



GILFILIAN ENGINEERING & ENVIRONMENTAL TESTING, INC.

Professional Environmental Consultants

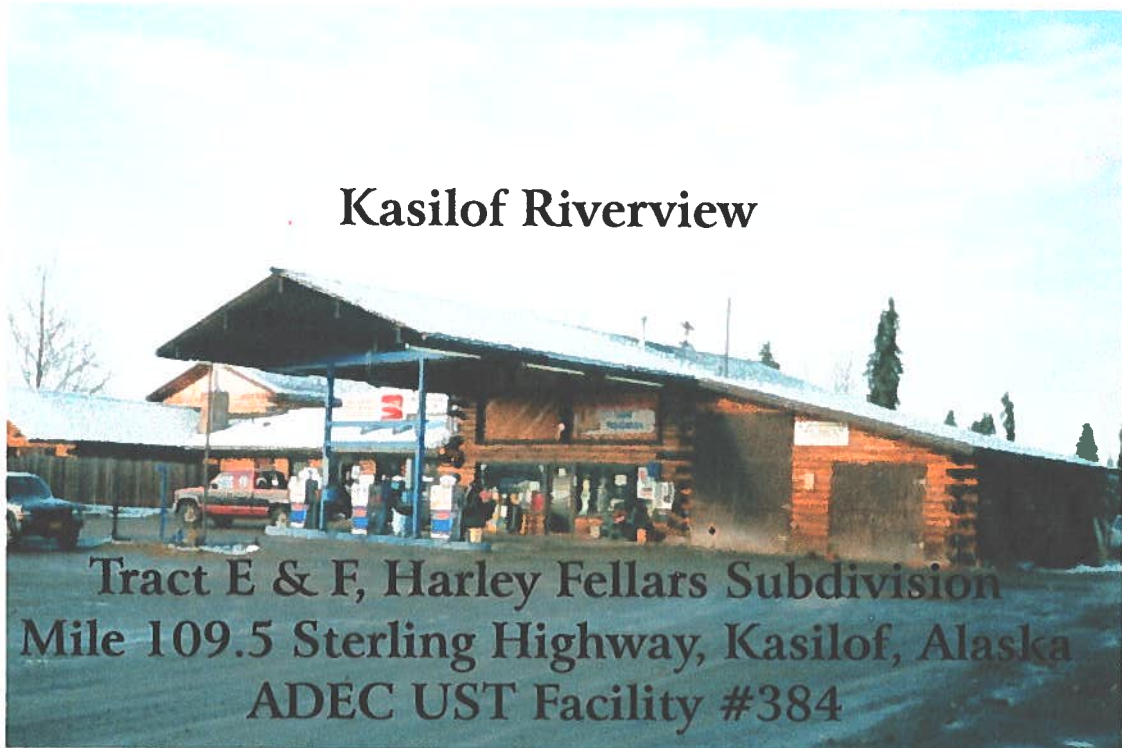
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UST SYSTEM UPGRADE SITE ASSESSMENT

RECEIVED

MAY 14 1999

Department of
Environmental Conservation
KDO



Kasilof Riverview

Tract E & F, Harley Fellars Subdivision
Mile 109.5 Sterling Highway, Kasilof, Alaska
ADEC UST Facility #384

Prepared for

Joanne Browning, Owner
Kasilof Riverview
Mile 109.5 Sterling Highway
Kasilof, Alaska 99610

GE²T Project #98013

May 12, 1999



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May 12, 1999

Joanne Browning, Owner
Kasilof Riverview
Mile 109.5 Sterling Highway
Kasilof, Alaska 99610

RE: UST Upgrade Site Assessment Report
Kasilof Riverview, Mile 109.5 Sterling Highway, Kasilof, Alaska
ADEC UST Facility ID #384
GE²T Project No. 98013

Dear Ms. Browning:

Attached is the report on the findings of the site assessment completed by Gilfilian Engineering & Environmental Testing, Inc. (GE²T) in October 1998. The site assessment was completed during the upgrade of the UST system at the subject site.

The site assessment report describes the field activities and soil sample test results for the site assessment of the UST system. Soil analytical results for all collected samples are discussed in the report.

A copy of this report is being forwarded to Paul Horwath, P.E., with the Alaska Department of Environmental Conservation (ADEC). Please contact us if you have any questions.

Sincerely,

Darci Bowers
Environmental Scientist

Attachment: UST System Upgrade Site Assessment Report

c: Paul Horwath, P.E., ADEC Kenai District Office
Melissa Fine, Dunlap Agency, Fairbanks

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1.0 INTRODUCTION

1.1 Executive Summary

An in-place upgrade of one (1) 2,000-gallon diesel and two (2) 6,000-gallon unleaded gasoline underground storage tanks (USTs) at Kasilof Riverview was completed between October 15 and October 20, 1998. In addition, one (1) 1,000-gallon heating oil UST was removed and one (1) 2,000-gallon unleaded gasoline UST was abandoned in-place during the UST system upgrade work. New dispensers, islands with containment sumps, new turbine pumps with containment sumps and double walled plastic product piping were installed as part of the new system upgrades. Additionally, the USTs were internally inspected and lined with UL approved lining material, and an impressed current cathodic protection system was installed.

A minor amount of diesel range organics (DRO) was encountered in the area of the 2,000-gallon UST. Contaminated soil was encountered near all the uncovered gasoline USTs and their associated dispensers. The vertical extent of soil contamination in the area of the gasoline USTs was previously defined with test borings drilled during a release investigation completed by Gilfilian Engineering and Environmental Testing, Inc. (GE²T) on April 29, 1998. Discussion of the test boring findings can be found in a report entitled *Phase I Release Investigation for Kasilof Riverview*, GE²T, May 15, 1998 and will not be repeated herein.

The horizontal extent of contamination in the area of the gasoline USTs was investigated with the excavation of multiple test pits. These test pits helped to define the horizontal extent of the contamination in the area of the gasoline USTs. GRO and DRO concentrations were below Category A cleanup levels in test pits to the west of the gasoline USTs. However, soil samples from one test pit to the south and one test pit to the north had benzene concentrations that slightly exceeded the Category A cleanup level. In addition, soil samples from two test pits to the east of the gasoline USTs had contaminant levels that exceeded the Category A cleanup levels.

No ground water was encountered during the site assessment. The deepest excavated depth was 12 feet below ground surface (bgs). Ground water was encountered in test borings during the Phase I Release investigation at a depth of approximately 27 feet bgs. A water sample was collected from the tap inside the building in order to determine whether the drinking water well on-site had been impacted by the petroleum releases.

Approximately 125 yards of contaminated soil were excavated during the in-place upgrades of the UST system. The contaminated soil was stockpiled in a constructed treatment cell on the property. A pipe was laid down the length of the stockpile and connected to the north side of the building where a blower may be installed in the future as part of a remediation plan. In addition, horizontal piping runs were placed in the ground from the north side of the building to strategic locations near the gasoline USTs. These horizontal lines will be connected to soil vapor extraction (SVE) wells, which will be drilled at a later date. The construction of the stockpile treatment cell and in-situ SVE remediation systems will be described in a corrective action plan (CAP) to be submitted to ADEC for review in the near future. The locations of monitoring wells to be installed during drilling of the SVE wells will also be discussed in the CAP.

1.2 Purpose and Scope

The site assessment of the USTs at Kasilof Riverview was conducted by GE²T on behalf of Joanne Browning, owner of Kasilof Riverview. The purpose of this site assessment was to assess the 2,000-gallon diesel UST system located approximately 60 feet north of three gasoline USTs. In addition, it was necessary to delineate the horizontal extent of contamination discovered during a previously completed Phase I release investigation in the area of the three gasoline USTs (one 2,000-gallon and two 6,000-gallon USTs). The vertical extent of contamination in the area of the gasoline USTs was previously defined in this release investigation.

A 1,000-gallon heating oil UST was discovered during the excavation in the area of the gasoline USTs and was removed from the ground. The 2,000-gallon gasoline UST was so shallow that upgrading with the required containment sumps was not possible. Furthermore, the UST could not be removed without dismantling the large canopy over the UST system. The UST was, therefore, abandoned in-place by filling with sand. A new 3,000-gallon gasoline UST was installed to replace this 2,000-gallon UST.

The scope of work for the site assessment included performing field screening and collecting soil samples. Field screening was also conducted during the removal of the piping and dispensers. A water sample was collected from the tap inside the building. Field procedures and methods were conducted in accordance with 18 AAC 78.090 and the September 22, 1995, Alaska Department of Environmental Conservation (ADEC) UST Procedures Manual.

1.3 Project Organization

- Owner/Operator – Joanne Browning, Owner of the Kasilof Riverview.
- Third Party Environmental Assessment – Chris Hawe, a Senior GeoEnvironmental Engineer with GE²T, supervised the site assessment activities.
- Certified UST Closure Contractor – Hank Brooner of Jackson Construction of Soldotna, Alaska completed the UST system upgrades.
- ADEC Certified Laboratory –CT&E Environmental Services, Inc. (CT&E) completed the analytical testing of soil samples.

1.4 ADEC Notification

The following notifications have been filed with the ADEC and are included in the appendices of this report:

- *Letter for Waiver of 15-day Notice Period for In-Place Abandonment of 2,000-gallon UST*, dated October 16, 1998 (see Appendix A).
- *Notice of Closure for In-Place Abandonment of 2,000-gallon UST*, submitted October 16, 1998 (see Appendix A).
- *Post Closure Notice*, submitted March 25, 1998 (see Appendix A).
- *Site Assessment and Release Investigation Summary Form* submitted with this report (see Appendix B).

1.5 Physical Setting and Geology

Kasilof Riverview is located at mile 109.5 of the Sterling Highway. The site has a large log structure divided into three sections: a garage, a general store and a residence. Other site improvements include a UST system used for retail fuel sales that consists of one (1) 2,000-gallon unleaded UST, two (2) 6,000-gallon unleaded USTs and one (1) 2,000-gallon diesel UST. The Sterling Highway is located approximately 175 feet to the east of the UST system, and the Kasilof River is located approximately 300 feet to the south (see Figures I and II).

The topography at the site is relatively flat with a slight slope to the west and south. Higher elevated ground (hills) are located immediately north and northwest of the property and a steep bank leading down to the Kasilof River flood plain is located just south and southwest.

The subsurface geology was described in the Phase I RI report previously submitted and will not be repeated herein.

2.0 BACKGROUND

Discussions of all previously completed activities at the site are included in a report entitled *Phase I Release Investigation Report for Kasilof Riverview* (GE²T, May 15, 1998). The site assessment discussed in this report was completed by GE²T between October 15 and October 20, 1998. The site assessment was conducted during the in-place upgrade of the UST system at the site.



Gasoline dispenser island and canopy.

The components of the UST system before in-place upgrades were completed are shown in Figures II and III. The dispenser island and canopy from the former UST system is shown in the photo to the left. The dispenser island for the 2,000-gallon diesel tank located approximately 60 feet north of the gasoline USTs is shown in the photo below.



Diesel dispenser island.

3.0 SITE ASSESSMENT

3.1 Field Screening

Field screening with a calibrated portable photo-ionization detector (PID) was performed to determine the apparent presence or absence of petroleum contamination. PID headspace readings were taken on representative soil samples that were placed in sealed half-full Ziploc[®] baggies and warmed to approximately 15°C. The screening was completed during excavations for the in-place upgrades, in an excavation for the new 3,000-gallon gasoline UST installed, and in test pits used to identify the horizontal extent of contamination in the area of the gasoline USTs.

3.2 Soil Excavation

The excavation limits for in-place upgrades of the USTs and the test pits used to define the horizontal extent of contamination are shown in Figures IV and V. Contaminated soil excavated from these areas was stockpiled in a treatment cell on-site (see Figure VII).

2,000-Gallon Gasoline UST - The 2,000-gallon gasoline UST was found to be buried only about one-foot bgs. The 1,000-gallon heating oil UST that was discovered during the uncovering of the 2,000-gallon gasoline UST was also buried to this depth. The photo to the right shows the tops of the USTs as they were uncovered. Because the 2,000-gallon UST was buried so shallow, it could not be retrofitted with the necessary containment sumps. Instead, it was planned that the 2,000-gallon



USTs as they are being uncovered.



Excavation shows concrete that was poured around the 2,000 gallon UST.

UST was going to be slid into the former heating oil UST and upgraded in that new location. However, further excavation revealed that concrete used for the canopy column support was poured around the 2,000-gallon UST (see photo to the left). Therefore, ADEC was contacted and Paul Horwath gave verbal approval to abandon the 2,000-gallon UST in-place. The UST was abandoned in-place by cutting a hole large enough for personnel entry. The tank was then cleaned out and filled with sand. The vent piping for this UST was removed as far as the point where it ran under the

building slab. The soil near the gasoline UST appeared to be contaminated with gasoline.

The excavation for the new 3,000-gallon UST installed to replace the 2,000 gallon gasoline UST is shown in Figure V. The soil excavated for installation of the new 3,000-gallon UST was contaminated.

The heating oil tank was removed from the ground and disposed of by Jackson Construction. Inspection did not reveal any evidence of holes or leakage from the heating oil tank, but a small pool of product was present in the excavation bottom (see photo to the right). The fuel was apparently pooled because of the tighter sandy silt that underlies the heating



Pooled product in bottom of heating oil UST excavation.

oil/gasoline UST systems. The product feed/return lines and the vent line for this tank were removed to the point where they ran underneath the building slab. The soil excavated around this UST appeared to be contaminated based on high PID readings.

2,000-Gallon Diesel UST - A small amount of diesel contaminated soil was encountered around the top of the diesel UST. The contamination did not appear to extend much further than a couple feet horizontally from the UST and the deepest vertical extent was approximately 3 feet below the top the tank (near the fill port). The limits of excavation around the diesel UST are shown in Figure IV. Except for approximately three feet of sandy/silty gravel immediately below



Looking north at 2,000-gallon diesel UST excavation.

ground surface, the soil in the diesel UST area was gray sandy silt with occasional gravel. The large excavation for the diesel UST was required to install horizontal anodes for the impressed current cathodic protection system. All piping for this UST ran vertically straight up to the concrete island and dispenser above the tank. The photo to the left shows the top of the uncovered diesel UST.

Two 6,000-Gallon Gasoline USTs - The depth to the top of the northern 6,000-gallon UST was approximately 4 feet bgs. The depth to the product piping was just below the concrete slab, approximately 6 inches, in the area of the dispenser island.

The piping near the north dispenser was slightly deeper and sloped slightly to the northern 6,000-gallon UST. An abandoned vent pipe that ran from this tank to the on-site building was found disconnected at the tank top. Another vent pipe connected at the east-end of this tank ran to the south and then vertically above ground. The soil excavated around this UST was apparently contaminated with gasoline.

The depth of the southern 6,000-gallon UST was also approximately 4-feet bgs. The vent pipe for this UST ran vertically upward from the top of the tank. The product piping ran from the middle dispenser on the dispenser island back to the tank top. It had an average burial of approximately 3 feet bgs. The soil excavated around this UST was also apparently contaminated with gasoline.

3.3 Soil Sampling

All soil samples collected during this site assessment were discrete grab samples collected in accordance with the ADEC UST Procedures Manual (September 22, 1995). The samples were placed in a cooler with blue ice and delivered under chain-of-custody procedure to CT&E Environmental Services, Inc. in Anchorage.

Twenty-three (23) discrete soil samples, including four duplicate samples, were collected from the tank top excavations and test pits during the site assessment. The locations of the samples are shown in Figures IV and V.

3.4 Tap Water Sampling

A water sample was collected from the tap inside the building. The sample was collected on October 16, 1998. The sample was placed in a cooler with blue ice and delivered under chain-of-custody procedure to CT&E Environmental Services, Inc. in Anchorage.

4.0 ANALYTICAL PROGRAM

4.1 Sample Analyses

Soil samples submitted to the laboratory as part of this site assessment were analyzed for the following parameters:

- Benzene, Toluene, Ethylbenzene and Xylenes (BTEX) by EPA method 8021B;
- Gasoline Range Organics (GRO) by Method AK101; and
- Diesel Range Organics (DRO) by Method AK102.

The water sample submitted to the laboratory was analyzed for volatiles by EPA method 524.

4.2 Analytical Results

A copy of the laboratory analytical reports and the executed Chain-of-Custody forms for all sample submittals are provided in Appendix C. The analytical results of BTEX, GRO and DRO for the soil samples are presented in Table 1.

