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December 3, 2004

Mr. Ernest W. Piper, A.V.P.
Health, Safety, and Environmental Department
Alaska Railroad Corporation
P.O. Box 107500
Anchorage, AK 99510-7500

Re: Alaska Railroad Corporation, Anchorage Terminal Reserve RI/FS
Administrative Order on Consent EPA Docket No. CERCLA 10-2004-0065
North Boundary Assessment Groundwater and Soil Results

Dear Mr. Gusmano:

This letter report provides a summary of soil and groundwater analytical results collected along the North Bluff of the Anchorage Terminal Reserve, (the Site). The sampling was conducted under guidance provided in the North Boundary Assessment Work Plan (RETEC, 2004) and fulfills groundwater and sampling requirements specified in the scope of work under the Administrative Order on Consent for the site. The purpose of this work was to identify potential upgradient sources of petroleum hydrocarbons, solvents and metals on the northern boundary of the site This information will help guide decisions regarding further background investigation during the remedial investigation (RI).

Introduction and Background

During the week of September 13, 2004 groundwater samples were collected from 20 spring locations along the North Bluff. Six soil samples were co-located with springs that exhibited possible petroleum–related odors and/or a sheen. Groundwater and soil samples were analyzed for the target analyte list of constituents provided in the work plan, including:

- VOCs by EPA Method 8260
- SVOCs by EPA Method 8270
- Gasoline Range Organics (GRO) by AK-101
- Diesel Range Organics (DRO) by AK-102
- Residual Range Organics (RRO) by AK-103

At the request of EPA, dissolved metals analysis was added to the groundwater sample target analyte list and total metals were added to the soil target analyte list. Metals for both media included the RCRA 8 list by method 6010/7000 series.

Soil and groundwater sampling procedures closely followed guidance provided in the work plan (RETEC, 2004). Deviations from the work plan were limited to the addition of metals to the target analyte list (discussed above), and the deletion of two sampling locations. Sampling location SP04 was not sampled because a seep was not present at the time samples were collected (note that some of the seeps are ephemeral). Sampling location OU 5 SP15 was not sampled because at the time samples were collected OU 5 SP15 was a stagnant pond whose waters were interpreted not to be

representative of groundwater (Figure 1). An alternate sampling location, SP01, was sampled in place of SP04.

Groundwater Results

Summaries of VOCs, SVOCs, fuel range hydrocarbons and metals in groundwater are provided in Tables 1, 2, and 3, respectively. Field sampling forms, photographs of the sample locations, and data validation reports are provided in Attachments 1 through 3, respectively. The tables include human health screening levels compiled from the lowest value between ADEC 18 AAC 75, EPA maximum contaminant level/drinking water equivalent levels MCL/DWELs, and EPA Region IX preliminary remediation goals (PRGs). Detected compounds are shown in bold face, compounds above the human health screening levels are bolded and shaded.

Nineteen VOC and five SVOC compounds were present above analytical detection limits across the northern boundary springs (Tables 1 and 2). Of these, only three VOCs (1,2,4-trimethylbenzene, benzene and TCE) exceeded groundwater screening criteria. Benzene and 1,2,4 trimethylbenzene exceeded the screening criteria at SP35 east of the bluff dig area (Figure 1, Table 1). Of the 20 springs sampled, SP35 was the only spring that exhibited both a petroleum odor and sheen. At SP35, 12 VOCs and three SVOCs were detected and attributed to petroleum hydrocarbons (diesel or aviation fuels), solvents (TCE), or degradation products of solvents (1,1,1 trichloroethane, 1,1-dichloroethane) with the exception of acetone. Acetone is a common laboratory artifact. TCE groundwater concentrations exceeded screening criteria at three locations, SP41, SP48, and SP49 toward the eastern end of the northern boundary.

Concentrations of DRO and RRO exceeded screening levels at SP12 and represent the only location sampled west of the knob area that exceeded regulatory standards (Figure 2, Table 2). Both GRO and DRO were above screening levels at SP35. Dissolved metals concentrations were largely below analytical detection limits across the northern boundary with the exception of barium and cadmium. Barium was ubiquitous across the site, but below screening levels in all samples (Table 3). Dissolved cadmium was detected at only SP 12 at a concentration of 0.0093 mg/L and above the screening level of 0.005 mg/L (Table 3)

Soil Results

Summaries of VOCs, SVOCs, fuel range hydrocarbons and metals in soil are provided in Tables 4, 5, and 6, respectively. The tables include screening levels derived from the lowest of the residential human health value between ADEC 18 AAC 75 standards and EPA Region IX PRGs. Similar to the groundwater tables, detected compounds are in bold face. Figures 3 shows benzene, TCE, and naphthalene results by location and Figure 4 shows and fuel range analysis (GRO, DRO, and RRO) results by sample location.

A total of 15 VOC and five SVOC compounds were detected in north boundary soil samples (Tables 4 and 5). None of these compounds were present above human health soil screening levels. Thirteen of the detected VOCs and four of the five detected SVOCs were common to SP35 and likely related to petroleum hydrocarbons. Benzene, TCE, and naphthalene results are shown on Figure 3. Figure 4 shows the fuel range results (GRO, DRO, and RRO) along the Northern Boundary. Detectable DRO and RRO concentrations were present in all six soil samples but below soil screening levels in all instances. In the absence of specific VOC and SVOC compounds, these low level detections may represent naturally occurring organic material and not be representative of petroleum hydrocarbons. Gasoline Range Organics were detected at three locations (SO30, SO34, and SO35), each of which was below screening levels. Metals results from all soil sample locations were below the human health screening levels (Table 6).

Conclusions

Groundwater and soil samples were collected from 20 spring locations across the northern site boundary from east of the ARRC shop areas to approximately Reeve Boulevard. Analytical results from the groundwater samples show low levels of several VOC compounds including benzene and TCE (which were previously identified constituents of interest within Elmendorf Air Force Base Operable Unit 5 (OU5)). Based on the existing data set, seeps with benzene and TCE concentrations exceeding human health screening levels (5 µg/L) are along the eastern side of the northern boundary and emanate from OU5. Groundwater from seeps in this area is generally thought to be collected and treated by the OU 5 remediation system. However, testing has not been conducted to verify this assumption. Of the 20 springs sampled, SP35 was the only one with clearly discernable hydrocarbon odor and sheen. Groundwater and co-located soil samples collected from this location contain the widest range of detectable VOC, SVOC, and fuel range compounds, including benzene, trimethylbenzenes, naphthalene, GRO and DRO. The SP35 location appears to be affected by an old fuel spill or source not related the TCE solvent plumes from OU5. The SP35 location reportedly coincides with a known diesel spill area from the late 1950s (USAF, 1994).

Fuel range analytical results indicate another possible source of fuel impacts may exist at SP12, west of the bluff dig area. The groundwater samples at SP12 contained concentrations of DRO and RRO above human health screening criteria, however, there were no detectable VOCs or SVOCs at this location. In the absence of specific petroleum hydrocarbon compounds at SP12, the DRO and RRO concentrations may be due to naturally occurring organic compounds. Overall, the soil analytical results were generally low and there were no exceedances of soil ingestion screening criteria in any of the samples analyzed. The contaminants identified during this investigation appear to be traveling within groundwater from sources upgradient of the springs.

Groundwater contaminants identified from this investigation are located primary along the OU5 segment, or eastern portion of the North Bluff. This area is thought to be within the capture zone of an operating remediation system that collects seep drainage along the base of the North Bluff. The collected water is pumped to an aeration cell and polished in a constructed wetland prior to discharge to Ship Creek. The presence and concentration of contaminants that by pass OU5 treatment system is not currently known. If hydraulic communication exists from the North Bluff to the Ship Creek Alluvium below the active railyard, a pathway for contaminants such as TCE and benzene to Ship Creek may exist. The potential migration of contaminants from the OU-5 and SP35 areas into the Ship Creek rail yard area may be included in the 2005 Remedial Investigation Work Plan.

Please feel free to contact me at 970.493.3700 or Chris Cosentini at 303.271.2129 if you have any questions.

Sincerely,

Bjorn Selvig
Project Geologist

Attachments:

References:

RETEC, 2004. *Draft North Boundary Assessment Interim Action Work Plan.* Prepared for Alaska Railroad Corporation, August 30.

USAF, 1994. *Operable Unit 5, Remedial Investigation/Feasibility Study, Volume 1-Text*. Prepared by Radian Corporation. March.

Table 1 North Boundary Assessment
Groundwater VOC Data Collected From Springs
Alaska Railroad Corporation, Anchorage, AK

		Sample ID	SP01-091304	SP07-091304	SP10-091304	SP12-091304	SP16-091304	SP19-091304	SP24-091304	SP26-091404
		Sample Date	9/13/2004	9/13/2004	9/13/2004	9/13/2004	9/13/2004	9/13/2004	9/13/2004	9/14/2004
		Sample Matrix	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep
Analyte	**GW Screening Level**									
Volatile Organics by Method 8260B	**ug/L**	**Units**								
1,1,1,2-Tetrachloroethane	1	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,1,1-Trichloroethane	200	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,1,2,2-Tetrachloroethane	4	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,1,2-Trichloro-1,2,2-trifluoroethane	NA	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,1,2-Trichloroethane	5	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,1-Dichloroethane	3,650	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,1-Dichloroethene	7	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,1-Dichloropropene	NA	ug/L	< 25	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5
1,2,3-Trichlorobenzene	NA	ug/L	< 28	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8
1,2,3-Trichloropropane	0.2	ug/L	< 25	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5
1,2,4-Trichlorobenzene	70	ug/L	< 27	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7
1,2,4-Trimethylbenzene	12	ug/L	< 27	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7
1,2-Dibromo-3-chloropropane	4.8E-02	ug/L	< 100	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,2-Dibromoethane	5.0E-02	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,2-Dichlorobenzene	600	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,2-Dichloroethane	5	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,2-Dichloropropane	5	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,3,5-Trimethylbenzene	12	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,3-Dichlorobenzene	1,100	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,3-Dichloropropane	NA	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,4-Dichlorobenzene	75	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
2,2-Dichloropropane	1	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
2-Butanone	22,000	ug/L	< 500	< 50	< 50	< 50	< 50	< 50	< 50	< 50
2-Chloroethylvinyl ether	NA	ug/L	< 100	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Chlorotoluene	120	ug/L	< 21	< 2.1	< 2.1	< 2.1	< 2.1	< 2.1	< 2.1	< 2.1
2-Hexanone	NA	ug/L	< 200	< 20	< 20	< 20	< 20	< 20	< 20	< 20
4-Chlorotoluene	NA	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
4-Isopropyl toluene	#N/A	ug/L	< 28	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8
4-Methyl-2-pentanone	158	ug/L	< 200	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Acetone	3,650	ug/L	< 500	< 50 U	< 50 U	< 50	< 50	< 50	< 50 U	< 50
Acrylonitrile	#N/A	ug/L	< 100	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	5	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Bromobenzene	20	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Bromochloromethane	0.5	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Bromodichloromethane	100	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Bromoform	100	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Bromomethane	50	ug/L	< 50	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Carbon disulfide	3,650	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon tetrachloride	5	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Chlorobenzene	100	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Chloroethane	5	ug/L	< 50	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroform	100	ug/L	< 20	**2.6**	< 2.0	< 2.0	**0.68 J**	**0.78 J**	< 2.0	**4.8 J**
Chloromethane	100	ug/L	< 50	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
cis-1,2-Dichloroethene	70	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
cis-1,3-Dichloropropene	9	ug/L	< 23	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3
Dibromochloromethane	700	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dibromomethane	NA	ug/L	< 22	< 2.2	< 2.2	< 2.2	< 2.2	< 2.2	< 2.2	< 2.2
Dichlorodifluoromethane	7,300	ug/L	< 50	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	700	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Hexachlorobutadiene	10	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0

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Alaska Railroad Corporation, Anchorage, AK

		Sample ID	SP01-091304	SP07-091304	SP10-091304	SP12-091304	SP16-091304	SP19-091304	SP24-091304	SP26-091404
		Sample Date	9/13/2004	9/13/2004	9/13/2004	9/13/2004	9/13/2004	9/13/2004	9/13/2004	9/14/2004
		Sample Matrix	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep
Analyte	**GW Screening Level**									
Isopropylbenzene	3,650	ug/L	< 26	< 2.6	< 2.6	< 2.6	< 2.6	< 2.6	< 2.6	< 2.6
m&p-Xylene	10,000	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Methyl Iodide	#N/A	ug/L	< 50	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Methyl tert-Butyl Ether	13	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Methylene chloride	5	ug/L	< 50	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Naphthalene	700	ug/L	< 27	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7
n-Butylbenzene	240	ug/L	< 27	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7
n-Propylbenzene	240	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
o-Xylene	70	ug/L	< 23	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3
sec-Butylbenzene	240	ug/L	< 22	< 2.2	< 2.2	< 2.2	< 2.2	< 2.2	< 2.2	< 2.2
Styrene	100	ug/L	< 23	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3
tert-Butylbenzene	240	ug/L	< 30	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Tetrachloroethene	5	ug/L	< 24	< 2.4	< 2.4	< 2.4	< 2.4	< 2.4	< 2.4	< 2.4
Toluene	1,000	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
trans-1,2-Dichloroethene	100	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
trans-1,3-Dichloropropene	9	ug/L	< 21	< 2.1	< 2.1	< 2.1	< 2.1	< 2.1	< 2.1	< 2.1
trans-1,4-Dichloro-2-butene	#N/A	ug/L	< 100	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Trichloroethene	5	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichlorofluoromethane	10,000	ug/L	< 20	< 2.0	< 2.0	< 2.0	**0.67 J**	**0.67 J**	< 2.0	< 2.0
Vinyl Acetate	36,500	ug/L	< 50	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl chloride	2	ug/L	< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0

Notes:
NA = not available
ADEC = Alaska Department of Environmental Conservation
mg/L = milligrams per liter
µg/L = micrograms per liter

References:
3) U.S. EPA, 2002. 2002 Edition of the Drinking Water Standards and Health Advisories. MCLs and DWELs. EPA 822R02038. Office of Water. Summer 2002.
4) ADEC, 2003. 18 AAC 75 Oil and Other Hazardous Substances Pollution Control. State of Alaska Department of Environmental Conservation. Table B1 and C in 18 AAC 75.345(b) Soil and Groundwater Clea
5) US. EPA, 2002. Region IX Preliminary Remediation Goals (PRGs). Available at U.S. EPA Region IX website:
www.epa.gov/region 09/waste/sfund/prg/intro.htm October, 2002.

