	TS-5	TS-6	TS-7	TS-8
1								
2	*244	22	9.9	8.9	23.8	*121	17	32
3	39.5	11.5	9.7	8.4	16.3	56	10	9.4

HS1 = surface; HS2 = 2 feet; HS3 = 4 feet
HS = Head-space; TS = Tank sample
R = Refusal by ice layers or frozen soil
W = Water lens/Wet soil
* = Submitted for laboratory analysis
Head-space results are in parts per million (ppm) concentrations
mg/dry kg = ppm
BGS or background sample level = 14.3 ppm

4.2 Aboveground Storage Tank Laboratory Results

Soil samples were submitted under chain-of-custody to NTL for laboratory analysis. The samples were analyzed for the following parameters (see Appendix D):

1) Method AK 102 or EPA Method 3550/8100 for Diesel Range Organics (DROs)
2) EPA Method 5030/8020 for Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX)

The laboratory results for the selected soil samples are as follows:

	TS-1	TS-6
DRO	2,880	554
Benzene	--	--
Ethyl	--	--
Toluene	0.18	--
Xylenes	7.90	2.29

TS = Tank soil boring; DRO = Diesel Range Organics; Ethyl = Ethylbenzene
Results in ppm (mg/dry kg = ppm)
-- = <Method Detection Limit (MDL)
Please refer to drawing no. S-2 (cross reference)

4.3 Aboveground Storage Tank ADEC Cleanup Matrix

As provided in ADEC's "Interim Guidance for Non-UST Contaminated Soil Cleanup Levels, Guidance Number 001, Revision Number 1, July 17, 1991", a cleanup matrix score sheet is provided to determine the regulatory cleanup levels for the site. Estimate score sheet No.2 in Appendix E reveals a score of 29 which means the cleanup levels for this area would be the following:

Matrix Score = 29 (Level B) DRO = 200 ppm Benzene = 0.5 ppm BTEX = 15 ppm

Based on a cross reference of head-space samples and corresponding laboratory analyses, it appears from the lab results that head-space levels that exist above 75 ppm for the field screening would suggest levels that would exceed regulatory cleanup guidelines. Therefore, approximately 15 to 25 cubic yards of soil appears to be contaminated at levels that exceed ADEC regulatory guidelines.

5.0 PIPELINE

EHS-Alaska assessed the soil conditions along the pipeline corridor which runs upgradient from the slough area to the existing bermed aboveground storage tanks (behind generator shack). EHS-Alaska personnel inspected the entire pipeline system for petroleum leakage, odor, and stressed vegetation. The existence of stressed vegetation is a possible sign that the flora is being impacted by a foreign substance such as petroleum hydrocarbons.

Upon locating and marking soil sampling locations with reflective tape, grab samples were taken approximately 4 inches into the soil surface. A portion of the samples were placed into 4-8 oz glass jars for head-space analysis with a PID. Five of the highest PID readings were selected for laboratory analysis.

5.1 Pipeline Head-Space Sampling

The parts per million or ppm results of the head-space field screening for this area are as follows:

HS	PLS-1	PLS-2	PLS-3	PLS-4	PLS-5	PLS-6	PLS-7	PLS-8	PLS-9
1	8160	120	*125	78	59	39.2	104	102	*106
2								*163	98.2
3								126	

HS1 = surface; HS2 = 2 feet; HS3 = 4 feet
HS = Head-space; PLS = Pipeline sample
R = Refusal by ice layers or frozen soil
W = Water table or water lens
* = Submitted for laboratory analysis
Head-space results are in parts per million (ppm) concentrations

mg/dry kg = ppm
BGS or background sample level = 12.8 ppm

5.2 Pipeline Sample Laboratory Results

Soil samples were submitted under chain-of-custody to NTL for laboratory analysis. The samples were analyzed for the following parameters (see Appendix D):

1) Method AK 102 or EPA Method 3550/8100 for Diesel Range Organics (DROs)
2) EPA Method 5030/8020 for Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX)

The laboratory results for the selected soil samples are as follows:

	PLS-1	PLS-3	PLS-8A	PLS-8B	PLS-9
DRO	39,100	2,010	25,800	23,600	2,860
Benzene	--	--	--	--	--
Ethyl	--	--	--	--	--
Toluene	--	--	--	--	--
Xylenes	2.14	1.21	119	105	2.69

PLS = Pipeline sample; DRO = Diesel Range Organics; Ethyl = Ethylbenzene
Results in ppm (mg/dry kg = ppm)
-- = <Method Detection Limit (MDL)
Please refer to drawing no. S-3 (cross reference)
BGS or background sample level = 16.2 ppm
PLS-8A and PLS-8B are duplicates

5.3 Pipeline ADEC Cleanup Matrix

As provided in ADEC's "Interim Guidance for Non-UST Contaminated Soil Cleanup Levels, Guidance Number 001, Revision Number 1, July 17, 1991," a cleanup matrix score sheet is provided to determine the regulatory cleanup levels for the site. Estimate score sheet No.3 in Appendix E reveals a score of 29 which means the cleanup levels for this area would be the following:

Matrix Score = 29 (Level B) DRO = 200 ppm Benzene = 0.5 ppm BTEX = 15 ppm

Based on a cross reference of head-space samples and corresponding laboratory analyses, it appears from the lab results that head-space levels that exist above 50 ppm for the field screening would suggest levels that would exceed regulatory cleanup guidelines. Therefore, approximately 15 to 25 cubic yards of soil appears to be contaminated at levels that exceed ADEC regulatory guidelines.

6.0 PUMP HOUSE AND STORAGE TANK NEAR AIRSTRIP

The area immediately surrounding the pump house and AST at the airstrip was effectively field-screened and sampled following the procedures outlined in Section 3.0. A maximum boring depth of two to four feet was achieved by the hand-auger tool prior to refusal by large cobbles and gravel (20 total borings). The pump house and corresponding tank rest on a gravel bar that has been built by human hands/machinery and the natural deposition of the meandering river. Historic information provided to us by interviews revealed that this area has been flooded and washed out periodically due to river flooding and ice jams. Occasional spillage of diesel fuel has happened in this region during tank filling and maintenance operations. The soil in this location was visibly stained and petroleum odors were evident.

6.1 Pump House and Storage Tank Head-Space Sampling

The parts per million or ppm results of the head-space field screening for this area are as follows:

HS	PHS-1	PHS-2	PHS-3	PHS-4	PHS-5	PHS-6	PHS-7	PHS-8	PHS-9
1									
2	153	204	*570	164	140	110	224	*303	91.4
3			173					240	

HS	PHS-10	PHS-11	PHS-12	PHS-13	PHS-14	PHS-15	PHS-16	PHS-17	PHS-18
1									
2	63	103	136	*209	184	39.5	40.5	21.4	27.9
3									

HS	PHS-19	PHS-20
1		
2	29.1	30.2
3		

HS1 = surface; HS2 = 2 feet; HS3 = 4 feet
HS = Head-space; PHS = Pump house sample
R = Refusal by ice layers or frozen soil
W = Water table or water lens
* = Submitted for laboratory analysis
Head-space results are in parts per million (ppm) concentrations
mg/dry kg = ppm
BGS = 14.8 ppm

6.2 Pump House and Storage Tank Sample Laboratory Results

Soil samples were submitted under chain-of-custody to NTL for laboratory analysis. The samples were analyzed for the following parameters (see Appendix D):

1) Method AK 102 or EPA Method 3550/8100 for Diesel Range Organics (DROs)
2) EPA Method 5030/8020 for Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX)

The laboratory results for the selected soil samples are as follows:

	PHS-3	PHS-8	PHS-13
DRO	32,400	7,380	2,500
Benzene	--	--	--
Ethyl	--	--	--
Toluene	--	--	--
Xylenes	160	22.3	3.66

PHS = Pump house sample; DRO = Diesel Range Organics; Ethyl = Ethylbenzene
Results in ppm (mg/dry kg = ppm)
-- = <Method Detection Limit (MDL)
Please refer to drawing no. S-4 (cross reference)

6.3 Pump House and Storage Tank ADEC Cleanup Matrix

As provided in ADEC's "Interim Guidance for Non-UST Contaminated Soil Cleanup Levels, Guidance Number 001, Revision Number 1, July 17, 1991", a cleanup matrix score sheet is provided to determine the regulatory cleanup levels for the site. Estimate score sheet No.4 in Appendix E reveals a score of 36 which means the cleanup levels for this area would be the following:

Matrix Score = 36 (Level B) DRO = 200 ppm Benzene = 0.5 ppm BTEX = 15 ppm

Based on a cross reference of head-space samples and corresponding laboratory analyses, it appears from the lab results that head-space levels that exist above 50 ppm for the field screening would suggest levels that would exceed regulatory cleanup guidelines. Therefore, approximately 50 to 100 cubic yards of soil appears to be contaminated at levels that exceed ADEC regulatory guidelines.

7.0 SLOUGH

The slough lies near the pipeline and pump house area. The slough has been altered by human factors such as road and airstrip development. Historically, the slough has been affected by flooding from the nearby river.

7.1 Slough Soil Sampling

EHS-Alaska sampled four soil locations along the banks of the slough in immediate vicinity of the pipeline. The head-space results from soil samples SS-1, SS-2, SS-3, and SS-4 were all within close range of the background head-space readings taken in the area. The background levels were found to be 9.8 ppm and 10.36 ppm.

The parts per million or ppm results of the head-space field screening for this area are as follows:

HS	SS-1	SS-2	SS-3	SS-4
1	10.11	11.28	13	11.9
2				

HS1 = surface; HS2 = 2 feet; HS3 = 4 feet
HS = Head-space; SS = Soil sample
R = Refusal by ice layers or frozen soil
W = Water table or water lens
* = Submitted for laboratory analysis
Head-space results are in parts per million (ppm) concentrations
mg/dry kg = ppm
BGS or background sample levels - 9.8 and 10.36 ppm

We elected not to submit the head-space soil samples for laboratory analysis, because the field screening results were within limits of the background samples taken in this area.

7.2 Slough Water Sampling

Two water samples were taken from the slough water which lies near the attachment fitting of the pipeline. One sample was taken northwest (right side) of the pipeline and the other was taken southwest (left side) of the pipeline. The following laboratory methods were conducted on the samples (see Appendix D):

1) EPA Method 3550/418.1 for Total Petroleum Hydrocarbons (TPH)
2) EPA Method 602/624 for BTEX

The results of these tests are as follows:

	NWR	SWL
TPH	0.5	--
Benzene	--	--
Ethyl	--	0.00023
Toluene	--	0.00055
Xylenes	--	0.00077

NWR = Northwest right; SWL = Southwest left; TPH = Total Petroleum Hydrocarbons; Ethyl = Ethylbenzene
Results in ppm (mg/L = ppm)
-- = <Method Detection Limit (MDL)
Please refer to drawing no. S-4 (cross reference)

7.3 ADEC Water Quality Standard Regulations (18 AAC 70)

ADEC Water Quality Regulations (18 AAC 70) under fresh water uses reveals the following standards for petroleum hydrocarbons, oil, and grease (growth and propagation of fish, shellfish, other aquatic life, and wildlife):

Total petroleum hydrocarbons in the water column shall not exceed 0.015 ppm, or 0.01 of the lowest measured continuous flow 96 hour LC50 (lethal concentration) for life stages of species identified by the Department (ADEC) as the most sensitive, biologically important species in a particular location, whichever concentration is less.

Total aromatic hydrocarbons in the water column shall not exceed 0.010 ppm, or 0.01 of the lowest measured continuous flow 96 hour LC50 for life stages of species identified by the Department as the most sensitive, biologically important species in a particular location, whichever concentration is less.

Concentrations of hydrocarbons, animal fats, or vegetable oils in the sediment shall not cause deleterious effects to aquatic life. Shall not cause a film, sheen, or discoloration on the surface or floor of the water body or adjoining shorelines. Surface waters shall be virtually free from floating oils.

The laboratory results for the slough water sampling revealed a TPH concentration of 0.5 ppm which is above the ADEC requirement of 0.015 ppm. The BTEX results were below regulatory standards. A very slight or thin sheen was noted at the water surface at a few regions along the bank of the slough. There are numerous sources in the area which may contribute to elevated hydrocarbon levels in the slough region. The Department of Transportation and Public Facilities (DOT/PF) maintenance facility has numerous storage drums upgradient of the slough. There is evidence of drum spillage at this location that appears to move toward the slough region. Storage drums rest along the side of the airstrip, there is evidence of spillage and mishandling in these locations. The spillage from these drums may possibly be contributing to the hydrocarbon levels in the slough region.

Lime Village has potential contaminant sources such as leaking tanks (health facility), runoff from the village in general, and an open landfill that lies upgradient of the river and slough area. Runoff from these regions may be contributing to the contaminants found in the slough.

Along with the sources discussed above, the IASD has a pipeline, pump house, and aboveground storage tank in vicinity of the slough area. These sources may also be contributing to the contaminant concentrations found in the slough water.

No fish species were noted in the slough water near the pipeline or northwest of the pipeline. The dirt/gravel road that was constructed at the head of the slough to the southwest (leads to village) appears to have effectively cut off the slough from its natural route, leaving the slough without free-flowing water and creating an area devoid of natural species. The water appears to be stagnant and possibly devoid of oxygen requirements to sustain fish species.