Table 1: Soil Sample Analytical Results

Sample #	Depth (feet)	Concentration (mg/kg)					
		Benzene	Toluene	Ethylbenzene	Xylenes	GRO	DRO
S1	6.5	NT	NT	NT	NT	NT	16.8
S2	6.5	NT	NT	NT	NT	NT	11.9
S3	6.5	NT	NT	NT	NT	NT	18.1
S4 (Dup of S3)	6.5	NT	NT	NT	NT	NT	19.8
S5	4.0	0.497	0.287	0.86	0.9	13.3	4.82
S6	5.5	NT	NT	NT	NT	NT	264
S7	5.5	7.66	20.7	9.82	42.04	279	NT
S8	5.5	39.2	71.1	21.1	72.9	582	NT
S9	5.5	15.5	44.4	13.8	49.3	431	NT
S10	4.5	58.5	205	76.5	266.1	2,400	NT
S11	4.5	23.1	74.6	22.5	86.3	644	NT
S12 (Dup of S11)	4.5	17.2	57.5	17.1	66.5	478	NT
S13	5.5	ND	0.0998	ND	0.106	ND	ND
S15	5.0	2.47	0.0888	1.1	1.038	12.1	NT
S16 (Dup of S15)	5.0	1.94	0.0664	0.853	0.83	10.6	NT
S17	10.0	12.0	43.9	16.7	63.6	402	22.1
S18	10.0	16.2	57.5	25.2	83.3	587	NT
S19	12.0	ND	ND	ND	0.0382	ND	NT
S20	12.0	0.491	0.121	0.0649	0.3344	2.52	NT
S21 (Dup of S20)	12.0	0.416	0.0538	ND	0.0637	ND	NT
S22	12.0	7.6	18.5	6.84	21.9	178	NT
S23	12.0	ND	ND	ND	ND	ND	NT
Category A Cleanup Level		0.02	5.4	5.5	78	50	100

NT = Not Tested

ND = Not Detected above practical quantitation limits given in Appendix C.

300

250

**Table 2: Tap Water Analytical Test Results
Sampled October 16, 1998**

Parameter	Results	Maximum Contaminant
	(mg/L)	Level (MCL)
Methylene chloride	0.00068	0.005
Chloroform	0.0030	0.1
Bromodichloromethane	0.00085	0.1
Total trihalomethanes	0.0043	0.1

Notes:

Only parameters that were detected above the practical quantitation limits listed in Appendix C are presented here.

NA = Not Applicable

A matrix score sheet was prepared for this site and is presented in Figure VI. As indicated in the figure, the matrix score was calculated to be 48, which indicates that Category A Cleanup levels apply at this site.

As shown in Table 1, analytical results for samples S1 through S4 from the diesel UST excavation indicated that DRO concentrations were below the

Category A Cleanup level. Samples S5 and S6 are from the heating oil UST excavation and indicate that benzene and DRO concentrations there are above cleanup levels.

Samples S7 through S12 were collected from the sidewalls of both of the 6,000-gallon gasoline UST excavations. Results for these samples indicate that BTEX and GRO concentrations in this area exceed the cleanup levels.

The results from samples S13 through S16 (collected from test pits around the USTs) indicate that benzene was the only contaminant to exceed cleanup levels in these locations. Samples S17 and S18 were collected from both ends of the newly installed 3,000-gallon gasoline UST excavation and levels of BTEX and GRO were above cleanup levels.

The remaining soil samples (S19 through S23) were collected from test pits around the USTs. Results were mixed for these samples, but most of them were found to contain benzene at concentrations exceeding cleanup levels.

As indicated in Table 2, no contaminants were detected in the tap water above the maximum contaminant level (MCL) specified in 18 AAC 80.070. Only the compounds that were detected above the practical quantitation limit (PQL) are listed in Table 2. A complete list of analytes can be found in Appendix C.

4.3 Quality Assurance/Quality Control

CT&E and Analytica in Anchorage, Alaska completed the laboratory analytical testing for petroleum hydrocarbons (BTEX, GRO and DRO). All laboratory analyses were conducted following standard laboratory Quality Assurance/Quality Control (QA/QC) procedures. Based on review of the laboratory data for all samples analyzed, all laboratory QA/QC criteria were met, with the exception of 9 samples for which GRO and BTEX surrogate recoveries were outside of acceptable quality control limits due to matrix interference.

GE²T determined whether the completeness, precision and holding times of the soil samples submitted as part of this closure site assessment were performed within the limits of the quality control objectives. Table 3 presents a summary of the QA/QC review completed by GE²T for the duplicate sample sets collected.

TABLE 3: FIELD QUALITY CONTROL OBJECTIVES

Quality Control Designation	Tolerance	Results for This Project
Holding times:		
BTEX/soil/to extract	ASAP	Criteria Met
BTEX/soil/to analyze	14 days	Criteria Met
GRO/soil/to extract	ASAP	Criteria Met
GRO/soil/to analyze	14 days	Criteria Met
DRO/soil/to extract	14 days	Criteria Met
DRO/soil/to analyze	< 40 days	Criteria Met
Field duplicates - Relative Percent Difference:		
Benzene/soil	±40%*	16.5% - 29%
DRO/soil	±50%*	9%
GRO/soil	±50%*	13% - 65%
Completeness:		
All samples	85%	92%

LEGEND:

*These numbers indicate Data Quality Objectives, as established in GE²T's QAPP, Table 1 and Table 2.

As shown in Table 3, the criteria for acceptable tolerances for extraction and analysis for all duplicate sample sets were met, and all sample results were complete. The precision of the analytical results as measured by the relative percent difference of duplicate sample sets collected as part of this assessment were within the acceptable range except for the sample set S20/S21 for GRO. The sample matrix and the very low GRO concentrations present in this duplicate sample set are the presumed cause of the low precision. No further action is warranted.

5.0 REMEDIATION SYSTEM

To address soil and ground water contamination documented during the site assessment of the UST system the initial construction phase of a soil remediation system was completed (see Figure VII). The horizontal pipe runs shown in Figure VII were set in place before completion of the UST system upgrades. Soil vapor extraction (SVE) wells will be drilled in the manholes placed at the end of each horizontal pipe run. These wells will be installed following the submission and approval of a Corrective Action Plan (CAP). A more detailed discussion of the remediation system will be included in the CAP to be submitted to ADEC in the near future.

6.0 CONCLUSIONS

A minor amount of diesel contamination was encountered in the soil around the diesel UST during the upgrade activities. Sample results indicate that this contamination was fully removed. Gasoline contaminated soil was encountered near all the gasoline USTs

and the associated dispensers. Sample results indicate that BTEX and GRO contamination remains in this area.

Test pits were dug around the USTs in an attempt to delineate the horizontal extent of the gasoline contamination. While sample results were generally lower than those from locations adjacent to the USTs, benzene was still detected at concentrations above cleanup levels in pits to the north and east. Samples collected from test pits to the south and west were found to contain no contaminant concentrations above cleanup levels. Additional test pits or soil test borings will have to be completed before the full extent of the contamination can be determined.

No ground water was encountered during the site assessment for the UST upgrades. The deepest excavated depth was 12 feet bgs. Ground water was encountered in test borings during the Phase I Release Investigation at a depth of approximately 27 feet bgs. The analytical results of the tap water sample that was collected indicate that no compounds were detected above MCLs. In particular, no BTEX compounds were detected above the PQL. This indicates that the UST related petroleum releases have not impacted the on-site drinking water well. Continued monitoring of the well water is recommended.

Approximately 125 yards of gasoline and diesel contaminated soil were excavated during the UST upgrades. The contaminated soil was stockpiled in a constructed treatment cell on the property. A pipe was laid down the length of the stockpile and connected to the north side of the building where a blower may be installed in the future as part of a remediation plan. In order to address the soil contamination remaining in the ground, horizontal piping runs were placed in the ground running from the north side of the building to strategic locations in the area of the gasoline USTs. These horizontal lines will be hooked up to SVE wells to be drilled later. The construction of the soil treatment cell and in-situ SVE remediation systems will be described in a CAP to be submitted to ADEC for review in the near future. The locations of proposed monitoring wells to be installed along with the SVE wells will also be discussed in the CAP.

FIGURES

Figure I Site Vicinity Map

Figure II Site Plan

Figure III Gasoline UST and Piping Layout

Figure IV Diesel UST Sample Analytical Results

Figure V Gasoline USTs Sample Analytical Results

Figure VI Matrix Score Sheet

Figure VII Remediation System

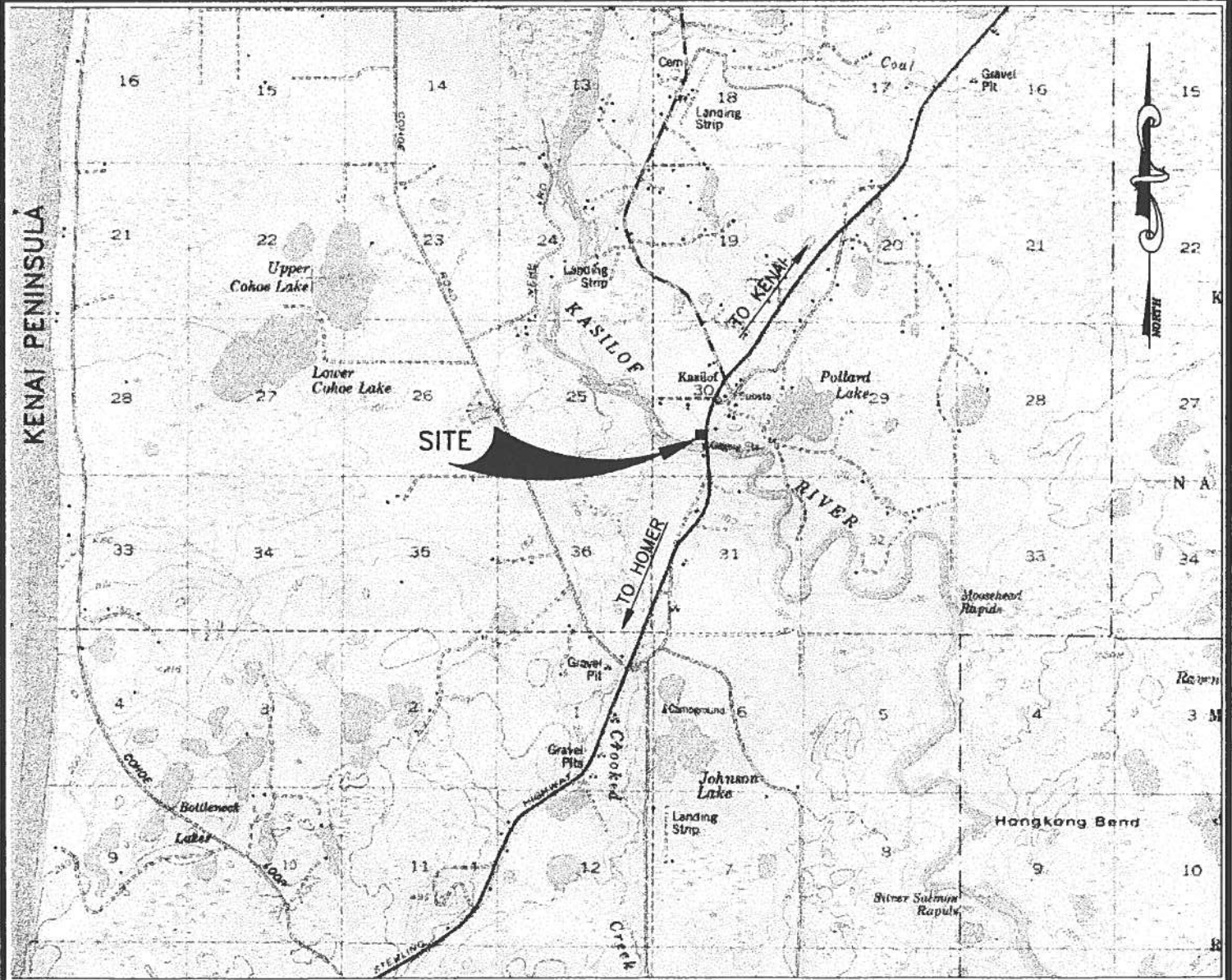
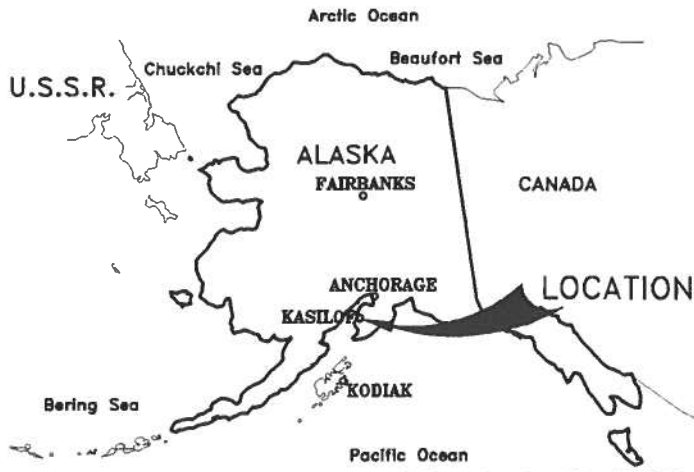


FIGURE 1: KASILOF RIVERVIEW - SITE VICINITY MAP



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2605 Denali St., Suite 203, Anchorage, Alaska 99503-2749

SCALE: N.T.S.

DATE: 01/11/99

PROJECT NO. 98013

DRAWN: WVZ

98013-VMAP.DWG

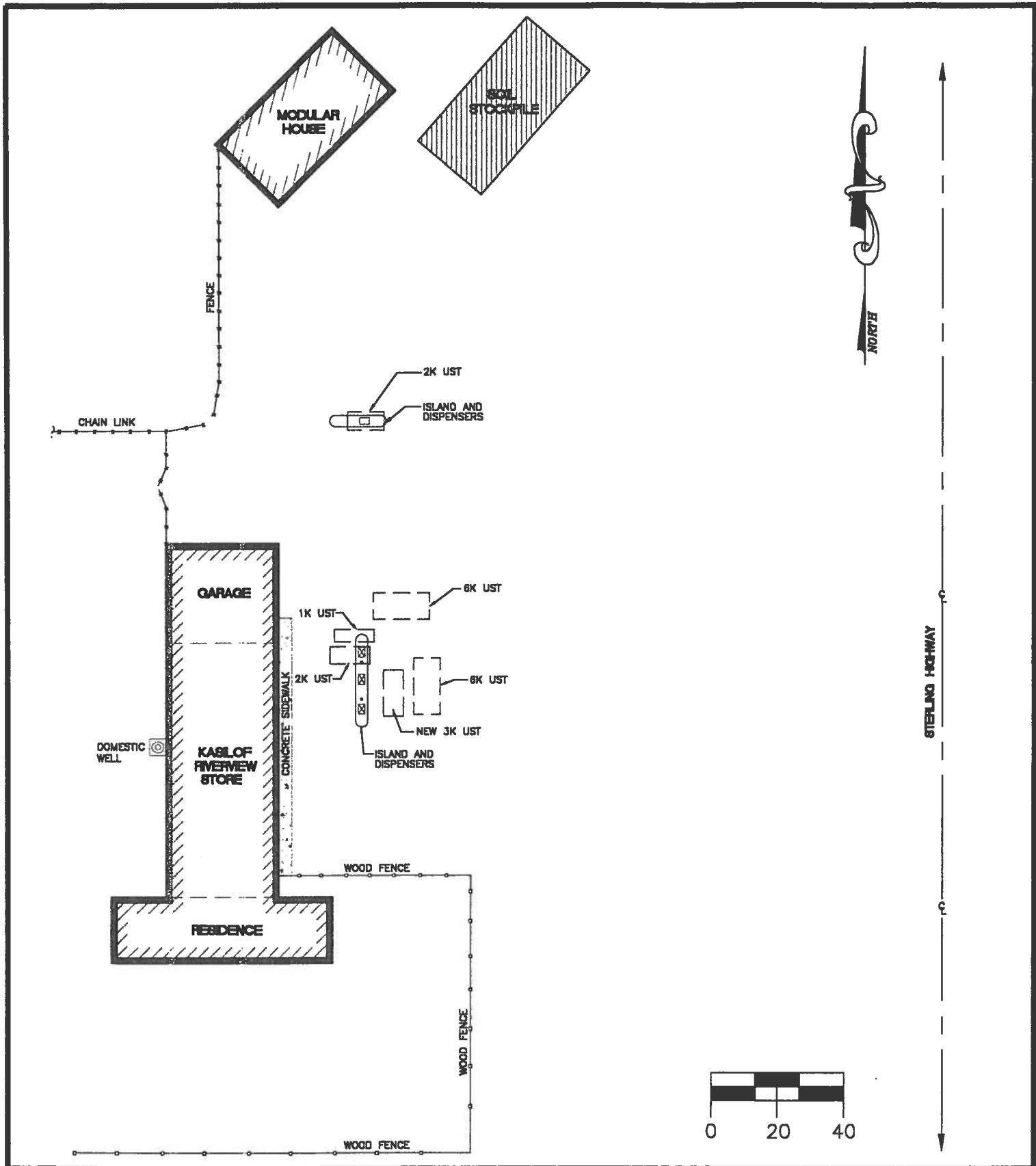


FIGURE II: KASILOF RIVERVIEW – SITE PLAN



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2605 Denali St., Suite 203, Anchorage, Alaska 99503-2749