Table 1 North Boundary Assessment
Groundwater VOC Data Collected From Springs
Alaska Railroad Corporation, Anchorage, AK

		Sample ID	SP26-091404 Dup	SP27-091404	SP30-091404	SP30-091404 Dup	SP33-091404	SP34-091404	SP35-091404	SP36-091404	SP40-091404	SP41-091404
		Sample Date	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004
		Sample Matrix	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep
Analyte	**GW Screening Level**											
Volatile Organics by Method 8260B	**ug/L**	**Units**										
1,1,1,2-Tetrachloroethane	1	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 4.0	< 2.0	< 2.0	< 2.0
1,1,1-Trichloroethane	200	ug/L	< 2.0	< 2.0	**1.1 J**	< 2.0	**5.7**	**2.7**	< 4.0	< 2.0	< 2.0	< 2.0
1,1,2,2-Tetrachloroethane	4	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 4.0	< 2.0	< 2.0	< 2.0
1,1,2-Trichloro-1,2,2-trifluoroethane	NA	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 4.0	< 2.0	< 2.0	< 2.0
1,1,2-Trichloroethane	5	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 4.0	< 2.0	< 2.0	< 2.0
1,1-Dichloroethane	3,650	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	**1.2 J**	**5.9**	< 4.0	< 2.0	< 2.0	< 2.0
1,1-Dichloroethene	7	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 4.0	< 2.0	< 2.0	< 2.0
1,1-Dichloropropene	NA	ug/L	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 5.0	< 2.5	< 2.5	< 2.5
1,2,3-Trichlorobenzene	NA	ug/L	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 5.6	< 2.8	< 2.8	< 2.8
1,2,3-Trichloropropane	0.2	ug/L	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 4.9	< 2.5	< 2.5	< 2.5
1,2,4-Trichlorobenzene	70	ug/L	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 5.5	< 2.7	< 2.7	< 2.7
1,2,4-Trimethylbenzene	12	ug/L	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	**85**	< 2.7	< 2.7	< 2.7
1,2-Dibromo-3-chloropropane	4.8E-02	ug/L	< 10	< 10	< 10	< 10	< 10	< 10	< 20	< 10	< 10	< 10
1,2-Dibromoethane	5.0E-02	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 4.0	< 2.0	< 2.0	< 2.0
1,2-Dichlorobenzene	600	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 4.0	< 2.0	< 2.0	< 2.0
1,2-Dichloroethane	5	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 4.0	< 2.0	< 2.0	< 2.0
1,2-Dichloropropane	5	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 4.0	< 2.0	< 2.0	< 2.0
1,3,5-Trimethylbenzene	12	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	**11**	< 2.0	< 2.0	< 2.0
1,3-Dichlorobenzene	1,100	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 4.0	< 2.0	< 2.0	< 2.0
1,3-Dichloropropane	NA	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 4.0	< 2.0	< 2.0	< 2.0
1,4-Dichlorobenzene	75	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 4.0	< 2.0	< 2.0	< 2.0
2,2-Dichloropropane	1	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 4.0	< 2.0	< 2.0	< 2.0
2-Butanone	22,000	ug/L	< 50	< 50	< 50	< 50	< 50	< 50	< 100	< 50	< 50	< 50
2-Chloroethylvinyl ether	NA	ug/L	< 10	< 10	< 10	< 10	< 10	< 10	< 20	< 10	< 10	< 10
2-Chlorotoluene	120	ug/L	< 2.1	< 2.1	< 2.1	< 2.1	< 2.1	< 2.1	< 4.2	< 2.1	< 2.1	< 2.1
2-Hexanone	NA	ug/L	< 20	< 20	< 20	< 20	< 20	< 20	< 40	< 20	< 20	< 20
4-Chlorotoluene	NA	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 4.0	< 2.0	< 2.0	< 2.0
4-Isopropyl toluene	#N/A	ug/L	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	**4.4 J**	< 2.8	< 2.8	< 2.8
4-Methyl-2-pentanone	158	ug/L	< 20	< 20	< 20	< 20	< 20	< 20	< 40	< 20	< 20	< 20
Acetone	3,650	ug/L	< 50	< 50	< 50	< 50	< 50	**7.1 J**	**8.5 J**	**6.6 J**	**3.1 J**	< 50
Acrylonitrile	#N/A	ug/L	< 10	< 10	< 10	< 10	< 10	< 10	< 20	< 10	< 10	< 10
Benzene	5	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	**8.3**	< 2.0	< 2.0	< 2.0
Bromobenzene	20	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 4.0	< 2.0	< 2.0	< 2.0
Bromochloromethane	0.5	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 4.1	< 2.0	< 2.0	< 2.0
Bromodichloromethane	100	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 4.0	< 2.0	< 2.0	< 2.0
Bromoform	100	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 4.0	< 2.0	< 2.0	< 2.0
Bromomethane	50	ug/L	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 10	< 5.0	< 5.0	< 5.0
Carbon disulfide	3,650	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 4.0	< 2.0	< 2.0	< 2.0
Carbon tetrachloride	5	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 4.0	< 2.0	< 2.0	< 2.0
Chlorobenzene	100	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 4.0	< 2.0	< 2.0	< 2.0
Chloroethane	5	ug/L	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 10	< 5.0	< 5.0	< 5.0
Chloroform	100	ug/L	**7.6 J**	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 4.0	< 2.0	< 2.0	< 2.0
Chloromethane	100	ug/L	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 10	< 5.0	< 5.0	< 5.0
cis-1,2-Dichloroethene	70	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 4.0	< 2.0	**1.9 J**	**4.6**
cis-1,3-Dichloropropene	9	ug/L	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3	< 4.7	< 2.3	< 2.3	< 2.3
Dibromochloromethane	700	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 4.0	< 2.0	< 2.0	< 2.0
Dibromomethane	NA	ug/L	< 2.2	< 2.2	< 2.2	< 2.2	< 2.2	< 2.2	< 4.3	< 2.2	< 2.2	< 2.2
Dichlorodifluoromethane	7,300	ug/L	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 10	< 5.0	< 5.0	< 5.0
Ethylbenzene	700	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	**4.7**	< 2.0	< 2.0	< 2.0
Hexachlorobutadiene	10	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 4.0	< 2.0	< 2.0	< 2.0

Table 1 North Boundary Assessment
Groundwater VOC Data Collected From Springs
Alaska Railroad Corporation, Anchorage, AK

		Sample ID	SP26-091404 Dup	SP27-091404	SP30-091404	SP30-091404 Dup	SP33-091404	SP34-091404	SP35-091404	SP36-091404	SP40-091404	SP41-091404
		Sample Date	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004
		Sample Matrix	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep
Analyte	**GW Screening Level**											
Isopropylbenzene	3,650	ug/L	< 2.6	< 2.6	< 2.6	< 2.6	< 2.6	< 2.6	**6.5**	< 2.6	< 2.6	< 2.6
m&p-Xylene	10,000	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	**29**	< 2.0	< 2.0	< 2.0
Methyl Iodide	#N/A	ug/L	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 10	< 5.0	< 5.0	< 5.0
Methyl tert-Butyl Ether	13	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 4.0	< 2.0	< 2.0	< 2.0
Methylene chloride	5	ug/L	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 10	< 5.0	< 5.0	< 5.0
Naphthalene	700	ug/L	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	**43**	**2.1 J**	< 2.7	< 2.7
n-Butylbenzene	240	ug/L	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	**2.2 J**	< 2.7	< 2.7	< 2.7
n-Propylbenzene	240	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	**7.4**	< 2.0	< 2.0	< 2.0
o-Xylene	70	ug/L	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3	< 4.5	< 2.3	< 2.3	< 2.3
sec-Butylbenzene	240	ug/L	< 2.2	< 2.2	< 2.2	< 2.2	< 2.2	< 2.2	**2.5 J**	< 2.2	< 2.2	< 2.2
Styrene	100	ug/L	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3	< 4.5	< 2.3	< 2.3	< 2.3
tert-Butylbenzene	240	ug/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 5.9	< 3.0	< 3.0	< 3.0
Tetrachloroethene	5	ug/L	< 2.4	< 2.4	< 2.4	< 2.4	< 2.4	< 2.4	< 4.8	< 2.4	< 2.4	< 2.4
Toluene	1,000	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 4.0	< 2.0	< 2.0	< 2.0
trans-1,2-Dichloroethene	100	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 4.0	< 2.0	< 2.0	< 2.0
trans-1,3-Dichloropropene	9	ug/L	< 2.1	< 2.1	< 2.1	< 2.1	< 2.1	< 2.1	< 4.2	< 2.1	< 2.1	< 2.1
trans-1,4-Dichloro-2-butene	#N/A	ug/L	< 10	< 10	< 10	< 10	< 10	< 10	< 20	< 10	< 10	< 10
Trichloroethene	5	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	**2.6**	< 2.0	< 4.0	< 2.0	< 2.0	**7.9**
Trichlorofluoromethane	10,000	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 4.0	< 2.0	< 2.0	< 2.0
Vinyl Acetate	36,500	ug/L	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 10	< 5.0	< 5.0	< 5.0
Vinyl chloride	2	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 4.0	< 2.0	< 2.0	< 2.0

Notes:
NA = not available
ADEC = Alaska Department of Environmental Conservation
mg/L = milligrams per liter
µg/L = micrograms per liter

References:
3) U.S. EPA, 2002. 2002 Edition of the Drinking Water Standards and Health Advisories. M
4) ADEC, 2003. 18 AAC 75 Oil and Other Hazardous Substances Pollution Control. State anup Levels
5) US. EPA, 2002. Region IX Preliminary Remediation Goals (PRGs). Available at U.S. EPA Region I
www.epa.gov/region 09/waste/sfund/prg/intro.htm October, 2002.

Table 1 North Boundary Assessment
Groundwater VOC Data Collected From Springs
Alaska Railroad Corporation, Anchorage, AK

		Sample ID	SP46-091404	SP48-091404	SP49-091404	SP50-091404	EB10-091504	FB10-091504	Trip Blank-091304	Trip Blank-091404	Trip BlankW-091504
		Sample Date	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/15/2004	9/15/2004	9/13/2004	9/14/2004	9/15/2004
		Sample Matrix	GW seep	GW seep	GW seep	GW seep	Water QC	Water QC	Water QC	Water QC	Water QC
Analyte	**GW Screening Level**										
Volatile Organics by Method 8260B	**ug/L**	**Units**									
1,1,1,2-Tetrachloroethane	1	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,1,1-Trichloroethane	200	ug/L	< 2.0	< 2.0	**12**	**1.6 J**	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,1,2,2-Tetrachloroethane	4	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,1,2-Trichloro-1,2,2-trifluoroethane	NA	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,1,2-Trichloroethane	5	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,1-Dichloroethane	3,650	ug/L	< 2.0	< 2.0	**1.5 J**	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,1-Dichloroethene	7	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,1-Dichloropropene	NA	ug/L	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5
1,2,3-Trichlorobenzene	NA	ug/L	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8
1,2,3-Trichloropropane	0.2	ug/L	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5
1,2,4-Trichlorobenzene	70	ug/L	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7
1,2,4-Trimethylbenzene	12	ug/L	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7
1,2-Dibromo-3-chloropropane	4.8E-02	ug/L	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,2-Dibromoethane	5.0E-02	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,2-Dichlorobenzene	600	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,2-Dichloroethane	5	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,2-Dichloropropane	5	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,3,5-Trimethylbenzene	12	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,3-Dichlorobenzene	1,100	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,3-Dichloropropane	NA	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,4-Dichlorobenzene	75	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
2,2-Dichloropropane	1	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
2-Butanone	22,000	ug/L	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
2-Chloroethylvinyl ether	NA	ug/L	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-Chlorotoluene	120	ug/L	< 2.1	< 2.1	< 2.1	< 2.1	< 2.1	< 2.1	< 2.1	< 2.1	< 2.1
2-Hexanone	NA	ug/L	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
4-Chlorotoluene	NA	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
4-Isopropyl toluene	#N/A	ug/L	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8
4-Methyl-2-pentanone	158	ug/L	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Acetone	3,650	ug/L	< 50	**2.5 J**	**3.7 J**	< 50	**2.7 J**	< 50	**3.8**	< 50	< 50
Acrylonitrile	#N/A	ug/L	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	5	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Bromobenzene	20	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Bromochloromethane	0.5	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Bromodichloromethane	100	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Bromoform	100	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Bromomethane	50	ug/L	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Carbon disulfide	3,650	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon tetrachloride	5	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Chlorobenzene	100	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Chloroethane	5	ug/L	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroform	100	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Chloromethane	100	ug/L	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
cis-1,2-Dichloroethene	70	ug/L	**1.9 J**	**1.6 J**	**1.1 J**	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
cis-1,3-Dichloropropene	9	ug/L	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3
Dibromochloromethane	700	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dibromomethane	NA	ug/L	< 2.2	< 2.2	< 2.2	< 2.2	< 2.2	< 2.2	< 2.2	< 2.2	< 2.2
Dichlorodifluoromethane	7,300	ug/L	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	700	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Hexachlorobutadiene	10	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0

Table 1 North Boundary Assessment
Groundwater VOC Data Collected From Springs
Alaska Railroad Corporation, Anchorage, AK

		Sample ID	SP46-091404	SP48-091404	SP49-091404	SP50-091404	EB10-091504	FB10-091504	Trip Blank-091304	Trip Blank-091404	Trip BlankW-091504
		Sample Date	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/15/2004	9/15/2004	9/13/2004	9/14/2004	9/15/2004
		Sample Matrix	GW seep	GW seep	GW seep	GW seep	Water QC	Water QC	Water QC	Water QC	Water QC
Analyte	**GW Screening Level**										
Isopropylbenzene	3,650	ug/L	< 2.6	< 2.6	< 2.6	< 2.6	< 2.6	< 2.6	< 2.6	< 2.6	< 2.6
m&p-Xylene	10,000	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Methyl Iodide	#N/A	ug/L	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Methyl tert-Butyl Ether	13	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Methylene chloride	5	ug/L	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Naphthalene	700	ug/L	< 2.7	< 2.7	< 2.7	< 2.7	**3.0**	< 2.7	< 2.7	< 2.7	< 2.7
n-Butylbenzene	240	ug/L	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7
n-Propylbenzene	240	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
o-Xylene	70	ug/L	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3
sec-Butylbenzene	240	ug/L	< 2.2	< 2.2	< 2.2	< 2.2	< 2.2	< 2.2	< 2.2	< 2.2	< 2.2
Styrene	100	ug/L	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3
tert-Butylbenzene	240	ug/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Tetrachloroethene	5	ug/L	< 2.4	< 2.4	< 2.4	< 2.4	< 2.4	< 2.4	< 2.4	< 2.4	< 2.4
Toluene	1,000	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
trans-1,2-Dichloroethene	100	ug/L	**0.87 J**	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
trans-1,3-Dichloropropene	9	ug/L	< 2.1	< 2.1	< 2.1	< 2.1	< 2.1	< 2.1	< 2.1	< 2.1	< 2.1
trans-1,4-Dichloro-2-butene	#N/A	ug/L	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Trichloroethene	5	ug/L	**1.5 J**	**15**	**6.7**	**2.5**	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichlorofluoromethane	10,000	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Vinyl Acetate	36,500	ug/L	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl chloride	2	ug/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0

Notes:
NA = not available
ADEC = Alaska Department of Environmental Conservation
mg/L = milligrams per liter
µg/L = micrograms per liter

References:
3) U.S. EPA, 2002. 2002 Edition of the Drinking Water Standards and Health Advisories. M
4) ADEC, 2003. 18 AAC 75 Oil and Other Hazardous Substances Pollution Control. State
5) US. EPA, 2002. Region IX Preliminary Remediation Goals (PRGs). Available at U.S. EPA Region IX
www.epa.gov/region 09/waste/sfund/prg/intro.htm October, 2002.

Table 2 North Boundary Assessment
Groundwater SVOC Data Collected From Springs
Alaska Railroad Corporation, Anchorage, AK