8.0 School Water Sampling

The Lime Village School water was sampled from the tap that exists in the water supply lines. This in-line tap is located before the water treatment filtration and softening system. 15 gallons of water was purged from the tap and then the tap was scrubbed with a non-phosphate/distilled water solution. The tap was thoroughly rinsed with distilled water prior to sampling the system. A one liter brown glass bottle with a Teflon lid was filled for TPH analysis. Two 40 mL VOAS were filled for BTEX analysis. The results of this sampling are as follows (see Appendix D):

	Lime Village School
TPH	*0.5
Benzene	0.00024
Ethyl	0.00024
Toluene	0.00053
Xylenes	0.00068

TPH = Total Petroleum Hydrocarbons; Ethyl = Ethylbenzene
Results in ppm (mg/L = ppm)
-- = <Method Detection Limit (MDL)
* = Groundwater Parameter

8.1 ADEC Drinking Water Maximum Contaminant Levels (MCLs)

The ADEC has two documents which contain standards that are applicable to the Lime Village School water source. "Interim Guidance for Surface and Groundwater Cleanup Levels, September 26, 1990" and "ADEC Drinking Water Regulations, 18 AAC 80, amended through March 18, 1993" are the documents which note the following regulatory MCLs for drinking water and groundwater.

TPH = non-detectable (groundwater)
Benzene = 0.005 ppm
Toluene = 1 ppm
Ethylbenzene = 0.7 ppm
Xylenes = 10 ppm

The TPH concentration of 0.5 ppm is the only laboratory tested parameter that is above regulatory guidelines or MCLs (non-detectable) for groundwater (see Appendix D). The drinking water laboratory results are below ADEC MCLs (acceptable).

9.0 Conclusions

Based on laboratory results and ADEC requirements, the following areas require corrective action plans to achieve acceptable cleanup levels.

1) Soil beneath and in vicinity of the generator shack.

2) The soil in vicinity of the aboveground tank near the teacher's house.

3) Specific soil locations along the pipeline.

4) The pump house and aboveground storage tank near the airstrip.

5) Regulatory review of slough water.

6) TPH levels in the drinking water at the school.

These areas should be addressed independently in order to provide cost-effective treatment in a timely manner. The IASD would benefit by addressing these areas independently because the costs of treatment would be spread out over a specific time period. Therefore, if the IASD has budgeting available, then each contaminated area can be approached as a separate concern.

10.0 Recommendations

The soil that is contaminated above ADEC requirements will have to be remediated. The contaminated soil in vicinity of the generator shack, the aboveground tank near the teacher's house, the pipeline, and beneath the tank and pump house near the airstrip will require treatment.

Depending on the porosity and resitivity of the soil (along with other factors), an in-situ treatment option such as bio-venting may be used, but no field testing has yet to be conducted to prove its usefulness in this situation. Bio-venting may also prove effective near the AST and pump house at the airstrip. Essentially, a feasibility study or bench-scale/field test will be required prior to installing effective remedial options at the site.

Due to the very low porosity or "tight" soil conditions in vicinity of the generator shack, AST by the teacher's house, pipeline, and the nature of the contaminant (diesel fuel), ex-situ treatment options may be more favorable.

If an ex-situ process is required, we propose either using thermal incineration or a bio/aeration cell for soil treatment. The thermal incineration cost for treating the soil would be more expensive than the bioremediation option, but a disadvantage of the bio cell is that the microbial process will take greater time to achieve regulatory cleanup levels. The incineration option would immediately treat the soil and be used for backfilling.

With the field information that we currently hold, we feel confident that a number of bio/aeration cells in specific areas will treat the contaminated soil at the site to levels at or below regulatory standards. Prior to installing or inacting remedial options at the site, a Corrective Action Plan or CAP will need to be submitted for review and acceptance by the ADEC.

The slough area will require review by the ADEC and additional sampling may be required, pending an ADEC Regional Supervisor decision.

The source water for the school should be re-sampled at two different points. Sampling point No.1 should be sampled at the tap where the first sample was taken, and sampling point No. 2 should be taken from the source water well. Duplicates should be taken at each point for QA/QC procedures. By following through with this sampling, possible contaminant concentrations will be determined and then actions can be taken if there is a sign of possible health risks affiliated with the drinking water at the site (none at this time).

Local discussion was made stating that a new drinking water well will be placed in the village in the near future. Based on the laboratory analyses from the second set of proposed source water testing from the school, a decision can be made to either abandon this well or tie in the supply line from the new well to the school. Possible regulatory actions may be required if the existing well is found to be contaminated at levels above regulatory standards. Also, immediate closure of the well may possibly take place per regulatory actions. Due to the health related risks from drinking contaminated water above ADEC MCLs, the second set of sampling on the school source water should be approved and enacted as soon as possible.

The laboratory results, conclusions, and recommendations provided in this report are based on the limited field procedures that took place at the site. No other warranty is expressed or implied, and the treatment options discussed above are based solely on information that is currently available. Should actions take place at the site which may alter the conclusions of this report, EHS-Alaska shall be immediately contacted by the Iditarod Area School District.

Any questions concerning this report should be directed to EHS-Alaska at (907) 694-1383. Cost-estimates for providing remedial services can be completed upon request. We look forward to working with the IASD in the near future.

Sincerely,
EHS-Alaska

/ Bruce W. Beck /

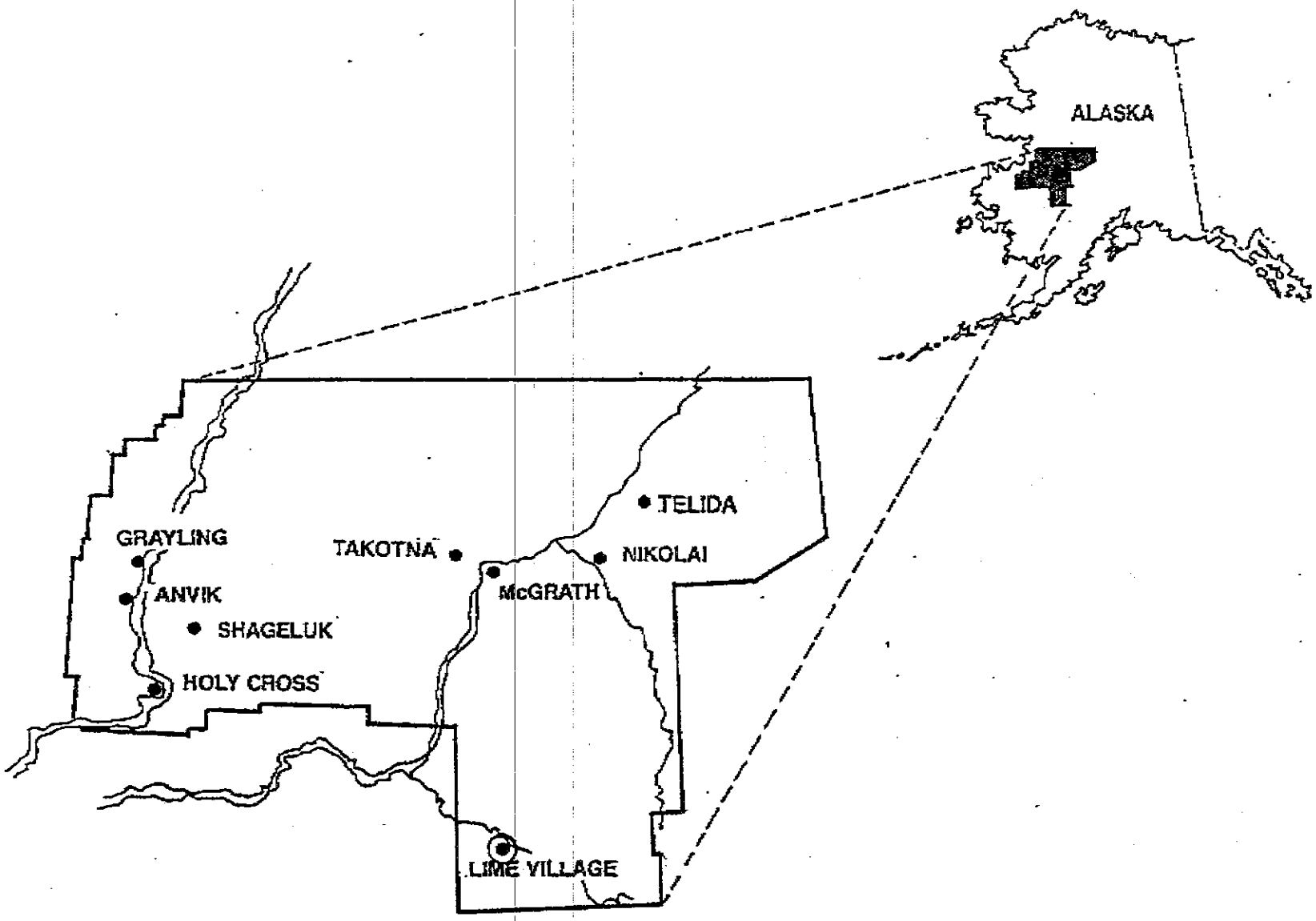
Bruce W. Beck, M.S., CEI/CES
Environmental Scientist