SCALE: 1" = 40'

DATE: 01/12/99

PROJECT NO. 98013E

DRAWN: WVZ

98013-SITEPLAN.DWG

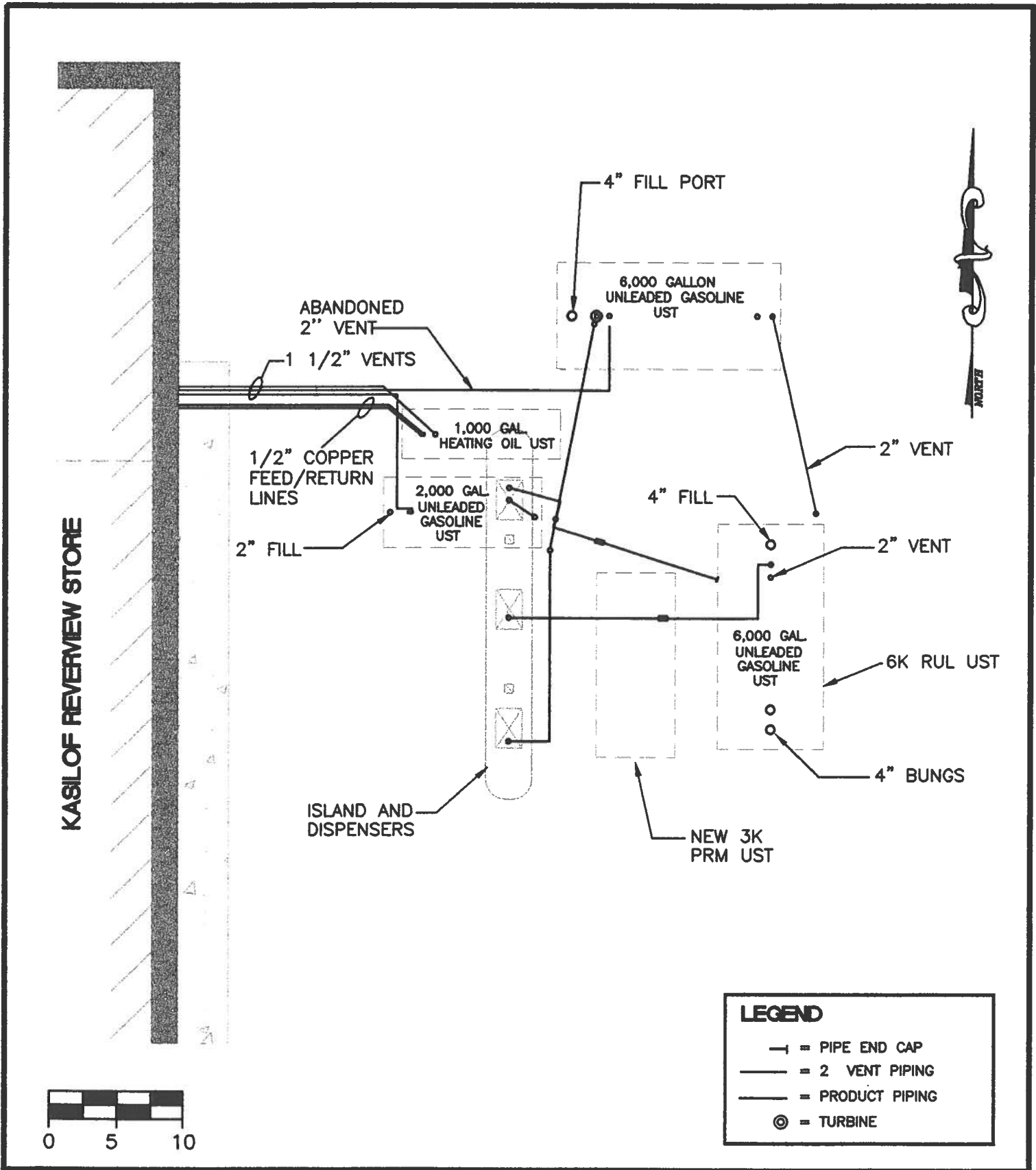


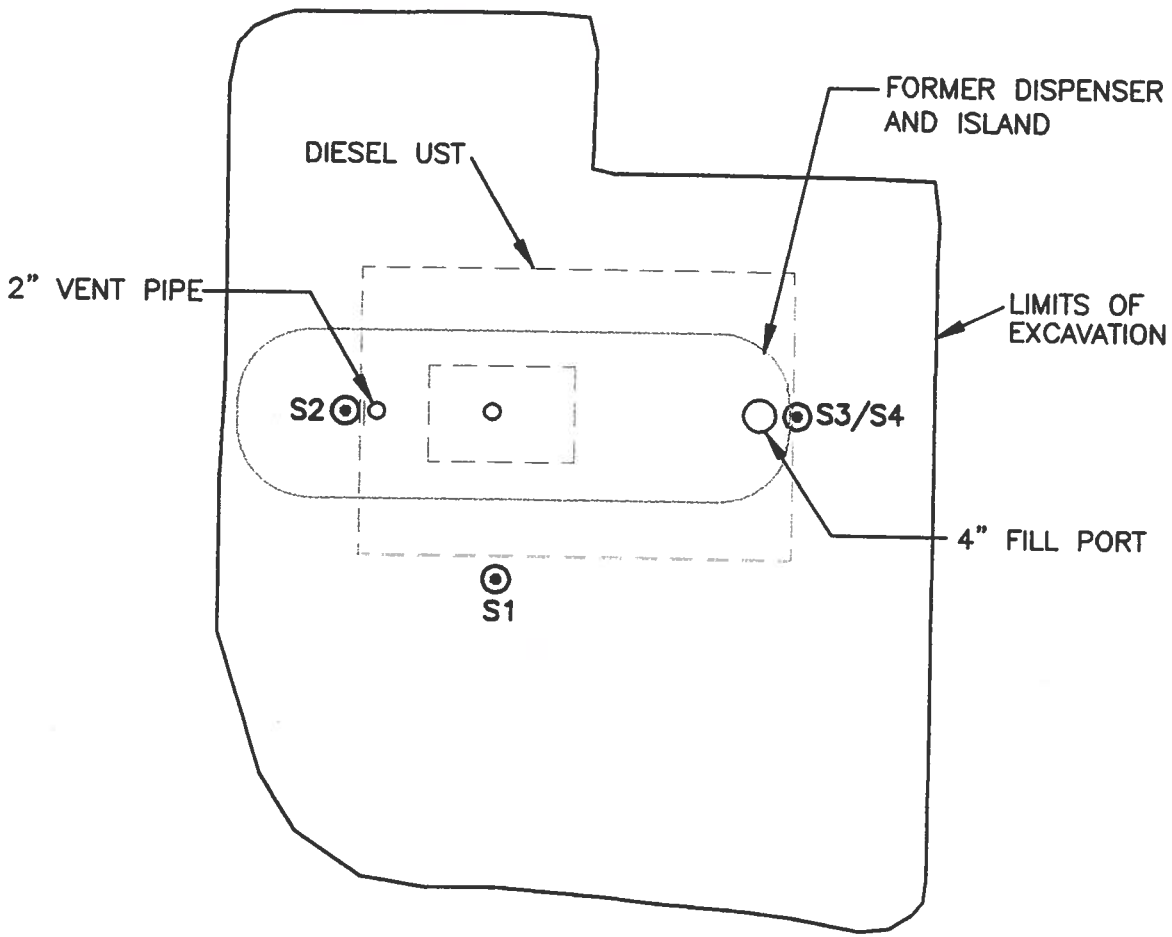
FIGURE III: GASOLINE UST AND PIPING LAYOUT



GILFILIAN ENGINEERING & ENVIRONMENTAL TESTING, INC.

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SCALE: 1" = 10'	
DATE: 04/19/99	
PROJECT NO. 98013E	DRAWN: WVZ
98013-SITEPLAN.DWG	



Lacking BTEX Analysis



Sample #	Depth (feet)	Benzene (mg/kg)	Ethylbenzene (mg/kg)	Toluene (mg/kg)	Xylenes (mg/kg)	GRO (mg/kg)	DRO (mg/kg)
S1	6.5	NT	NT	NT	NT	NT	16.8
S2	6.5	NT	NT	NT	NT	NT	11.9
S3	6.5	NT	NT	NT	NT	NT	18.1
S4 (dup of S3)	6.5	NT	NT	NT	NT	NT	19.8
Category A cleanup levels		0.02	5.5	5.4	78	50	100

NT = Not tested

FIGURE IV: KASILOF RIVERVIEW - DIESEL UST SAMPLE ANALYTICAL RESULTS



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2605 Denali St., Suite 203, Anchorage, Alaska 99503-2749

SCALE: 1" = 4'

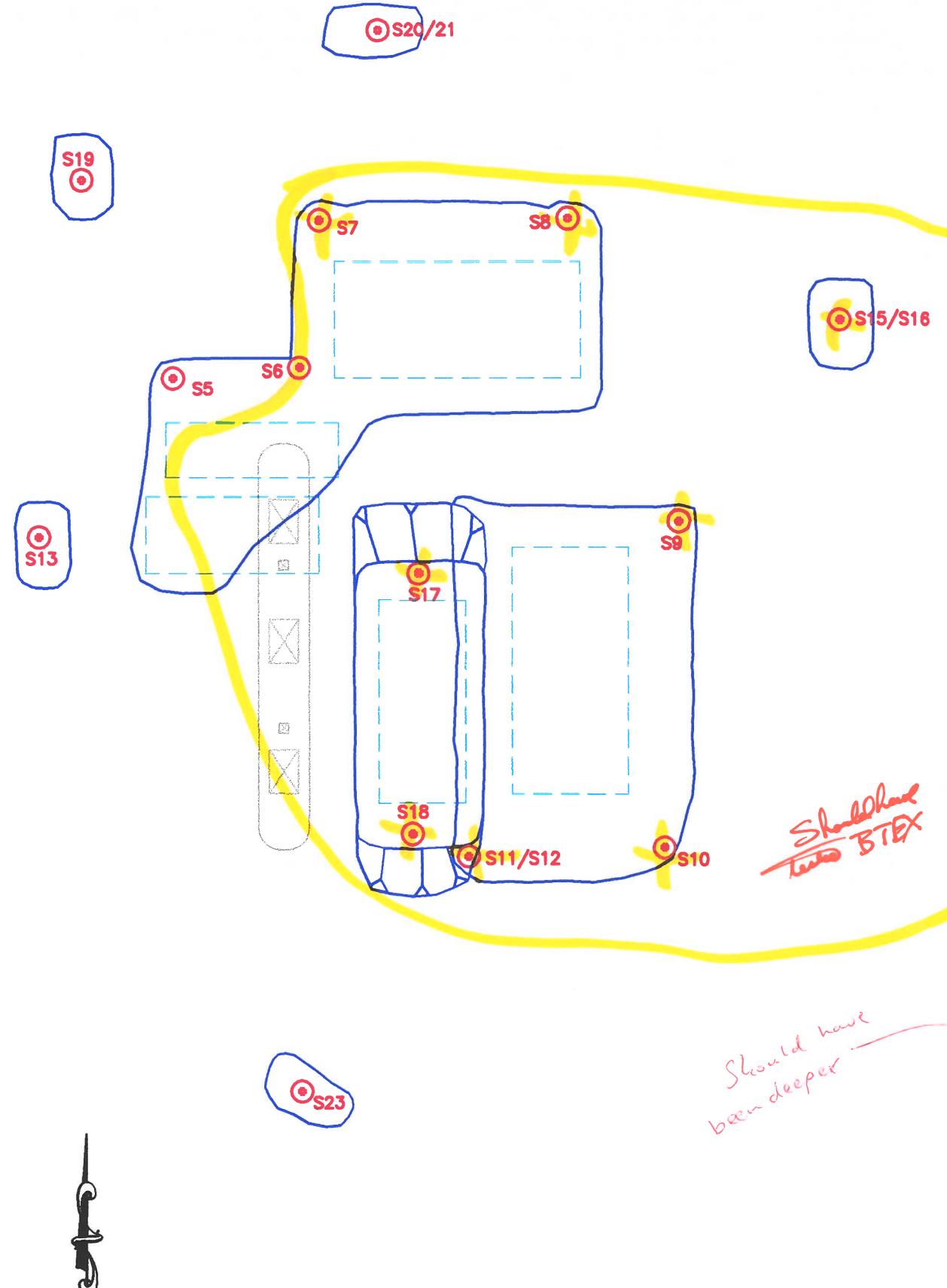
DATE: 04/19/99

PROJECT NO. 98013E

DRAWN: WVZ

98013-MW.DWG

KASILOF REVERVIEW STORE



SAMPLE LOCATION LAYOUT

SCALE: 1" = 10'



Should have tested BTEX

Should have been deeper

Sample #	Depth (feet)	Benzene (mg/kg)	Ethylbenzene (mg/kg)	Toluene (mg/kg)	Xylenes (mg/kg)	GRO (mg/kg)	DRO (mg/kg)
S5	4.0	0.497	0.86	0.287	0.9	13.3	4.82
S6	5.5	NT	NT	NT	NT	NT	264
S7	5.5	7.66	9.82	20.7	42.04	279	NT
S8	5.5	39.2	21.1	71.1	72.9	582	NT
S9	5.5	15.5	13.8	44.4	49.3	431	NT
S10	4.5	58.5	76.5	205	266.1	2400	NT
S11 (dup of S10)	4.5	23.1	22.5	74.6	86.3	644	NT
S12 (dup of S11)	4.5	17.2	17.1	57.5	66.5	478	NT
S13	5.5	ND	ND	0.0998	0.106	ND	ND
S15	5.0	2.47	1.1	0.0888	1.038	12.1	NT
S16 (dup of S15)	5.0	1.94	0.853	0.0664	0.83	10.6	NT
S17	10.0	12.0	16.7	43.9	63.6	402	22.1
S18	10.0	16.2	25.2	57.5	83.3	587	NT
S19	12.0	ND	ND	ND	0.0382	ND	NT
S20	12.0	0.491	0.0649	0.121	0.3344	2.52	NT
S21 (dup of S20)	12.0	0.416	ND	0.0538	0.0637	ND	NT
S22	12.0	7.6	6.84	18.5	21.9	178	NT
S23	12.0	ND	ND	ND	ND	ND	NT
Category A cleanup levels		0.02	5.5	5.4	78	50	100
Method 2 Minimum TOGW						300	250

Note: Numbers in red exceed cleanup levels.

ND = Not detected

NT = Not tested

Sheet No. **FIGURE-V**

PROJECT No: 00013	DATE: 04/29/00	SCALE: 1" = 10'	REVISIONS
LCTN TAG: 00013-000	DRAWN BY: WAZ	CHECKED BY: BEG	DATE
			BY

GASOLINE UBT'S SAMPLE ANALYTICAL RESULTS

KASILOF REVERVIEW
PO BOX 284
KASILOF, ALASKA 99560

Gilfillan Engineering & Environmental Testing, Inc.
2925 Denali Street, Suite 203
Anchorage, Alaska 99503

Figure VI

MATRIX SCORE SHEET

Kasilof Riverview, Mile 109.5 Sterling Highway, Kasilof, Alaska

Part A: Determine score for each item*

1.	Depth to Ground water		Score
	Less than 5 feet	(10)	10
	5 - 15 feet	(8)	
	16 - 25 feet	(6)	
	26 - 50 feet	(4)	
More than 50 feet	(1)		
2.	Mean Annual Precipitation		3
	More than 40 inches	(10)	
	26 - 40 inches	(5)	
	16 - 25 inches	(3)	
3.	Soil Type (Unified Soil Classification)		10
	Clean, coarse-grained soils	(10)	
	Coarse-grained soils with fines	(8)	
	Fine-grained soils (low organic carbon)	(3)	
4.	Potential Receptors (select the most applicable category)		15
	a. Public water system within 1000 feet, or private water system within 500 feet	(15)	
	b. Public/private water within ½ mile	(12)	
	c. Public/private water system within one mile	(8)	
	d. No water system within one mile	(4)	
	e. Nonpotable groundwater	(1)	
5.	Volume of Contaminated Soil		10 (assumed)
	More than 500 cubic yards	(10)	
	101 - 500 cubic yards	(8)	
	26 - 100 cubic yards	(5)	
	10 - 25 cubic yards	(2)	
	Less than 10 cubic yards	0	
Total Score			48

*The items to be scored are defined in note 1 to this table.

Part B: Add scores from Part A to determine matrix score and cleanup level.