		Sample ID	SP01-091304	SP07-091304	SP10-091304	SP12-091304	SP16-091304	SP19-091304	SP24-091304	SP26-091404	SP26-091404 D	SP27-091404	SP30-091404	SP30-091404 D
		Sample Date	9/13/2004	9/13/2004	9/13/2004	9/13/2004	9/13/2004	9/13/2004	9/13/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004
		Sample Matrix	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep
Analyte	**GW Screening Level**													
Semivolatile Organics by Method 8270C	**ug/L**	**Units**												
1,2,4-Trichlorobenzene	70	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
1,2-Dichlorobenzene	600	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
1,3-Dichlorobenzene	1,100	ug/L	< 5.4 UJ	< 5.2 UJ	< 5.2 UJ	< 6.1 UJ	< 5.2 UJ	< 5.2 UJ	< 5.8 UJ	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
2,2'-Oxybis(1-Chloropropane)	1,000	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
2,4,5-Trichlorophenol	3,650	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
2,4,6-Trichlorophenol	77	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
2,4-Dichlorophenol	100	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
2,4-Dimethylphenol	700	ug/L	< 27	< 26	< 26	< 30	< 26	< 26	< 29	< 29 UJ	< 31	< 31	< 28	< 28
2,4-Dinitrophenol	70	ug/L	< 110 UJ	< 100 UJ	< 100 UJ	< 120 UJ	< 100 UJ	< 100 UJ	< 120 UJ	< 120	< 120	< 120	< 110	< 110
2,4-Dinitrotoluene	1	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
2,6-Dinitrotoluene	1	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
2-Chloronaphthalene	2,900	ug/L	< 11	< 10	< 10	< 12	< 10	< 10	< 12	< 12	< 13	< 13	< 11	< 11
2-Chlorophenol	200	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
2-Methylnaphthalene	780	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
2-Methylphenol	1,800	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
2-Nitroaniline	1	ug/L	< 110	< 100	< 100	< 120	< 100	< 100	< 120	< 120	< 120	< 120	< 110	< 110
2-Nitrophenol	300	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
3,3'-Dichlorobenzidine	2	ug/L	< 22	< 21	< 21	< 24	< 21	< 21	< 23	< 24 UJ	< 25	< 25	< 22	< 22
3-Nitroaniline	NA	ug/L	< 54	< 52	< 52	< 61	< 52	< 52	< 58	< 59	< 63	< 63	< 56	< 56
4,6-Dinitro-2-methylphenol	NA	ug/L	< 27	< 26	< 26	< 30	< 26	< 26	< 29	< 29	< 31	< 31	< 28	< 28
4-Bromophenyl-phenylether	NA	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
4-Chloro-3-methylphenol	NA	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
4-Chloroaniline	150	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
4-Chlorophenyl-phenylether	NA	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
4-Methylphenol	182	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
4-Nitroaniline	NA	ug/L	< 54	< 52	< 52	< 61	< 52	< 52	< 58	< 59	< 63	< 63	< 56	< 56
4-Nitrophenol	300	ug/L	< 110	< 100	< 100	< 120	< 100	< 100	< 120	< 120	< 120	< 120	< 110	< 110
Acenaphthene	2,200	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
Acenaphthylene	2,200	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
Aniline	12	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
Anthracene	11,000	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
Benzidine	#N/A	ug/L	< 220 R	< 210 R	< 210 R	< 240 R	< 210 R	< 210 R	< 230 R	< 240 UJ	< 250 UJ	< 250 UJ	< 220 UJ	< 220 UJ
Benzo(a)anthracene	1	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
Benzo(a)pyrene	0	ug/L	< 5.4 UJ	< 5.2	< 5.2	< 6.1	< 5.2 UJ	< 5.2 UJ	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
Benzo(b)fluoranthene	1	ug/L	< 5.4 UJ	< 5.2	< 5.2	< 6.1	< 5.2 UJ	< 5.2 UJ	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
Benzo(g,h,i)perylene	1,100	ug/L	< 5.4 UJ	< 5.2	< 5.2	< 6.1	< 5.2 UJ	< 5.2 UJ	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
Benzo(k)fluoranthene	10	ug/L	< 5.4 UJ	< 5.2	< 5.2	< 6.1	< 5.2 UJ	< 5.2 UJ	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
Benzoic acid	146,000	ug/L	< 140	< 140	< 140	< 160	< 140	< 140	< 150	< 150	< 160	< 160	< 140	< 140
Benzyl alcohol	11,000	ug/L	< 11	< 10	**1.8 J**	**25**	< 10	< 10	< 12	< 12 UJ	< 13	< 13	< 11	< 11
bis(2-Chloroethoxy)methane	NA	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
bis(2-Chloroethyl)ether	1	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
bis(2-Ethylhexyl)phthalate	6	ug/L	< 2.7	< 2.6	< 2.6	< 3.0	< 2.6	< 2.6	< 2.9	< 2.9	< 3.1	< 3.1	< 2.8	< 2.8
Butylbenzylphthalate	7,300	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
Chrysene	100	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
Dibenz(a,h)anthracene	0	ug/L	< 5.4 UJ	< 5.2	< 5.2	< 6.1	< 5.2 UJ	< 5.2 UJ	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
Dibenzofuran	73	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
Diethylphthalate	29,000	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
Dimethylphthalate	364,867	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
Di-n-butylphthalate	3,650	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
Di-n-octylphthalate	700	ug/L	< 5.4 UJ	< 5.2	< 5.2	< 6.1	< 5.2 UJ	< 5.2 UJ	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
Fluoranthene	1,460	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
Fluorene	1,460	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
Hexachlorobenzene	1	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
Hexachlorobutadiene	10	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
Hexachlorocyclopentadiene	50	ug/L	< 11	< 10	< 10	< 12	< 10	< 10	< 12	< 12	< 13	< 13	< 11	< 11
Hexachloroethane	60	ug/L	< 5.4 UJ	< 5.2 UJ	< 5.2 UJ	< 6.1 UJ	< 5.2 UJ	< 5.2 UJ	< 5.8 UJ	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
Indeno(1,2,3-cd)pyrene	1	ug/L	< 5.4 UJ	< 5.2	< 5.2	< 6.1	< 5.2 UJ	< 5.2 UJ	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
Isophorone	900	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
Naphthalene	700	ug/L	< 11	< 10	< 10	< 12	< 10	< 10	< 12	< 12	< 13	< 13	< 11	< 11

Table 2 North Boundary Assessment
Groundwater SVOC Data Collected From Springs
Alaska Railroad Corporation, Anchorage, AK

		Sample ID	SP01-091304	SP07-091304	SP10-091304	SP12-091304	SP16-091304	SP19-091304	SP24-091304	SP26-091404	SP26-091404 D	SP27-091404	SP30-091404	SP30-091404 D
		Sample Date	9/13/2004	9/13/2004	9/13/2004	9/13/2004	9/13/2004	9/13/2004	9/13/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004
		Sample Matrix	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep
Analyte	**GW Screening Level**													
Nitrobenzene	18	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
N-Nitroso-di-n-propylamine	0	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
N-Nitrosodiphenylamine	170	ug/L	< 11	< 10	< 10	< 12	< 10	< 10	< 12	< 12	< 13	< 13	< 11	< 11
Pentachlorophenol	1	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
Phenanthrene	11,000	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6
Pyrene	1,100	ug/L	< 5.4	< 5.2	< 5.2	< 6.1	< 5.2	< 5.2	< 5.8	< 5.9	< 6.3	< 6.3	< 5.6	< 5.6

Notes:
NA = not available
ADEC = Alaska Department of Environmental Conservation
mg/L = milligrams per liter
µg/L = micrograms per liter

References:
3) U.S. EPA, 2002. 2002 Edition of the Drinking Water Standards and Health Advisories. MCLs and DWELs. EPA 822R02038. Office of Water. Summer 2002.
4) ADEC, 2003. 18 AAC 75 Oil and Other Hazardous Substances Pollution Control. State of Alaska Department of Environmental Conservation. Table B1 and C in 18 AAC 75.345(b) Soil and Groundwater Cleanup Levels.
5) US. EPA, 2002. Region IX Preliminary Remediation Goals (PRGs). Available at U.S. EPA Region IX website:
www.epa.gov/region 09/waste/sfund/prg/intro.htm October, 2002.

Table 2 North Boundary Assessment
Groundwater SVOC Data Collected From Springs
Alaska Railroad Corporation, Anchorage, AK

		Sample ID	SP33-091404	SP34-091404	SP35-091404	SP36-091404	SP40-091404	SP41-091404	SP46-091404	SP48-091404	SP49-091404	SP50-091404	EB10-091504	FB10-091504
		Sample Date	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/15/2004	9/15/2004
		Sample Matrix	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	Water QC	Water QC
Analyte	**GW Screening Level**													
Semivolatile Organics by Method 8270C	**ug/L**	**Units**												
1,2,4-Trichlorobenzene	70	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
1,2-Dichlorobenzene	600	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
1,3-Dichlorobenzene	1,100	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
2,2'-Oxybis(1-Chloropropane)	1,000	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
2,4,5-Trichlorophenol	3,650	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
2,4,6-Trichlorophenol	77	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
2,4-Dichlorophenol	100	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
2,4-Dimethylphenol	700	ug/L	< 28	< 25	< 25	< 25	< 28	< 25	< 25	< 25	< 25	< 23	< 25	< 25
2,4-Dinitrophenol	70	ug/L	< 110	< 100	< 100	< 100	< 110	< 100	< 100	< 100	< 100	< 91	< 100	< 100
2,4-Dinitrotoluene	1	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
2,6-Dinitrotoluene	1	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
2-Chloronaphthalene	2,900	ug/L	< 11	< 10	< 10	< 10	< 11	< 10	< 10	< 10	< 10	< 9.1	< 10	< 10
2-Chlorophenol	200	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
2-Methylnaphthalene	780	ug/L	< 5.6	< 5.0	**18**	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
2-Methylphenol	1,800	ug/L	< 5.6	**2.4 J**	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
2-Nitroaniline	1	ug/L	< 110	< 100	< 100	< 100	< 110	< 100	< 100	< 100	< 100	< 91	< 100	< 100
2-Nitrophenol	300	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
3,3'-Dichlorobenzidine	2	ug/L	< 22	< 20	< 20	< 20	< 22	< 20	< 20	< 20	< 20	< 18	< 20	< 20
3-Nitroaniline	NA	ug/L	< 56	< 50	< 50	< 50	< 56	< 50	< 50	< 50	< 50	< 45	< 50	< 50
4,6-Dinitro-2-methylphenol	NA	ug/L	< 28	< 25	< 25	< 25	< 28	< 25	< 25	< 25	< 25	< 23	< 25	< 25
4-Bromophenyl-phenylether	NA	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
4-Chloro-3-methylphenol	NA	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
4-Chloroaniline	150	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
4-Chlorophenyl-phenylether	NA	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
4-Methylphenol	182	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
4-Nitroaniline	NA	ug/L	< 56	< 50	< 50	< 50	< 56	< 50	< 50	< 50	< 50	< 45	< 50	< 50
4-Nitrophenol	300	ug/L	< 110	< 100	< 100	< 100	< 110	< 100	< 100	< 100	< 100	< 91	< 100	< 100
Acenaphthene	2,200	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
Acenaphthylene	2,200	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
Aniline	12	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
Anthracene	11,000	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
Benzidine	#N/A	ug/L	< 220 UJ	< 200 UJ	< 200 UJ	< 200 UJ	< 220 UJ	< 200 UJ	< 200 UJ	< 200 UJ	< 200 UJ	< 180 UJ	< 200	< 200
Benzo(a)anthracene	1	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
Benzo(a)pyrene	0	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
Benzo(b)fluoranthene	1	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
Benzo(g,h,i)perylene	1,100	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
Benzo(k)fluoranthene	10	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
Benzoic acid	146,000	ug/L	< 140	< 130	< 130	< 130	< 140	< 130	< 130	< 130	< 130	< 120	< 130	< 130
Benzyl alcohol	11,000	ug/L	< 11	< 10	< 10	**24**	**37**	< 10	< 10	< 10 U	**25**	< 9.1	< 10	< 10
bis(2-Chloroethoxy)methane	NA	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
bis(2-Chloroethyl)ether	1	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
bis(2-Ethylhexyl)phthalate	6	ug/L	< 2.8	< 2.5	< 2.5	< 2.5	< 2.8	< 2.5	< 2.5	< 2.5	< 2.5	< 2.3	< 2.5	**8.2**
Butylbenzylphthalate	7,300	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
Chrysene	100	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
Dibenz(a,h)anthracene	0	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
Dibenzofuran	73	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
Diethylphthalate	29,000	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
Dimethylphthalate	364,867	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
Di-n-butylphthalate	3,650	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
Di-n-octylphthalate	700	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
Fluoranthene	1,460	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
Fluorene	1,460	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
Hexachlorobenzene	1	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
Hexachlorobutadiene	10	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
Hexachlorocyclopentadiene	50	ug/L	< 11	< 10	< 10	< 10	< 11	< 10	< 10	< 10	< 10	< 9.1	< 10	< 10
Hexachloroethane	60	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
Indeno(1,2,3-cd)pyrene	1	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
Isophorone	900	ug/L	< 5.6	< 5.0	**1.7 J**	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
Naphthalene	700	ug/L	< 11	< 10	**33**	< 10	< 11	< 10	< 10	< 10	< 10	< 9.1	< 10	< 10

Table 2 North Boundary Assessment
Groundwater SVOC Data Collected From Springs
Alaska Railroad Corporation, Anchorage, AK

		Sample ID	SP33-091404	SP34-091404	SP35-091404	SP36-091404	SP40-091404	SP41-091404	SP46-091404	SP48-091404	SP49-091404	SP50-091404	EB10-091504	FB10-091504
		Sample Date	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/15/2004	9/15/2004
		Sample Matrix	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	Water QC	Water QC
Analyte	**GW Screening Level**													
Nitrobenzene	18	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
N-Nitroso-di-n-propylamine	0	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
N-Nitrosodiphenylamine	170	ug/L	< 11	< 10	< 10	< 10	< 11	< 10	< 10	< 10	< 10	< 9.1	< 10	< 10
Pentachlorophenol	1	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
Phenanthrene	11,000	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0
Pyrene	1,100	ug/L	< 5.6	< 5.0	< 5.0	< 5.0	< 5.6	< 5.0	< 5.0	< 5.0	< 5.0	< 4.5	< 5.0	< 5.0

Notes:
NA = not available
ADEC = Alaska Department of Environmental Conservation
mg/L = milligrams per liter
µg/L = micrograms per liter

References:
3) U.S. EPA, 2002. 2002 Edition of the Drinking Water Standards and Health Advisories. MC
4) ADEC, 2003. 18 AAC 75 Oil and Other Hazardous Substances Pollution Control. State of
5) US. EPA, 2002. Region IX Preliminary Remediation Goals (PRGs). Available at U.S. EPA Region IX w
www.epa.gov/region 09/waste/sfund/prg/intro.htm October, 2002.

Table 3 North Boundary Assessment
Groundwater Fuels and Dissolved Metals Data Collected From Springs
Alaska Railroad Corporation, Anchorage, AK

		Sample ID	SP01-091304	SP02-091404	SP07-091304	SP07-091404	SP10-091304	SP10-091404	SP12-091304	SP12-091404	SP16-091304	SP16-091404	SP19-091304	SP19-091404
		Sample Date	9/13/2004	9/14/2004	9/13/2004	9/14/2004	9/13/2004	9/14/2004	9/13/2004	9/14/2004	9/13/2004	9/14/2004	9/13/2004	9/14/2004
		Sample Matrix	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep
Analyte	**GW Screening Level**													
GC Fuels by Methods AK101/AK102/AK103	**ug/L**	**Units**												
Gasoline Range Hydrocarbons	1,300	ug/L	< 50	NA	< 50	NA	< 50	NA	< 50	NA	< 50	NA	< 50	NA
Diesel Range Hydrocarbons	1.5	mg/L	< 0.10	NA	< 0.10	NA	< 0.10	NA	**4.2**	NA	< 0.11	NA	< 0.10	NA
Residual Range Organics	1.1	mg/L	**0.28**	NA	< 0.21	NA	**0.21**	NA	**2.3**	NA	< 0.22	NA	< 0.21	NA
Dissolved Metals by Methods 6010B/7470A														
Arsenic	0.05	mg/L	NA	< 0.1	NA	< 0.1	NA	< 0.1	NA	< 0.1	NA	< 0.1	NA	< 0.1
Barium	2	mg/L	NA	**0.26**	NA	**0.12**	NA	**0.14**	NA	< 0.01	NA	**0.12**	NA	**0.22**
Cadmium	0.005	mg/L	NA	< 0.006	NA	< 0.006	NA	< 0.006	NA	**0.0093**	NA	< 0.006	NA	< 0.006
Chromium	0.10	mg/L	NA	< 0.01	NA	< 0.01	NA	< 0.01	NA	< 0.01	NA	< 0.01	NA	< 0.01
Lead	0.02	mg/L	NA	< 0.05	NA	< 0.05	NA	< 0.05	NA	< 0.05	NA	< 0.05	NA	< 0.05
Selenium	0.05	mg/L	NA	< 0.1	NA	< 0.1	NA	< 0.1	NA	< 0.1	NA	< 0.1	NA	< 0.1
Silver	0.18	mg/L	NA	< 0.015	NA	< 0.015	NA	< 0.015	NA	< 0.015	NA	< 0.015	NA	< 0.015
Mercury	0.002	mg/L	NA	< 0.0002	NA	< 0.0002	NA	< 0.0002	NA	**0.00029**	NA	< 0.0002	NA	< 0.0002

Notes:
NA = not available
ADEC = Alaska Department of Environmental Conservation
mg/L = milligrams per liter
ug/L = micrograms per liter

References:

3) U.S. EPA, 2002. 2002 Edition of the Drinking Water Standards and Health Advisories. MCLs and DWELs. EPA 822R02038. Office of Water. Summer 2002.
4) ADEC, 2003. 18 AAC 75 Oil and Other Hazardous Substances Pollution Control. State of Alaska Department of Environmental Conservation. Table B1 and C in 18 AAC 75.345(b) Soil and Groundwater Cleanup Levels.
5) US. EPA, 2002. Region IX Preliminary Remediation Goals (PRGs). Available at U.S. EPA Region IX website:
www.epa.gov/region 09/waste/sfund/prg/intro.htm October, 2002.