/ww

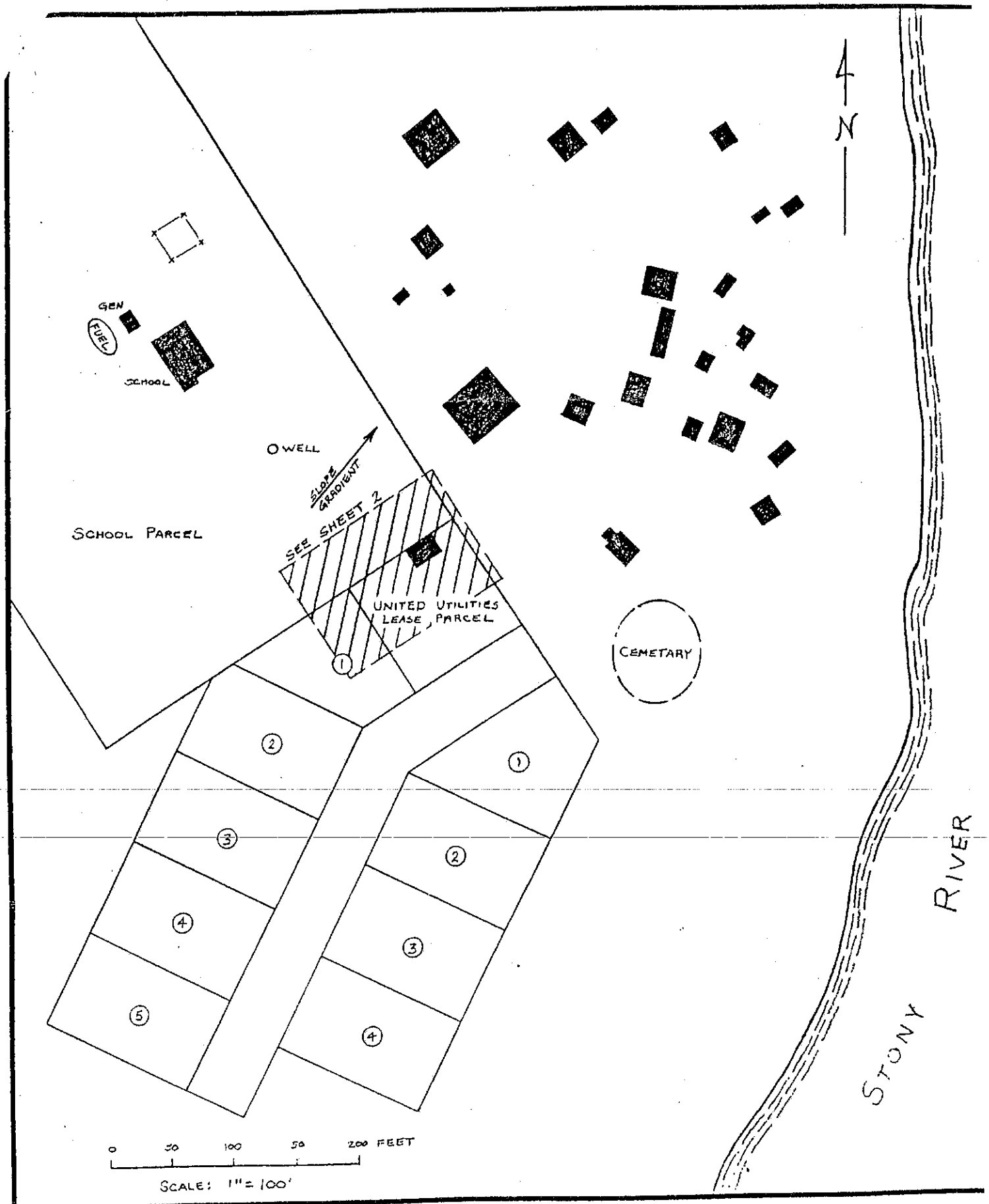
3611-01-01

APPENDIX A

REGIONAL MAP



REGIONAL MAP



LIME VILLAGE

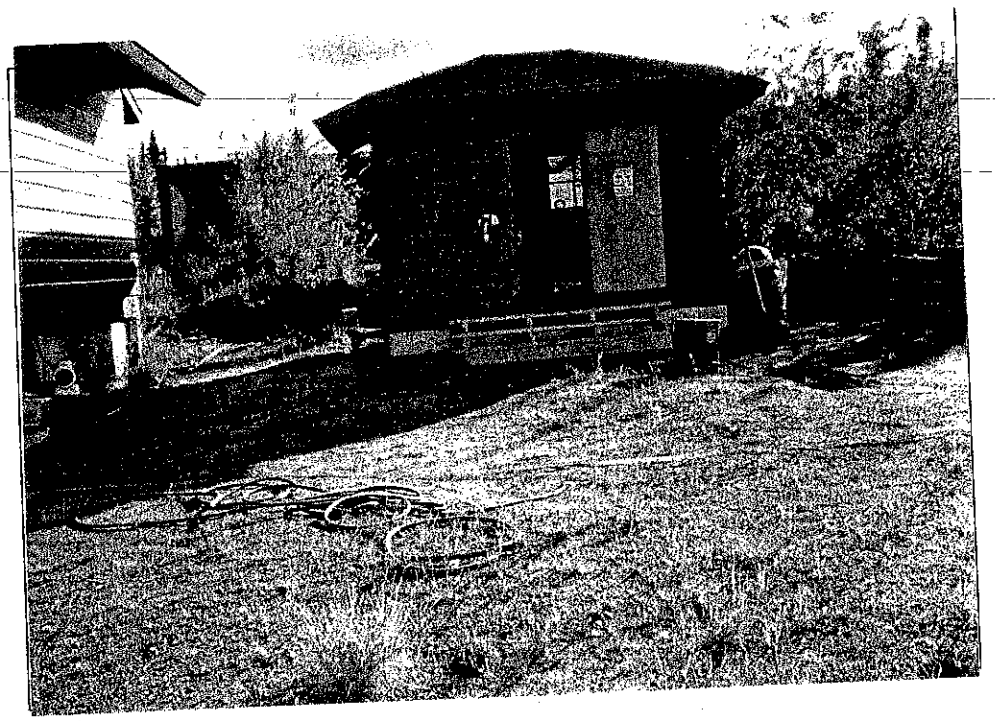
SITE PLAN

30204-
SHEET 1/2

APPENDIX B

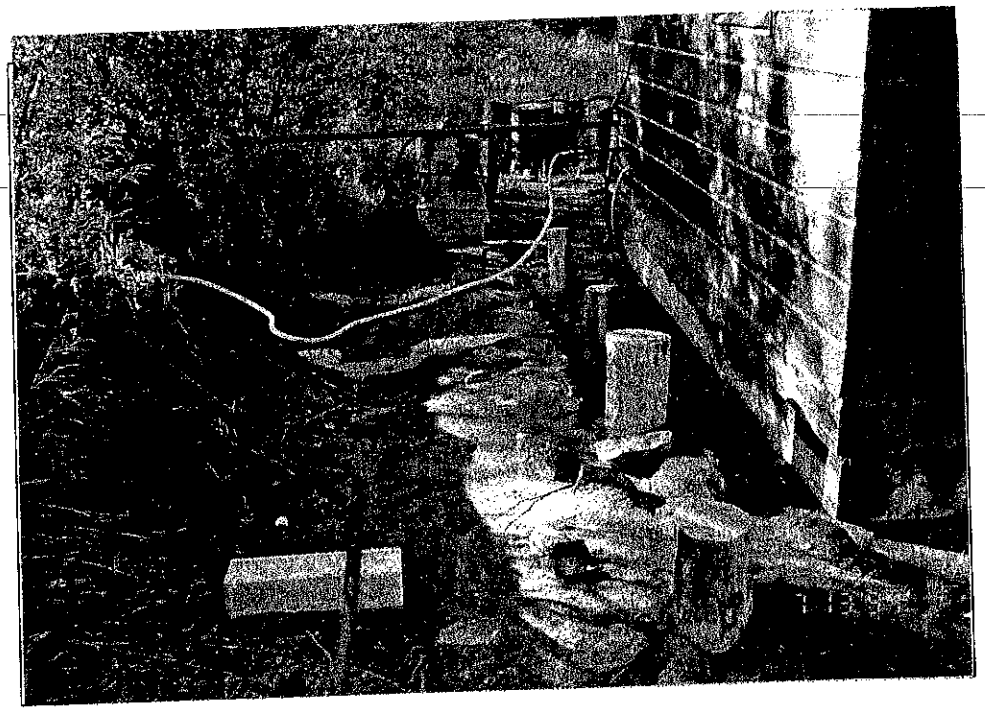
PHOTO LOG

1) Lime Village School and generator shack.

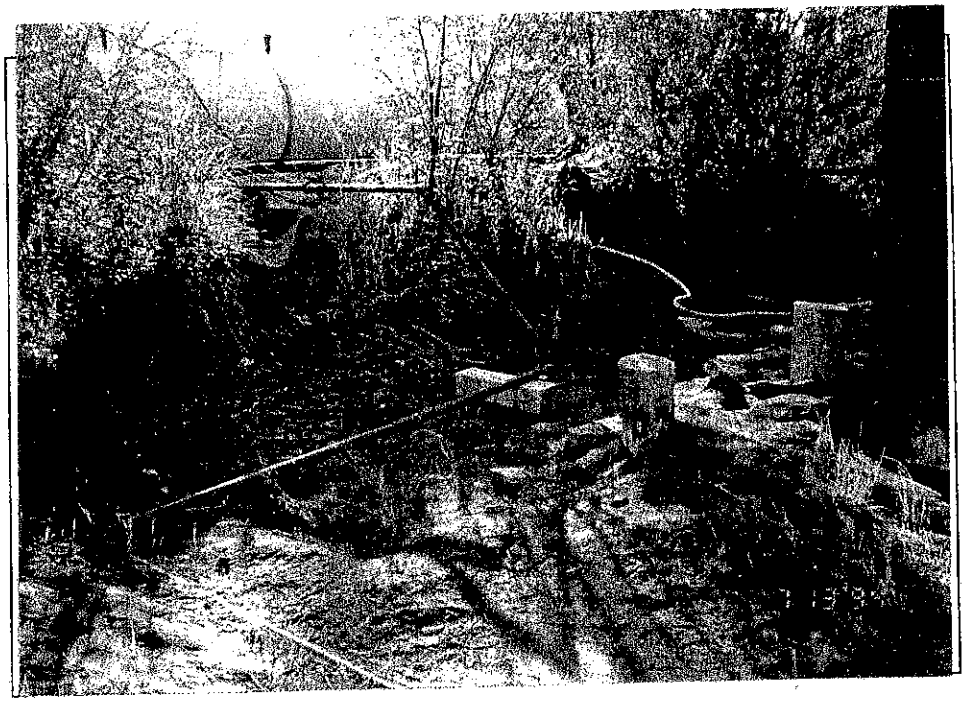


2) Generator shack and sampling area.

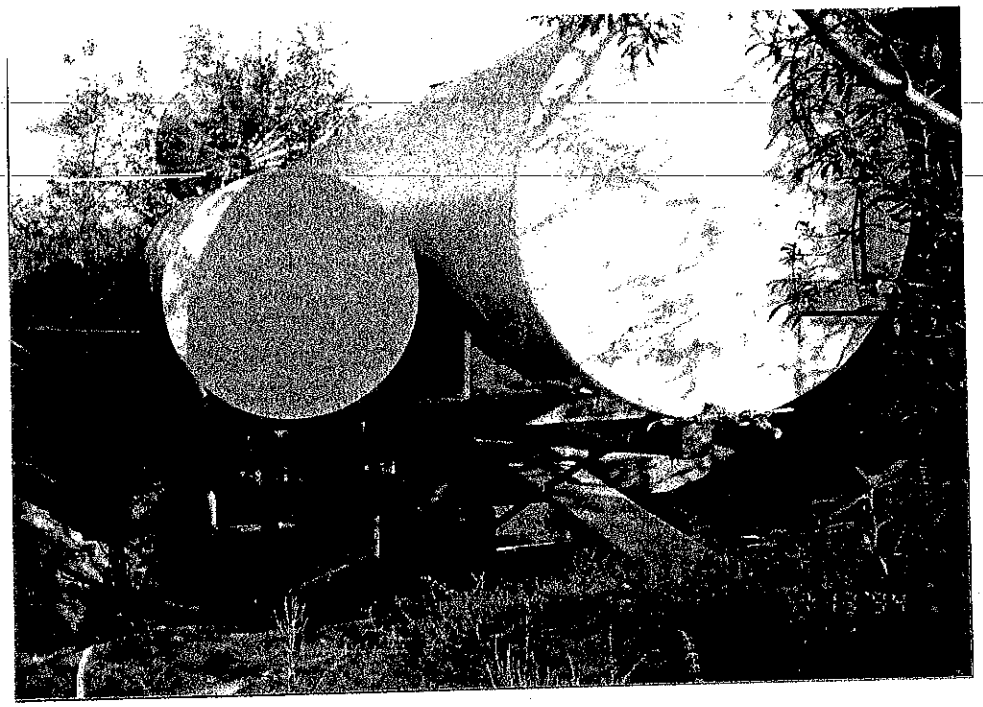
3) Pipe joint near school (petroleum leakage).



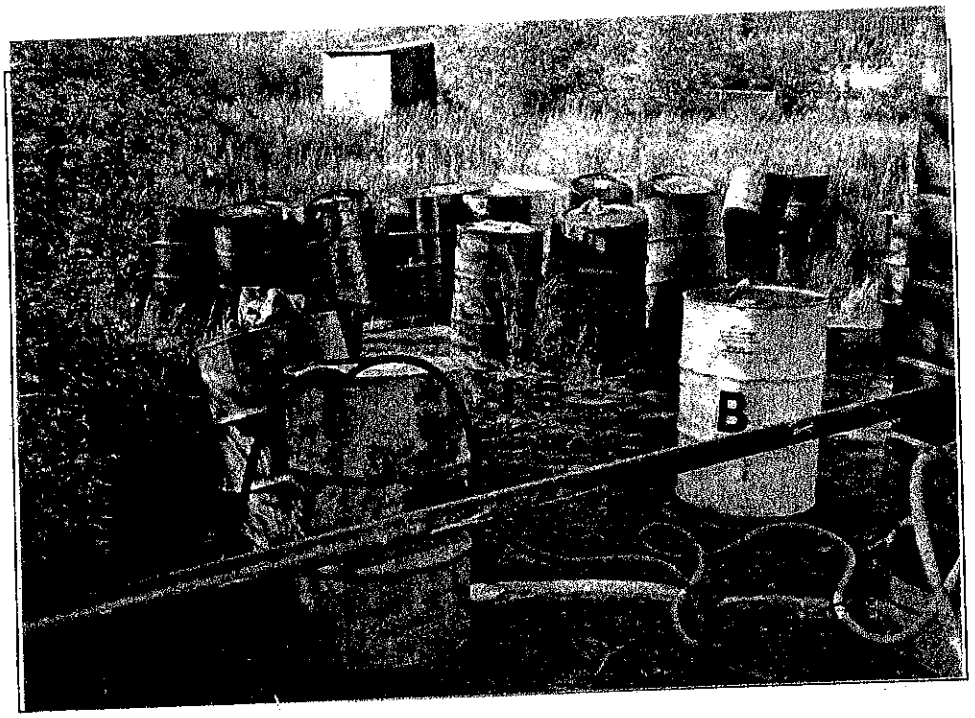
4) Rear of generator shack.



5) Piping from ASTs to school.



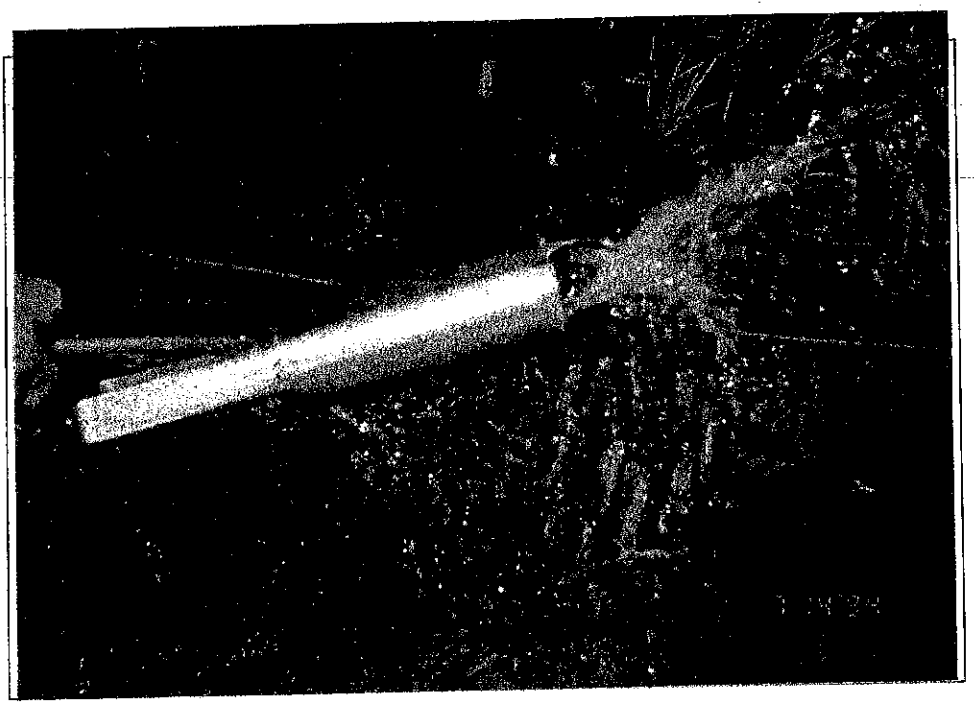
6) ASTs in containment berm.



7) 55 gallon drums of petroleum products (mainly diesel fuels).

8) Soil boring placed near drum storage area.

9) Soil boring and gas powered auger.



10) Hand-auger tool for soil boring (rinsing of gross matter off tool).

11) Soil boring placed near feed line of AST at teacher's house

12) Soil borings placed neat AST at teacher's house.