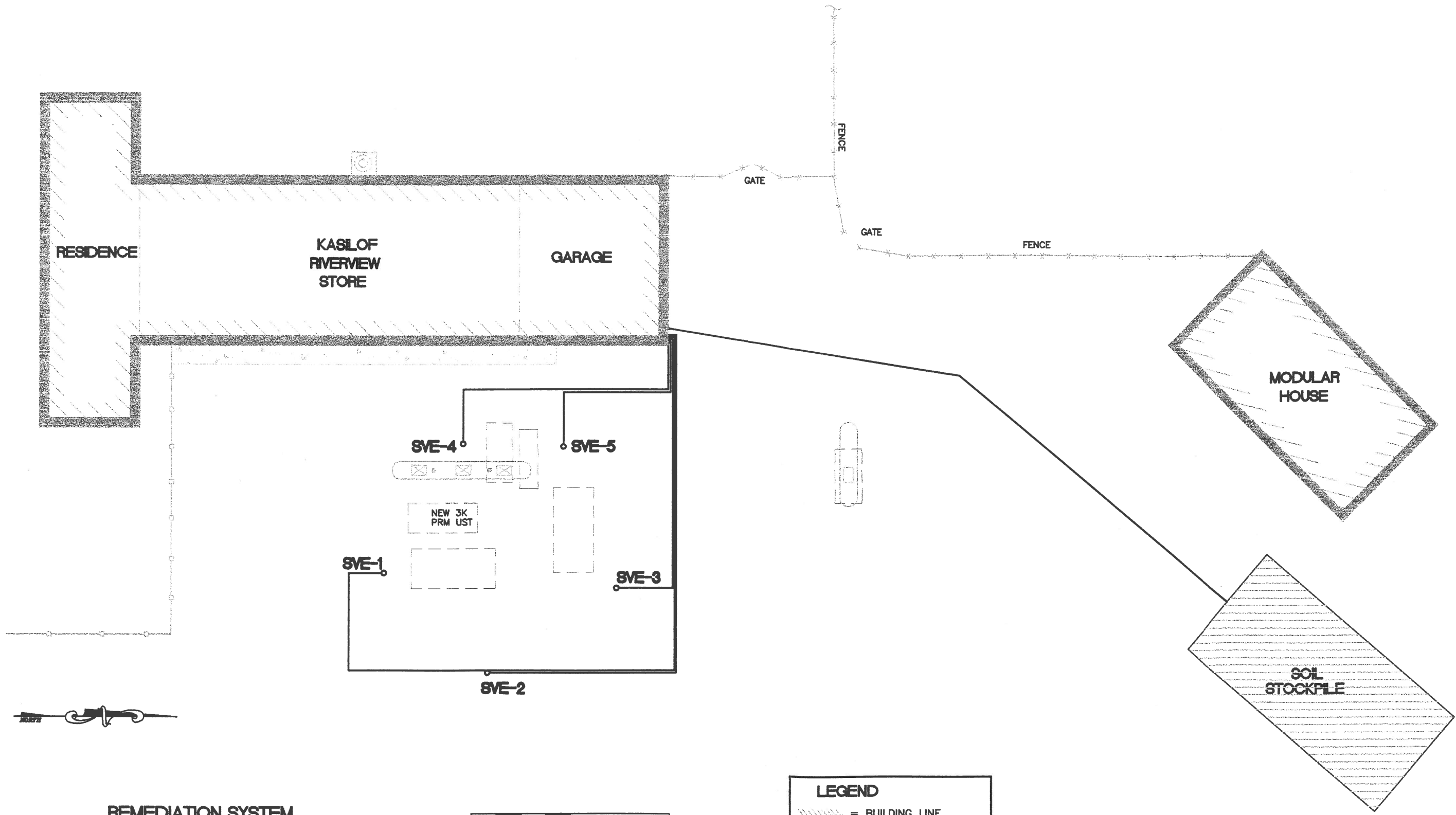
Matrix Score for Each Category	Cleanup Level in mg/kg		
	Gasoline Range	Diesel Range	Residual Range
Category A: More than 40	50	100	2000
Category B: More than 26 to 40	100	200	2000
Category C: 21-26	500	1000	2000
Category D: Less than 21	1000	2000	2000

PROJECT No: 09013	LCTN TAG: 09013-NW	BY:
DATE: 04/02/09	DRAWN BY: WJZ	DATE:
SCALE: AS SHOWN	CHECKED BY: BEG	DATE:
REVISIONS		

REMEDIATION SYSTEM

ESA KASLOF RIVERVIEW
P.O. BOX 254
KASLOF, ALASKA

Girilian Engineering & Environmental Testing, Inc.
2005 Denali Street, Suite 203
Anchorage, Alaska 99503



REMEDIATION SYSTEM
SCALE: 1" = 20'



LEGEND

	= BUILDING LINE
	= CHAIN LINK FENCE
	= WOOD FENCE
	= SVE PIPE LINE
	= UNDERGROUND STORAGE TANK

APPENDICES

Appendix A

ADEC Notifications (3)

STATE OF ALASKA

TONY KNOWLES, GOVERNOR

DEPT. OF ENVIRONMENTAL CONSERVATION

SOUTHCENTRAL OFFICE
STORAGE TANK PROGRAM
555 CORDOVA STREET
ANCHORAGE, AK 99501

TELEPHONE: (907) 269-7504
FAX: (907) 269-7507

RECEIVED

October 16, 1998

SEP 19 1998

Gilfilian Engineering

Joanne Browning
dba Kasilof Riverview Lodge
P.O. Box 254
Kasilof, Alaska 99610

Re: Waiver of the 15-day notification period for closure of one 2000 gallon UST located at the Kasilof Riverview Lodge, Mile 109.5 Sterling Highway, Kasilof, Alaska. Facility ID # 0-000384, tank # 004.

Dear Mrs. Browning

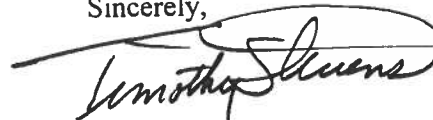
The Department of Environmental Conservation (ADEC) has received a request for waiver of the 15-day notification period for closure of one underground storage tank system (UST) located at your facility at the above location. Chris Hawe of Gilfilian Engineering submitted the waiver request today October 16, 1998.

ADEC grants the waiver allowing the UST closure to begin as requested. Please contact Paul Horwath, at (907) 262-5210 ext. 250, if the closure activities are rescheduled, to report a change in the certified worker or qualified person, or to obtain ADEC approval to move petroleum contaminated soils off-site. Closure activities must be supervised by a person certified under, 18 AAC 78.400 - 78.495. A site assessment of the UST excavation must be conducted in accordance with 18 AAC 78.090 and the UST Procedures Manual dated September 22, 1995. Please submit the site assessment report to Paul Horwath, ADEC/STP, 35390 Kalifonsky Beach Rd, Ste 11, Soldotna, Alaska 99699.

Upon removal, the tank and associated piping must be emptied, cleaned, removed and disposed, as specified in 18 AAC 78.085. In accordance with 18 AAC 78.085 (f), please submit the post-closure notice to David Allen at ADEC/STP, 555 Cordova Street, Anchorage, Alaska 99501, within 30 days of completing closure activities. Any release reporting and corrective action must be done in accordance with 18 AAC 78.220 - 18 AAC 78.280.

Please contact me at (907) 269-7538 if you have any questions.

Sincerely,



Timothy Stevens
Environmental Specialist

TSS: D/letters/0000384 wai

cc: Paul Pinard, ADEC, Anchorage
Paul Horwath, ADEC Soldotna
Chris Hawe, Gilfilian Engineering



ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION

NOTIFICATION OF CLOSURE
UNDERGROUND STORAGE TANKS



Notice of Closure is required for any tank and/or piping removed, closed in-ground, or changed in service. See 18 AAC 78.085 (a).
"Change in service" means to change the use of a UST from containing a regulated substance to a non-regulated substance (such as heating oil).

Facility - Location (Do not use P.O. Box)

Tank Owner

Name Kasilof Riverview
Address Mile 109.5 Sterling Highway
City Kasilof
State/Zip Alaska
Phone/Fax _____

Name Kasilof Riverview
Address Mile 109.5 Sterling Highway
City Kasilof
State/Zip Alaska
Phone/Fax _____

Facility ID Number 384

Scheduled Date for Closure October 16, 1998

This form MUST be completed and sent to ADEC at the address listed below at least 15 and no more than 60 days prior to closure.
Alaska Statute 46.03.375 requires those who supervise an UST closure be certified by the State of Alaska for Decommissioning.
A UST with a confirmed release must be permanently removed from the ground. In-place closure or change in service is not allowed.
A Site Assessment or Release Investigation in accordance with 18 AAC 78.090 must be performed at time of closure by an impartial third party using "Qualified" persons under a Standard Sampling Procedures Manual (SSPM).

Person to Perform Closure: Harold Jackson, Jackson Construction UST Worker License # 090

Person and Company to Perform Site Assessment or Release Investigation: Christopher J. Howe, Gilfilian Engineering & Environmental Inc.

Is the Person "Qualified" and on file with ADEC? Yes

Method of Closure: Removal _____
In-ground X (If so, See Discussion on Reverse Side)
Change in Service _____ (If so, what is new fuel usage? _____)

Is there a leak/spill at this site? Yes (if so, please notify the closest ADEC office) Spill#93-23-00-154-02

Have you contacted the local fire department of your intent to close the tank(s)? No (Contractor will contact)

Where are the tank, piping, equipment, and sludge to be disposed? Abandoning in place per API #1604

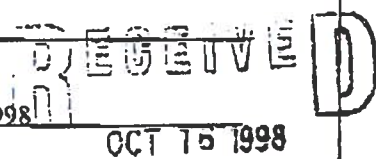
Closure for (please check): <input type="checkbox"/> Tanks and Piping <input checked="" type="checkbox"/> Tanks only <input type="checkbox"/> Piping Only				
Tank Number	Tank Age	Tank Size	Last Product Stored	Date Last Used
<u>4</u>	<u>Unknown</u>	<u>2,000</u>	<u>Premium Unleaded</u>	<u>10/16/98</u>

Closure Notice Submitted By: Owner Operator Other Consultant

Darci H. Bowers Environmental Scientist
(Please print name) (Title)

Darci Bowers
(Signature)

October 16, 1998
(Date)



Return Completed Form to: ADEC, Storage Tank Program
555 Cordova Street
Anchorage, AK 99501

Dept. of Environmental Conservation
Underground Storage Tanks - FAP



ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION



NOTIFICATION OF POST-CLOSURE UNDERGROUND STORAGE TANKS

Post-Closure information is required 30 days after UST closure or change in service. See 18 AAC 78.083 (f). The Owner/Operator or his/her representative must fill out and sign Page 1. The Certified worker who performed or supervised the closure must fill out and sign Page 2.

Facility - Location (Do not use P.O. Box.)

Tank Owner

Name Kaslof River view
Address Mt. 1081.5 Sterling Hwy.
City Kaslof
State/Zip AK 99610
Phone/Fax (907) 262-1573 FX 262-8445

Name Same
Address
City
City/State
Phone/Fax

Facility ID # 384

TANKS REMOVED OR CLOSED IN-GROUND

Table with 5 columns: Tank#, Tank Size, Removed or Closed In-ground, Date Product Last Stored, Contamination Found? Row 1: 4, 2000, Closed in ground, 10/16/98

CLOSURE:

Performed By: (Person) H. Jackson (Company) Jackson Const. UST License # 12390

Date Completed: X

PERSON WHO PERFORMED/SUPERVISED CLOSURE MUST FILL OUT BACK PAGE.

SITE ASSESSMENT/RELEASE INVESTIGATION:

Performed by: (Person) Christopher J. Hawk (Company) Gilfillian Eng. & Env. Inc.

SITE ASSESSMENT REPORT MUST BE SUBMITTED TO LOCAL ADEC OFFICE WITH 60 DAYS AFTER CLOSURE. RELEASE INVESTIGATION REPORT MUST BE SUBMITTED TO ADEC WITHIN 45 DAYS AFTER CLOSURE.

Was the closed tank replaced by a new UST? Yes X No

X If yes, please submit a new Registration form containing information on the new tanks.

Submitted by: [X] Owner [] Operator [] Other
Joanne Brownish
(Please Print Name)
Joanne Brownish (Signature)
Owner (Title)
3/25/99 (Date)

Return Completed Form to: ADEC, Storage Tank Program
555 Cordova Street
Anchorage, AK 99501
FAX # (907) 269-7507

CLOSURE CHECKLIST

Certified persons who perform or supervise UST closure must complete and sign this checklist.
(18 AAC.78.455 (a)(8))

Tank Removal

- Notified ADEC Office 15 - 60 days prior to beginning permanent closure.
- Notified applicable local government and fire department.
- Emptied and clean tank by removing liquids and accumulated sludges.*
- Purged or inert the tank of flammable vapors.*
- Removed piping and plug or cap all accessible holes except vent line.*
- Removed and dispose of tank(s) properly.*
- Submitted Post Closure Notice to ADEC within 30 days after completion of Closure.

In-ground Closure/Change in Service

- Notified ADEC Office 15 - 60 days prior to beginning permanent closure.
- Notified applicable local government and fire department.
- Emptied and clean tank by removing liquids and accumulated sludges.*
- Removed piping and plug or cap all accessible holes except for vent line.*
- Purged the tank of flammable vapors.*
- Filled the tank as full as possible with sand or other inert material.*
- Removed and cap the vent line.*
- Submitted Post Closure Notice to ADEC within 30 days after completion of Closure.

Must be performed or supervised by a person certified in UST Decommissioning in Alaska.

Person who performed or supervised UST work:

HAROLD A JACKSON OWNER (Please Print Name) AH YD (UST Worker License #)
 JACKSON CONSTRUCTION (Signature) 3/27/99 (Date)

All releases/contamination should be reported to a DEC District Office within 24 hours. For further information refer to the Alaska Underground Storage Tank Regulations (18 AAC 78) or contact the Department of Environmental Conservation at 1-800-478-4974.

Appendix B

ADEC Storage Tank Summary Form



APPENDIX B
ADEC Storage Tank Program
Site Assessment & Release Investigation Summary Form



This document summarizes information from site assessments and release investigation reports that are required by Alaska's Underground Storage Tanks Regulations (18 AAC 78). It is intended to ensure minimum requirements are met when submitting full reports to ADEC. It cannot be substituted for comprehensive site assessment or release investigation reports. Site assessments (as defined in AS 46.03.450) are conducted to check for the presence or absence of petroleum contamination. If contamination of soil or groundwater is identified then a release investigation is required. Site assessments and release investigations must be conducted by a qualified impartial third party (as defined in 18 AAC 78) and in accordance with chapter two of the Underground Storage Tanks Procedures Manual (UST Manual).

How to fill out this form

Type or print in ink the requested information and sign in ink the "signature" blocks on page 7. Please attach this form to the comprehensive site assessment or release investigation report (or include it in the report introduction) and submit it to the nearest ADEC field operations office (Juneau, Anchorage, Fairbanks or Soldotna).

1. GENERAL INFORMATION

Purpose of

Site assessment/

UST System Upgrade

Release investigation:

(Closure, Change-in-service, Suspected or confirmed release, Compliance check, Other)

Owner of site:

Joanne Browning (907) 262-1573

Name of company/legal entity that owns the site

Phone number

Mile 109.5 Sterling Hwy.

Kasilof, Alaska 99610

Mailing address

City, State, Zip code

Operator of site:

Same

Name of company/legal entity that operates the site

Phone number

Mailing address of operator

City, State, Zip code

Location of site:

Kasilof Riverview

(907) 262-1573

Name of site (e.g. John Doe's Service Station)

Phone number

Mile 109.5 Sterling Hwy

Kasilof, Alaska 99610

Physical address of site (be as specific as possible)

City, State, Zip code

Tract E and F, Harley Fellars Subd.

Legal description of site

Section/township/range

Store/Retail Fuel Sales

384

Type of business at site

Facility ID # / Tank ID number(s)

Financial Assistance

Applications filed

(this site only)

Site assessment/
tightness test

Tank cleanup

Tank upgrade

Tank closure

**Reports on file
with ADEC:**

Tightness test

Closure notice

Other

2. SYSTEM AND TANK STATUS

Describe the status, size, and contents of the tanks that have been at the site:

Tank ID Number:	Tank No. <u>1</u>	Tank No. <u>2</u>	Tank No. <u>3</u>	Tank No. <u>4</u>	Tank No. <u>5</u>
Tank status (check one)					
Currently in use	<u> X </u>	<u> X </u>	<u> X </u>	<u> </u>	<u> X </u>
Temporarily closure	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Closed/left in place	<u> </u>	<u> </u>	<u> </u>	<u> X </u>	<u> </u>
Closed/removed	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Total capacity (gallons)	<u> 6,000 </u>	<u> 6,000 </u>	<u> 2,000 </u>	<u> 2,000 </u>	<u> 3,000 </u>
Contents (diesel, etc)	<u> Gasoline </u>	<u> Gasoline </u>	<u> Diesel </u>	<u> Gasoline </u>	<u> Gasoline </u>

3. FIRM CONDUCTING SITE ASSESSMENT AND RELEASE INVESTIGATION

<u>Gilfilian Engineering & Environmental Testing, Inc.</u>	<u>277-2021</u>
Name of firm	Phone number
<u>2605 Denali St., Suite 203</u>	<u>Anchorage, Alaska 99503</u>
Mailing address	City, State, Zip code
<u>Robert E. Gilfilian, P.E.</u>	<u>Christopher J. Hawe</u>
Site assessment supervisor(s)	Person(s) collecting samples

4. SITE HISTORY

Based on the best available knowledge, please check the appropriate box below:

<u> Y </u>	<u> N </u>	
<u> X </u>	<u> </u>	Was soil contamination observed or identified?
<u> </u>	<u> X </u>	Was groundwater contamination observed or identified?
<u> </u>	<u> X </u>	Did inventory control or prior tank repairs indicate a possible release?
<u> X </u>	<u> </u>	Has a tank tightness test been performed on any USTs on the site?
<u> X </u>	<u> </u>	Have any of the facility's USTs or piping ever failed a tightness test?
<u> X </u>	<u> </u>	Have there been any previous site assessments performed at this site?
<u> X </u>	<u> </u>	Do previous site assessments indicate any contamination has occurred?