Table 3 North Boundary Assessment
Groundwater Fuels and Dissolved Metals Data Collect
Alaska Railroad Corporation, Anchorage, AK

		Sample ID	SP24-091304	SP24-091404	SP26-091404	SP26-091404 D	SP27-091404	SP30-091404	SP30-091404 D	SP33-091404	SP34-091404	SP35-091404	SP36-091404	SP40-091404
		Sample Date	9/13/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004
		Sample Matrix	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep	GW seep
Analyte	**GW Screening Level**													
GC Fuels by Methods AK101/AK102/AK103	**ug/L**	**Units**												
Gasoline Range Hydrocarbons	1,300	ug/L	< 50	NA	< 50	< 50	< 50	< 50	< 50	< 50	< 50	**1600**	< 50	< 50
Diesel Range Hydrocarbons	1.5	mg/L	< 0.10	NA	< 0.12	< 0.12	< 0.11	< 0.10	< 0.10	< 0.11	< 0.10	**1.6**	< 0.10	< 0.11
Residual Range Organics	1.1	mg/L	< 0.20	NA	**0.3**	< 0.24	< 0.22	< 0.21	< 0.21	**0.35**	< 0.21	**0.5**	< 0.21	**0.22**
Dissolved Metals by Methods 6010B/7470A														
Arsenic	0.05	mg/L	NA	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Barium	2	mg/L	NA	**0.18**	< 0.01	< 0.01	**0.04**	**0.017**	**0.017**	**0.14**	**0.26**	**0.44**	**0.25**	**0.13**
Cadmium	0.005	mg/L	NA	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006
Chromium	0.10	mg/L	NA	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Lead	0.02	mg/L	NA	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Selenium	0.05	mg/L	NA	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Silver	0.18	mg/L	NA	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015
Mercury	0.002	mg/L	NA	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	**0.00026**	< 0.0002	< 0.0002

Notes:
NA = not available
ADEC = Alaska Department of Environmental Conservation
mg/L = milligrams per liter
ug/L = micrograms per liter

References:

3) U.S. EPA, 2002. 2002 Edition of the Drinking Water Standards and Health Advisories. MC
4) ADEC, 2003. 18 AAC 75 Oil and Other Hazardous Substances Pollution Control. State of
5) US. EPA, 2002. Region IX Preliminary Remediation Goals (PRGs). Available at U.S. EPA Region IX w
www.epa.gov/region 09/waste/sfund/prg/intro.htm October, 2002.

Table 3 North Boundary Assessment
Groundwater Fuels and Dissolved Metals Data Collecti
Alaska Railroad Corporation, Anchorage, AK

		Sample ID	SP41-091404	SP46-091404	SP48-091404	SP49-091404	SP50-091404	EB10-091504	FB10-091504
		Sample Date	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/14/2004	9/15/2004	9/15/2004
		Sample Matrix	GW seep	GW seep	GW seep	GW seep	GW seep	Water QC	Water QC
Analyte	**GW Screening Level**								
GC Fuels by Methods AK101/AK102/AK103	**ug/L**	**Units**							
Gasoline Range Hydrocarbons	1,300	ug/L	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Diesel Range Hydrocarbons	1.5	mg/L	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Residual Range Organics	1.1	mg/L	< 0.21	< 0.21	< 0.20	**0.29**	< 0.20	< 0.20	< 0.20
Dissolved Metals by Methods 6010B/7470A									
Arsenic	0.05	mg/L	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	NA	NA
Barium	2	mg/L	**0.14**	**0.13**	**0.11**	**0.12**	**0.24**	NA	NA
Cadmium	0.005	mg/L	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	NA	NA
Chromium	0.10	mg/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	NA	NA
Lead	0.02	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	NA	NA
Selenium	0.05	mg/L	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	NA	NA
Silver	0.18	mg/L	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	NA	NA
Mercury	0.002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	NA	NA

Notes:
NA = not available
ADEC = Alaska Department of Environmental Conservation
mg/L = milligrams per liter
ug/L = micrograms per liter

References:
3) U.S. EPA, 2002. 2002 Edition of the Drinking Water Standards and Health Advisories. MC
4) ADEC, 2003. 18 AAC 75 Oil and Other Hazardous Substances Pollution Control. State of
5) US. EPA, 2002. Region IX Preliminary Remediation Goals (PRGs). Available at U.S. EPA Region IX w
www.epa.gov/region 09/waste/sfund/prg/intro.htm October, 2002.

Table 4 North Boundary Assessment
Soil VOC Data Collected From Spring Locations
Alaska Railroad Corporation, Anchorage, AK

		Sample ID	SO10-0-1-091504	SO12-0-1-091504	SO24-0-1-091504	SO30-0-1-091504	SO34-0-2-091504	SO35-0-2-091504	SO35-0-2-091504	Trip BlankS-09150
		Sample Date	9/15/2004	9/15/2004	9/15/2004	9/15/2004	9/15/2004	9/15/2004	9/15/2004	9/15/2004
		Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil QC
Analyte	**Soil Screening Level**									
Volatile Organics by Method 8260B	**ug/kg**	**Units**								
1,1,1,2-Tetrachloroethane	3,200	ug/kg	< 41	< 45	< 10	< 10	< 5.6	< 6.7	< 5.5	< 10
1,1,1-Trichloroethane	460,000	ug/kg	< 35	< 38	< 8.8	< 8.5	< 4.8	< 5.7	< 4.7	< 8.9
1,1,2,2-Tetrachloroethane	5,400	ug/kg	< 52	< 57	< 13	< 13	< 7.1	< 8.5	< 7.0	< 13
1,1,2-Trichloro-1,2,2-trifluoroethane	NA	ug/kg	< 35	< 38	< 8.8	**14**	< 4.8	< 5.7	< 4.7	**130**
1,1,2-Trichloroethane	10,000	ug/kg	< 64	< 70	< 16	< 16	< 8.8	< 10	< 8.6	< 16
1,1-Dichloroethane	890,000	ug/kg	< 35	< 38	< 8.8	< 8.5	< 4.8	< 5.7	< 4.7	< 8.9
1,1-Dichloroethene	900	ug/kg	< 69	< 76	< 18	< 17	< 9.4	< 11	< 9.3	< 18
1,1-Dichloropropene	NA	ug/kg	< 35	< 38	< 8.8	< 8.5	< 4.8	< 5.7	< 4.7	< 8.9
1,2,3-Trichlorobenzene	NA	ug/kg	< 230	< 250	< 59	< 57	< 32	< 38	< 31	< 59
1,2,3-Trichloropropane	5	ug/kg	< 68	< 75	< 17	< 17	< 9.3	< 11	< 9.2	< 17
1,2,4-Trichlorobenzene	570,000	ug/kg	< 53	< 58	< 13	< 13	< 7.2	< 8.6	< 7.1	< 13
1,2,4-Trimethylbenzene	52,000	ug/kg	< 28	< 31	< 7.1	< 6.9	< 3.8	**1500 J**	**680 J**	< 7.1
1,2-Dibromo-3-chloropropane	454	ug/kg	< 350	< 380	< 88	< 85	< 48	< 57	< 47	< 89
1,2-Dibromoethane	100	ug/kg	< 66	< 72	< 17	< 16	< 9.0	< 11	< 8.8	< 17
1,2-Dichlorobenzene	110,000	ug/kg	< 47	< 52	< 12	< 12	< 6.5	< 7.7	< 6.3	< 12
1,2-Dichloroethane	5,000	ug/kg	< 39	< 42	< 9.8	< 9.4	< 5.3	< 6.3	< 5.2	< 9.8
1,2-Dichloropropane	17,000	ug/kg	< 45	< 50	< 12	< 11	< 6.2	< 7.4	< 6.1	< 12
1,3,5-Trimethylbenzene	21,000	ug/kg	< 36	< 40	< 9.2	< 8.8	< 4.9	**270 J**	**120 J**	< 9.2
1,3-Dichlorobenzene	3,040,000	ug/kg	< 34	< 38	< 8.8	< 8.4	< 4.7	< 5.6	< 4.6	< 8.8
1,3-Dichloropropane	NA	ug/kg	< 35	< 38	< 8.8	< 8.5	< 4.8	< 5.7	< 4.7	< 8.9
1,4-Dichlorobenzene	350,000	ug/kg	< 39	< 42	< 9.8	< 9.5	< 5.3	< 6.3	< 5.2	< 9.9
2,2-Dichloropropane	NA	ug/kg	< 61	< 67	< 16	< 15	< 8.4	< 10	< 8.2	< 16
2-Butanone	28,100,000	ug/kg	< 350 U	< 380	< 88 U	< 120 U	< 48 U	< 57 U	< 47	**130**
2-Chlorotoluene	160,000	ug/kg	< 41	< 45	< 10	< 10	< 5.6	< 6.7	< 5.5	< 10
2-Hexanone	NA	ug/kg	< 35	< 39	< 9.0	< 8.7	< 4.8	< 5.8	< 4.8	< 9.0
4-Chlorotoluene	NA	ug/kg	< 35	< 38	< 8.8	< 8.5	< 4.8	< 5.7	< 4.7	< 8.9
4-Isopropyl toluene	#N/A	ug/kg	< 46	< 50	< 12	< 11	< 6.3	**230 J**	**95 J**	< 12
4-Methyl-2-pentanone	786,532	ug/kg	< 97	< 110	< 25	< 24	< 13	< 16	< 13	< 25
Acetone	10,000,000	ug/kg	< 690	< 760	**100 J**	< 170	< 95	**33 J**	< 93	< 180
Benzene	9,000	ug/kg	< 46	< 50	< 12	< 11	< 6.2	< 7.5	**2.4 J**	< 12
Bromobenzene	27,000	ug/kg	< 35	< 38	< 8.8	< 8.5	< 4.8	< 5.7	< 4.7	< 8.9
Bromochloromethane	NA	ug/kg	< 150	< 160	< 37	< 36	< 20	< 24	< 20	< 37
Bromodichloromethane	824	ug/kg	< 35	< 38	< 8.8	< 8.5	< 4.7	< 5.6	< 4.6	< 8.8
Bromoform	500,000	ug/kg	< 49	< 53	< 12	< 12	< 6.6	< 7.9	< 6.5	< 12
Bromomethane	3,897	ug/kg	< 160	< 170	< 41	< 39	< 22	< 26	< 21	< 41
Carbon disulfide	453,000	ug/kg	< 59	< 65	< 15	< 15	< 8.1	< 9.7	< 8.0	< 15
Carbon tetrachloride	3,400	ug/kg	< 38	< 41	< 9.5	< 9.2	< 5.1	< 6.1	< 5.0	< 9.6
Chlorobenzene	110,000	ug/kg	< 42	< 46	< 11	< 10	< 5.8	< 6.9	< 5.7	< 11
Chloroethane	3,026	ug/kg	< 240	< 270	< 62	< 59	< 33	< 40	< 33	< 62
Chloroform	3,400	ug/kg	< 45	< 49	< 11	< 11	< 6.2	< 7.4	< 6.1	< 11
Chloromethane	1,227	ug/kg	< 73	< 80	< 19	< 18	< 10	< 12	< 9.8	< 19
cis-1,2-Dichloroethene	1,000,000	ug/kg	< 75	< 82	< 19	< 18	< 10	< 12	< 10	< 19
cis-1,3-Dichloropropene	14,000	ug/kg	< 41	< 45	< 10	< 10	< 5.6	< 6.7	< 5.5	< 10
Dibromochloromethane	1,109	ug/kg	< 35	< 38	< 8.8	< 8.5	< 4.8	< 5.7	< 4.7	< 8.9
Dibromomethane	NA	ug/kg	< 95	< 100	< 24	< 23	< 13	< 16	< 13	< 24
Dichlorodifluoromethane	260,000	ug/kg	< 39	< 43	< 10	< 9.6	< 5.4	< 6.4	< 5.3	< 10
Ethylbenzene	89,000	ug/kg	< 38	< 41	< 9.6	< 9.2	< 5.2	**34**	**21**	< 9.6
Hexachlorobutadiene	20,000	ug/kg	< 99	< 110	< 25	< 24	< 14	< 16	< 13	< 25
Isopropyl acetate	#N/A	ug/kg	< 59	< 64	< 15	< 14	< 8.0	< 9.6	< 7.9	< 15
Isopropylbenzene	585,000	ug/kg	< 46	< 51	< 12	< 11	< 6.3	**120 J**	**58 J**	< 12

Table 4 North Boundary Assessment
Soil VOC Data Collected From Spring Locations
Alaska Railroad Corporation, Anchorage, AK

		Sample ID	SO10-0-1-091504	SO12-0-1-091504	SO24-0-1-091504	SO30-0-1-091504	SO34-0-2-091504	SO35-0-2-091504	SO35-0-2-091504	Trip BlankS-09150
		Sample Date	9/15/2004	9/15/2004	9/15/2004	9/15/2004	9/15/2004	9/15/2004	9/15/2004	9/15/2004
		Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil QC
Analyte	**Soil Screening Level**									
m&p-Xylene	81,000	ug/kg	< 88	< 97	< 22	< 22	< 12	**220 J**	**120 J**	< 23

Table 4 North Boundary Assessment
Soil VOC Data Collected From Spring Locations
Alaska Railroad Corporation, Anchorage, AK

		Sample ID	SO10-0-1-091504	SO12-0-1-091504	SO24-0-1-091504	SO30-0-1-091504	SO34-0-2-091504	SO35-0-2-091504	SO35-0-2-091504	Trip BlankS-09150
		Sample Date	9/15/2004	9/15/2004	9/15/2004	9/15/2004	9/15/2004	9/15/2004	9/15/2004	9/15/2004
		Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil QC
Analyte	**Soil Screening Level**									
Methyl Iodide	#N/A	ug/kg	< 310	< 340	< 79	< 76	< 42	< 51	< 42	< 79
Methyl tert-Butyl Ether	61,540	ug/kg	< 46	< 50	< 12	< 11	< 6.3	< 7.5	< 6.2	< 12
Methylene chloride	180,000	ug/kg	< 170 U	< 190 U	< 44 U	< 43 U	< 24 U	< 28 U	< 23 U	**35**
Naphthalene	120,000	ug/kg	< 210	< 230	< 53	< 51	< 29	**430 J**	**200 J**	< 53
n-Butylbenzene	240,000	ug/kg	< 43	< 48	< 11	< 11	< 5.9	**150 J**	**69 J**	< 11
n-Propylbenzene	240,000	ug/kg	< 38	< 41	< 9.5	< 9.2	< 5.1	**220 J**	**100 J**	< 9.6
o-Xylene	NA	ug/kg	< 47	< 52	< 12	< 12	< 6.4	< 7.7	< 6.3	< 12
sec-Butylbenzene	220,000	ug/kg	< 41	< 45	< 10	< 10	< 5.6	**150 J**	**65 J**	< 10
Styrene	280,000	ug/kg	< 36	< 39	< 9.1	< 8.7	< 4.9	< 5.8	< 4.8	< 9.1
tert-Butylbenzene	390,000	ug/kg	< 40	< 44	< 10	< 9.8	< 5.5	**18 J**	**8.1 J**	< 10
Tetrachloroethene	80,000	ug/kg	< 58	< 64	< 15	< 14	< 8.0	< 9.5	< 7.8	< 15
Toluene	180,000	ug/kg	< 41	< 45	**5.3 J**	< 10	< 5.7	< 6.8	< 5.6	< 11
trans-1,2-Dichloroethene	2,000,000	ug/kg	< 120	< 140	< 31	< 30	< 17	< 20	< 17	< 31
trans-1,3-Dichloropropene	14,000	ug/kg	< 35	< 38	< 8.8	< 8.5	< 4.8	< 5.7	< 4.7	< 8.9
Trichloroethene	43,000	ug/kg	< 44	< 48	< 11	< 11	< 6.0	< 7.2	< 5.9	< 11
Trichlorofluoromethane	385,818	ug/kg	< 130	< 150	< 34	< 32	< 18	< 22	< 18	< 34
Vinyl chloride	4,000	ug/kg	< 35	< 38	< 8.8	< 8.5	< 4.8	< 5.7	< 4.7	< 8.9

Notes:
NA = not available
ADEC = Alaska Department of Environmental Conservation
ug/kg = micrograms per kilogram
Screening levels area based on the lower of the ADEC Method 2 "Under 40 Inch Zone" Ingestion or Inhalation values. If an ADEC value was not available, USEPA Region IX Residential PRGs were applied.

References:
1) ADEC, 2003. 18 AAC 75 Oil and Other Hazardous Substances Pollution Control. State of Alaska Department of Environmental Conservation. Table B1 and C in 18 AAC 75.345(b) Soil and Groundwater Cleanup Levels.
2) US. EPA, 2002. Region IX Preliminary Remediation Goals (PRGs). Available at U.S. EPA Region IX website:
www.epa.gov/region 09/waste/sfund/prg/intro.htm October, 2002.