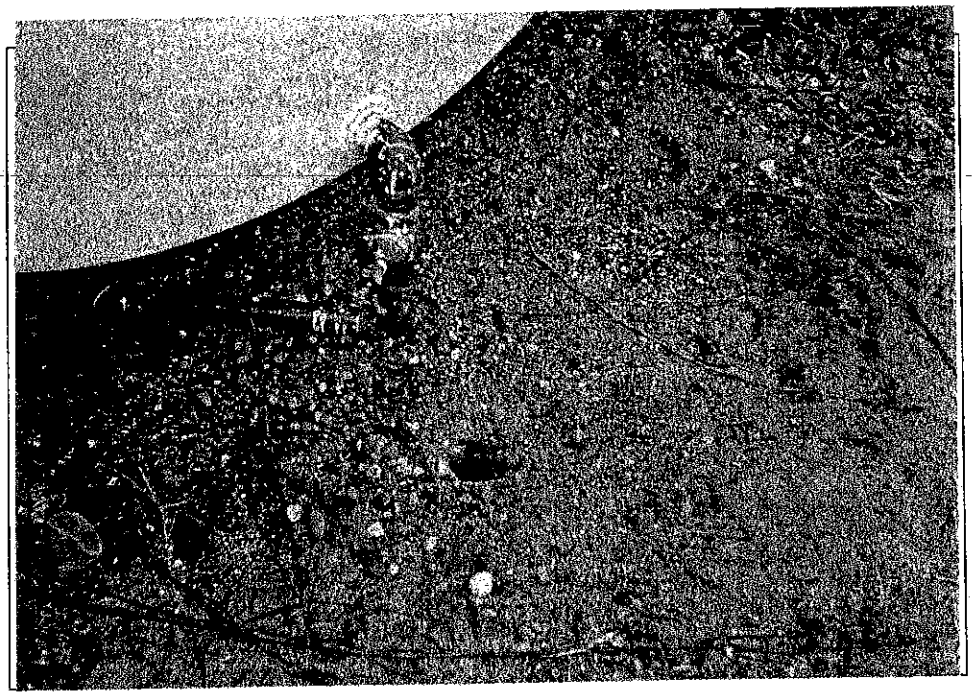
13) Leakage near joint on pipeline (note stressed vegetation beneath pipe).

14) Contaminated soil at end of pipeline near slough.

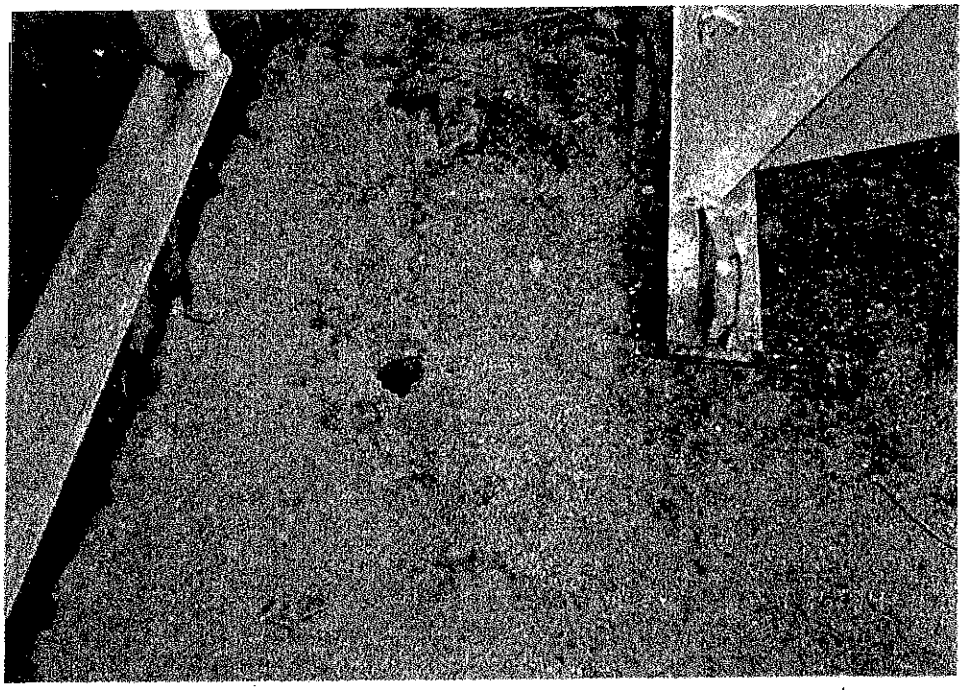
15) Soil boring placed at side of pump house near airstrip.

16) Soil boring placed at rear of pump house.

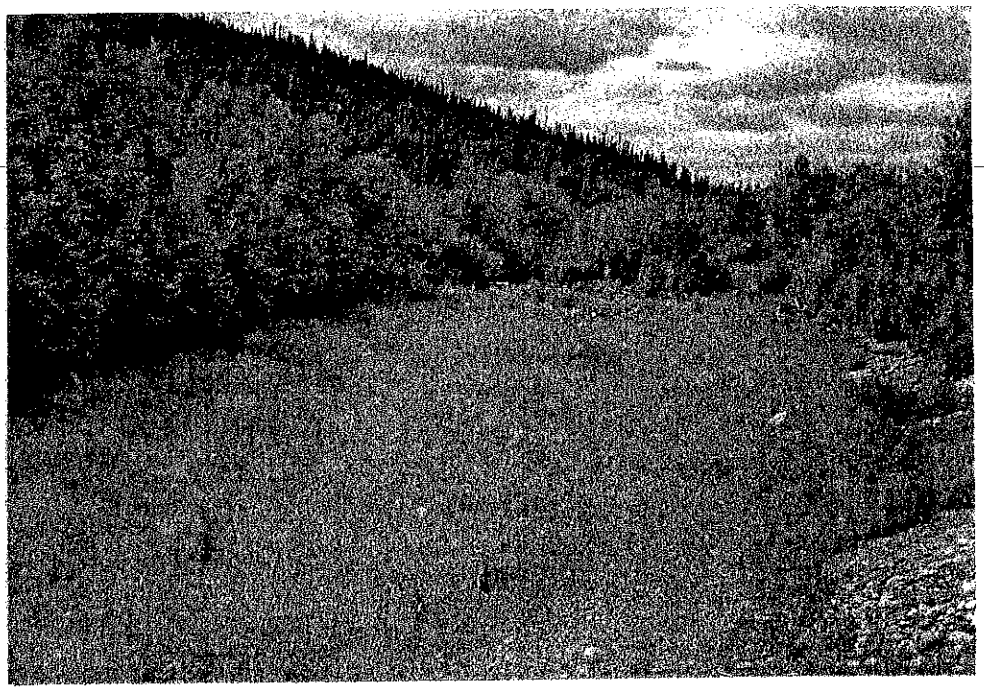
17) Soil boring placed at footing of AST near pump house.



18) Soil boring placed beneath AST pipe joint near pump house.



19) Soil boring placed between AST and pump house.

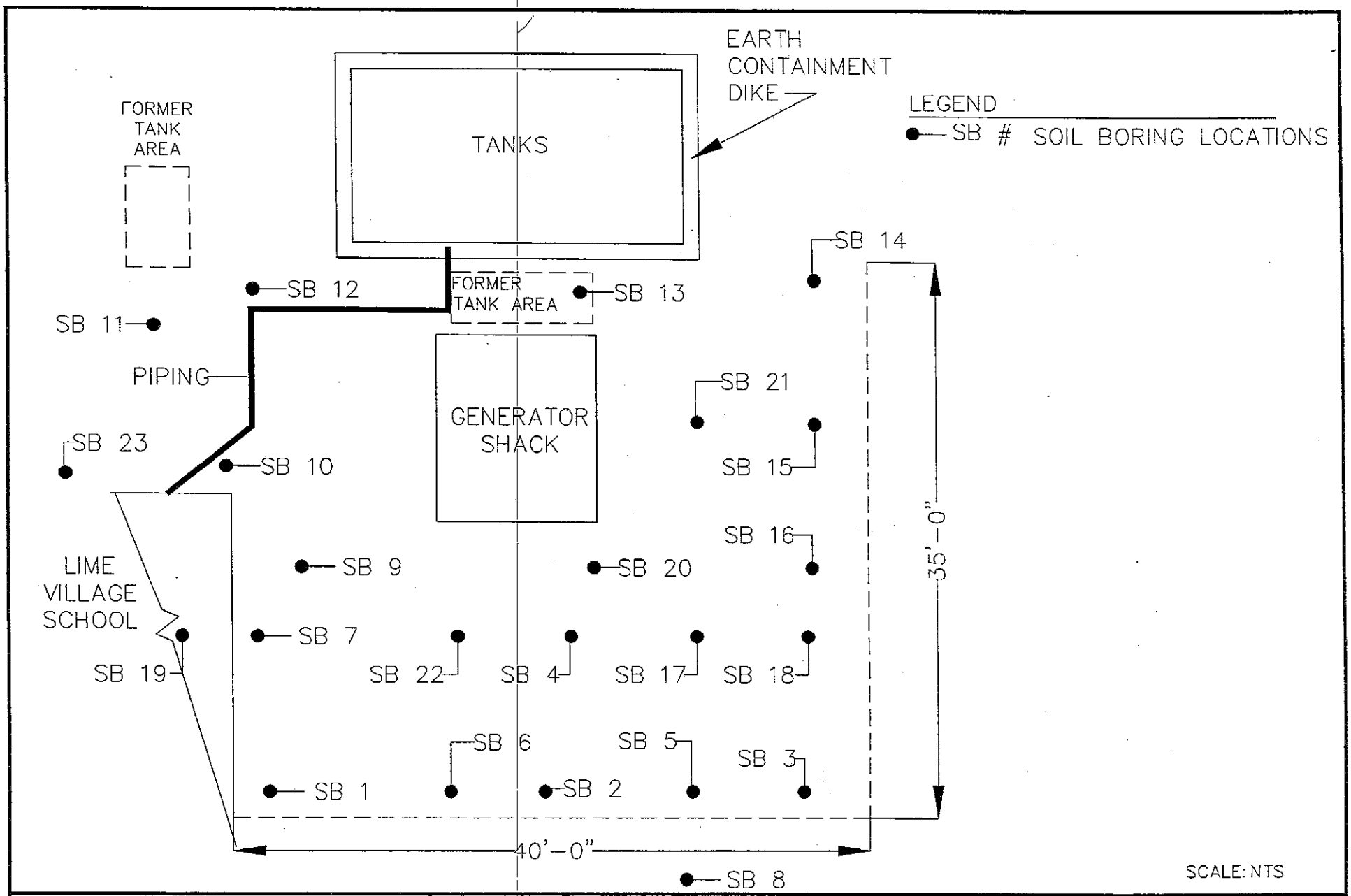


20) Slough area northwest of pipeline.

21) Slough area southwest of pipeline.

APPENDIX C

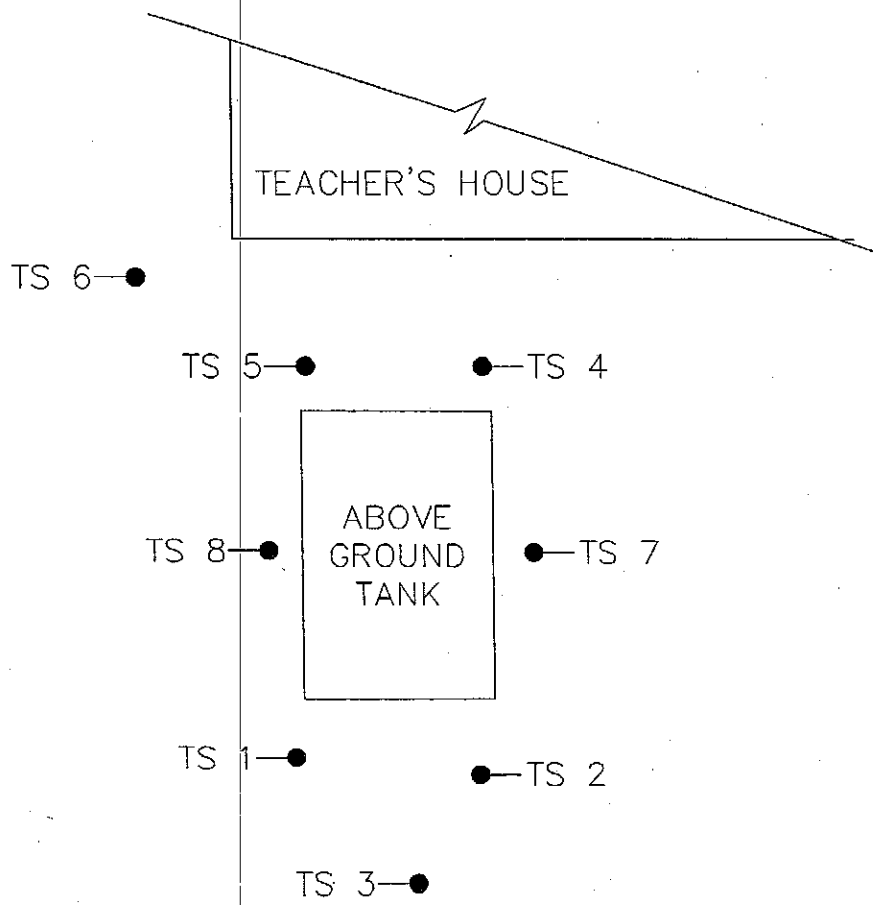
SITE DRAWINGS



IDITAROD SCHOOL DISTRICT LIME VILLAGE SCHOOL LIME VILLAGE, ALASKA	GENERATOR SHACK SCHOOL AREA SOIL BORING LOCATIONS	EHS ALASKA INCORPORATED ENVIRONMENTAL HEALTH SCIENCES – ALASKA, INC.	DATE 8/3/94 DWG.NO S-1