If the answer to any of these questions is yes, please describe (or attach copy of report discussion). Give dates and circumstances use continuation sheet if necessary:

Refer to attached assessment report.

5. FIELD SCREENING ANALYSIS

Date(s) of field screening: 10/15 – 10/20/98 Temperature(s) during screening: 20-50°F
 Estimated wind speeds: 0-20 mph Weather (clear, raining, etc): Clear/Rainy/Sunny

Type of field detection instrument used: photoionization detector
 Brand: Photovac Model: 2020 Date calibrated: 10/15 – 10/20/98
 Number of tests: 82 Range of results: 0 – 1,515

If an instrument wasn't used, what field detection method was used? _____
 Number of tests: _____ Range of results: _____

6. COLLECTION OF SOIL SAMPLESFor site assessments done for USTs remaining in place

Check the appropriate boxes below (if not applicable, leave blank):

<u>Y</u>	<u>N</u>	
<u> </u>	<u>X</u>	Were samples taken from borings (or test pits) within 5 feet of the UST?
<u> </u>	<u>X</u>	Were samples collected from within 2 feet below the bottom of the UST?
<u>X</u>	<u> </u>	Were dispensers connected to the UST system?
<u>X</u>	<u> </u>	Were samples taken from borings (or test pits) adjacent to dispensers?
<u>X</u>	<u> </u>	Were samples taken from borings (or test pits) adjacent to piping?

How many borings/pits were made? 10 How many samples were analyzed? 23

For site assessments done at excavation and removal of USTs:

Check the appropriate boxes below (if not applicable, leave blank):

<u>Y</u>	<u>N</u>	
<u> </u>	<u> </u>	Were any areas of obvious contamination identified or observed?
<u> </u>	<u> </u>	Were samples taken from areas of obvious contamination?
<u> </u>	<u> </u>	Were at least two discrete analytical samples taken from excavated pit area?
<u> </u>	<u> </u>	Was at least one sample taken from below each dispensing island's piping?
<u> </u>	<u> </u>	Was at least one sample taken from the piping trench?
<u> </u>	<u> </u>	Were the samples referenced above collected taken from native soil within two feet below the bottom of the tank pit or dispenser/piping trench?
<u> </u>	<u> </u>	If multiple tanks were removed, were at least three samples collected?
<u> </u>	<u> </u>	Were additional samples collected for each 250 square feet of excavated pit over 250 square feet?

Number of distinct points sampled Estimated excavation's surface area:

For all site assessments

Check the appropriate boxes below:

<u>Y</u>	<u>N</u>	
<u>X</u>	<u> </u>	Were field duplicate samples collected and analyzed?
<u>X</u>	<u> </u>	Were all samples kept at the appropriate temperature until analysis?
<u>X</u>	<u> </u>	Were all samples extracted & analyzed within recommended holding times?
<u>X</u>	<u> </u>	Did chain-of-custody/transfer logs accompany samples to laboratory?

7. LABORATORY ANALYSIS OF SOIL SAMPLES

(see Table 1 of UST Procedures Manual or Table G of 18 AAC 78.800(b))

Identify the possible contaminants (gasoline, BTEX, diesel, etc.): BTEX, gasoline, diesel

Please list the analytical methods used to detect these contaminants in the soil samples, the number of samples analyzed by each method, and the range of results for each method:

Possible Product	Analytical method	Number of samples	Range of results	Location(s) of sample point(s) w/ highest level of contamination
<u>Gasoline</u>	<u>AK 101</u>	<u>17</u>	<u>ND-2400</u>	<u>Southern 6 K UST Excavation</u>
<u>Diesel</u>	<u>AK 102</u>	<u>8</u>	<u>ND-264</u>	<u>Near Heating Oil UST</u>
<u>BTEX</u>	<u>EPA 8021B</u>	<u>17</u>	<u>0.038-606.1</u>	<u>Southern 6 K UST Excavation</u>
<u>Benzene</u>	<u>EPA 8021B</u>	<u>17</u>	<u>ND-58.5</u>	<u>Southern 6 K UST Excavation</u>

8. GROUNDWATER INVESTIGATION

Check the appropriate boxes below:

<u>Y</u>	<u>N</u>	
<u> </u>	<u>X</u>	Was groundwater encountered during the excavation or drilling work?
<u> </u>	<u>X</u>	Were borings drilled/pits dug at least five feet below the USTs bottom?
<u> </u>	<u>X</u>	Is groundwater or seasonal high water table known or suspected to exist within five feet of the bottom of the USTs?
<u> </u>	<u>X</u>	Were samples taken from borings drilled/test pits dug to this water level?
<u>X</u>	<u> </u>	Were all these samples analyzed within recommended holding times?

How many groundwater/saturated-soil samples were collected & analyzed? 0

How many of these samples were taken from the top 6" of water table? 0

How many field QC samples were analyzed? 0 0 0
Trip blanks Duplicates Decon blanks

9. LABORATORY ANALYSIS OF GROUNDWATER SAMPLES

(see Table 1 of UST Procedures Manual or Table G of 18 AAC 78.800(b))

Identify the possible contaminants at the site: _____

Identify the analytical methods used to detect these contaminants in the water samples, the number of samples analyzed by each method, and the range of results for each method:

Analytical method	Number of samples	Range of results (ppm)	Location(s) of sample point with highest level of contamination
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

10. DISPOSAL OF MATERIALS

Check the appropriate boxes below (if not applicable, leave blank):

<u>Y</u>	<u>N</u>	
<u>X</u>	_____	Were tanks cleaned in accordance with API 2015 (Cleaning Petroleum Storage Tanks)?
<u>X</u>	_____	Were the tanks and piping removed and disposed in accordance with API 1604 (Removal and disposal of used petroleum Storage tanks)?

Where were the tanks and piping disposed? Jackson ConstructionWhere was the tank sludge and rinsewater disposed? Jackson Construction**11. STOCKPILES**

Check the appropriate boxes below:

<u>Y</u>	<u>N</u>	
<u>X</u>	_____	Is any soil stockpiled at the site?
<u>X</u>	_____	Are soils stockpiled in accordance with 18 AAC 78.311?

12. RELEASE INVESTIGATION

Check the appropriate box below:

<u>Y</u>	<u>N</u>	
<u>X</u>	_____	Was any petroleum contamination identified during site assessment?

(Answer "yes" if any evidence a release occurred; if no, proceed to item 13)

If contamination was found, what was matrix score for site? 48
 (Attach completed matrix score sheet to this form)

When did release occur? Unknown When was release confirmed? 4/30/98
 (Date & time) (Date & time)

When was ADEC notified? 5/15/98 List ADEC staff notified: Paul Horwath, KDO
 (Date & time) (Name)

What is status of UST that prompted the investigation? X _____ _____ _____
 In use Out-of-use, product still in system Out-of-use; system empty Permanently closed

Briefly describe (or attach copy of report discussion) the steps taken to prevent further migration of the release and steps taken to monitor and mitigate fire and safety hazards: _____
see attached report

13. SITE SKETCH

Sketch the site in the space below. Alternatively, attach a site map to the back of the form. The sketch (or accompanying narrative) should include the following information:

- locations of all USTs, piping, and dispensers
- distances from tanks to nearby structures
- property line locations
- location and dimensions of excavation(s)
- type of backfill used to surround system
- locations of any known historical releases
- locations of any observed contamination
- location of any boreholes and test pits
- soil types
- field screening locations and readings
- sampling locations, depths, & sample ID numbers
- water wells and monitoring wells (if present)
- depth to groundwater/seasonal high groundwater
- locations of any stockpiled soils
- north arrow
- bar scale (specify feet or meters)

For release investigations, in addition to the above information, show the groundwater gradient; surface drainages (including potential hydraulic connections with groundwater) and utility trenches.

See attached report

14. QUALITY ASSURANCE

Check the appropriate boxes below:

<u> </u> Y	<u> </u> N	Were there deviations from Chapter 2 of the UST Procedures Manual? (Note that any deviations must be documented in a section of the comprehensive report)
<u> </u> X	<u> </u> X	Is a field quality control summary included in the reports?
<u> </u> X	<u> </u>	Is a laboratory QC summary included in the report for all samples used to verify cleanup levels have been met?

15. CERTIFICATION

The following certification is to be signed by the assessment firm's principal investigator or Quality Assurance Officer:

I certify that except as specifically noted in this report, all statements and data appearing in this report are in conformance with the provisions of Chapter 2 of the UST Procedures Manual.

<u>Gary M. Dubuisson</u>	<u>Quality Assurance Officer</u>
(Print name)	(Title)
_____	_____
(Signature)	(Date)

The following certification is to be signed by the UST owner/operator (or designated representative):

I certify that I have personally examined and am familiar with the information in this and all attached documents and based on my inquiry of the individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete.

<u>Joanne Browning</u>	<u>Owner</u>
(Print name)	(Title)
_____	_____
(Signature)	(Date)
<u>Mile 109.5 Sterling Highway</u>	<u>Kasilof, Alaska 99610</u>
(Street Address)	(City, State, Zip)

16. ATTACHMENTS

Please check the boxes showing any comprehensive reports attached to this summary:

<u> </u> X	Site Assessment Report (include if no release investigation is needed)
<u> </u>	Release Investigation Report (include if release investigation is needed)

Appendix C

Laboratory Analytical Results



CT&E Environmental Services Inc.

Laboratory Division

Laboratory Analysis Report

October 30, 1998

Chris Hawe
Gilfilian Engr/Env Testing Inc
2605 Denali St #203
Anchorage, AK 99503

Client Name	Kasilof Riverview
Project ID	Kasilof Riverview [986133]
Printed	October 30, 1998

Enclosed are the analytical results associated with the above project.

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

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

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

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

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

**CTE Environmental Services
Alaska Division
Laboratory Data Report**

Project: Kasilof Riverview
Client: Kasilof Riverview
CTE Work Order: 986133

Contents:

Chain of Custody
Quality Control Summary Forms

Note:

Unless otherwise noted, all quality assurance/quality control criteria is in compliance with the proper regulatory authority and/or CTE's Quality Assurance Program Plan.

Case Narrative

Customer: KASILOF

Kasilof Riverview

Project: 986133

Kasilof Riverview

986133001 PS

DRO - Pattern consistent with weathered middle distillate.

986133002 PS

DRO - Unknown hydrocarbon with several peaks.

986133003 PS

DRO - Heavier hydrocarbons contributing to diesel range quantitation.

986133004 PS

DRO - Heavier hydrocarbons contributing to diesel range quantitation.

986133005 PS

DRO - Heavier hydrocarbons contributing to diesel range quantitation.

986133006 PS

DRO - Pattern consistent with gasoline.

986133007 PS

GRO/BTEX - Surrogate recoveries outside control limits due to matrix interference.

986133008 PS

GRO/BTEX - Surrogate recoveries outside control limits due to matrix interference.

986133009 PS

GRO/BTEX - Surrogate recoveries outside control limits due to matrix interference.

986133010 PS

GRO/BTEX - Surrogates do not meet QC goals due to matrix interference.

986133011 PS

GRO/BTEX - Surrogate recoveries outside control limits due to matrix interference.

986133012 PS

GRO/BTEX - Surrogate recoveries outside control limits due to matrix interference.

986133016 PS

GRO/BTEX - Surrogate recoveries outside control limits due to matrix interference.
DRO - Pattern consistent with weathered gasoline.

986133017 PS

GRO/BTEX - Surrogate recoveries outside control limits due to matrix interference.

986133021 PS

GRO/BTEX - Surrogate recoveries outside control limits due to matrix interference.

986133024 PS

524.2 - Dibromochloromethane detected below the PQL at 0.00042 mg/L.



CT&E Ref.# 986133001
Client Name Kasilof Riverview
Project Name/# Kasilof Riverview
Client Sample ID S1
Matrix Soil
Ordered By PWSID

Client PO#
Printed Date/Time 10/30/98 12:43
Collected Date/Time 10/15/98 15:10
Received Date/Time 10/21/98 13:00
Technical Director: Stephen C. Ede

Released By J. W. Widebank

Sample Remarks:
DRO - Pattern consistent with weathered middle distillate.

Table with 10 columns: Parameter, Results, PQL, Units, Method, Allowable Limits, Prep Date, Analysis Date, Init. Rows include Total Solids, Diesel Range Organics, and 5a Androstane <surr>.



CT&E Ref.# 986133002
Client Name Kasilof Riverview
Project Name/# Kasilof Riverview
Client Sample ID S2
Matrix Soil
Ordered By
PWSID

Client PO#
Printed Date/Time 10/30/98 12:43
Collected Date/Time 10/15/98 15:20
Received Date/Time 10/21/98 13:00
Technical Director: Stephen C. Ede

Released By J. W. Winkler

Sample Remarks:
DRO - Unknown hydrocarbon with several peaks.

Table with 10 columns: Parameter, Results, PQL, Units, Method, Allowable Limits, Prep Date, Analysis Date, Init. Rows include Total Solids, Diesel Range Organics, and 5a Androstane <surr>.



CT&E Ref.# 986133003
 Client Name Kasilof Riverview
 Project Name/# Kasilof Riverview
 Client Sample ID S3
 Matrix Soil
 Ordered By
 PWSID

Client PO#
 Printed Date/Time 10/30/98 12:43
 Collected Date/Time 10/15/98 15:30
 Received Date/Time 10/21/98 13:00
 Technical Director: Stephen C. Ede

Released By *J. W. Underbank*

Sample Remarks:
 DRO - Heavier hydrocarbons contributing to diesel range quantitation.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	83.6		%	SM18 2540G			10/22/98	SKW
AK102								
Diesel Range Organics	18.1	7.62	mg/Kg	AK102 DRO		10/27/98	10/30/98	MMP
Surrogates								
5a Androstane <surr>	134		%	AK102 DRO	(50-150)	10/27/98	10/30/98	



CT&E Ref.# 986133004
Client Name Kasilof Riverview
Project Name/# Kasilof Riverview
Client Sample ID S4
Matrix Soil
Ordered By PWSID

Client PO#
Printed Date/Time 10/30/98 12:43
Collected Date/Time 10/15/98 15:40
Received Date/Time 10/21/98 13:00
Technical Director: Stephen C. Ede

Released By J Windibank

Sample Remarks:
DRO - Heavier hydrocarbons contributing to diesel range quantitation.

Table with 10 columns: Parameter, Results, PQL, Units, Method, Allowable Limits, Prep Date, Analysis Date, Init. Rows include Total Solids, Diesel Range Organics, and 5a Androstane <surrogate>.



CT&E Ref.# 986133005
 Client Name Kasilof Riverview
 Project Name/# Kasilof Riverview
 Client Sample ID S5
 Matrix Soil
 Ordered By
 PWSID

Client PO#
 Printed Date/Time 10/30/98 12:43
 Collected Date/Time 10/16/98 18:05
 Received Date/Time 10/21/98 13:00
 Technical Director: Stephen C. Ede

Released By *J. Windelbank*

Sample Remarks:
 DRO - Heavier hydrocarbons contributing to diesel range quantitation.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	89.9		%	SM18 2540G			10/22/98	SKW
GRO/8021 Combo								
Gasoline Range Organics	13.3	1.69	mg/Kg	AK101/8021B		10/16/98	10/22/98	BLS
Benzene	0.497	0.0422	mg/Kg	AK101/8021B		10/16/98	10/22/98	BLS
Toluene	0.287	0.0422	mg/Kg	AK101/8021B		10/16/98	10/22/98	BLS
Ethylbenzene	0.860	0.0422	mg/Kg	AK101/8021B		10/16/98	10/22/98	BLS
P & M -Xylene	0.726	0.0422	mg/Kg	AK101/8021B		10/16/98	10/22/98	BLS
o-Xylene	0.174	0.0422	mg/Kg	AK101/8021B		10/16/98	10/22/98	BLS
Surrogates								
4-Bromofluorobenzene <Surr>	100		%	AK101/8021B	(50-150)	10/16/98	10/22/98	
1,4-Difluorobenzene <Surr>	109		%	AK101/8021B	(50-150)	10/16/98	10/22/98	
AK102								
Diesel Range Organics	4.82	4.06	mg/Kg	AK102 DRO		10/27/98	10/30/98	MMP
Surrogates								
5a Androstane <surr>	55.8		%	AK102 DRO	(50-150)	10/27/98	10/30/98	



CT&E Ref.# 986133006
Client Name Kasilof Riverview
Project Name/# Kasilof Riverview
Client Sample ID S6
Matrix Soil
Ordered By
PWSID

Client PO#
Printed Date/Time 11/02/98 10:51
Collected Date/Time 10/16/98 18:10
Received Date/Time 10/21/98 13:00
Technical Director: Stephen C. Ede

Released By J Wundebank

Sample Remarks:
DRO - Pattern consistent with gasoline.