Table 5 North Boundary Assessment
Soil SVOC Data Collected From Spring Locations
Alaska Railroad Corporation, Anchorage, AK

		Sample ID	SO10-0-1-091504	SO12-0-1-091504	SO24-0-1-091504	SO30-0-1-091504	SO34-0-2-091504	SO35-0-2-091504	SO35-0-2-091504 Dup
		Sample Date	9/15/2004	9/15/2004	9/15/2004	9/15/2004	9/15/2004	9/15/2004	9/15/2004
		Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Analyte	**Soil Screening Level**								
Semivolatile Organics by Method 8270C	**ug/kg**	**Units**							
1,2,4-Trichlorobenzene	570,000	ug/kg	< 840	< 1100	< 310	< 230	< 260	< 270	< 290
1,2-Dichlorobenzene	110,000	ug/kg	< 940	< 1300	< 350	< 260	< 280	< 300	< 320
1,3-Dichlorobenzene	3,040,000	ug/kg	< 940	< 1300	< 350	< 260	< 280	< 300 UJ	< 320
2,2'-Oxybis(1-Chloropropane)	2,884	ug/kg	< 1000	< 1400	< 380	< 290	< 310	< 330	< 350
2,4,5-Trichlorophenol	10,000,000	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250	< 260
2,4,6-Trichlorophenol	750,000	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250 UJ	< 260
2,4-Dichlorophenol	300,000	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250	< 260
2,4-Dimethylphenol	2,000,000	ug/kg	< 780	< 1100	**77 J**	< 220	< 240	< 250 UJ	< 260
2,4-Dinitrophenol	200,000	ug/kg	< 5100	< 6900	< 1900	< 1400	< 1500	< 1600 UJ	< 1700
2,4-Dinitrotoluene	12,000	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250 UJ	< 260
2,6-Dinitrotoluene	12,000	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250	< 260
2-Chloronaphthalene	8,110,000	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250	< 260
2-Chlorophenol	510,000	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250	< 260
2-Methylnaphthalene	2,030,000	ug/kg	< 780	< 1100	< 290	**66 J**	< 240	**1100**	**1500**
2-Methylphenol	5,100,000	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250 UJ	< 260
2-Nitroaniline	1,748	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250	< 260
2-Nitrophenol	NA	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250	< 260
3,3'-Dichlorobenzidine	18,000	ug/kg	< 780 UJ	< 1100 UJ	< 290 UJ	< 220 UJ	< 240 UJ	< 250 UJ	< 260 UJ
3-Nitroaniline	NA	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250 UJ	< 260
4,6-Dinitro-2-methylphenol	NA	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250	< 260
4-Bromophenyl-phenylether	NA	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250	< 260
4-Chloro-3-methylphenol	NA	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250	< 260
4-Chloroaniline	410,000	ug/kg	< 1300	< 1700	< 470	< 350	< 380	< 400 UJ	< 430
4-Chlorophenyl-phenylether	NA	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250	< 260
4-Methylphenol	305,515	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250	< 260
4-Nitroaniline	NA	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250 UJ	< 260
4-Nitrophenol	NA	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250	< 260
Acenaphthene	6,100,000	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250	< 260
Acenaphthylene	6,100,000	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250	< 260
Aniline	85,000	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250	< 260
Anthracene	30,000,000	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250 UJ	< 260
Benzo(a)anthracene	11,000	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250 UJ	< 260
Benzo(a)pyrene	1,000	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250	< 260
Benzo(b)fluoranthene	11,000	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250	< 260
Benzo(g,h,i)perylene	3,000,000	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250	< 260
Benzo(k)fluoranthene	110,000	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250	< 260
Benzoic acid	410,000,000	ug/kg	< 6100	< 8200	< 2300	< 1700	< 1800	< 1900	< 2100
Benzyl alcohol	18,000,000	ug/kg	< 780 UJ	< 1100 UJ	< 290 UJ	< 220 UJ	< 240 UJ	< 250 UJ	< 260 UJ
bis(2-Chloroethoxy)methane	NA	ug/kg	< 890	< 1200	< 330	< 250	< 270	< 280	< 300
bis(2-Chloroethyl)ether	3,000	ug/kg	< 940	< 1300	< 350	< 260	< 280	< 300	< 320
bis(2-Ethylhexyl)phthalate	590,000	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250	< 260
Butylbenzylphthalate	20,000,000	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250	< 260
Chrysene	1,100,000	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250	< 260
Dibenz(a,h)anthracene	1,000	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250	< 260
Dibenzofuran	203,000	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250	< 260
Diethylphthalate	81,000,000	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250	< 260

Table 5 North Boundary Assessment
Soil SVOC Data Collected From Spring Locations
Alaska Railroad Corporation, Anchorage, AK

		Sample ID	SO10-0-1-091504	SO12-0-1-091504	SO24-0-1-091504	SO30-0-1-091504	SO34-0-2-091504	SO35-0-2-091504	SO35-0-2-091504 Dup
		Sample Date	9/15/2004	9/15/2004	9/15/2004	9/15/2004	9/15/2004	9/15/2004	9/15/2004
		Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Analyte	**Soil Screening Level**								
Dimethylphthalate	1,000,000,000	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250 UJ	< 260
Di-n-butylphthalate	10,000,000	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250	< 260
Di-n-octylphthalate	2,000,000	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250 UJ	< 260
Fluoranthene	4,100,000	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250	< 260
Fluorene	4,100,000	ug/kg	< 780	< 1100	< 290	< 220	< 240	**64 J**	**93 J**
Hexachlorobenzene	5,000	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250	< 260
Hexachlorobutadiene	20,000	ug/kg	< 940	< 1300	< 350	< 260	< 280	< 300 UJ	< 320
Hexachlorocyclopentadiene	7,000	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250	< 260
Hexachloroethane	101,000	ug/kg	< 840	< 1100	< 310	< 230	< 260	< 270	< 290
Indeno(1,2,3-cd)pyrene	11,000	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250	< 260
Isophorone	8,700,000	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250	< 260
Naphthalene	120,000	ug/kg	< 780	< 1100	< 290	< 220	< 240	**730**	**920**
Nitrobenzene	51,000	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250	< 260
N-Nitroso-di-n-propylamine	1,200	ug/kg	< 780	< 1100	< 290	< 220	< 240	< 250	< 260
N-Nitrosodiphenylamine	1,700,000	ug/kg	< 1200	< 1600	< 450	< 340	< 370	< 380	< 410
Pentachlorophenol	35,000	ug/kg	< 3100	< 4200	< 1200	< 870	< 950	< 990	< 1100
Phenanthrene	30,000,000	ug/kg	< 780	< 1100	**68 J**	**69 J**	< 240	**84 J**	**110 J**
Pyrene	3,000,000	ug/kg	< 780	< 1100	**74 J**	< 220	< 240	< 250	< 260

Notes:
NA = not available
ADEC = Alaska Department of Environmental Conservation
ug/kg = micrograms per kilogram
Screening levels area based on the lower of the ADEC Method 2 "Under 40 Inch Zone" Ingestion or Inhalation values. If an ADEC value was not available, USEPA Region IX Residential PRGs were applied.

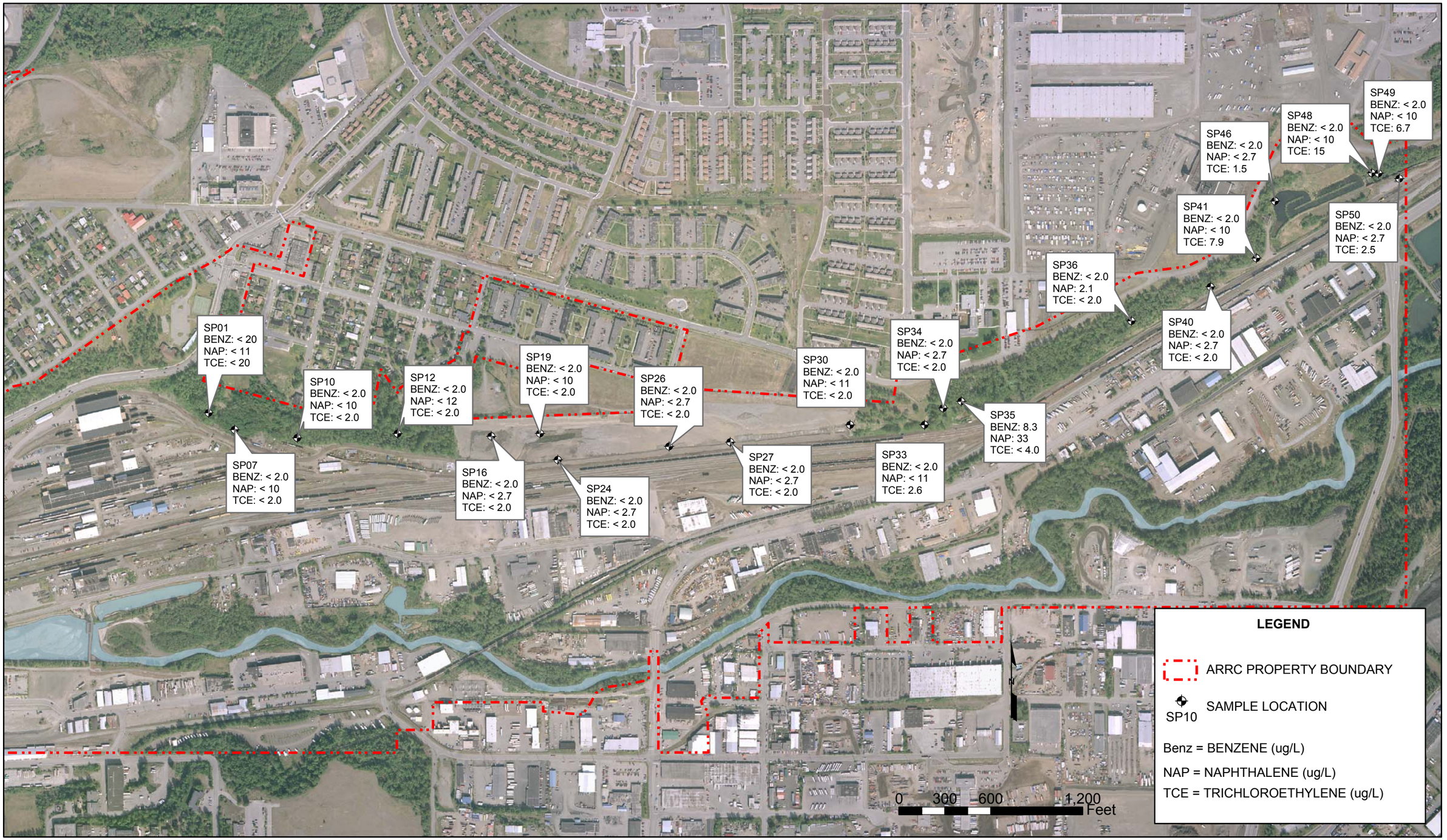
References:
1) ADEC, 2003. 18 AAC 75 Oil and Other Hazardous Substances Pollution Control. State of Alaska Department of Environmental Conservation. Table B1 and C in 18 AAC 75.345(b) Soil and Groundwater Cleanup Levels.
2) US. EPA, 2002. Region IX Preliminary Remediation Goals (PRGs). Available at U.S. EPA Region IX website:
www.epa.gov/region 09/waste/sfund/prg/intro.htm October, 2002.

Table 6 North Boundary Assessment
Soil Fuels and Total Metals Data Collected From Spring Locations
Alaska Railroad Corporation, Anchorage, AK

		Sample ID	SO10-0-1-091504	SO12-0-1-091504	SO24-0-1-091504	SO30-0-1-091504	SO34-0-2-091504	SO35-0-2-091504	SO35-0-2-091504 Dup
		Sample Date	9/15/2004	9/15/2004	9/15/2004	9/15/2004	9/15/2004	9/15/2004	9/15/2004
		Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Analyte	**Soil Screening Level**								
GC Fuels by Methods AK101/AK102/AK103	**mg/kg**	**Units**							
Gasoline Range Hydrocarbons	1,400	mg/kg	< 4.0 UJ	< 11 UJ	< 3.0 UJ	**0.91 J**	**1.1 J**	**6.7 J**	**10**
Diesel Range Hydrocarbons	10,250	mg/kg	**100**	**79**	**36**	**12**	**22**	**370 J**	**300**
Residual Range Organics	10,000	mg/kg	**710**	**590**	**610**	**48**	**57**	**250 J**	**210**
Total Metals by Methods 6010B/7471									
Arsenic	6	mg/kg	< 58	< 78	< 15	< 12	< 18	< 16	< 12
Barium	7,100	mg/kg	**64**	**55**	**45**	**99**	**63**	**58**	**72**
Cadmium	100	mg/kg	< 3.6	< 4.8	< 0.94	**0.78**	< 1.1	< 0.98	< 0.74
Chromium	300	mg/kg	**68 J+**	**58 J+**	**21 J+**	**41 J+**	**33 J+**	**28 J+**	**34 J+**
Lead	400	mg/kg	< 27	< 36	**11**	**6.2**	< 8.5	< 7.3	**5.9**
Selenium	510	mg/kg	< 44	< 60	< 12	< 9.2	< 14	< 12	< 9.3
Silver	510	mg/kg	< 6.7	< 9.0	< 1.8	< 1.4	< 2.1	< 1.8	< 1.4
Mercury	18	mg/kg	**0.62**	**0.6**	**0.12**	**0.18**	**0.17**	**0.08 J**	**0.14 J**
Moisture by Method D2216									
Percent Moisture	NA	%	**79**	**84**	**43**	**22**	**30**	**32**	**36**

Notes:
NA = not available
ADEC = Alaska Department of Environmental Conservation
mg/kg = milligrams per kilogram
Screening levels area based on the lower of the ADEC Method 2 "Under 40 Inch Zone" Ingestion or Inhalation values. If an ADEC value was not available, USEPA Region IX Residential PRGs were applied.

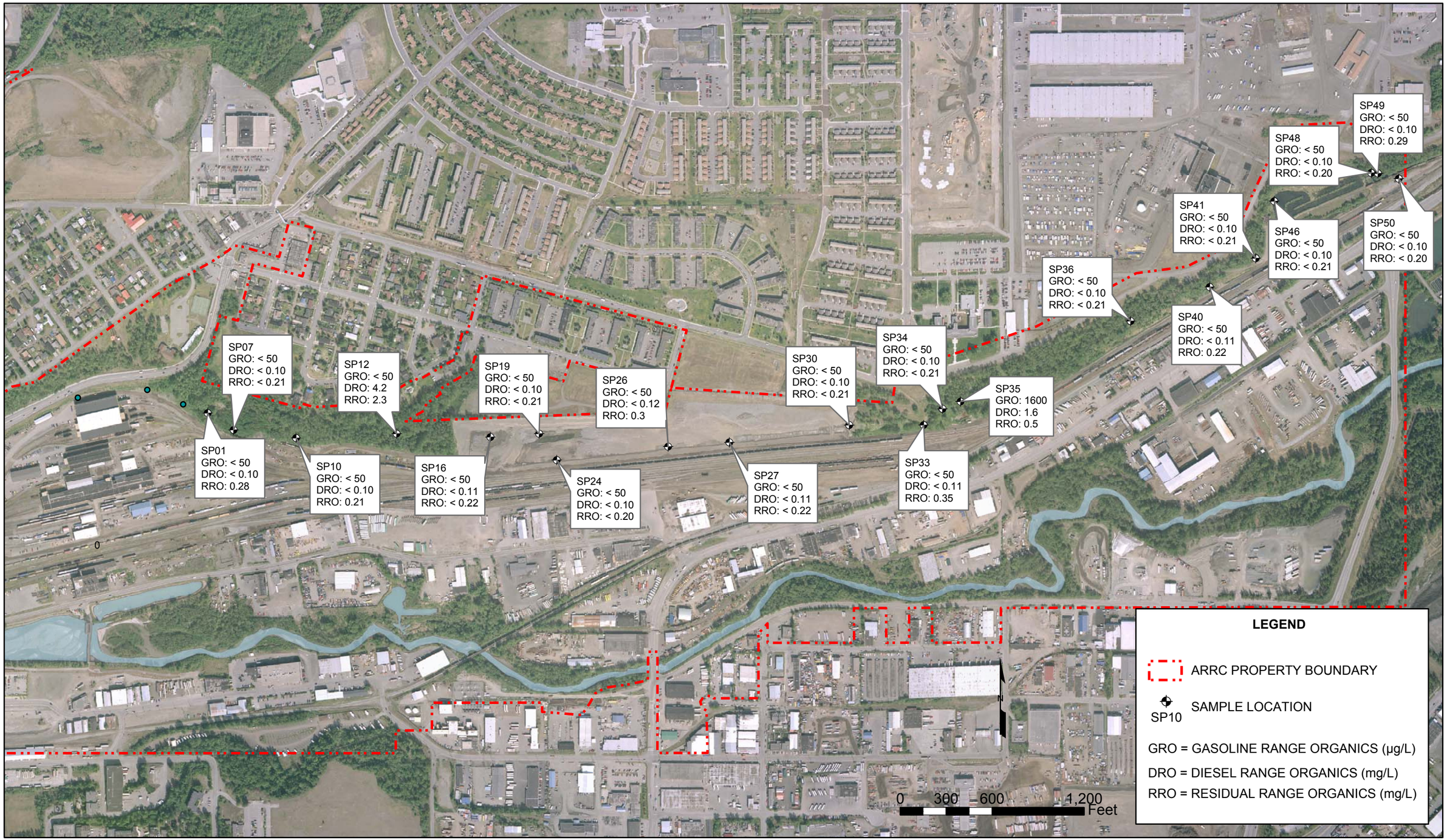
References:
1) ADEC, 2003. 18 AAC 75 Oil and Other Hazardous Substances Pollution Control. State of Alaska Department of Environmental Conservation. Table B1 and C in 18 AAC 75.345(b) Soil and Groundwater Cleanup Levels.
2) US. EPA, 2002. Region IX Preliminary Remediation Goals (PRGs). Available at U.S. EPA Region IX website:
www.epa.gov/region 09/waste/sfund/prg/intro.htm October, 2002.