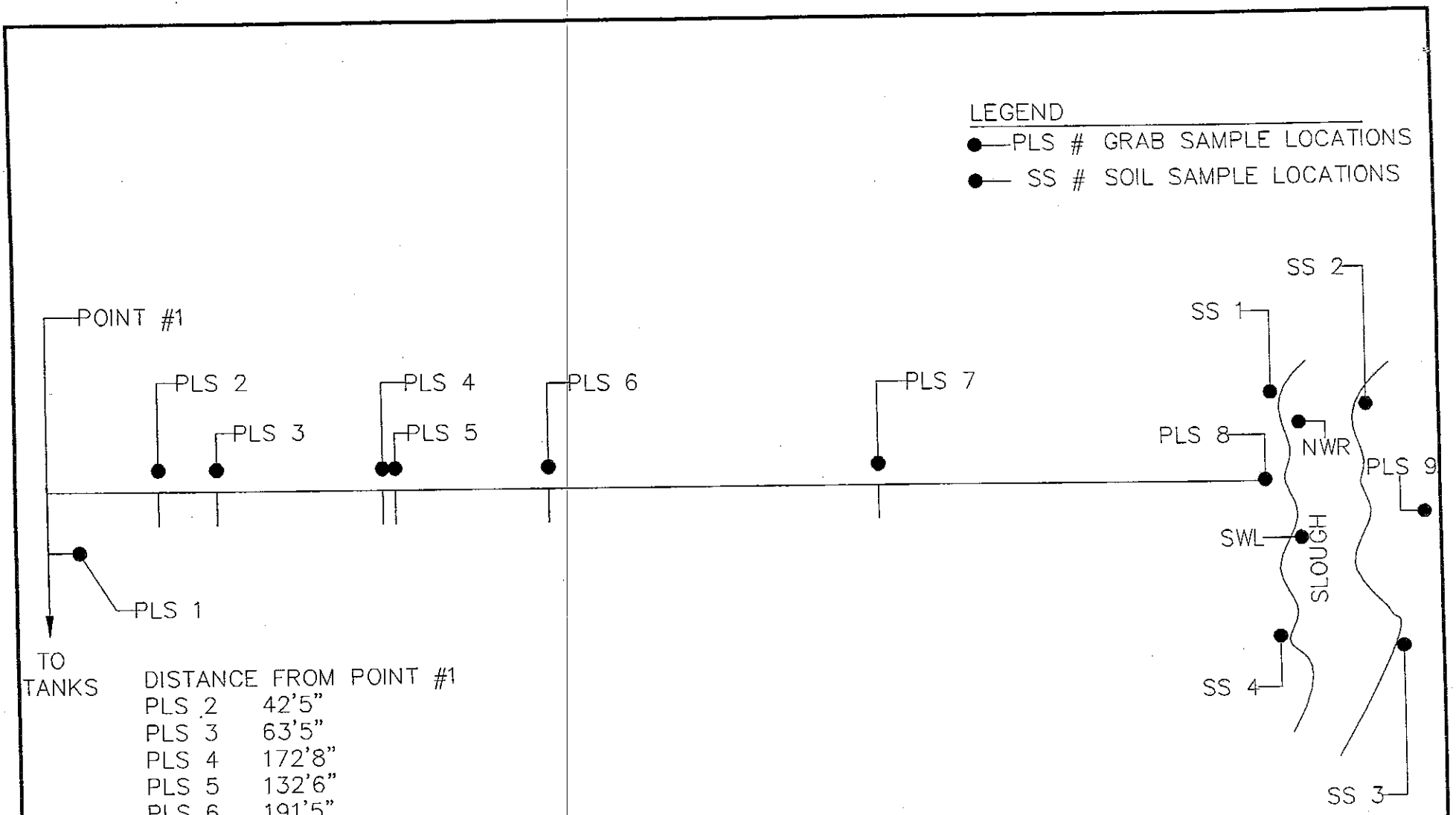
LEGEND

● TS # SAMPLE LOCATIONS



SCALE: NTS

IDITAROD SCHOOL DISTRICT LIME VILLAGE SCHOOL LIME VILLAGE, ALASKA	TEACHER'S HOUSE ABOVEGROUND TANK SAMPLE LOCATIONS	EHS ALASKA INCORPORATED ENVIRONMENTAL HEALTH SCIENCES - ALASKA, INC.	DATE 8/3/94 DWG.NO S-2



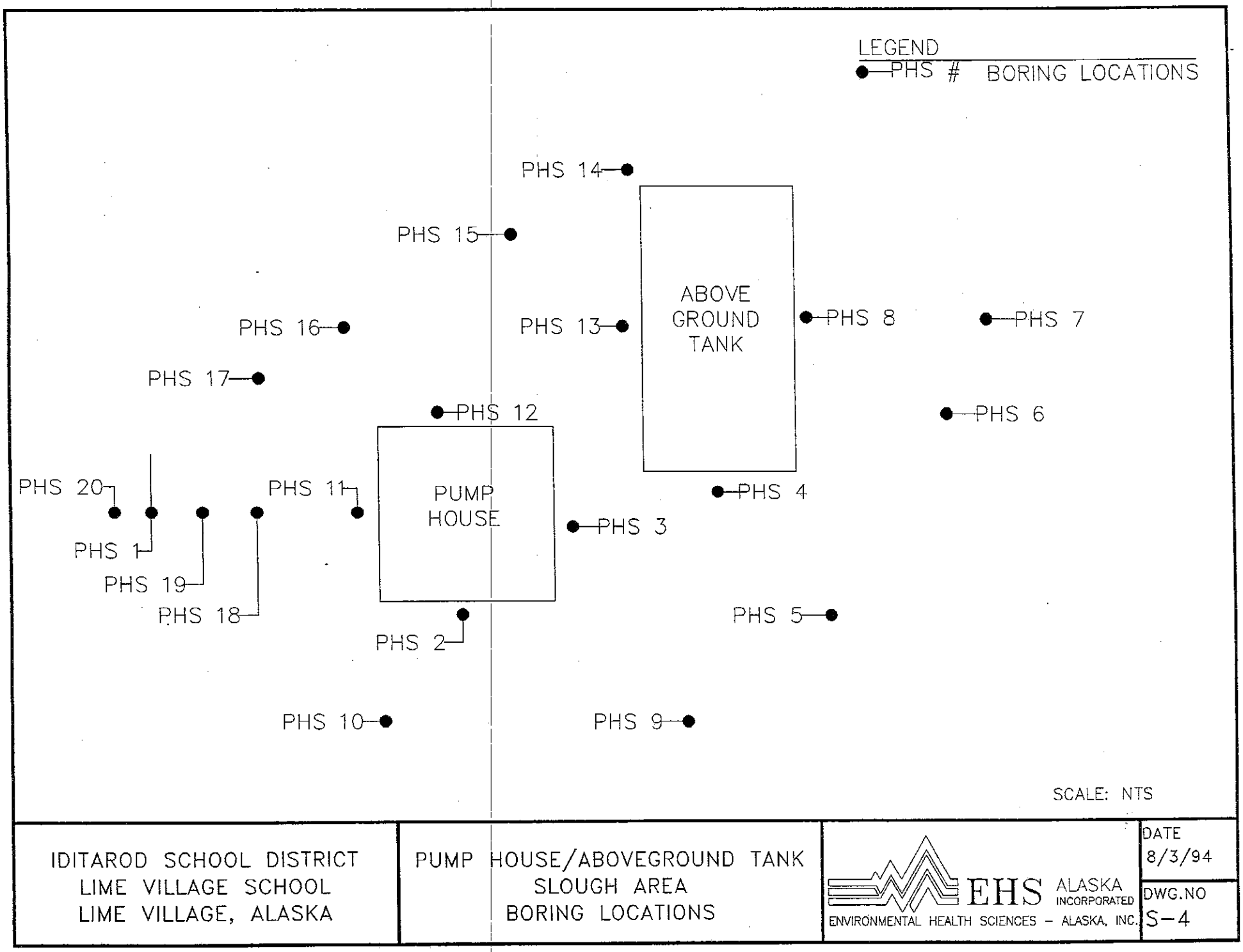
IDITAROD SCHOOL DISTRICT
LIME VILLAGE SCHOOL
LIME VILLAGE, ALASKA

DIESEL FUEL PIPELINE
SLOUGH TO STORAGE TANK AREA
PIPELINE SAMPLING LOCATIONS

EHS ALASKA INCORPORATED
ENVIRONMENTAL HEALTH SCIENCES – ALASKA, INC.

DATE 8/3/94

DWG.NO S-3



IDITAROD SCHOOL DISTRICT LIME VILLAGE SCHOOL LIME VILLAGE, ALASKA	PUMP HOUSE/ABOVEGROUND TANK SLOUGH AREA BORING LOCATIONS	EHS ALASKA INCORPORATED ENVIRONMENTAL HEALTH SCIENCES – ALASKA, INC.	DATE 8/3/94 DWG.NO S-4

APPENDIX D

LABORATORY RESULTS

NORTHERN TESTING LABORATORIES, INC.

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2505 FAIRBANKS STREET, ANCHORAGE, ALASKA 99503, (907) 277-8378 • FAX 274-9645

EHS Alaska, Inc.
10928 Eagle River Rd., Suite 202
Eagle River Ak 99577

Attn: Bruce Beck

Report Date: 08/11/94
Date Arrived: 07/21/94
Date Sampled: 07/14/94
Time Sampled: 1430
Collected By: BB

Our Lab #: A132282
Location/Project: Lime Village-Iditarod SD
Your Sample ID: SB-5
Sample Matrix: Soil
Comments:

* Definitions *
B = Below Regulatory Min.
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
A132282	AK 102	Diesel Range (C-10 thru C-24)	mg/dry kg	4580		118.66	07/26/94	07/28/94
		Surrogate Spike (Recovery)	%	75				
A132282	EPA 160.3	Solids	%	72.2				07/23/94
A132282	EPA 8020	Benzene	mg/dry kg	<MDL		0.09	07/21/94	08/04/94
		Chlorobenzene	mg/dry kg	<MDL		0.36		
		1,2-Dichlorobenzene	mg/dry kg	<MDL		0.36		
		1,3-Dichlorobenzene	mg/dry kg	<MDL		0.36		
		1,4-Dichlorobenzene	mg/dry kg	<MDL		0.36		
		Ethylbenzene	mg/dry kg	<MDL		0.36		
		Toluene	mg/dry kg	0.36		0.14		
		Xylenes	mg/dry kg	7.10		0.72		
		Surrogate Recovery	%	D				

Reported By: Anthony J. Lange
Chemistry Supervisor

NORTHERN TESTING LABORATORIES, INC.

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2505 FAIRBANKS STREET
FAIRBANKS, ALASKA 99701
ANCHORAGE, ALASKA 99503
(907) 456-3116 • FAX 456-3125
(907) 277-8378 • FAX 274-9645

EHS Alaska, Inc.
10928 Eagle River Rd., Suite 202
Eagle River Ak 99577

Attn: Bruce Beck

Report Date: 08/10/94
Date Arrived: 07/21/94
Date Sampled: 07/14/94
Time Sampled: 1535
Collected By: BB

* Definitions *
B = Below Regulatory Min.
H = Above Regulatory Max.
E = Estimated Value
M = Matrix Interference
D = Lost to Dilution
MDL = Method Detection Limit

Our Lab #: A132283
Location/Project: Lime Village-Iditarod SD
Your Sample ID: SB-7
Sample Matrix: Soil
Comments:

ab umber	Method	Parameter	Units	Result	*	MDL	Date Prepared	Date Analyzed
132283	AK 102	Diesel Range (C-10 thru C-24)	mg/dry kg	10600		476.05	07/26/94	07/28/94
		Surrogate Spike (Recovery)	%	82				
132283	EPA 160.3	Solids	%	83.7				07/23/94
132283	EPA 8020	Benzene	mg/dry kg	<MDL		1.53	07/21/94	08/04/94
		Chlorobenzene	mg/dry kg	<MDL		1.53		
		1,2-Dichlorobenzene	mg/dry kg	<MDL		1.53		
		1,3-Dichlorobenzene	mg/dry kg	<MDL		1.53		
		1,4-Dichlorobenzene	mg/dry kg	<MDL		1.53		
		Ethylbenzene	mg/dry kg	<MDL		1.53		
		Toluene	mg/dry kg	2.60		2.30		
		Xylenes	mg/dry kg	6.44		3.06		
		Surrogate Recovery	%	D				

eported By: Anthony J. Lange
hemistry Supervisor

NORTHERN TESTING LABORATORIES, INC.