Table with 10 columns: Parameter, Results, PQL, Units, Method, Allowable Limits, Prep Date, Analysis Date, Init. Rows include Total Solids, Diesel Range Organics, and 5a Androstane <surr>.



CT&E Ref.# 986133007
Client Name Kasilof Riverview
Project Name/# Kasilof Riverview
Client Sample ID S7
Matrix Soil
Ordered By
PWSID

Client PO#
Printed Date/Time 10/30/98 12:43
Collected Date/Time 10/16/98 18:20
Received Date/Time 10/21/98 13:00
Technical Director: Stephen C. Ede

Released By J. W. Winkler

Sample Remarks:
GRO/BTEX - Surrogate recoveries outside control limits due to matrix interference.

Table with columns: Parameter, Results, PQL, Units, Method, Allowable Limits, Prep Date, Analysis Date, Init. Rows include Total Solids, GRO/8021 Combo, Gasoline Range Organics, Benzene, Toluene, Ethylbenzene, P & M -Xylene, o-Xylene, and Surrogates.



CT&E Ref.# 986133008
Client Name Kasilof Riverview
Project Name/# Kasilof Riverview
Client Sample ID S8
Matrix Soil
Ordered By
PWSID

Client PO#
Printed Date/Time 10/30/98 12:43
Collected Date/Time 10/16/98 18:30
Received Date/Time 10/21/98 13:00
Technical Director: Stephen C. Ede

Released By J Windelbank

Sample Remarks:

GRO/BTEX - Surrogate recoveries outside control limits due to matrix interference.

Table with columns: Parameter, Results, PQL, Units, Method, Allowable Limits, Prep Date, Analysis Date, Init. Rows include Total Solids, GRO/8021 Combo (Gasoline Range Organics, Benzene, Toluene, Ethylbenzene, P & M -Xylene, o-Xylene), and Surrogates (4-Bromofluorobenzene, 1,4-Difluorobenzene).



CT&E Ref.# 986133009
Client Name Kasilof Riverview
Project Name/# Kasilof Riverview
Client Sample ID S9
Matrix Soil
Ordered By
PWSID

Client PO#
Printed Date/Time 10/30/98 12:43
Collected Date/Time 10/16/98 18:50
Received Date/Time 10/21/98 13:00
Technical Director: Stephen C. Ede

Released By J. Windbank

Sample Remarks:

GRO/BTEX - Surrogate recoveries outside control limits due to matrix interference.

Table with 9 columns: Parameter, Results, PQL, Units, Method, Allowable Limits, Prep Date, Analysis Date, Init. Rows include Total Solids, GRO/8021 Combo, Gasoline Range Organics, Benzene, Toluene, Ethylbenzene, P & M -Xylene, o-Xylene, and Surrogates (4-Bromofluorobenzene, 1,4-Difluorobenzene).



CT&E Ref.# 986133010
 Client Name Kasilof Riverview
 Project Name/# Kasilof Riverview
 Client Sample ID S10
 Matrix Soil
 Ordered By
 PWSID

Client PO#
 Printed Date/Time 10/30/98 12:43
 Collected Date/Time 10/16/98 18:55
 Received Date/Time 10/21/98 13:00
 Technical Director: Stephen C. Ede

Released By *J. Wundebank*

Sample Remarks:
 GRO/BTEX - Surrogates do not meet QC goals due to matrix interference.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	85.7		%	SM18 2540G			10/22/98	SKW
GRO/8021 Combo								
Gasoline Range Organics	2400	36.7	mg/Kg	AK101/8021B		10/16/98	10/23/98	BLS
Benzene	58.5	0.918	mg/Kg	AK101/8021B		10/16/98	10/23/98	BLS
Toluene	205	0.918	mg/Kg	AK101/8021B		10/16/98	10/23/98	BLS
Ethylbenzene	76.5	0.918	mg/Kg	AK101/8021B		10/16/98	10/23/98	BLS
P & M -Xylene	190	0.918	mg/Kg	AK101/8021B		10/16/98	10/23/98	BLS
o-Xylene	76.1	0.918	mg/Kg	AK101/8021B		10/16/98	10/23/98	BLS
Surrogates								
4-Bromofluorobenzene <Surr>	!	1680	%	AK101/8021B	(50-150)	10/16/98	10/23/98	
1,4-Difluorobenzene <Surr>	!	699	%	AK101/8021B	(50-150)	10/16/98	10/23/98	



CT&E Ref.# 986133011
Client Name Kasilof Riverview
Project Name/# Kasilof Riverview
Client Sample ID S11
Matrix Soil
Ordered By
PWSID

Client PO#
Printed Date/Time 10/30/98 12:43
Collected Date/Time 10/16/98 19:00
Received Date/Time 10/21/98 13:00
Technical Director: Stephen C. Ede

Released By J. Wendebank

Sample Remarks:

GRO/BTEX - Surrogate recoveries outside control limits due to matrix interference.

Table with columns: Parameter, Results, PQL, Units, Method, Allowable Limits, Prep Date, Analysis Date, Init. Rows include Total Solids, GRO/8021 Combo (Gasoline Range Organics, Benzene, Toluene, Ethylbenzene, P & M -Xylene, o-Xylene), and Surrogates (4-Bromofluorobenzene, 1,4-Difluorobenzene).



CT&E Ref.# 986133012
 Client Name Kasilof Riverview
 Project Name/# Kasilof Riverview
 Client Sample ID S12
 Matrix Soil
 Ordered By
 PWSID

Client PO#
 Printed Date/Time 10/30/98 12:43
 Collected Date/Time 10/16/98 19:10
 Received Date/Time 10/21/98 13:00
 Technical Director: Stephen C. Ede

Released By *J. W. DeBank*

Sample Remarks:

GRO/BTEX - Surrogate recoveries outside control limits due to matrix interference.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	100		%	SM18 2540G			10/22/98	SKW
GRO/8021 Combo								
Gasoline Range Organics	478	16.1	mg/Kg	AK101/8021B		10/16/98	10/23/98	BLS
Benzene	17.2	0.402	mg/Kg	AK101/8021B		10/16/98	10/23/98	BLS
Toluene	57.5	0.402	mg/Kg	AK101/8021B		10/16/98	10/23/98	BLS
Ethylbenzene	17.1	0.402	mg/Kg	AK101/8021B		10/16/98	10/23/98	BLS
P & M -Xylene	47.3	0.402	mg/Kg	AK101/8021B		10/16/98	10/23/98	BLS
o-Xylene	19.2	0.402	mg/Kg	AK101/8021B		10/16/98	10/23/98	BLS
Surrogates								
4-Bromofluorobenzene <Surr>	!	491	%	AK101/8021B	(50-150)	10/16/98	10/23/98	
1,4-Difluorobenzene <Surr>	!	212	%	AK101/8021B	(50-150)	10/16/98	10/23/98	



CT&E Ref.# 986133013
 Client Name Kasilof Riverview
 Project Name/# Kasilof Riverview
 Client Sample ID S13
 Matrix Soil
 Ordered By
 PWSID

Client PO#
 Printed Date/Time 10/30/98 12:43
 Collected Date/Time 10/17/98 11:40
 Received Date/Time 10/21/98 13:00
 Technical Director: Stephen C. Ede

Released By *J. W. Indebank*

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	85.8		%	SM18 2540G			10/22/98	SKW
GRO/8021 Combo								
Gasoline Range Organics	2.87 U	2.87	mg/Kg	AK101/8021B		10/17/98	10/22/98	BLS
Benzene	0.0717 U	0.0717	mg/Kg	AK101/8021B		10/17/98	10/22/98	BLS
Toluene	0.0998	0.0717	mg/Kg	AK101/8021B		10/17/98	10/22/98	BLS
Ethylbenzene	0.0717 U	0.0717	mg/Kg	AK101/8021B		10/17/98	10/22/98	BLS
P & M -Xylene	0.106	0.0717	mg/Kg	AK101/8021B		10/17/98	10/22/98	BLS
o-Xylene	0.0717 U	0.0717	mg/Kg	AK101/8021B		10/17/98	10/22/98	BLS
Surrogates								
4-Bromofluorobenzene <Surr>	85.3		%	AK101/8021B	(50-150)	10/17/98	10/22/98	
1,4-Difluorobenzene <Surr>	97.5		%	AK101/8021B	(50-150)	10/17/98	10/22/98	
AK102								
Diesel Range Organics	4.10 U	4.10	mg/Kg	AK102 DRO		10/27/98	10/30/98	MMP
Surrogates								
5a Androstane <surr>	83		%	AK102 DRO	(50-150)	10/27/98	10/30/98	



CT&E Ref.# 986133014
Client Name Kasilof Riverview
Project Name/# Kasilof Riverview
Client Sample ID S15
Matrix Soil
Ordered By
PWSID

Client PO#
Printed Date/Time 10/30/98 12:43
Collected Date/Time 10/17/98 12:50
Received Date/Time 10/21/98 13:00
Technical Director: Stephen C. Ede

Released By J. Winkler

Sample Remarks:

Table with columns: Parameter, Results, PQL, Units, Method, Allowable Limits, Prep Date, Analysis Date, Init. Rows include Total Solids, GRO/8021 Combo, Gasoline Range Organics (Benzene, Toluene, Ethylbenzene, P & M -Xylene, o-Xylene), and Surrogates (4-Bromofluorobenzene, 1,4-Difluorobenzene).



CT&E Ref.# 986133015
Client Name Kasilof Riverview
Project Name/# Kasilof Riverview
Client Sample ID S16
Matrix Soil
Ordered By
PWSID

Client PO#
Printed Date/Time 10/30/98 12:43
Collected Date/Time 10/17/98 13:00
Received Date/Time 10/21/98 13:00
Technical Director: Stephen C. Ede

Released By J Windelbank

Sample Remarks:

Table with columns: Parameter, Results, PQL, Units, Method, Allowable Limits, Prep Date, Analysis Date, Init. Rows include Total Solids, GRO/8021 Combo, Gasoline Range Organics, Benzene, Toluene, Ethylbenzene, P & M -Xylene, o-Xylene, and Surrogates.



CT&E Ref.# 986133016
 Client Name Kasilof Riverview
 Project Name/# Kasilof Riverview
 Client Sample ID S17
 Matrix Soil
 Ordered By
 PWSID

Client PO#
 Printed Date/Time 10/30/98 12:43
 Collected Date/Time 10/20/98 11:15
 Received Date/Time 10/21/98 13:00
 Technical Director: Stephen C. Ede

Released By *J. Windebank*

Sample Remarks:
 GRO/BTEX - Surrogate recoveries outside control limits due to matrix interference.
 DRO - Pattern consistent with weathered gasoline.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	88.6		%	SM18 2540G			10/22/98	SKW
GRO/8021 Combo								
Gasoline Range Organics	402	13.0	mg/Kg	AK101/8021B		10/20/98	10/22/98	BLS
Benzene	12.0	0.324	mg/Kg	AK101/8021B		10/20/98	10/22/98	BLS
Toluene	43.9	0.324	mg/Kg	AK101/8021B		10/20/98	10/22/98	BLS
Ethylbenzene	16.7	0.324	mg/Kg	AK101/8021B		10/20/98	10/22/98	BLS
P & M -Xylene	45.7	0.324	mg/Kg	AK101/8021B		10/20/98	10/22/98	BLS
o-Xylene	17.9	0.324	mg/Kg	AK101/8021B		10/20/98	10/22/98	BLS
Surrogates								
4-Bromofluorobenzene <Surr>	!	391	%	AK101/8021B	(50-150)	10/20/98	10/22/98	
1,4-Difluorobenzene <Surr>	!	307	%	AK101/8021B	(50-150)	10/20/98	10/22/98	
AK102								
Diesel Range Organics	22.1	4.00	mg/Kg	AK102 DRO		10/27/98	10/30/98	MMP
Surrogates								
5a Androstane <surr>	69.2		%	AK102 DRO	(50-150)	10/27/98	10/30/98	



CT&E Ref.# 986133017
Client Name Kasilof Riverview
Project Name/# Kasilof Riverview
Client Sample ID S18
Matrix Soil
Ordered By
PWSID

Client PO#
Printed Date/Time 10/30/98 12:43
Collected Date/Time 10/20/98 11:45
Received Date/Time 10/21/98 13:00
Technical Director: Stephen C. Ede

Released By [Signature]

Sample Remarks:

GRO/BTEX - Surrogate recoveries outside control limits due to matrix interference.

Table with columns: Parameter, Results, PQL, Units, Method, Allowable Limits, Prep Date, Analysis Date, Init. Rows include Total Solids, GRO/8021 Combo, Gasoline Range Organics (Benzene, Toluene, Ethylbenzene, P & M -Xylene, o-Xylene), and Surrogates (4-Bromofluorobenzene, 1,4-Difluorobenzene).



CT&E Ref.# 986133018
Client Name Kasilof Riverview
Project Name/# Kasilof Riverview
Client Sample ID S19
Matrix Soil
Ordered By
PWSID

Client PO#
Printed Date/Time 10/30/98 12:44
Collected Date/Time 10/20/98 13:25
Received Date/Time 10/21/98 13:00
Technical Director: Stephen C. Ede

Released By J Windebank

Sample Remarks:

Table with 10 columns: Parameter, Results, PQL, Units, Method, Allowable Limits, Prep Date, Analysis Date, Init. Rows include Total Solids, GRO/8021 Combo, Gasoline Range Organics, Benzene, Toluene, Ethylbenzene, P & M -Xylene, o-Xylene, Surrogates, 4-Bromofluorobenzene, and 1,4-Difluorobenzene.



CT&E Ref.# 986133019
Client Name Kasilof Riverview
Project Name/# Kasilof Riverview
Client Sample ID S20
Matrix Soil
Ordered By
PWSID

Client PO#
Printed Date/Time 10/30/98 12:44
Collected Date/Time 10/20/98 13:45
Received Date/Time 10/21/98 13:00
Technical Director: Stephen C. Ede

Released By J Wundebank

Sample Remarks:

Table with 9 columns: Parameter, Results, PQL, Units, Method, Allowable Limits, Prep Date, Analysis Date, Init. Rows include Total Solids, GRO/8021 Combo, Gasoline Range Organics (Benzene, Toluene, Ethylbenzene, P & M -Xylene, o-Xylene), and Surrogates (4-Bromofluorobenzene, 1,4-Difluorobenzene).



CT&E Ref.# 986133020
Client Name Kasilof Riverview
Project Name/# Kasilof Riverview
Client Sample ID S21
Matrix Soil
Ordered By
PWSID

Client PO#
Printed Date/Time 10/30/98 12:44
Collected Date/Time 10/20/98 13:55
Received Date/Time 10/21/98 13:00
Technical Director: Stephen C. Ede

Released By J. Windbank

Sample Remarks:

Table with 10 columns: Parameter, Results, PQL, Units, Method, Allowable Limits, Prep Date, Analysis Date, Init. Rows include Total Solids, GRO/8021 Combo, Gasoline Range Organics, Benzene, Toluene, Ethylbenzene, P & M -Xylene, o-Xylene, and Surrogates (4-Bromofluorobenzene, 1,4-Difluorobenzene).



CT&E Ref.# 986133021
Client Name Kasilof Riverview
Project Name/# Kasilof Riverview
Client Sample ID S22
Matrix Soil
Ordered By
PWSID

Client PO#
Printed Date/Time 10/30/98 12:44
Collected Date/Time 10/20/98 13:55
Received Date/Time 10/21/98 13:00
Technical Director: Stephen C. Ede

Released By J Windebank

Sample Remarks:
GRO/BTEX - Surrogate recoveries outside control limits due to matrix interference.

Table with 9 columns: Parameter, Results, PQL, Units, Method, Allowable Limits, Prep Date, Analysis Date, Init. Rows include Total Solids, GRO/8021 Combo, Gasoline Range Organics (Benzene, Toluene, Ethylbenzene, P & M -Xylene, o-Xylene), and Surrogates (4-Bromofluorobenzene, 1,4-Difluorobenzene).