NOTES:
1. Aerial photo base taken May 22, 2003, provided by ARRC.
2. Property boundary digitized from ARRC CADD basemap August 12, 2004.

RETEC

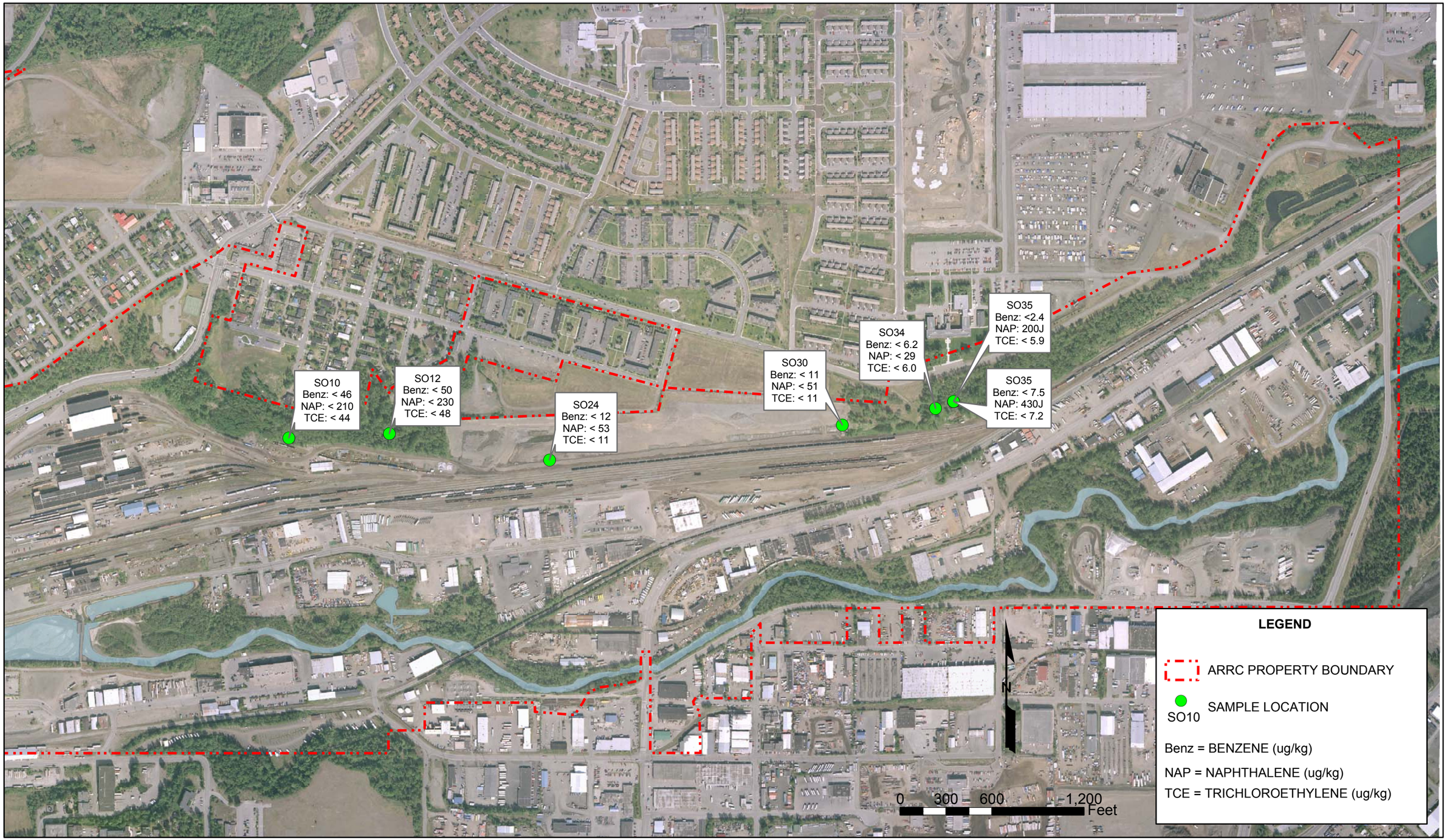
NORTH BOUNDARY ASSESSMENT ARRC, ANCHORAGE TERMINAL RESERVE			VOC AND SVOC CONCENTRATIONS IN GROUNDWATER, SEPTEMBER 2004
DATE: 11/18/04	DWN. BY:	FILE:	**FIGURE 1**



NOTES:
1. Aerial photo base taken May 22, 2003, provided by ARRC.
2. Property boundary digitized from ARRC CADD basemap August 12, 2004.

RETEC

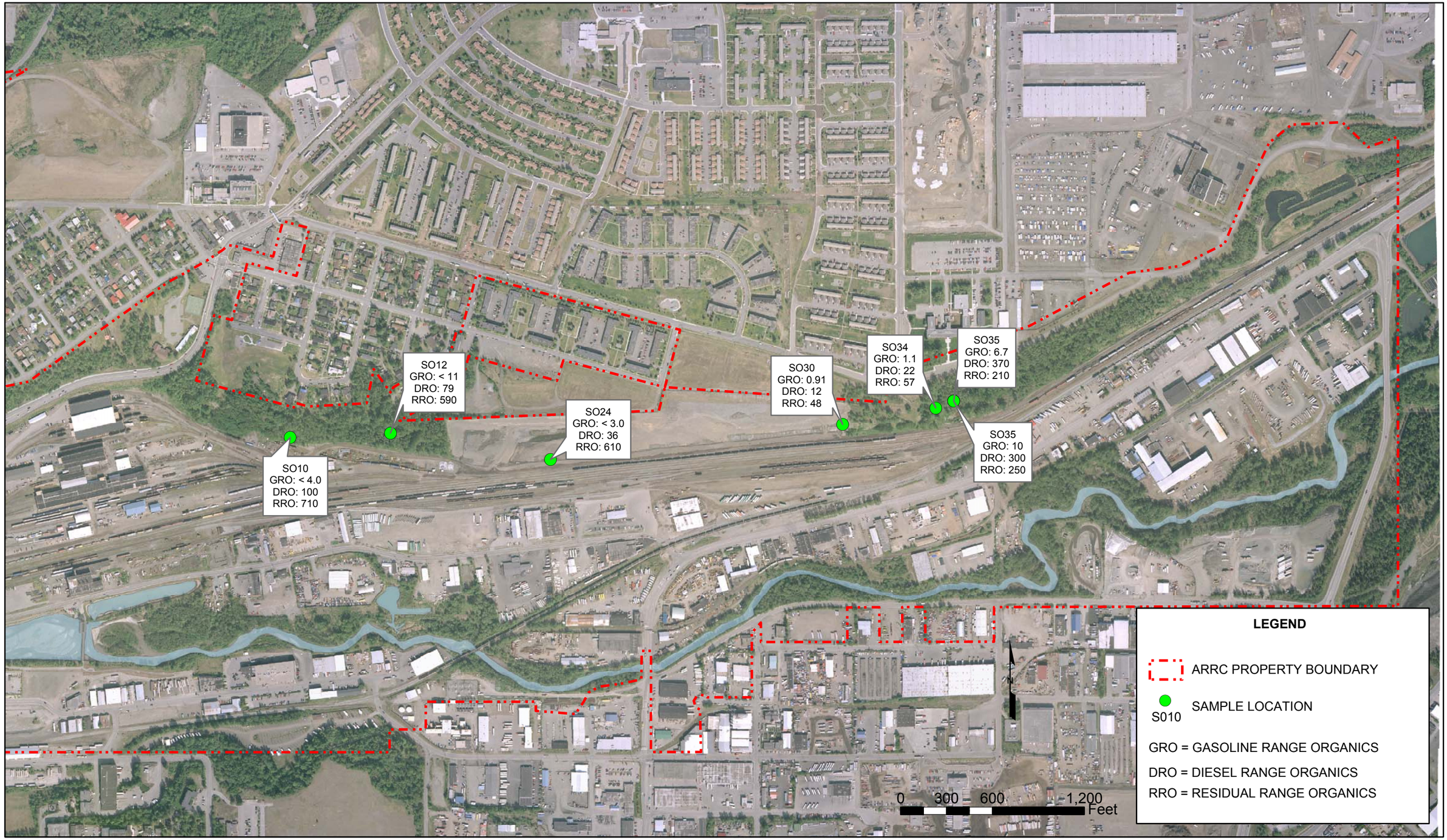
NORTH BOUNDARY ASSESSMENT ARRC, ANCHORAGE TERMINAL RESERVE			FUEL RANGE ANALYTICAL RESULTS IN GROUNDWATER, SEPTEMBER 2004
DATE: 11/18/04	DWN. BY:	FILE:	**FIGURE 2**



NOTES:
1. Aerial photo base taken May 22, 2003, provided by ARRC.
2. Property boundary digitized from ARRC CADD basemap August 12, 2004.

RETEC

NORTH BOUNDARY ASSESSMENT ARRC, ANCHORAGE TERMINAL RESERVE			VOC AND SVOC RESULTS IN SOIL (RESULTS IN ug/kg), SEPTEMBER 2004
DATE: 11/18/04	DWN. BY:	FILE:	**FIGURE 3**



NOTES:
1. Aerial photo base taken May 22, 2003, provided by ARRC.
2. Property boundary digitized from ARRC CADD basemap August 12, 2004.

RETEC

NORTH BOUNDARY ASSESSMENT ARRC, ANCHORAGE TERMINAL RESERVE			FUEL RANGE ANALYTICAL RESULTS IN SOIL (RESULTS IN mg/kg), SEPTEMBER 2004
DATE: 11/18/04	DWN. BY:	FILE:	**FIGURE 4**

Photo SP01

Photo SP07

Photo SP10

Photo SP12

Photo SP16

Photo SP19

Photo SP26

Photo SP27

Photo SP30

Photo SP33

Photo SP33a

Photo SP34

Photo SP35

Photo SP35a

Photo SP40

Photo SP41

Photo SP46

Photo SP48

Photo SP49

The RETEC Group, Inc.
Groundwater Sampling Form

PROJECT ARCC N. Bluff — PROJECT NO. AKRC1-18277-221
WELL/SPRING NO. SP-01 — WELL OR SPRING? —
SAMPLERS BWS / JA

1. **WELL CONDITION CHECKLIST:**
   a. Bump Posts _____ Pro.casing/lock _____ Surface pad _____
   b. Well visibility (paint) _____
   c. Well label _____

2. **WATER LEVEL/SPRING FLOW MEASUREMENT:**
   DATE 9-13-04 TIME 1250
   WELL – WATER LEVEL MEASUREMENT
   a. Location of measuring point _____
   b. Depth of water table from measuring point _____
   c. Height of measuring point above ground surface _____
   d. Total depth of well below measuring point _____
   e. Length of water column (line 2d-2b) _____
   SPRING – FLOW MEASUREMENT
   a. Flow rate 0.75 gpm
   b. Method of measurement _____

3. **WELL PURGING:**
   DATE 9-13-04 TIME 1257
   WEATHER CONDITIONS _____
   a. Purge method _____
   b. Required purge volume at 3 well volumes _____

Pumping Duration	Volume Removed	pH	Sp Cond.	T(°C)	DO	ORP	Appearance
1257		5.64	0.560	7.6	1.65	273	11.3 NTU

SP01-091304

4. **SAMPLE COLLECTION:**
   DATE 9-13-04 TIME 1300
   WEATHER CONDITIONS Sunny 50
   a. Collection method _____
   b. Meter calibration: Date 9-13-04 Model Horiba U-22
      multi-meter
      other
   c. Sample information pH 5.64 Sp Cond. 0.560 T(°C) 7.6 DO 1.65 ORP 273

Analysis/Method	Containers			Sample Prep./Preservation
VOC's (EPA 8260)	2	40 ml	VOAs	HCl
SVOCS (EPA 8270)	1	1L	Amber	None
GRO (AK 101)	1	40ml	VOA	HCl
DRO (AK 102)	1	1L	Amber	HCl
RRO (AK 103)	"	"	"	HCl

   d. Chain of custody form _____ COC tape _____
   e. Shipping container _____

5. **COMMENTS:** Sampled instead of SP02 due to more flow, located 15' East of SP02
No QUC

The RETEC Group, Inc.
Groundwater Sampling Form

PROJECT ARCC
PROJECT NO. SP07
WELL/SPRING NO. AKRCL-18277-221
WELL OR SPRING?
SAMPLERS BWS/JA

1. **WELL CONDITION CHECKLIST:**
   a. Bump Posts _____ Pro.casing/lock _____ Surface pad _____
   b. Well visibility (paint) _____
   c. Well label _____

2. **WATER LEVEL/SPRING FLOW MEASUREMENT:**
   DATE 9-13-04 TIME 1335
   WELL – WATER LEVEL MEASUREMENT
   a. Location of measuring point _____
   b. Depth of water table from measuring point _____
   c. Height of measuring point above ground surface _____
   d. Total depth of well below measuring point _____
   e. Length of water column (line 2d-2b) _____
   SPRING – FLOW MEASUREMENT
   a. Flow rate 0.5 gpm
   b. Method of measurement Bucket

3. **WELL PURGING:**
   DATE _____ TIME _____
   WEATHER CONDITIONS _____
   a. Purge method _____
   b. Required purge volume at 3 well volumes _____

Pumping Duration	Volume Removed	pH	Sp Cond.	T(°C)	DO	ORP	Appearance

SP07-091304

4. **SAMPLE COLLECTION:**
   DATE 9-13-04 TIME 1340
   WEATHER CONDITIONS _____
   a. Collection method _____
   b. Meter calibration: Date Model
      multi-meter 10 NTU _____
      other _____
   c. Sample information pH 5.87 Sp Cond. 0.499 mS/cm T(°C) 6.7 DO 5.26 ORP 293 mV

Analysis/Method	Containers	Sample Prep./Preservation
VOC's (EPA 8260)	2	HCl
SVOCS (EPA 8270)	1	—
GRO (AK 101)	1	HCl
DRO (AK 102)	1	"
RRO (AK 103)	"	"

   d. Chain of custody form _____ COC tape _____
   e. Shipping container _____

5. **COMMENTS:** No OUC

The RETEC Group, Inc.
Groundwater Sampling Form

PROJECT ARCC
PROJECT NO. AKRC1 - 18277
WELL/SPRING NO. ~~ARRC1~~ SP10
WELL OR SPRING?
SAMPLERS BWS / JA

1. **WELL CONDITION CHECKLIST:**
   a. Bump Posts _____ Pro.casing/lock _____ Surface pad _____
   b. Well visibility (paint) _____
   c. Well label _____

2. **WATER LEVEL/SPRING FLOW MEASUREMENT:**
   DATE 9-13-04 TIME 1410
   WELL – WATER LEVEL MEASUREMENT
   a. Location of measuring point _____
   b. Depth of water table from measuring point _____
   c. Height of measuring point above ground surface _____
   d. Total depth of well below measuring point _____
   e. Length of water column (line 2d-2b) _____
   SPRING – FLOW MEASUREMENT
   a. Flow rate 0.1 gpm
   b. Method of measurement _____

3. **WELL PURGING:**
   DATE _____ TIME _____
   WEATHER CONDITIONS _____
   a. Purge method _____
   b. Required purge volume at 3 well volumes _____

Pumping Duration	Volume Removed	pH	Sp Cond.	T(°C)	DO	ORP	Appearance

4. **SAMPLE COLLECTION:** SP10-091304
   DATE 9-13-04 TIME 1420
   WEATHER CONDITIONS _____
   a. Collection method _____
   b. Meter calibration: Date _____ Model _____
      multi-meter _____
      other _____
   c. Sample information pH 6.4 Sp Cond. 0.49 T(°C) 8.9 DO 11.7 ORP 328

Analysis/Method	Containers	Sample Prep./Preservation
VOC's (EPA 8260)	2	
SVOCS (EPA 8270)	1	
GRO (AK 101)	1	
DRO (AK 102)	1	
RRO (AK 103)	"	

   d. Chain of custody form _____ COC tape _____
   e. Shipping container _____

5. **COMMENTS:** Trace of parts below seep seep is from gravel & peat beds in undercut bank.