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EHS Alaska, Inc.
10928 Eagle River Rd., Suite 202
Eagle River Ak 99577

Report Date: 08/11/94
Date Arrived: 07/21/94
Date Sampled: 07/14/94
Time Sampled: 1620
Collected By: BB

Attn: Bruce Beck

* Definitions *
B = Below Regulatory Min.
H = Above Regulatory Max.
E = Estimated Value
M = Matrix Interference
D = Lost to Dilution
MDL = Method Detection Limit

Our Lab #: A132284
Location/Project: Lime Village-Iditarod SD
Your Sample ID: SB-9
Sample Matrix: Soil
Comments:

Lab Number	Method	Parameter	Units	Result	*	MDL	Date Prepared	Date Analyzed
A132284	AK 102	Diesel Range (C-10 thru C-24)	mg/dry kg	1500		95.41	07/26/94	07/28/94
		Surrogate Spike (Recovery)	%	87				
A132284	EPA 160.3	Solids		81.4				07/23/94
A132284	EPA 8020	Benzene	mg/dry kg	<MDL		0.08	07/21/94	08/04/94
		Chlorobenzene	mg/dry kg	<MDL		0.08		
		1,2-Dichlorobenzene	mg/dry kg	<MDL		0.08		
		1,3-Dichlorobenzene	mg/dry kg	<MDL		0.08		
		1,4-Dichlorobenzene	mg/dry kg	<MDL		0.08		
		Ethylbenzene	mg/dry kg	<MDL		0.08		
		Toluene	mg/dry kg	0.29		0.12		
		Xylenes	mg/dry kg	3.96		0.15		
		Surrogate Recovery	%	D				

Reported By: Anthony J. Lange
Chemistry Supervisor

NORTHERN TESTING LABORATORIES, INC.

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EHS Alaska, Inc.
10928 Eagle River Rd., Suite 202
Eagle River Ak 99577

Attn: Bruce Beck

Report Date: 08/10/94
Date Arrived: 07/21/94
Date Sampled: 07/14/94
Time Sampled: 0630
Collected By: BB

Our Lab #: A132277
Location/Project: Lime Village-Iditarod SD
Your Sample ID: SB-10
Sample Matrix: Soil
Comments:

* Definitions *
B = Below Regulatory Min.
H = Above Regulatory Max.
E = Estimated Value
M = Matrix Interference
D = Lost to Dilution
MDL = Method Detection Limit

ab mber	Method	Parameter	Units	Result	*	MDL	Date Prepared	Date Analyzed
132277	AK 102	Diesel Range (C-10 thru C-24)	mg/dry kg	118		11.21	07/26/94	07/28/94
		Surrogate Spike (Recovery)	%	72				
132277	EPA 160.3	Solids	%	76.6				07/23/94
132277	EPA 8020	Benzene	mg/dry kg	<MDL		0.08	07/21/94	08/03/93
		Chlorobenzene	mg/dry kg	<MDL		0.08		
		1,2-Dichlorobenzene	mg/dry kg	<MDL		0.08		
		1,3-Dichlorobenzene	mg/dry kg	<MDL		0.08		
		1,4-Dichlorobenzene	mg/dry kg	<MDL		0.08		
		Ethylbenzene	mg/dry kg	<MDL		0.08		
		Toluene	mg/dry kg	0.16		0.12		
		Xylenes	mg/dry kg	1.00		0.16		
		Surrogate Recovery	%	D				

eported By: Anthony J. Lange
iemistry Supervisor

NORTHERN TESTING LABORATORIES, INC.

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2505 FAIRBANKS STREET
FAIRBANKS, ALASKA 99701
ANCHORAGE, ALASKA 99503
(907) 456-3116 • FAX 456-3125
(907) 277-8378 • FAX 274-9645

EHS Alaska, Inc.
10928 Eagle River Rd., Suite 202
Eagle River Ak 99577

Attn: Bruce Beck

Report Date: 08/10/94
Date Arrived: 07/21/94
Date Sampled: 07/14/94
Time Sampled: 0700
Collected By: BB

* Definitions *
B = Below Regulatory Min.
H = Above Regulatory Max.
E = Estimated Value
M = Matrix Interference
D = Lost to Dilution
MDL = Method Detection Limit

Our Lab #: A132278
Location/Project: Lime Village-Iditarod SD
Your Sample ID: SB-11
Sample Matrix: Soil
Comments:

Lab Number	Method	Parameter	Units	Result	*	MDL	Date Prepared	Date Analyzed
132278	AK 102	Diesel Range (C-10 thru C-24)	mg/dry kg	156		11.43	07/26/94	07/28/94
		Surrogate Spike (Recovery)	%	72				
132278	EPA 160.3	Solids	%	72.9				07/23/94
132278	EPA 8020	Benzene	mg/dry kg	<MDL		0.08	07/21/94	08/03/93
		Chlorobenzene	mg/dry kg	<MDL		0.08		
		1,2-Dichlorobenzene	mg/dry kg	<MDL		0.08		
		1,3-Dichlorobenzene	mg/dry kg	<MDL		0.08		
		1,4-Dichlorobenzene	mg/dry kg	<MDL		0.08		
		Ethylbenzene	mg/dry kg	0.15		0.08		
		Toluene	mg/dry kg	<MDL		0.13		
		Xylenes	mg/dry kg	0.92		0.17		
		Surrogate Recovery	%	D				

Reported By: Anthony J. Lange
Chemistry Supervisor

NORTHERN TESTING LABORATORIES, INC.

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EHS Alaska, Inc.
10928 Eagle River Rd., Suite 202
Eagle River Ak 99577

Report Date: 08/11/94
Date Arrived: 07/21/94
Date Sampled: 07/14/94
Time Sampled: 0812
Collected By: BB

Attn: Bruce Beck

* Definitions *
B = Below Regulatory Min.
H = Above Regulatory Max.
E = Estimated Value
M = Matrix Interference
D = Lost to Dilution
MDL = Method Detection Limit

Our Lab #: A132279
Location/Project: Lime Village-Iditarod SD
Your Sample ID: SB-13
Sample Matrix: Soil
Comments:

Lab Number	Method	Parameter	Units	Result	*	MDL	Date Prepared	Date Analyzed
A132279	AK 102	Diesel Range (C-10 thru C-24)	mg/dry kg	77900		479.33	07/26/94	07/28/94
		Surrogate Spike (Recovery)	%	71				
A132279	EPA 160.3	Solids	%	88.4				07/23/94
A132279	EPA 8020	Benzene	mg/dry kg	<MDL		14.56	07/21/94	08/03/93
		Chlorobenzene	mg/dry kg	<MDL		14.56		
		1,2-Dichlorobenzene	mg/dry kg	<MDL		14.56		
		1,3-Dichlorobenzene	mg/dry kg	<MDL		14.56		
		1,4-Dichlorobenzene	mg/dry kg	<MDL		14.56		
		Ethylbenzene	mg/dry kg	<MDL		14.56		
		Toluene	mg/dry kg	<MDL		21.85		
		Xylenes	mg/dry kg	365		29.13		
		Surrogate Recovery	%	D				

Reported By: Anthony J. Lange
Chemistry Supervisor

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EHS Alaska, Inc.
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Eagle River Ak 99577

Report Date: 08/10/94
Date Arrived: 07/21/94
Date Sampled: 07/14/94
Time Sampled: 1010
Collected By: BB

Attn: Bruce Beck

* Definitions *
B = Below Regulatory Min.
H = Above Regulatory Max.
E = Estimated Value
M = Matrix Interference
D = Lost to Dilution
MDL = Method Detection Limit

Our Lab #: A132280
Location/Project: Lime Village-Iditarod SD
Your Sample ID: SB-15
Sample Matrix: Soil
Comments:

Lab Number	Method	Parameter	Units	Result	*	MDL	Date Prepared	Date Analyzed
A132280	AK 102	Diesel Range (C-10 thru C-24)	mg/dry kg	31.5		8.94	07/26/94	07/28/94
		Surrogate Spike (Recovery)	%	73				
A132280	EPA 160.3	Solids	%	92.0				07/23/94
A132280	EPA 8020	Benzene	mg/dry kg	<MDL		0.01	07/21/94	08/04/94
		Chlorobenzene	mg/dry kg	<MDL		0.01		
		1,2-Dichlorobenzene	mg/dry kg	<MDL		0.01		
		1,3-Dichlorobenzene	mg/dry kg	<MDL		0.01		
		1,4-Dichlorobenzene	mg/dry kg	<MDL		0.01		
		Ethylbenzene	mg/dry kg	<MDL		0.01		
		Toluene	mg/dry kg	0.04		0.02		
		Xylenes	mg/dry kg	0.06		0.03		
		Surrogate Recovery	%	106				

Reported By: Anthony J. Lange
Chemistry Supervisor

NORTHERN TESTING LABORATORIES, INC.

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EHS Alaska, Inc.
10928 Eagle River Rd., Suite 202
Eagle River Ak 99577

Attn: Bruce Beck

Report Date: 08/10/94
Date Arrived: 07/20/94
Date Sampled: 07/15/94
Time Sampled: 1415
Collected By: BB

Our Lab #: A132268
Location/Project: Lime Village-Iditarod SD
Your Sample ID: SB-17/2A
Sample Matrix: Soil
Comments:

* Definitions *
B = Below Regulatory Min.
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
A132268	AK 102	Diesel Range (C-10 thru C-24)	mg/dry kg	4950		183.91	07/26/94	07/28/94
		Surrogate Spike (Recovery)	%	56				
A132268	EPA 160.3	Solids	%	86.2				07/23/94
A132268	EPA 8020	Benzene	mg/dry kg	<MDL		0.07	07/21/94	08/03/93
		Chlorobenzene	mg/dry kg	<MDL		0.07		
		1,2-Dichlorobenzene	mg/dry kg	<MDL		0.07		
		1,3-Dichlorobenzene	mg/dry kg	<MDL		0.07		
		1,4-Dichlorobenzene	mg/dry kg	<MDL		0.07		
		Ethylbenzene	mg/dry kg	<MDL		0.07		
		Toluene	mg/dry kg	0.12		0.11		
		Xylenes	mg/dry kg	8.47		0.14		
		Surrogate Recovery	%	D				

Reported By: Anthony J. Lange
Chemistry Supervisor

NORTHERN TESTING LABORATORIES, INC.

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2505 FAIRBANKS STREET, ANCHORAGE, ALASKA 99503 (907) 277-8378 • FAX 274-9645

EHS Alaska, Inc.
10928 Eagle River Rd., Suite 202
Eagle River Ak 99577

Attn: Bruce Beck

Report Date: 08/10/94
Date Arrived: 07/20/94
Date Sampled: 07/15/94
Time Sampled: 1415
Collected By: BB

Our Lab #: A132269
Location/Project: Lime Village-Iditarod SD
Your Sample ID: SB-17/2B
Sample Matrix: Soil
Comments:

* Definitions *
B = Below Regulatory Min.
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
A132269	AK 102	Diesel Range (C-10 thru C-24)	mg/dry kg	4550		183.74	07/26/94	07/28/94
		Surrogate Spike (Recovery)	%	69				
A132269	EPA 160.3	Solids	%	86.1				07/23/94
A132269	EPA 8020	Benzene	mg/dry kg	<MDL		0.07	07/21/94	08/03/93
		Chlorobenzene	mg/dry kg	<MDL		0.07		
		1,2-Dichlorobenzene	mg/dry kg	<MDL		0.07		
		1,3-Dichlorobenzene	mg/dry kg	<MDL		0.07		
		1,4-Dichlorobenzene	mg/dry kg	<MDL		0.07		
		Ethylbenzene	mg/dry kg	<MDL		0.07		
		Toluene	mg/dry kg	0.23		0.11		
		Xylenes	mg/dry kg	8.88		0.15		
		Surrogate Recovery	%	D				

Reported By: Anthony J. Lange
Chemistry Supervisor

9

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2505 FAIRBANKS STREET, ANCHORAGE, ALASKA 99503, (907) 277-8378 • FAX 274-9645

EHS Alaska, Inc.
10928 Eagle River Rd., Suite 202
Eagle River Ak 99577

Attn: Bruce Beck

Report Date: 08/10/94
Date Arrived: 07/20/94
Date Sampled: 07/15/94
Time Sampled: 1500
Collected By: BB

Our Lab #: A132270
Location/Project: Lime Village-Iditarod SD
Your Sample ID: SB-20
Sample Matrix: Soil
Comments:

* Definitions *
B = Below Regulatory Min.
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
A132270	AK 102	Diesel Range (C-10 thru C-24)	mg/dry kg	4040		187.43	07/26/94	07/28/94
		Surrogate Spike (Recovery)	%	63				
A132270	EPA 160.3	Solids	%	88.2				07/23/94
A132270	EPA 8020	Benzene	mg/dry kg	<MDL		0.07	07/21/94	08/03/93
		Chlorobenzene	mg/dry kg	<MDL		0.07		
		1,2-Dichlorobenzene	mg/dry kg	<MDL		0.07		
		1,3-Dichlorobenzene	mg/dry kg	<MDL		0.07		
		1,4-Dichlorobenzene	mg/dry kg	<MDL		0.07		
		Ethylbenzene	mg/dry kg	<MDL		0.07		
		Toluene	mg/dry kg	0.23		0.11		
		Xylenes	mg/dry kg	4.97		0.14		
		Surrogate Recovery	%	D				

Reported By: Anthony J. Lange
Chemistry Supervisor

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10928 Eagle River Rd., Suite 202
Eagle River Ak 99577

Attn: Bruce Beck

Report Date: 08/10/94
Date Arrived: 07/20/94
Date Sampled: 07/15/94
Time Sampled: 1530
Collected By: BB

* Definitions *
B = Below Regulatory Min.
H = Above Regulatory Max.
E = Estimated Value
M = Matrix Interference
D = Lost to Dilution
MDL = Method Detection Limit

Our Lab #: A132271
Location/Project: Lime Village-Iditarod SD
Your Sample ID: SB-21
Sample Matrix: Soil
Comments:

Lab Number	Method	Parameter	Units	Result	*	MDL	Date Prepared	Date Analyzed
A132271	AK 102	Diesel Range (C-10 thru C-24)	mg/dry kg	6210		195.19	07/26/94	07/28/94
		Surrogate Spike (Recovery)	%	73				
A132271	EPA 160.3	Solids	%	83.2				07/23/94
A132271	EPA 8020	Benzene	mg/dry kg	<MDL		0.08	07/21/94	08/03/93
		Chlorobenzene	mg/dry kg	<MDL		0.08		
		1,2-Dichlorobenzene	mg/dry kg	<MDL		0.08		
		1,3-Dichlorobenzene	mg/dry kg	<MDL		0.08		
		1,4-Dichlorobenzene	mg/dry kg	<MDL		0.08		
		Ethylbenzene	mg/dry kg	<MDL		0.08		
		Toluene	mg/dry kg	0.32		0.12		
		Xylenes	mg/dry kg	13		0.15		
		Surrogate Recovery	%	D				

Reported By: Anthony J. Lange
Chemistry Supervisor

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Eagle River Ak 99577

Report Date: 08/11/94
Date Arrived: 07/21/94
Date Sampled: 07/14/94
Time Sampled: 1615
Collected By: BB

Attn: Bruce Beck

* Definitions *
B = Below Regulatory Min.
H = Above Regulatory Max.
E = Estimated Value
M = Matrix Interference
D = Lost to Dilution
MDL = Method Detection Limit

Our Lab #: A132281
Location/Project: Lime Village-Iditarod SD
Your Sample ID: SB-22
Sample Matrix: Soil
Comments:

Lab Number	Method	Parameter	Units	Result	*	MDL	Date Prepared	Date Analyzed
A132281	AK 102	Diesel Range (C-10 thru C-24)	mg/dry kg	19.8		10.32	07/26/94	07/28/94
		Surrogate Spike (Recovery)	%	74				
A132281	EPA 160.3	Solids	%	84.6				07/23/94
A132281	EPA 8020	Benzene	mg/dry kg	0.02		0.01	07/21/94	08/04/94
		Chlorobenzene	mg/dry kg	<MDL		0.01		
		1,2-Dichlorobenzene	mg/dry kg	<MDL		0.01		
		1,3-Dichlorobenzene	mg/dry kg	<MDL		0.01		
		1,4-Dichlorobenzene	mg/dry kg	<MDL		0.01		
		Ethylbenzene	mg/dry kg	<MDL		0.01		
		Toluene	mg/dry kg	0.04		0.02		
		Xylenes	mg/dry kg	0.05		0.03		
		Surrogate Recovery	%	98				

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Chemistry Supervisor

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Attn: Bruce Beck

Report Date: 08/10/94
Date Arrived: 07/20/94
Date Sampled: 07/15/94
Time Sampled: 1635
Collected By: BB

Our Lab #: A132272
Location/Project: Lime Village-Iditarod SD
Your Sample ID: SB-23
Sample Matrix: Soil
Comments:

* Definitions *
B = Below Regulatory Min.
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
A132272	AK 102	Diesel Range (C-10 thru C-24)	mg/dry kg	8100		445.93	07/26/94	07/28/94
		Surrogate Spike (Recovery)	%	76				
A132272	EPA 160.3	Solids	%	89.6				07/23/94
A132272	EPA 8020	Benzene	mg/dry kg	<MDL		0.07	07/21/94	08/03/93
		Chlorobenzene	mg/dry kg	<MDL		0.07		
		1,2-Dichlorobenzene	mg/dry kg	<MDL		0.07		
		1,3-Dichlorobenzene	mg/dry kg	<MDL		0.07		
		1,4-Dichlorobenzene	mg/dry kg	<MDL		0.07		
		Ethylbenzene	mg/dry kg	<MDL		0.07		
		Toluene	mg/dry kg	0.28		0.11		
		Xylenes	mg/dry kg	4.38		2.83		
		Surrogate Recovery	%	D				

Reported By: Anthony D. Lange
Chemistry Supervisor

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Attn: Bruce Beck

Report Date: 08/10/94
Date Arrived: 07/21/94
Date Sampled: 07/14/94
Time Sampled: 0920
Collected By: BB

Our Lab #: A132276
Location/Project: Lime Village-Iditarod SD
Your Sample ID: TS-1
Sample Matrix: Soil
Comments:

* Definitions *
B = Below Regulatory Min.
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
A132276	AK 102	Diesel Range (C-10 thru C-24)	mg/dry kg	2880		98.99	07/26/94	07/28/94
		Surrogate Spike (Recovery)	%	76				
A132276	EPA 160.3	Solids	%	85.2				07/23/94
A132276	EPA 8020	Benzene	mg/dry kg	<MDL		0.07	07/21/94	08/03/93
		Chlorobenzene	mg/dry kg	<MDL		0.07		
		1,2-Dichlorobenzene	mg/dry kg	<MDL		0.07		
		1,3-Dichlorobenzene	mg/dry kg	<MDL		0.07		
		1,4-Dichlorobenzene	mg/dry kg	<MDL		0.07		
		Ethylbenzene	mg/dry kg	<MDL		0.07		
		Toluene	mg/dry kg	0.18		0.11		
		Xylenes	mg/dry kg	7.90		0.15		
		Surrogate Recovery	%	D				

Reported By: Anthony J. Lange
Chemistry Supervisor

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2505 FAIRBANKS STREET
FAIRBANKS, ALASKA 99701
ANCHORAGE, ALASKA 99503
(907) 456-3116 • FAX 456-3125
(907) 277-8378 • FAX 274-9645

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Eagle River Ak 99577

Attn: Bruce Beck

Report Date: 08/10/94
Date Arrived: 07/20/94
Date Sampled: 07/14/94
Time Sampled: 1140
Collected By: BB

* Definitions *
B = Below Regulatory Min.
H = Above Regulatory Max.
E = Estimated Value
M = Matrix Interference
D = Lost to Dilution
MDL = Method Detection Limit

Our Lab #: A132267
Location/Project: Lime Village-Iditarod SD
Your Sample ID: TS-6
Sample Matrix: Soil
Comments:

Lab Number	Method	Parameter	Units	Result	*	MDL	Date Prepared	Date Analyzed
A132267	AK 102	Diesel Range (C-10 thru C-24)	mg/dry kg	554		9.90	07/26/94	07/28/94
		Surrogate Spike (Recovery)	%	76				
A132267	EPA 160.3	Solids	%	82.9				07/23/94
A132267	EPA 8020	Benzene	mg/dry kg	<MDL		0.01	07/21/94	08/03/93
		Chlorobenzene	mg/dry kg	<MDL		0.07		
		1,2-Dichlorobenzene	mg/dry kg	<MDL		0.07		
		1,3-Dichlorobenzene	mg/dry kg	<MDL		0.07		
		1,4-Dichlorobenzene	mg/dry kg	<MDL		0.07		
		Ethylbenzene	mg/dry kg	<MDL		0.07		
		Toluene	mg/dry kg	<MDL		0.11		
		Xylenes	mg/dry kg	2.29		0.15		
		Surrogate Recovery	%	D				

Reported By: Anthony J. Lange
Chemistry Supervisor

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Eagle River Ak 99577

Attn: Bruce Beck

Report Date: 08/10/94
Date Arrived: 07/20/94
Date Sampled: 07/15/94
Time Sampled: 1200
Collected By: BB

Our Lab #: A132262
Location/Project: Lime Village-Iditarod SD
Your Sample ID: PLS-1
Sample Matrix: Soil
Comments:

* Definitions *
B = Below Regulatory Min.
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
A132262	AK 102	Diesel Range (C-10 thru C-24)	mg/dry kg	39100		1112.3	07/26/94	07/28/94
		Surrogate Spike (Recovery)	%	75				
132262	EPA 160.3	Solids	%	30.1				07/23/94
A132262	EPA 8020	Benzene	mg/dry kg	<MDL		0.21	07/21/94	08/01/94
		Chlorobenzene	mg/dry kg	<MDL		0.21		
		1,2-Dichlorobenzene	mg/dry kg	<MDL		0.21		
		1,3-Dichlorobenzene	mg/dry kg	<MDL		0.21		
		1,4-Dichlorobenzene	mg/dry kg	<MDL		0.21		
		Ethylbenzene	mg/dry kg	<MDL		0.21		
		Toluene	mg/dry kg	<MDL		0.32		
		Xylenes	mg/dry kg	2.14		0.42		
		Surrogate Recovery	%	D				

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Chemistry Supervisor

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Eagle River Ak 99577

Report Date: 08/10/94
Date Arrived: 07/20/94
Date Sampled: 07/15/94
Time Sampled: 1215
Collected By: BB

Attn: Bruce Beck

* Definitions *
B = Below Regulatory Min.
H = Above Regulatory Max.
E = Estimated Value
M = Matrix Interference
D = Lost to Dilution
MDL = Method Detection Limit

Our Lab #: A132263
Location/Project: Lime Village-Iditarod SD
Your Sample ID: PLS-3
Sample Matrix: Soil
Comments:

Lab Number	Method	Parameter	Units	Result	*	MDL	Date Prepared	Date Analyzed
A132263	AK 102	Diesel Range (C-10 thru C-24)	mg/dry kg	2010		123.86	07/26/94	07/28/94
		Surrogate Spike (Recovery)	%	84				
132263	EPA 160.3	Solids	%	73.1				07/23/94
A132263	EPA 8020	Benzene	mg/dry kg	<MDL		0.08	07/21/94	08/01/94
		Chlorobenzene	mg/dry kg	<MDL		0.08		
		1,2-Dichlorobenzene	mg/dry kg	<MDL		0.08		
		1,3-Dichlorobenzene	mg/dry kg	<MDL		0.08		
		1,4-Dichlorobenzene	mg/dry kg	<MDL		0.08		
		Ethylbenzene	mg/dry kg	<MDL		0.08		
		Toluene	mg/dry kg	<MDL		0.13		
		Xylenes	mg/dry kg	1.21		0.17		
		Surrogate Recovery	%	D				

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Attn: Bruce Beck

Report Date: 08/10/94
Date Arrived: 07/20/94
Date Sampled: 07/15/94
Time Sampled: 1225
Collected By: BB

Our Lab #: A132264
Location/Project: Lime Village-Iditarod SD
Your Sample ID: PLS-8A
Sample Matrix: Soil
Comments:

* Definitions *
B = Below Regulatory Min.
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
A132264	AK 102	Diesel Range (C-10 thru C-24)	mg/dry kg	25800		617.25	07/26/94	07/28/94
		Surrogate Spike (Recovery)	%	77				
A132264	EPA 160.3	Solids	%	67.9				07/23/94
A132264	EPA 8020	Benzene	mg/dry kg	<MDL		1.85	07/21/94	08/01/94
		Chlorobenzene	mg/dry kg	<MDL		1.85		
		1,2-Dichlorobenzene	mg/dry kg	<MDL		1.85		
		1,3-Dichlorobenzene	mg/dry kg	<MDL		1.85		
		1,4-Dichlorobenzene	mg/dry kg	<MDL		1.85		
		Ethylbenzene	mg/dry kg	<MDL		1.85		
		Toluene	mg/dry kg	<MDL		2.78		
		Xylenes	mg/dry kg	119		3.70		
		Surrogate Recovery	%	D				

Reported By: Anthony J. Lange
Chemistry Supervisor

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EHS Alaska, Inc.
10928 Eagle River Rd., Suite 202
Eagle River Ak 99577

Attn: Bruce Beck

Report Date: 08/10/94
Date Arrived: 07/20/94
Date Sampled: 07/15/94
Time Sampled: 1222
Collected By: BB

Our Lab #: A132265
Location/Project: Lime Village-Iditarod SD
Your Sample ID: PLS-8B
Sample Matrix: Soil
Comments:

* Definitions *
B = Below Regulatory Min.
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
A132265	AK 102	Diesel Range (C-10 thru C-24)	mg/dry kg	23600		692.97	07/26/94	07/28/94
		Surrogate Spike (Recovery)	%	78				
A132265	EPA 160.3	Solids	%	64.9				07/23/94
A132265	EPA 8020	Benzene	mg/dry kg	<MDL		1.90	07/21/94	08/01/94
		Chlorobenzene	mg/dry kg	<MDL		1.90		
		1,2-Dichlorobenzene	mg/dry kg	<MDL		1.90		
		1,3-Dichlorobenzene	mg/dry kg	<MDL		1.90		
		1,4-Dichlorobenzene	mg/dry kg	<MDL		1.90		
		Ethylbenzene	mg/dry kg	<MDL		1.90		
		Toluene	mg/dry kg	<MDL		2.85		
		Xylenes	mg/dry kg	105		3.80		
		Surrogate Recovery	%	D				

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Chemistry Supervisor

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Attn: Bruce Beck

Report Date: 08/10/94
Date Arrived: 07/20/94
Date Sampled: 07/15/94
Time Sampled: 1240
Collected By: BB

Our Lab #: A132266
Location/Project: Lime Village-Iditarod SD
Your Sample ID: PLS-9
Sample Matrix: Soil
Comments:

* Definitions *
B = Below Regulatory Min.
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
A132266	AK 102	Diesel Range (C-10 thru C-24)	mg/dry kg	2860		120.61	07/26/94	07/28/94
		Surrogate Spike (Recovery)	%	86				
A132266	EPA 160.3	Solids	%	68.5				07/23/94
A132266	EPA 8020	Benzene	mg/dry kg	<MDL		0.09	07/21/94	08/01/94
		Chlorobenzene	mg/dry kg	<MDL		0.09		
		1,2-Dichlorobenzene	mg/dry kg	<MDL		0.09		
		1,3-Dichlorobenzene	mg/dry kg	<MDL		0.09		
		1,4-Dichlorobenzene	mg/dry kg	<MDL		0.09		
		Ethylbenzene	mg/dry kg	<MDL		0.09		
		Toluene	mg/dry kg	<MDL		0.13		
		Xylenes	mg/dry kg	2.69		0.17		
		Surrogate Recovery	%	D				