CT&E Ref.# 986133022
Client Name Kasilof Riverview
Project Name/# Kasilof Riverview
Client Sample ID S23
Matrix Soil
Ordered By
PWSID

Client PO#
Printed Date/Time 10/30/98 12:44
Collected Date/Time 10/20/98 15:20
Received Date/Time 10/21/98 13:00
Technical Director: Stephen C. Ede

Released By J Windbank

Sample Remarks:

Table with 9 columns: Parameter, Results, PQL, Units, Method, Allowable Limits, Prep Date, Analysis Date, Init. Rows include Total Solids, GRO/8021 Combo, Gasoline Range Organics (Benzene, Toluene, Ethylbenzene, P & M -Xylene, o-Xylene), and Surrogates (4-Bromofluorobenzene, 1,4-Difluorobenzene).



CT&E Ref.# 986133023
Client Name Kasilof Riverview
Project Name/# Kasilof Riverview
Client Sample ID Trip Blank
Matrix Soil
Ordered By
PWSID

Client PO#
Printed Date/Time 10/30/98 12:44
Collected Date/Time
Received Date/Time 10/21/98 13:00
Technical Director: Stephen C. Ede

Released By J Windelbank

Sample Remarks:

Table with columns: Parameter, Results, PQL, Units, Method, Allowable Limits, Prep Date, Analysis Date, Init. Rows include Total Solids, GRO/8021 Combo, Gasoline Range Organics, Benzene, Toluene, Ethylbenzene, P & M -Xylene, o-Xylene, and Surrogates (4-Bromofluorobenzene, 1,4-Difluorobenzene).



CT&E Ref.# 986133024
 Client Name Kasilof Riverview
 Project Name/# Kasilof Riverview
 Client Sample ID Tap Water
 Matrix Water (Surface, Eff., Ground)
 Ordered By
 PWSID

Client PO#
 Printed Date/Time 10/30/98 09:10
 Collected Date/Time
 Received Date/Time 10/21/98 13:00
 Technical Director: Stephen C. Ede

Released By *J. W. DeBark*

Sample Remarks:

524.2 - Dibromochloromethane detected below the PQL at 0.00042 mg/L.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Volatiles by GC/MS (DW)								
Dichlorodifluoromethane	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Chloromethane	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Vinyl chloride	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Bromomethane	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Chloroethane	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Trichlorofluoromethane	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
1,1-Dichloroethene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Methylene chloride	0.00068	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
trans-1,2-Dichloroethene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
1,1-Dichloroethane	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
2,2-Dichloropropane	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
cis-1,2-Dichloroethene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Bromochloromethane	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Chloroform	0.0030	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
1,1,1-Trichloroethane	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Carbon tetrachloride	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
1,1-Dichloropropene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Benzene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
1,2-Dichloroethane	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Trichloroethene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
1,2-Dichloropropane	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Dibromomethane	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Bromodichloromethane	0.00085	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
cis-1,3-Dichloropropene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Toluene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
trans-1,3-Dichloropropene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM



CT&E Ref.# 986133024
 Client Name Kasilof Riverview
 Project Name/# Kasilof Riverview
 Client Sample ID Tap Water
 Matrix Water (Surface, Eff., Ground)
 Ordered By
 PWSID

Client PO#
 Printed Date/Time 10/30/98 09:10
 Collected Date/Time
 Received Date/Time 10/21/98 13:00
 Technical Director: Stephen C. Ede

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
1,1,2-Trichloroethane	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Tetrachloroethene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
1,3-Dichloropropane	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Dibromochloromethane	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
1,2-Dibromoethane	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Chlorobenzene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
1,1,1,2-Tetrachloroethane	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Ethylbenzene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
P & M -Xylene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
o-Xylene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Styrene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Bromoform	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Isopropylbenzene (Cumene)	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Bromobenzene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
1,1,2,2-Tetrachloroethane	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
1,2,3-Trichloropropane	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
n-Propylbenzene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
2-Chlorotoluene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
4-Chlorotoluene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
1,3,5-Trimethylbenzene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
tert-Butylbenzene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
1,2,4-Trimethylbenzene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
sec-Butylbenzene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
1,3-Dichlorobenzene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
4-Isopropyltoluene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
1,4-Dichlorobenzene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
1,2-Dichlorobenzene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
n-Butylbenzene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
1,2-Dibromo-3-chloropropane	0.0010 U	0.0010	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
1,2,4-Trichlorobenzene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Hexachlorobutadiene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Naphthalene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM



CT&E Ref.# 986133024
Client Name Kasilof Riverview
Project Name/# Kasilof Riverview
Client Sample ID Tap Water
Matrix Water (Surface, Eff., Ground)
Ordered By
PWSID

Client PO#
Printed Date/Time 10/30/98 09:10
Collected Date/Time
Received Date/Time 10/21/98 13:00
Technical Director: Stephen C. Ede

<u>Parameter</u>	<u>Results</u>	<u>PQL</u>	<u>Units</u>	<u>Method</u>	<u>Allowable Limits</u>	<u>Prep Date</u>	<u>Analysis Date</u>	<u>Init</u>
1,2,3-Trichlorobenzene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Total Trihalomethanes	0.0043	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Surrogates								
1,2-Dichloroethane-D4 <surr>	97.3		%	EPA 524.2	(80-120)	10/26/98	10/26/98	
Toluene-d8 <surr>	101		%	EPA 524.2	(80-120)	10/26/98	10/26/98	
4-Bromofluorobenzene <Surr>	97.9		%	EPA 524.2	(80-120)	10/26/98	10/26/98	



CT&E Ref.# 986133025
Client Name Kasilof Riverview
Project Name/# Kasilof Riverview
Client Sample ID Trip Blank
Matrix Water (Surface, Eff., Ground)
Ordered By PWSID

Client PO#
Printed Date/Time 10/30/98 09:10
Collected Date/Time
Received Date/Time 10/21/98 13:00
Technical Director: Stephen C. Ede

Released By J Wundelbank

Sample Remarks:

Table with columns: Parameter, Results, PQL, Units, Method, Allowable Limits, Prep Date, Analysis Date, Init. Includes a section for Volatiles by GC/MS (DW) listing various compounds like 1,1,1,2-Tetrachloroethane, etc.



CT&E Ref.# 986133025
 Client Name Kasilof Riverview
 Project Name/# Kasilof Riverview
 Client Sample ID Trip Blank
 Matrix Water (Surface, Eff., Ground)
 Ordered By
 PWSID

Client PO#
 Printed Date/Time 10/30/98 09:10
 Collected Date/Time
 Received Date/Time 10/21/98 13:00
 Technical Director: Stephen C. Ede

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Bromodichloromethane	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Bromoform	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Bromomethane	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Carbon tetrachloride	0.00050 U	0.00050	mg/L	EPA 524.2	.005 max	10/26/98	10/26/98	SPM
Chlorobenzene	0.00050 U	0.00050	mg/L	EPA 524.2	.1 max	10/26/98	10/26/98	SPM
Chloroethane	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Chloroform	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Chloromethane	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Dibromochloromethane	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Dibromomethane	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Dichlorodifluoromethane	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Ethylbenzene	0.00050 U	0.00050	mg/L	EPA 524.2	.7 max	10/26/98	10/26/98	SPM
Hexachlorobutadiene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Isopropylbenzene (Cumene)	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Methylene chloride	0.00050 U	0.00050	mg/L	EPA 524.2	.005 max	10/26/98	10/26/98	SPM
Naphthalene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Styrene	0.00050 U	0.00050	mg/L	EPA 524.2	.1 max	10/26/98	10/26/98	SPM
Tetrachloroethene	0.00050 U	0.00050	mg/L	EPA 524.2	.005 max	10/26/98	10/26/98	SPM
Toluene	0.00050 U	0.00050	mg/L	EPA 524.2	1 max	10/26/98	10/26/98	SPM
Total Trihalomethanes	0.00050 U	0.00050	mg/L	EPA 524.2	.1 max	10/26/98	10/26/98	SPM
Trichloroethene	0.00050 U	0.00050	mg/L	EPA 524.2	.005 max	10/26/98	10/26/98	SPM
Trichlorofluoromethane	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Vinyl chloride	0.00050 U	0.00050	mg/L	EPA 524.2	.002 max	10/26/98	10/26/98	SPM
cis-1,2-Dichloroethene	0.00050 U	0.00050	mg/L	EPA 524.2	.07 max	10/26/98	10/26/98	SPM
cis-1,3-Dichloropropene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
n-Butylbenzene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
n-Propylbenzene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
P & M -Xylene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
o-Xylene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Total Xylenes	0.00050 U	0.00050	mg/L	EPA 524.2	10 max	10/26/98	10/26/98	SPM
sec-Butylbenzene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
tert-Butylbenzene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM



CT&E Ref.# 986133025
 Client Name Kasilof Riverview
 Project Name/# Kasilof Riverview
 Client Sample ID Trip Blank
 Matrix Water (Surface, Eff., Ground)
 Ordered By
 PWSID

Client PO#
 Printed Date/Time 10/30/98 09:10
 Collected Date/Time
 Received Date/Time 10/21/98 13:00
 Technical Director: Stephen C. Ede

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
trans-1,2-Dichloroethene	0.00050 U	0.00050	mg/L	EPA 524.2	.1 max	10/26/98	10/26/98	SPM
trans-1,3-Dichloropropene	0.00050 U	0.00050	mg/L	EPA 524.2		10/26/98	10/26/98	SPM
Surrogates								
1,2-Dichloroethane-D4 <surr>	99.5		%	EPA 524.2	(80-120)	10/26/98	10/26/98	
Toluene-d8 <surr>	102		%	EPA 524.2	(80-120)	10/26/98	10/26/98	
4-Bromofluorobenzene <Surr>	100		%	EPA 524.2	(80-120)	10/26/98	10/26/98	



Client Kasilof Riverview
Workorder Kasilof Riverview

QC Batch VXX 4473 (52632)
Original
Matrix Drinking Water

Prep Date 10/26/98 11:00
Analysis Method EPA 524.2

QC results affect the following production samples:

986133024 986133025

QC results for Method Blank [200891]

Run Instrument: HP 5890 Series II MS5 VLA

Parameter	Analyzed	Result	PQL	Units
Dichlorodifluoromethane	10/26/98	0.00050 U	0.00050	mg/L
Chloromethane	10/26/98	0.00050 U	0.00050	mg/L
Vinyl chloride	10/26/98	0.00050 U	0.00050	mg/L
Bromomethane	10/26/98	0.00050 U	0.00050	mg/L
Chloroethane	10/26/98	0.00050 U	0.00050	mg/L
Trichlorofluoromethane	10/26/98	0.00050 U	0.00050	mg/L
1,1-Dichloroethene	10/26/98	0.00050 U	0.00050	mg/L
Methylene chloride	10/26/98	0.00050 U	0.00050	mg/L
trans-1,2-Dichloroethene	10/26/98	0.00050 U	0.00050	mg/L
1,1-Dichloroethane	10/26/98	0.00050 U	0.00050	mg/L
2,2-Dichloropropane	10/26/98	0.00050 U	0.00050	mg/L
cis-1,2-Dichloroethene	10/26/98	0.00050 U	0.00050	mg/L
Bromochloromethane	10/26/98	0.00050 U	0.00050	mg/L
Chloroform	10/26/98	0.00050 U	0.00050	mg/L
1,1,1-Trichloroethane	10/26/98	0.00050 U	0.00050	mg/L
Carbon tetrachloride	10/26/98	0.00050 U	0.00050	mg/L
1,1-Dichloropropene	10/26/98	0.00050 U	0.00050	mg/L
Benzene	10/26/98	0.00050 U	0.00050	mg/L



Client Kasilof Riverview
 Workorder Kasilof Riverview

QC Batch VXX 4473 (52632)
 Original
 Matrix Drinking Water

Prep Date 10/26/98 11:00
 Analysis Method EPA 524.2

QC results for Method Blank [200891] (continued)

Run Instrument: HP 5890 Series II MS5 VLA

Parameter	Analyzed	Result	PQL	Units
1,2-Dichloroethane	10/26/98	0.00050 U	0.00050	mg/L
Trichloroethene	10/26/98	0.00050 U	0.00050	mg/L
1,2-Dichloropropane	10/26/98	0.00050 U	0.00050	mg/L
Dibromomethane	10/26/98	0.00050 U	0.00050	mg/L
Bromodichloromethane	10/26/98	0.00050 U	0.00050	mg/L
cis-1,3-Dichloropropene	10/26/98	0.00050 U	0.00050	mg/L
Toluene	10/26/98	0.00050 U	0.00050	mg/L
trans-1,3-Dichloropropene	10/26/98	0.00050 U	0.00050	mg/L
1,1,2-Trichloroethane	10/26/98	0.00050 U	0.00050	mg/L
Tetrachloroethene	10/26/98	0.00050 U	0.00050	mg/L
1,3-Dichloropropane	10/26/98	0.00050 U	0.00050	mg/L
Dibromochloromethane	10/26/98	0.00050 U	0.00050	mg/L
1,2-Dibromoethane	10/26/98	0.00050 U	0.00050	mg/L
Chlorobenzene	10/26/98	0.00050 U	0.00050	mg/L
1,1,1,2-Tetrachloroethane	10/26/98	0.00050 U	0.00050	mg/L
Ethylbenzene	10/26/98	0.00050 U	0.00050	mg/L
P & M -Xylene	10/26/98	0.00050 U	0.00050	mg/L
o-Xylene	10/26/98	0.00050 U	0.00050	mg/L
Styrene	10/26/98	0.00050 U	0.00050	mg/L
Bromoform	10/26/98	0.00050 U	0.00050	mg/L
Isopropylbenzene (Cumene)	10/26/98	0.00050 U	0.00050	mg/L



Client Kasilof Riverview
Workorder Kasilof Riverview
QC Batch VXX 4473 (52632)
Original
Matrix Drinking Water

Prep Date 10/26/98 11:00
Analysis Method EPA 524.2

QC results for Method Blank [200891] (continued)

Run Instrument: HP 5890 Series II MS5 VLA

Parameter	Analyzed	Result	PQL	Units
Bromobenzene	10/26/98	0.00050 U	0.00050	mg/L
1,1,2,2-Tetrachloroethane	10/26/98	0.00050 U	0.00050	mg/L
1,2,3-Trichloropropane	10/26/98	0.00050 U	0.00050	mg/L
n-Propylbenzene	10/26/98	0.00050 U	0.00050	mg/L
2-Chlorotoluene	10/26/98	0.00050 U	0.00050	mg/L
4-Chlorotoluene	10/26/98	0.00050 U	0.00050	mg/L
1,3,5-Trimethylbenzene	10/26/98	0.00050 U	0.00050	mg/L
tert-Butylbenzene	10/26/98	0.00050 U	0.00050	mg/L
1,2,4-Trimethylbenzene	10/26/98	0.00050 U	0.00050	mg/L
sec-Butylbenzene	10/26/98	0.00050 U	0.00050	mg/L
1,3-Dichlorobenzene	10/26/98	0.00050 U	0.00050	mg/L
4-Isopropyltoluene	10/26/98	0.00050 U	0.00050	mg/L
1,4-Dichlorobenzene	10/26/98	0.00050 U	0.00050	mg/L
1,2-Dichlorobenzene	10/26/98	0.00050 U	0.00050	mg/L
n-Butylbenzene	10/26/98	0.00050 U	0.00050	mg/L
1,2-Dibromo-3-chloropropane	10/26/98	0.0010 U	0.0010	mg/L
1,2,4-Trichlorobenzene	10/26/98	0.00050 U	0.00050	mg/L
Hexachlorobutadiene	10/26/98	0.00050 U	0.00050	mg/L
Naphthalene	10/26/98	0.00050 U	0.00050	mg/L
1,2,3-Trichlorobenzene	10/26/98	0.00050 U	0.00050	mg/L
Total Trihalomethanes	10/26/98	0.00050 U	0.00050	mg/L



Client Kasilof Riverview
 Workorder Kasilof Riverview

QC Batch VXX 4473 (52632)

Original Matrix Drinking Water

Prep Date 10/26/98 11:00
 Analysis Method EPA 524.2

QC results affect the following production samples:

986133024 986133025

QC results for Lab Check Standard [200892] - Lab Check Standard Duplicate [200893]