The RETEC Group, Inc.
Groundwater Sampling Form

PROJECT AKRC
PROJECT NO. AKRC1-18277-221
WELL/SPRING NO. SP12
WELL OR SPRING?
SAMPLERS BWS / JA

1. **WELL CONDITION CHECKLIST:**
   a. Bump Posts _____ Pro.casing/lock _____ Surface pad _____
   b. Well visibility (paint) _____
   c. Well label _____

2. **WATER LEVEL/SPRING FLOW MEASUREMENT:**
   DATE 9-13-04 TIME 1435
   WELL – WATER LEVEL MEASUREMENT
   a. Location of measuring point _____
   b. Depth of water table from measuring point _____
   c. Height of measuring point above ground surface _____
   d. Total depth of well below measuring point _____
   e. Length of water column (line 2d-2b) _____
   SPRING – FLOW MEASUREMENT
   a. Flow rate < 0.1 gpm
   b. Method of measurement Visual Estimate

3. **WELL PURGING:**
   DATE _____ TIME _____
   WEATHER CONDITIONS _____
   a. Purge method _____
   b. Required purge volume at 3 well volumes _____

Pumping Duration	Volume Removed	pH	Sp Cond.	T(°C)	DO	ORP	Appearance

SP12-091304

4. **SAMPLE COLLECTION:**
   DATE 9-13-04 TIME 1440
   WEATHER CONDITIONS _____
   a. Collection method _____
   b. Meter calibration: Date Model
      multi-meter _____
      other _____
   c. Sample information pH 6.13 Sp Cond. 0.5 T(°C) 8.53 DO 3.84 ORP 322

Analysis/Method	Containers	Sample Prep./Preservation
VOC's (EPA 8260)	2	
SVOCS (EPA 8270)	1	
GRO (AK 101)	1	
DRO (AK 102)	1	
RRO (AK 103)	1	

   d. Chain of custody form _____ COC tape _____
   e. Shipping container _____

5. **COMMENTS:** Peat & leaf litter in spring, difficult to obtain a clear sample

The RETEC Group, Inc.
Groundwater Sampling Form

PROJECT ARCC
WELL/SPRING NO. SP16
SAMPLERS BW / SA

PROJECT NO. AKRCI - 18277-221
WELL OR SPRING?

1. WELL CONDITION CHECKLIST:

a. Bump Posts _____ Pro.casing/lock _____ Surface pad _____
b. Well visibility (paint) _____
c. Well label _____

2. WATER LEVEL/SPRING FLOW MEASUREMENT:

DATE _____ TIME _____

WELL – WATER LEVEL MEASUREMENT

a. Location of measuring point _____
b. Depth of water table from measuring point _____
c. Height of measuring point above ground surface _____
d. Total depth of well below measuring point _____
e. Length of water column (line 2d-2b) _____

SPRING – FLOW MEASUREMENT

a. Flow rate ~ 0.2 gpm
b. Method of measurement Visual Observation

3. WELL PURGING:

DATE _____ TIME _____

WEATHER CONDITIONS _____

a. Purge method _____
b. Required purge volume at 3 well volumes _____

Pumping Duration	Volume Removed	pH	Sp Cond.	T(°C)	DO	ORP	Appearance

SP16-091304

4. SAMPLE COLLECTION:

DATE 9-13-04 TIME 1500

WEATHER CONDITIONS _____

a. Collection method _____
b. Meter calibration: Date Model
multi-meter _____
other _____
c. Sample information pH 6.15 Sp Cond. 0.51 T(°C) 10.41 DO 9.06 ORP 303

Analysis/Method	Containers	Sample Prep./Preservation
VOC's (EPA 8260)	2	
SVOCS (EPA 8270)	1	
GRO (AK 101)	1	
DRO (AK 102)	1	
RRO (AK 103)	1	

d. Chain of custody form _____ COC tape _____
e. Shipping container _____

5. COMMENTS: Spring on W. end of Bluff Dig

The RETEC Group, Inc.
Groundwater Sampling Form

PROJECT ARCC
PROJECT NO.
WELL/SPRING NO. SP19
WELL OR SPRING? SP19
SAMPLERS BWS/JA

1. **WELL CONDITION CHECKLIST:**
   a. Bump Posts _____ Pro.casing/lock _____ Surface pad _____
   b. Well visibility (paint) _____
   c. Well label _____

2. **WATER LEVEL/SPRING FLOW MEASUREMENT:**
   DATE 9-13-04 TIME 1510
   WELL – WATER LEVEL MEASUREMENT
   a. Location of measuring point _____
   b. Depth of water table from measuring point _____
   c. Height of measuring point above ground surface _____
   d. Total depth of well below measuring point _____
   e. Length of water column (line 2d-2b) _____
   SPRING – FLOW MEASUREMENT
   a. Flow rate .5 gpm
   b. Method of measurement Estimated

3. **WELL PURGING:**
   DATE _____ TIME _____
   WEATHER CONDITIONS _____
   a. Purge method _____
   b. Required purge volume at 3 well volumes _____

Pumping Duration	Volume Removed	pH	Sp Cond.	T(°C)	DO	ORP	Appearance

SP19-091304

4. **SAMPLE COLLECTION:**
   DATE 9-13-04 TIME 1515
   WEATHER CONDITIONS _____
   a. Collection method _____
   b. Meter calibration: Date _____ Model _____
      multi-meter
      other
   c. Sample information pH 6.47 Sp Cond. 0.345 T(°C) 12.25 DO 11.36 ORP 281

Analysis/Method	Containers	Sample Prep./Preservation
VOC's (EPA 8260)	2	2X 40ml
SVOCS (EPA 8270)	1	1 X 1L
GRO (AK 101)	1	1 X 40ml
DRO (AK 102)	1	1 X 1L
RRO (AK 103)	"	"

   d. Chain of custody form _____ COC tape _____
   e. Shipping container _____

5. **COMMENTS:** _____

The RETEC Group, Inc.
Groundwater Sampling Form

PROJECT AKRC — PROJECT NO. AKRC1-18277
WELL/SPRING NO. SP24 — WELL OR SPRING? SP24
SAMPLERS BWS / JA

1. **WELL CONDITION CHECKLIST:**
   a. Bump Posts _____ Pro.casing/lock _____ Surface pad _____
   b. Well visibility (paint) _____
   c. Well label _____

2. **WATER LEVEL/SPRING FLOW MEASUREMENT:**
   DATE _____ TIME _____
   WELL – WATER LEVEL MEASUREMENT
   a. Location of measuring point _____
   b. Depth of water table from measuring point _____
   c. Height of measuring point above ground surface _____
   d. Total depth of well below measuring point _____
   e. Length of water column (line 2d-2b) _____
   SPRING – FLOW MEASUREMENT
   a. Flow rate < 0.1 spm
   b. Method of measurement Filling Sample bottles

3. **WELL PURGING:**
   DATE _____ TIME _____
   WEATHER CONDITIONS _____
   a. Purge method _____
   b. Required purge volume at 3 well volumes _____

Pumping Duration	Volume Removed	pH	Sp Cond.	T(°C)	DO	ORP	Appearance

4. **SAMPLE COLLECTION:** SP24-091304
   DATE 9-13-04 TIME 1540
   WEATHER CONDITIONS _____
   a. Collection method _____
   b. Meter calibration: Date _____ Model _____
      multi-meter _____
      other _____
   c. Sample information pH 6.00 Sp Cond. 0.562 T(°C) 15.7 DO 0.34 ORP -36

Analysis/Method	Containers	Sample Prep./Preservation
VOC's (EPA 8260)	2	2X 40ml
SVOCS (EPA 8270)	1	1X 1L
GRO (AK 101)	1	1X 40ml
DRO (AK 102)	1	1X 1L
RRO (AK 103)	1	"

   d. Chain of custody form _____ COC tape _____
   e. Shipping container _____

5. **COMMENTS:** Seep has Fe-reducing bacteria, biogenic sheen, peaty, anoxic

The RETEC Group, Inc.
Groundwater Sampling Form

PROJECT ARCC
PROJECT NO. AKRC1-18277-221
WELL/SPRING NO. SPZ6
WELL OR SPRING? SPZ6
SAMPLERS BWS/JA

1. **WELL CONDITION CHECKLIST:**
   a. Bump Posts _____ Pro.casing/lock _____ Surface pad _____
   b. Well visibility (paint) _____
   c. Well label _____

2. **WATER LEVEL/SPRING FLOW MEASUREMENT:**
   DATE 9-14-04 TIME 0950
   WELL – WATER LEVEL MEASUREMENT
   a. Location of measuring point _____
   b. Depth of water table from measuring point _____
   c. Height of measuring point above ground surface _____
   d. Total depth of well below measuring point _____
   e. Length of water column (line 2d-2b) _____
   SPRING – FLOW MEASUREMENT
   a. Flow rate 0.5 gpm
   b. Method of measurement Bucket & stopwatch

3. **WELL PURGING:**
   DATE _____ TIME _____
   WEATHER CONDITIONS _____
   a. Purge method _____
   b. Required purge volume at 3 well volumes _____

Pumping Duration	Volume Removed	pH	Sp Cond.	T(°C)	DO	ORP	Appearance

4. **SAMPLE COLLECTION:** SPZ6-091404
   DATE 9-14-04 TIME 1000
   WEATHER CONDITIONS _____
   a. Collection method _____
   b. Meter calibration: Date 9-14-04 0820 Model Horiba U-22
      multi-meter
      other
   c. Sample information pH 6.62 Sp Cond. .282 T(°C) 9.3 DO 9.6 ORP 280

Analysis/Method	Containers		Sample Prep./Preservation
VOC's (EPA 8260)	2	2 x 40ml	HCl
SVOCS (EPA 8270)	1	1 x 1L	–
GRO (AK 101)	1	1 x 40ml	HCl
DRO (AK 102)	1	1 x 1L	HCl
RRO (AK 103)	1	1	1

D. Metals 1x1L

   d. Chain of custody form _____ COC tape _____
   e. Shipping container _____

5. **COMMENTS:** Collected Duplicate SPZ60-091404
   Collected MS/MSD

The RETEC Group, Inc.
Groundwater Sampling Form

PROJECT ARCC
PROJECT NO. AKRE1-18277-221
WELL/SPRING NO. SP-27
WELL OR SPRING?
SAMPLERS BWS / JA

1. **WELL CONDITION CHECKLIST:**
   a. Bump Posts _____ Pro.casing/lock _____ Surface pad _____
   b. Well visibility (paint) _____
   c. Well label _____

2. **WATER LEVEL/SPRING FLOW MEASUREMENT:**
   DATE _____ TIME _____
   WELL – WATER LEVEL MEASUREMENT
   a. Location of measuring point _____
   b. Depth of water table from measuring point _____
   c. Height of measuring point above ground surface _____
   d. Total depth of well below measuring point _____
   e. Length of water column (line 2d-2b) _____
   SPRING – FLOW MEASUREMENT
   a. Flow rate 0.2 gpm
   b. Method of measurement Bottles & Stopwatch

3. **WELL PURGING:**
   DATE _____ TIME _____
   WEATHER CONDITIONS _____
   a. Purge method _____
   b. Required purge volume at 3 well volumes _____

Pumping Duration	Volume Removed	pH	Sp Cond.	T(°C)	DO	ORP	Appearance
		6.2	.542	11.48	4.9	224	Clear

4. **SAMPLE COLLECTION:**
   DATE 9-14-2004 TIME 1025
   WEATHER CONDITIONS _____
   a. Collection method _____
   b. Meter calibration: Date _____ Model _____
      multi-meter _____
      other _____
   c. Sample information pH 6.7 Sp Cond. .542 T(°C) 11.48 DO 4.9 ORP 224

Analysis/Method	Containers	Sample Prep./Preservation
VOC's (EPA 8260)	2 x 40ml	HCl
SVOCS (EPA 8270)	1 x 1L	—
GRO (AK 101)	1 x 40ml	HCl
DRO (AK 102)	1 x 1L	HCl
RRO (AK 103)	"	"

Dmetals 1x1L

   d. Chain of custody form _____ COC tape _____
   e. Shipping container _____

5. **COMMENTS:** On Eastern portion of Bluff Dg

The RETEC Group, Inc.
Groundwater Sampling Form

PROJECT ARCC
PROJECT NO. AKRC1-18277-221
WELL/SPRING NO. SP30
WELL OR SPRING?
SAMPLERS BWS / SA

1. **WELL CONDITION CHECKLIST:**
   a. Bump Posts _____ Pro.casing/lock _____ Surface pad _____
   b. Well visibility (paint) _____
   c. Well label _____

2. **WATER LEVEL/SPRING FLOW MEASUREMENT:**
   DATE 9-14-04 TIME 1120
   WELL – WATER LEVEL MEASUREMENT
   a. Location of measuring point _____
   b. Depth of water table from measuring point _____
   c. Height of measuring point above ground surface _____
   d. Total depth of well below measuring point _____
   e. Length of water column (line 2d-2b) _____
   SPRING – FLOW MEASUREMENT
   a. Flow rate 30 gpm
   b. Method of measurement Bucket & Stopwatch

3. **WELL PURGING:**
   DATE _____ TIME _____
   WEATHER CONDITIONS _____
   a. Purge method _____
   b. Required purge volume at 3 well volumes _____

Pumping Duration	Volume Removed	pH	Sp Cond.	T(°C)	DO	ORP	Appearance

4. **SAMPLE COLLECTION:** SP30 - 091404
   DATE 9/14/04 TIME 1050
   WEATHER CONDITIONS _____
   a. Collection method _____
   b. Meter calibration: Date _____ Model _____
      multi-meter
      other
   c. Sample information pH 6.69 Sp Cond. 0.523 T(°C) 11.51 DO 9.90 ORP 157

Analysis/Method	Containers	Sample Prep./Preservation
VOC's (EPA 8260)		
SVOCS (EPA 8270)		
GRO (AK 101)		
DRO (AK 102)		
RRO (AK 103)		

D. Metals 1X 1L

   d. Chain of custody form _____ COC tape _____
   e. Shipping container _____

5. **COMMENTS:** Collected Duplicate SP300 -091404

The RETEC Group, Inc.
Groundwater Sampling Form

PROJECT ARCC
PROJECT NO. AKRC1-18277-221
WELL/SPRING NO. SP33
WELL OR SPRING?
SAMPLERS BWS/SA

1. **WELL CONDITION CHECKLIST:**
   a. Bump Posts _____ Pro.casing/lock _____ Surface pad _____
   b. Well visibility (paint) _____
   c. Well label _____

2. **WATER LEVEL/SPRING FLOW MEASUREMENT:**
   DATE _____ TIME _____
   WELL – WATER LEVEL MEASUREMENT
   a. Location of measuring point _____
   b. Depth of water table from measuring point _____
   c. Height of measuring point above ground surface _____
   d. Total depth of well below measuring point _____
   e. Length of water column (line 2d-2b) _____
   SPRING – FLOW MEASUREMENT
   a. Flow rate 2 Spm
   b. Method of measurement Bucket & Stop Watch

3. **WELL PURGING:**
   DATE _____ TIME _____
   WEATHER CONDITIONS _____
   a. Purge method _____
   b. Required purge volume at 3 well volumes _____

Pumping Duration	Volume Removed	pH	Sp Cond.	T(°C)	DO	ORP	Appearance
							Clear, No O.U.C

4. **SAMPLE COLLECTION:**
   DATE 9-14-04 TIME 1320 67 NTU
   WEATHER CONDITIONS _____
   a. Collection method _____
   b. Meter calibration: Date _____ Model _____
      multi-meter _____
      other _____
   c. Sample information pH 6.78 Sp Cond. .358 T(°C) 7.40 DO 3.02 ORP 146

Analysis/Method	Containers	Sample Prep./Preservation
VOC's (EPA 8260)	2X 40ml	HCl
SVOCS (EPA 8270)	1X 1L	-
GRO (AK 101)	1x 40ml	HCl
DRO (AK 102)	1x 1L	HCl
RRO (AK 103)	1x 1L	D metals 1x 250ml Poly

   d. Chain of custody form _____ COC tape _____
   e. Shipping container _____

5. **COMMENTS:** Same as MWH Site 2, Seep 3

The RETEC Group, Inc.
Groundwater Sampling Form

PROJECT ARCC
WELL/SPRING NO. SP34
SAMPLERS DWS / DA

PROJECT NO. AKRC1-18277-221
WELL OR SPRING?