Reported By: Anthony J. Lange
Chemistry Supervisor

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Eagle River Ak 99577

Report Date: 08/10/94
Date Arrived: 07/20/94
Date Sampled: 07/15/94
Time Sampled: 1410
Collected By: BB

Attn: Bruce Beck

* Definitions *
B = Below Regulatory Min.
H = Above Regulatory Max.
E = Estimated Value
M = Matrix Interference
D = Lost to Dilution
MDL = Method Detection Limit

Our Lab #: A132258
Location/Project: Lime Village-Iditarod SD
Your Sample ID: PHS - Ø 3
Sample Matrix: Soil
Comments:

Lab Number	Method	Parameter	Units	Result	*	MDL	Date Prepared	Date Analyzed
A132258	AK 102	Diesel Range (C-10 thru C-24)	mg/dry kg	32400		531.09	07/26/94	07/28/94
		Surrogate Spike (Recovery)	%	81				
A132258	EPA 160.3	Solids	%	78.0				07/23/94
A132258	EPA 8020	Benzene	mg/dry kg	<MDL		1.59	07/21/94	08/01/94
		Chlorobenzene	mg/dry kg	<MDL		1.59		
		1,2-Dichlorobenzene	mg/dry kg	<MDL		1.59		
		1,3-Dichlorobenzene	mg/dry kg	<MDL		1.59		
		1,4-Dichlorobenzene	mg/dry kg	<MDL		1.59		
		Ethylbenzene	mg/dry kg	<MDL		1.59		
		Toluene	mg/dry kg	<MDL		2.38		
		Xylenes	mg/dry kg	160		3.18		
		Surrogate Recovery	%	D				

Reported By: Anthony J. Lange
Chemistry Supervisor

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10928 Eagle River Rd., Suite 202
Eagle River Ak 99577

Attn: Bruce Beck

Report Date: 08/10/94
Date Arrived: 07/20/94
Date Sampled: 07/15/94
Time Sampled: 1520
Collected By: BB

* Definitions *
B = Below Regulatory Min.
H = Above Regulatory Max.
E = Estimated Value
M = Matrix Interference
D = Lost to Dilution
MDL = Method Detection Limit

Our Lab #: A132259
Location/Project: Lime Village-Iditarod SD
Your Sample ID: PHS-8
Sample Matrix: Soil
Comments:

Lab Number	Method	Parameter	Units	Result	*	MDL	Date Prepared	Date Analyzed
A132259	AK 102	Diesel Range (C-10 thru C-24)	mg/dry kg	7380		202.91	07/26/94	07/28/94
		Surrogate Spike (Recovery)	%	89				
A132259	EPA 160.3	Solids	%	79.9				07/23/94
A132259	EPA 8020	Benzene	mg/dry kg	<MDL		1.55	07/21/94	08/01/94
		Chlorobenzene	mg/dry kg	<MDL		1.55		
		1,2-Dichlorobenzene	mg/dry kg	<MDL		1.55		
		1,3-Dichlorobenzene	mg/dry kg	<MDL		1.55		
		1,4-Dichlorobenzene	mg/dry kg	<MDL		1.55		
		Ethylbenzene	mg/dry kg	<MDL		1.55		
		Toluene	mg/dry kg	<MDL		2.33		
		Xylenes	mg/dry kg	22.3		3.11		
		Surrogate Recovery	%	D				

Reported By: Anthony J. Lange
Chemistry Supervisor

NORTHERN TESTING LABORATORIES, INC.

3330 INDUSTRIAL AVENUE, FAIRBANKS, ALASKA 99701, (907) 456-3116 • FAX 456-3125
2505 FAIRBANKS STREET, ANCHORAGE, ALASKA 99503, (907) 277-8378 • FAX 274-9645

EHS Alaska, Inc.
10928 Eagle River Rd., Suite 202
Eagle River Ak 99577

Attn: Bruce Beck

Report Date: 08/10/94
Date Arrived: 07/20/94
Date Sampled: 07/15/94
Time Sampled: 1340
Collected By: BB

* Definitions *
B = Below Regulatory Min.
H = Above Regulatory Max.
E = Estimated Value
M = Matrix Interference
D = Lost to Dilution
MDL = Method Detection Limit

Our Lab #: A132260
Location/Project: Lime Village-Iditarod SD
Your Sample ID: PHS-13
Sample Matrix: Soil
Comments:

Lab Number	Method	Parameter	Units	Result	*	MDL	Date Prepared	Date Analyzed
A132260	AK 102	Diesel Range (C-10 thru C-24)	mg/dry kg	2500		100.25	07/26/94	07/28/94
		Surrogate Spike (Recovery)	%	72				
A132260	EPA 160.3	Solids	%	83.1				07/23/94
A132260	EPA 8020	Benzene	mg/dry kg	<MDL		0.08	07/21/94	08/01/94
		Chlorobenzene	mg/dry kg	<MDL		0.08		
		1,2-Dichlorobenzene	mg/dry kg	<MDL		0.08		
		1,3-Dichlorobenzene	mg/dry kg	<MDL		0.08		
		1,4-Dichlorobenzene	mg/dry kg	<MDL		0.08		
		Ethylbenzene	mg/dry kg	<MDL		0.08		
		Toluene	mg/dry kg	<MDL		0.11		
		Xylenes	mg/dry kg	3.66		0.15		
		Surrogate Recovery	%	D				

Reported By: Anthony J. Lange
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EHS Alaska, Inc.
10928 Eagle River Rd., Suite 202
Eagle River Ak 99577

Report Date: 07/30/94
Date Arrived: 07/21/94
Date Sampled: 07/15/94
Time Sampled: 1500
Collected By: BB

Attn: Bruce Beck

* Definitions *
B = Below Regulatory Min.
H = Above Regulatory Max.
E = Estimated Value
M = Matrix Interference
D = Lost to Dilution
MDL = Method Detection Limit

Our Lab #: A132275
Location/Project: Lime Village-Iditarod SD
Your Sample ID: Lime V. Slough SWL
Sample Matrix: Water
Comments:

Lab Number	Method	Parameter	Units	Result	*	MDL	Date Prepared	Date Analyzed
A132275	EPA 418.1	Total Petroleum Hydrocarbons	mg/l	<MDL		0.4	07/25/94	07/25/94
A132275	EPA 602/624	Benzene	ug/l	<MDL		0.20		07/26/94
		Chlorobenzene	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		
		Ethylbenzene	ug/l	0.23		0.20		
		Toluene	ug/l	0.55		0.30		
		Xylenes	ug/l	0.77		0.40		
		Surrogate Recovery	%	95				

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EHS Alaska, Inc.
10928 Eagle River Rd., Suite 202
Eagle River Ak 99577

Report Date: 07/30/94
Date Arrived: 07/21/94
Date Sampled: 07/15/94
Time Sampled: 1445
Collected By: BB

Attn: Bruce Beck

* Definitions *
B = Below Regulatory Min.
H = Above Regulatory Max.
E = Estimated Value
M = Matrix Interference
D = Lost to Dilution
MDL = Method Detection Limit

Our Lab #: A132274
Location/Project: Lime Village-Iditarod SD
Your Sample ID: Lime V. Slough NWR
Sample Matrix: Water
Comments:

Lab Number	Method	Parameter	Units	Result	*	MDL	Date Prepared	Date Analyzed
A132274	EPA 418.1	Total Petroleum Hydrocarbons	mg/l	0.5		0.4	07/25/94	07/25/94
132274	EPA 602/624	Benzene	ug/l	<MDL		0.20		07/26/94
		Chlorobenzene	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		
		Ethylbenzene	ug/l	<MDL		0.20		
		Toluene	ug/l	<MDL		0.30		
		Xylenes	ug/l	<MDL		0.40		
		Surrogate Recovery	%	98				

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EHS Alaska, Inc.
10928 Eagle River Rd., Suite 202
Eagle River Ak 99577

Attn: Bruce Beck

Report Date: 07/30/94
Date Arrived: 07/20/94
Date Sampled: 07/15/94
Time Sampled: 1000
Collected By: BB

Our Lab #: A132273
Location/Project: Lime Village-Iditarod SD
Your Sample ID: Lime Village School
Sample Matrix: Water
Comments:

* Definitions *
B = Below Regulatory Min.
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
A132273	EPA 418.1	Total Petroleum Hydrocarbons	mg/l	0.5		0.4	07/25/94	07/25/94
132273	EPA 602/624	Benzene	ug/l	0.24		0.20		07/26/94
		Chlorobenzene	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		
		Ethylbenzene	ug/l	0.24		0.20		
		Toluene	ug/l	0.53		0.30		
		Xylenes	ug/l	0.68		0.40		
		Surrogate Recovery	%	104				

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APPENDIX E

ADEC MATRIX SCORE SHEET

1. Depth to Subsurface Water		
< 5 Feet	(10)	
5 - 15 Feet	(8)	
15 -25 Feet	(6)	8
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)	3
Fine-Grained Soils (Low OC)	(3)	
Fine-Grained Soils (High OC)	(1)	
4. Potential Receptors		
Public Wells Within 1000 Feet, or		
Private Well(s) Within 500 Feet	(15)	15
Municipal/Private Wells Within 1/2 Mile	(12)	
Municipal/Private Wells Within 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)	
100 - 500 Cubic Yards	(8)	
25 - 100 Cubic Yards	(5)	8
> De Minimis - 25 Cubic Yards	(2)	
De Minimis	(0)	

Matrix Score	Cleanup Level in mg/kg			
	Diesel	Gasoline / Unknown		
	Diesel Range Petroleum Hydrocarbons	Gasoline Range Petroleum Hydrocardons	Benzene	BTEX
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

1. Depth to Subsurface Water		6
< 5 Feet	(10)	
5 - 15 Feet	(8)	
15 -25 Feet	(6)	
25 - 50 Feet	(4)	
> 50 Feet	(1)	
2. Mean Annual Precipitation		3
> 40 Inches	(10)	
25 - 40 Inches	(5)	
15 - 25 Inches	(3)	
< 15 Inches	(1)	
3. Soil Type (Unified Soil Classification)		3
Clean, Coarse-Grained Soils	(10)	
Coarse-Grained Soils with Fines	(8)	
Fine-Grained Soils (Low OC)	(3)	
Fine-Grained Soils (High OC)	(1)	
4. Potential Receptors		15
Public Wells Within 1000 Feet, or Private Well(s) Within 500 Feet	(15)	
Municipal/Private Wells Within 1/2 Mile	(12)	
Municipal/Private Wells Within 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		2
> 500 Cubic Yards	(10)	
100 - 500 Cubic Yards	(8)	
25 - 100 Cubic Yards	(5)	
> De Minimis - 25 Cubic Yards	(2)	
De Minimis	(0)	

Matrix Score	Cleanup Level in mg/kg			
	Diesel	Gasoline / Unknown		
	Diesel Range Petroleum Hydrocarbons	Gasoline Range Petroleum Hydrocardons	Benzene	BTEX
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

1. Depth to Subsurface Water		
< 5 Feet	(10)	
5 - 15 Feet	(8)	
15 -25 Feet	(6)	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)	
Fine-Grained Soils (Low OC)	(3)	3
Fine-Grained Soils (High OC)	(1)	
4. Potential Receptors		
Public Wells Within 1000 Feet, or		
Private Well(s) Within 500 Feet	(15)	
Municipal/Private Wells Within 1/2 Mile	(12)	15
Municipal/Private Wells Within 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)	
100 - 500 Cubic Yards	(8)	
25 - 100 Cubic Yards	(5)	2
> De Minimis - 25 Cubic Yards	(2)	
De Minimis	(0)	

Matrix Score	Cleanup Level in mg/kg			
	Diesel	Gasoline / Unknown		
	Diesel Range Petroleum Hydrocarbons	Gasoline Range Petroleum Hydrocardons	Benzene	BTEX
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

1. Depth to Subsurface Water		
< 5 Feet	(10)	8
5 - 15 Feet	(8)	
15 -25 Feet	(6)	
25 - 50 Feet	(4)	
> 50 Feet	(1)	
2. Mean Annual Precipitation		
> 40 Inches	(10)	3
25 - 40 Inches	(5)	
15 - 25 Inches	(3)	
< 15 Inches	(1)	
3. Soil Type (Unified Soil Classification)		
Clean, Coarse-Grained Soils	(10)	8
Coarse-Grained Soils with Fines	(8)	
Fine-Grained Soils (Low OC)	(3)	
Fine-Grained Soils (High OC)	(1)	
4. Potential Receptors		
Public Wells Within 1000 Feet, or		12
Private Well(s) Within 500 Feet	(15)	
Municipal/Private Wells Within 1/2 Mile	(12)	
Municipal/Private Wells Within 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)	5
100 - 500 Cubic Yards	(8)	
25 - 100 Cubic Yards	(5)	
> De Minimis - 25 Cubic Yards	(2)	
De Minimis	(0)	

Matrix Score	Cleanup Level in mg/kg			
	Diesel	Gasoline / Unknown		
	Diesel Range Petroleum Hydrocarbons	Gasoline Range Petroleum Hydrocardons	Benzene	BTEX
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