Parameter		QC Result	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analyzed	Instru ID
Dichlorodifluoromethane	LCS	0.009	89.8	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.009	90.3		.56	0-30	.01mg/L	10/26/98	VLA
Chloromethane	LCS	0.01	101	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.0099	99.3		1.7	0-30	.01mg/L	10/26/98	VLA
Vinyl chloride	LCS	0.011	111	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.011	107		3.7	0-30	.01mg/L	10/26/98	VLA
Bromomethane	LCS	0.011	107	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.01	102		4.8	0-30	.01mg/L	10/26/98	VLA
Chloroethane	LCS	0.0095	94.6	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.0087	86.8		8.6	0-30	.01mg/L	10/26/98	VLA
Trichlorofluoromethane	LCS	0.01	103	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.0099	99		4	0-30	.01mg/L	10/26/98	VLA
1,1-Dichloroethene	LCS	0.0095	95.4	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.0094	93.8		1.7	0-30	.01mg/L	10/26/98	VLA
Methylene chloride	LCS	0.01	103	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.0098	98.3		4.7	0-30	.01mg/L	10/26/98	VLA
trans-1,2-Dichloroethene	LCS	0.0097	97.3	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.0096	96.2		1.1	0-30	.01mg/L	10/26/98	VLA



Client Kasilof Riverview
 Workorder Kasilof Riverview

QC Batch VXX 4473 (52632)
 Original
 Matrix Drinking Water

Prep Date 10/26/98 11:00
 Analysis Method EPA 524.2

QC results for Lab Check Standard [200892] - Lab Check Standard Duplicate [200893] (continued)

Parameter		QC Result	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analyzed	Instru ID
1,1-Dichloroethane	LCS	0.0095	94.6	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.0093	93.2		1.5	0-30	.01mg/L	10/26/98	VLA
2,2-Dichloropropane	LCS	0.01	103	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.01	100		3	0-30	.01mg/L	10/26/98	VLA
cis-1,2-Dichloroethene	LCS	0.01	102	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.01	99.6		2.4	0-30	.01mg/L	10/26/98	VLA
Bromochloromethane	LCS	0.011	105	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.01	101		3.9	0-30	.01mg/L	10/26/98	VLA
Chloroform	LCS	0.0099	99.1	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.0096	95.8		3.4	0-30	.01mg/L	10/26/98	VLA
1,1,1-Trichloroethane	LCS	0.01	101	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.0099	98.7		2.3	0-30	.01mg/L	10/26/98	VLA
Carbon tetrachloride	LCS	0.011	105	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.01	104		.96	0-30	.01mg/L	10/26/98	VLA
1,1-Dichloropropene	LCS	0.011	111	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.011	109		1.8	0-30	.01mg/L	10/26/98	VLA
Benzene	LCS	0.01	101	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.0099	99.2		1.8	0-30	.01mg/L	10/26/98	VLA
1,2-Dichloroethane	LCS	0.0095	95.1	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.0092	92.3		3	0-30	.01mg/L	10/26/98	VLA



Client Kasilof Riverview
 Workorder Kasilof Riverview

QC Batch VXX 4473 (52632)
 Original
 Matrix Drinking Water

Prep Date 10/26/98 11:00
 Analysis Method EPA 524.2

QC results for Lab Check Standard [200892] - Lab Check Standard Duplicate [200893] (continued)

Parameter		QC Result	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analyzed	Instru ID
Trichloroethene	LCS	0.01	104	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.01	102		1.9	0-30	.01mg/L	10/26/98	VLA
1,2-Dichloropropane	LCS	0.01	102	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.0098	98.2		3.8	0-30	.01mg/L	10/26/98	VLA
Dibromomethane	LCS	0.0098	98	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.0091	90.9		7.5	0-30	.01mg/L	10/26/98	VLA
Bromodichloromethane	LCS	0.0095	94.5	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.0093	92.7		1.9	0-30	.01mg/L	10/26/98	VLA
cis-1,3-Dichloropropene	LCS	0.0098	98.1	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.0096	95.5		2.7	0-30	.01mg/L	10/26/98	VLA
Toluene	LCS	0.01	105	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.01	102		2.9	0-30	.01mg/L	10/26/98	VLA
trans-1,3-Dichloropropene	LCS	0.0099	98.7	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.0094	94.2		4.7	0-30	.01mg/L	10/26/98	VLA
1,1,2-Trichloroethane	LCS	0.0099	99.4	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.0093	93.1		6.5	0-30	.01mg/L	10/26/98	VLA
Tetrachloroethene	LCS	0.012	116	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.011	112		3.5	0-30	.01mg/L	10/26/98	VLA
1,3-Dichloropropane	LCS	0.0098	97.5	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.0092	92.3		5.5	0-30	.01mg/L	10/26/98	VLA



Client Kasilof Riverview
 Workorder Kasilof Riverview

QC Batch VXX 4473 (52632)
 Original
 Matrix Drinking Water

Prep Date 10/26/98 11:00
 Analysis Method EPA 524.2

QC results for Lab Check Standard [200892] - Lab Check Standard Duplicate [200893] (continued)

Parameter		QC Result	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analyzed	Instru ID
Dibromochloromethane	LCS	0.011	108	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.01	102		5.7	0-30	.01mg/L	10/26/98	VLA
1,2-Dibromoethane	LCS	0.01	101	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.0097	97.3		3.7	0-30	.01mg/L	10/26/98	VLA
Chlorobenzene	LCS	0.01	104	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.01	103		.97	0-30	.01mg/L	10/26/98	VLA
1,1,1,2-Tetrachloroethane	LCS	0.011	108	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.011	107		.93	0-30	.01mg/L	10/26/98	VLA
Ethylbenzene	LCS	0.01	103	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.01	104		.97	0-30	.01mg/L	10/26/98	VLA
P & M -Xylene	LCS	0.021	106	70-130			.02mg/L	10/26/98	VLA
	LCSD	0.021	106		0	0-30	.02mg/L	10/26/98	VLA
o-Xylene	LCS	0.01	105	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.01	104		.96	0-30	.01mg/L	10/26/98	VLA
Styrene	LCS	0.01	103	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.01	101		2	0-30	.01mg/L	10/26/98	VLA
Bromoform	LCS	0.011	114	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.011	113		.88	0-30	.01mg/L	10/26/98	VLA
Isopropylbenzene (Cumene)	LCS	0.011	109	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.011	109		0	0-30	.01mg/L	10/26/98	VLA



Client Kasilof Riverview
 Workorder Kasilof Riverview

QC Batch VXX 4473 (52632)
 Original
 Matrix Drinking Water

Prep Date 10/26/98 11:00
 Analysis Method EPA 524.2

QC results for Lab Check Standard [200892] - Lab Check Standard Duplicate [200893] (continued)

Parameter		QC Result	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analyzed	Instru ID
Bromobenzene	LCS	0.011	112	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.011	112		0	0-30	.01mg/L	10/26/98	VLA
1,1,2,2-Tetrachloroethane	LCS	0.01	99.6	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.0098	98		1.6	0-30	.01mg/L	10/26/98	VLA
1,2,3-Trichloropropane	LCS	0.0098	97.8	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.0095	95.1		2.8	0-30	.01mg/L	10/26/98	VLA
n-Propylbenzene	LCS	0.011	107	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.011	107		0	0-30	.01mg/L	10/26/98	VLA
2-Chlorotoluene	LCS	0.01	104	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.01	105		.96	0-30	.01mg/L	10/26/98	VLA
4-Chlorotoluene	LCS	0.011	105	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.011	105		0	0-30	.01mg/L	10/26/98	VLA
1,3,5-Trimethylbenzene	LCS	0.011	108	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.011	108		0	0-30	.01mg/L	10/26/98	VLA
tert-Butylbenzene	LCS	0.011	111	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.011	112		.9	0-30	.01mg/L	10/26/98	VLA
1,2,4-Trimethylbenzene	LCS	0.011	109	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.011	110		.91	0-30	.01mg/L	10/26/98	VLA
sec-Butylbenzene	LCS	0.011	112	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.011	114		1.8	0-30	.01mg/L	10/26/98	VLA



Client Kasilof Riverview
 Workorder Kasilof Riverview

QC Batch VXX 4473 (52632)
 Original
 Matrix Drinking Water

Prep Date 10/26/98 11:00
 Analysis Method EPA 524.2

QC results for Lab Check Standard [200892] - Lab Check Standard Duplicate [200893] (continued)

Parameter		QC Result	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analyzed	Instru ID
1,3-Dichlorobenzene	LCS	0.011	113	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.011	113		0	0-30	.01mg/L	10/26/98	VLA
4-Isopropyltoluene	LCS	0.011	114	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.011	114		0	0-30	.01mg/L	10/26/98	VLA
1,4-Dichlorobenzene	LCS	0.011	115	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.011	115		0	0-30	.01mg/L	10/26/98	VLA
1,2-Dichlorobenzene	LCS	0.011	105	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.01	104		.96	0-30	.01mg/L	10/26/98	VLA
n-Butylbenzene	LCS	0.011	111	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.011	112		.9	0-30	.01mg/L	10/26/98	VLA
1,2-Dibromo-3-chloropropane	LCS	0.0098	98.4	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.0091	91.3		7.5	0-30	.01mg/L	10/26/98	VLA
1,2,4-Trichlorobenzene	LCS	0.011	113	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.011	113		0	0-30	.01mg/L	10/26/98	VLA
Hexachlorobutadiene	LCS	0.012	122	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.012	123		.82	0-30	.01mg/L	10/26/98	VLA
Naphthalene	LCS	0.01	104	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.01	103		.97	0-30	.01mg/L	10/26/98	VLA
1,2,3-Trichlorobenzene	LCS	0.011	110	70-130			.01mg/L	10/26/98	VLA
	LCSD	0.011	108		1.8	0-30	.01mg/L	10/26/98	VLA

CHAIN OF CUSTODY RECORD

986133

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CT&E Environmental Services Inc.
Laboratory Division

1 CLIENT: **GE RT** PHONE NO: () **277-2021**

CONTACT: **CHRIS HAWE** SITE:

PROJECT: **KASLOF RIVERVIEW**

REPORTS TO: **CHRIS HAWE** FAX NO: () **274-8603**

INVOICE TO: **BOE BROWNING** P.O. NUMBER:

KASLOF RIVERVIEW

PAGE 1 OF 3

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No. CONTAINERS	SAMPLE TYPE C - COMP G - GRAB	Analysis Required ③	Remarks
①	S1	10/15/98	1510	SOIL	1-803	G	AK101	
②	S2	10/15/98	1520	"	"	"	AK102	BTEX
③	S3	10/15/98	1530	"	"	"	AK102	EPA 524
④	S4	10/15/98	1540	"	"	"	AK101	
⑤	S5	10/16/98	1805	"	1-803 1-422	"	AK101	
⑥	S6	10/16/98	1810	"	1-803	"	AK101	
⑦	S7	10/16/98	1820	"	1-803 1-422	"	AK101	
⑧	S8	10/16/98	1830	"	"	"	AK101	
	TAP WATER	10/16/98	0030	"	2-404	"		
	TRIP BLANK							

4

Collected/Relinquished By: (1) *Chris Hawe*

Relinquished By: (2)

Relinquished By: (3)

Relinquished By: (4) *Frank Powell*

Received By: _____

Received By: _____

Received By: _____

Received For Laboratory By: _____

Received Date: 10/21/98 1200

Date: _____

Date: _____

Date: _____

Date: 10/21/98 1300

Requested Turnaround Time and Special Instructions:
STD. TURNAROUND

Requested Turnaround Time and Special Instructions:
STD. TURNAROUND

Requested Turnaround Time and Special Instructions:
STD. TURNAROUND

5

Samples Received Cold? (Circle) YES NO

Temperature °C: **4.2**

Chain of Custody Seal: (Circle)

INTACT BROKEN ABSENT

Data Deliverables Required
AOEC DATA Deliverable

Level I Level II Level III



Client Kasilof Riverview
Workorder Kasilof Riverview

QC Batch XXX 4831 (52660)
Original
Matrix Soil

Prep Date 10/27/98 13:00
Analysis Method AK102 DRO

QC results affect the following production samples:

986133001	986133002	986133003	986133004	986133005
986133006	986133013	986133016		

QC results for Method Blank [201016]

Run Instrument: HP 5890 Series II FID SV B R

Parameter	Analyzed	Result	PQL	Units
Diesel Range Organics	11/01/98	3.26 J	3.91	mg/Kg



Client Kasilof Riverview
Workorder Kasilof Riverview

QC Batch XXX 4831 (52660)
Original
Matrix Soil

Prep Date 10/27/98 13:00
Analysis Method AK102 DRO

QC results affect the following production samples:

986133001	986133002	986133003	986133004	986133005
986133006	986133013	986133016		

QC results for Lab Check Standard [201017] - Lab Check Standard Duplicate [201018]

Parameter		QC Result	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analyzed	Instru ID
Diesel Range Organics	LCS	242	73.2	60-120			331mg/Kg	11/01/98	SBR
	LCSD	260	79.6		8.4	0-20	331mg/Kg	11/01/98	SBR



Client Kasilof Riverview
Workorder Kasilof Riverview

QC Batch SPT 2507 (52487)
Original
Matrix Soil

Analysis Method SM18 2540G

QC results affect the following production samples:

986133001	986133002	986133003	986133004	986133005
986133006	986133007	986133008	986133009	986133010
986133011	986133012	986133013	986133014	986133015
986133016	986133017	986133018	986133019	986133020

QC results for Method Blank [200211]

Run Instrument:

Parameter	Analyzed	Result	PQL	Units
Total Solids	10/22/98	100		%



Client Kasilof Riverview
Workorder Kasilof Riverview

QC Batch SPT 2507 (52487)
Original 986133020
Matrix Soil

Analysis Method SM18 2540G

QC results affect the following production samples:

986133001	986133002	986133003	986133004	986133005
986133006	986133007	986133008	986133009	986133010
986133011	986133012	986133013	986133014	986133015
986133016	986133017	986133018	986133019	986133020

QC results for Duplicate [200212]

Parameter	Original Result	QC Result	RPD	RPD Limits	Analyzed	Instru ID
Total Solids	88.2	87.1	1.4		10/22/98	



Client Kasilof Riverview
Workorder Kasilof Riverview
QC Batch SPT 2508 (52489)
Original
Matrix Soil

Analysis Method SM18 2540G

QC results affect the following production samples:

986133021 986133022 986133023

QC results for Method Blank [200218]

Run Instrument:

Parameter	Analyzed	Result	PQL	Units
Total Solids	10/22/98	100		%



Client Kasilof Riverview
Workorder Kasilof Riverview

QC Batch SPT 2508 (52489)
Original 986127001
Matrix Soil

Analysis Method SM18 2540G

QC results affect the following production samples:

986133021 986133022 986133023

QC results for Duplicate [200219]

Parameter	Original Result	QC Result	RPD	RPD Limits	Analyzed	Instru ID
Total Solids	69.8	69.8	.13		10/22/98	



Client Kasilof Riverview
Workorder Kasilof Riverview

QC Batch VXX 4460 (52408)
Original
Matrix Soil

Prep Date 10/22/98 11:54
Analysis Method AK101/8020

QC results affect the following production samples:

Table with 5 columns of sample IDs: 986133005, 986133007, 986133008, 986133009, 986133010, 986133011, 986133012, 986133013, 986133014, 986133015, 986133016, 986133017, 986133018, 986133019, 986133020, 986133021, 986133022, 986133023

QC results for Method Blank [199989]

Run Instrument: HP 5890 Series II PID+FID VCA

Table with 5 columns: Parameter, Analyzed, Result, PQL, Units. Rows include Gasoline Range Organics, Benzene, Toluene, Ethylbenzene, P & M -Xylene, o-Xylene.



Client Kasilof Riverview
 Workorder Kasilof Riverview
 QC Batch VXX 4460 (52408)
 Original
 Matrix Soil

Prep Date 10/22/98 11:54
 Analysis Method AK101/8020

QC results affect the following production samples:

986133005	986133007	986133008	986133009	986133010
986133011	986133012	986133013	986133014	986133015
986133016	986133017	986133018	986133019	986133020
986133021	986133022	986133023		

QC results for Lab Check Standard [199990] - Lab Check Standard Duplicate [199991]

Parameter		QC Result	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analyzed	Instru ID
Gasoline Range Organics	LCS	46.9	104	60-120			45mg/Kg	10/22/98	VCA
	LCSD	44.4	98.6		5.3	0-25	45mg/Kg	10/22/98	VCA
Benzene	LCS	2.16	89.8	60-120			2.4mg/Kg	10/22/98	VCA
	LCSD	2.24	93.5		4	0-25	2.4mg/Kg	10/22/98	VCA
Toluene	LCS	7.68	92.8	60-120			8.28mg/Kg	10/22/98	VCA
	LCSD	7.92	95.6		3	0-25	8.28mg/Kg	10/22/98	VCA
Ethylbenzene	LCS	1.41	104	60-120			1.36mg/Kg	10/22/98	VCA
	LCSD	1.44	106		1.9	0-25	1.36mg/Kg	10/22/98	VCA
P & M -Xylene	LCS	5.02	102	60-120			4.92mg/Kg	10/22/98	VCA
	LCSD	5.11	104		1.9	0-25	4.92mg/Kg	10/22/98	VCA
o-Xylene	LCS	1.86	101	60-120			1.84mg/Kg	10/22/98	VCA
	LCSD	1.92	104		2.9	0-25	1.84mg/Kg	10/22/98	VCA