1. **WELL CONDITION CHECKLIST:**
   a. Bump Posts _____ Pro.casing/lock _____ Surface pad _____
   b. Well visibility (paint) _____
   c. Well label _____

2. **WATER LEVEL/SPRING FLOW MEASUREMENT:**
   DATE _____ TIME _____
   WELL – WATER LEVEL MEASUREMENT
   a. Location of measuring point _____
   b. Depth of water table from measuring point _____
   c. Height of measuring point above ground surface _____
   d. Total depth of well below measuring point _____
   e. Length of water column (line 2d-2b) _____
   SPRING – FLOW MEASUREMENT
   a. Flow rate 0.2 gpm
   b. Method of measurement Visual Estimate

3. **WELL PURGING:**
   DATE _____ TIME _____
   WEATHER CONDITIONS _____
   a. Purge method _____
   b. Required purge volume at 3 well volumes _____

Pumping Duration	Volume Removed	pH	Sp Cond.	T(°C)	DO	ORP	Appearance
							Clear, iron stained soil, possible HC sheen

4. **SAMPLE COLLECTION:**
   DATE 9-14-04 TIME 1340
   WEATHER CONDITIONS _____
   a. Collection method _____
   b. Meter calibration: Date _____ Model _____
      multi-meter _____
      other _____
   c. Sample information pH 6.64 Sp Cond. 0.373 T(°C) 7.42 DO 5.12 ORP 178

Analysis/Method	Containers	Sample Prep./Preservation
VOC's (EPA 8260)		
SVOCS (EPA 8270)		
GRO (AK 101)		
DRO (AK 102)		
RRO (AK 103)	D	none

   d. Chain of custody form _____ COC tape _____
   e. Shipping container _____

5. **COMMENTS:** Possible HC-sheen, Fe bacteria + biogenic sheen too. Faint HC odor

The RETEC Group, Inc.
Groundwater Sampling Form

PROJECT ARCC
PROJECT NO. AKRCI-18277-221
WELL/SPRING NO. SP35
WELL OR SPRING?
SAMPLERS BWS / SA

1. **WELL CONDITION CHECKLIST:**
   a. Bump Posts _____ Pro.casing/lock _____ Surface pad _____
   b. Well visibility (paint) _____
   c. Well label _____

2. **WATER LEVEL/SPRING FLOW MEASUREMENT:**
   DATE 9-14-04 TIME 1350
   WELL – WATER LEVEL MEASUREMENT
   a. Location of measuring point _____
   b. Depth of water table from measuring point _____
   c. Height of measuring point above ground surface _____
   d. Total depth of well below measuring point _____
   e. Length of water column (line 2d-2b) _____
   SPRING – FLOW MEASUREMENT
   a. Flow rate < 0.1 gpm
   b. Method of measurement Visual Estimate

3. **WELL PURGING:**
   DATE _____ TIME _____
   WEATHER CONDITIONS _____
   a. Purge method _____
   b. Required purge volume at 3 well volumes _____

Pumping Duration	Volume Removed	pH	Sp Cond.	T(°C)	DO	ORP	Appearance

4. **SAMPLE COLLECTION:** SP35-091404
   DATE 9-14-04 TIME 1355
   WEATHER CONDITIONS _____
   a. Collection method _____
   b. Meter calibration: Date / Model
      multi-meter Horiba U-22 9/14/04
      other _____
   c. Sample information pH 6.34 Sp Cond. 0.542 T(°C) 10.18 DO 0 ORP -47

Analysis/Method	Containers		Sample Prep./Preservation	
VOC's (EPA 8260)	2 x 40ml	VOA	HCl	
SVOCS (EPA 8270)	1 x 1L		-	
GRO (AK 101)	1 x 40ml		HCl	
DRO (AK 102)	1 x 1L		HCl	
RRO (AK 103)	1,		D. Metals	1 x 250ml Poly

   d. Chain of custody form _____ COC tape _____
   e. Shipping container _____

5. **COMMENTS:** HC sheen & odor - Possibly W. Diesel
   Very low flow, had to sample w/ transfer jar from a shallow sump

The RETEC Group, Inc.
Groundwater Sampling Form

PROJECT ARCC
PROJECT NO. AKTK1-18277-221
WELL/SPRING NO. SP 36
WELL OR SPRING?
SAMPLERS BWS / JA

1. **WELL CONDITION CHECKLIST:**
   a. Bump Posts _____ Pro.casing/lock _____ Surface pad _____
   b. Well visibility (paint) _____
   c. Well label _____

2. **WATER LEVEL/SPRING FLOW MEASUREMENT:**
   DATE _____ TIME _____
   WELL – WATER LEVEL MEASUREMENT
   a. Location of measuring point _____
   b. Depth of water table from measuring point _____
   c. Height of measuring point above ground surface _____
   d. Total depth of well below measuring point _____
   e. Length of water column (line 2d-2b) _____
   SPRING – FLOW MEASUREMENT
   a. Flow rate 0.1 gpm
   b. Method of measurement Based on filling containers

3. **WELL PURGING:**
   DATE _____ TIME _____
   WEATHER CONDITIONS _____
   a. Purge method _____
   b. Required purge volume at 3 well volumes _____

Pumping Duration	Volume Removed	pH	Sp Cond.	T(°C)	DO	ORP	Appearance

4. **SAMPLE COLLECTION:** SP36-091404
   DATE 9-14-04 TIME 1445
   WEATHER CONDITIONS _____
   a. Collection method _____
   b. Meter calibration: Date / Model
      multi-meter Horiba U-22 9-14-04 0820
      other
   c. Sample information pH 7.07 Sp Cond. 0.459 T(°C) 7.8 DO 5.67 ORP 87

Analysis/Method	Containers	Sample Prep./Preservation
VOC's (EPA 8260)	2x 40ml	VOA
SVOCS (EPA 8270)	1x 1L	
GRO (AK 101)	1x 40ml	VOA
DRO (AK 102)	1x 1L	
RRO (AK 103)	"	

   d. Chain of custody form _____ COC tape _____
   e. Shipping container _____

5. **COMMENTS:** _____

The RETEC Group, Inc.
Groundwater Sampling Form

PROJECT ARCC
PROJECT NO. AKRCI - 18277-221
WELL/SPRING NO. SP40
WELL OR SPRING? SP40
SAMPLERS ~~BWS / SA~~

1. **WELL CONDITION CHECKLIST:**
   a. Bump Posts _____ Pro.casing/lock _____ Surface pad _____
   b. Well visibility (paint) _____
   c. Well label _____

2. **WATER LEVEL/SPRING FLOW MEASUREMENT:**
   DATE _____ TIME _____
   WELL – WATER LEVEL MEASUREMENT
   a. Location of measuring point _____
   b. Depth of water table from measuring point _____
   c. Height of measuring point above ground surface _____
   d. Total depth of well below measuring point _____
   e. Length of water column (line 2d-2b) _____
   SPRING – FLOW MEASUREMENT
   a. Flow rate 0.2 gpm
   b. Method of measurement Based on bottle fill rate

3. **WELL PURGING:**
   DATE _____ TIME _____
   WEATHER CONDITIONS _____
   a. Purge method _____
   b. Required purge volume at 3 well volumes _____

Pumping Duration	Volume Removed	pH	Sp Cond.	T(°C)	DO	ORP	Appearance

4. **SAMPLE COLLECTION:**
   DATE 9-14-04 TIME 1500
   WEATHER CONDITIONS _____
   a. Collection method _____
   b. Meter calibration: Date _____ Model _____
      multi-meter _____
      other _____
   c. Sample information pH 6.78 Sp Cond. 0.567 T(°C) 9.67 DO 4.94 ORP 121

Analysis/Method	Containers	Sample Prep./Preservation
VOC's (EPA 8260)	2 x 40 ml	HCl
SVOCS (EPA 8270)	1 x 1L	-
GRO (AK 101)	1 x 40 ml	HCl
DRO (AK 102)	1 x 1L	HCl
RRO (AK 103)	"	HCl D. mtls 1X 250ml Poly

   d. Chain of custody form _____ COC tape _____
   e. Shipping container _____

5. **COMMENTS:** Spring is next to 045-SP03

The RETEC Group, Inc.
Groundwater Sampling Form

PROJECT ARCC
PROJECT NO. AKRC1 - 18277-221
WELL/SPRING NO. SP41
WELL OR SPRING?
SAMPLERS BWS / JA

1. **WELL CONDITION CHECKLIST:**
   a. Bump Posts _____ Pro.casing/lock _____ Surface pad _____
   b. Well visibility (paint) _____
   c. Well label _____

2. **WATER LEVEL/SPRING FLOW MEASUREMENT:**
   DATE _____ TIME _____
   WELL – WATER LEVEL MEASUREMENT
   a. Location of measuring point _____
   b. Depth of water table from measuring point _____
   c. Height of measuring point above ground surface _____
   d. Total depth of well below measuring point _____
   e. Length of water column (line 2d-2b) _____
   SPRING – FLOW MEASUREMENT
   a. Flow rate 4 gpm
   b. Method of measurement Bucket & Stopwatch

3. **WELL PURGING:**
   DATE _____ TIME _____
   WEATHER CONDITIONS _____
   a. Purge method _____
   b. Required purge volume at 3 well volumes _____

Pumping Duration	Volume Removed	pH	Sp Cond.	T(°C)	DO	ORP	Appearance
							Clear, No odor

4. **SAMPLE COLLECTION:**
   DATE _____ TIME _____
   WEATHER CONDITIONS _____
   a. Collection method _____
   b. Meter calibration: Date _____ Model _____
      multi-meter _____
      other _____
   c. Sample information pH 6.66 Sp Cond. 0.521 T(°C) 9.22 DO 1.57 ORP 138

Analysis/Method	Containers	Sample Prep./Preservation
VOC's (EPA 8260)	2 x 40ml	HCl
SVOCS (EPA 8270)	1 x 1L	-
GRO (AK 101)	1 x 40ml	HCl
DRO (AK 102)	1 x 1L	HCl
RRO (AK 103)	" " HCl	D. Metals 1x250 ml Poly

   d. Chain of custody form _____ COC tape _____ & Hymes.
   e. Shipping container _____

5. **COMMENTS:** _____

The RETEC Group, Inc.
Groundwater Sampling Form

PROJECT ARCC
PROJECT NO. AKRC1-18277-221
WELL/SPRING NO. SP46
WELL OR SPRING?
SAMPLERS BWS/JA

1. **WELL CONDITION CHECKLIST:**
   a. Bump Posts _____ Pro.casing/lock _____ Surface pad _____
   b. Well visibility (paint) _____
   c. Well label _____

2. **WATER LEVEL/SPRING FLOW MEASUREMENT:**
   DATE _____ TIME _____
   WELL – WATER LEVEL MEASUREMENT
   a. Location of measuring point _____
   b. Depth of water table from measuring point _____
   c. Height of measuring point above ground surface _____
   d. Total depth of well below measuring point _____
   e. Length of water column (line 2d-2b) _____
   SPRING – FLOW MEASUREMENT
   a. Flow rate ≈ 2 gpm across 15' wide seepfa
   b. Method of measurement _____

3. **WELL PURGING:**
   DATE _____ TIME _____
   WEATHER CONDITIONS _____
   a. Purge method _____
   b. Required purge volume at 3 well volumes _____

Pumping Duration	Volume Removed	pH	Sp Cond.	T(°C)	DO	ORP	Appearance
							Clear

4. **SAMPLE COLLECTION:**
   DATE 9-14-04 TIME 1545
   WEATHER CONDITIONS _____
   a. Collection method _____
   b. Meter calibration: Date _____ Model Horiba U-22
      multi-meter _____
      other _____
   c. Sample information pH 6.55 Sp Cond. 0.556 T(°C) 7.64 DO 2.88 ORP 92

Analysis/Method	Containers		Sample Prep./Preservation	
VOC's (EPA 8260)	2X40ml		HCl	
SVOCS (EPA 8270)	1 X 1L		-	
GRO (AK 101)	1X40ml		HCl	
DRO (AK 102)	1 x 1L		HCl	
RRO (AK 103)	"	HCl	D. Metals	1X250 ml Poly

   d. Chain of custody form _____ COC tape _____ (2 coolers. Lgs Filter)
   e. Shipping container _____

5. **COMMENTS:** AKA Seep #17 (PVC stickup)

The RETEC Group, Inc.
Groundwater Sampling Form

PROJECT ARCC
PROJECT NO. AKRC1 - 18277 - 221
WELL/SPRING NO. 5748
WELL OR SPRING?
SAMPLERS BWS / SA

1. WELL CONDITION CHECKLIST:

a. Bump Posts _____ Pro.casing/lock _____ Surface pad _____
b. Well visibility (paint) _____
c. Well label _____

2. WATER LEVEL/SPRING FLOW MEASUREMENT:

DATE 9-14-04 TIME 1600

WELL – WATER LEVEL MEASUREMENT

a. Location of measuring point _____
b. Depth of water table from measuring point _____
c. Height of measuring point above ground surface _____
d. Total depth of well below measuring point _____
e. Length of water column (line 2d-2b) _____

SPRING – FLOW MEASUREMENT

a. Flow rate 1 gpm
b. Method of measurement Timing filling of 1L bottle

3. WELL PURGING:

DATE _____ TIME _____

WEATHER CONDITIONS _____

a. Purge method _____
b. Required purge volume at 3 well volumes _____

Pumping Duration	Volume Removed	pH	Sp Cond.	T(°C)	DO	ORP	Appearance

4. SAMPLE COLLECTION:

DATE 9-14-04 TIME 1610

WEATHER CONDITIONS _____

a. Collection method _____
b. Meter calibration: Date _____ Model _____
multi-meter _____
other _____
c. Sample information pH 6.7 Sp Cond. .585 T(°C) 7.3 DO 2.38 ORP 146

Analysis/Method	Containers	Sample Prep./Preservation
VOC's (EPA 8260)	2 X 40ml	HCl
SVOCS (EPA 8270)	1 X 1L	-
GRO (AK 101)	1 x 40ml	HCl
DRO (AK 102)	1 X 1L	HCl
RRO (AK 103)	"	D. Metals 1 x 250 poly

d. Chain of custody form _____ COC tape _____
e. Shipping container _____

5. COMMENTS: E end of constructed wetland

The RETEC Group, Inc.
Groundwater Sampling Form

AKRC-18277-221

PROJECT AKRC
PROJECT NO. AKRC
WELL/SPRING NO. SP-49
WELL OR SPRING?
SAMPLERS

1. **WELL CONDITION CHECKLIST:**
   a. Bump Posts _____ Pro.casing/lock _____ Surface pad _____
   b. Well visibility (paint) _____
   c. Well label _____

2. **WATER LEVEL/SPRING FLOW MEASUREMENT:**
   DATE _____ TIME _____
   WELL – WATER LEVEL MEASUREMENT
   a. Location of measuring point _____
   b. Depth of water table from measuring point _____
   c. Height of measuring point above ground surface _____
   d. Total depth of well below measuring point _____
   e. Length of water column (line 2d-2b) _____
   SPRING – FLOW MEASUREMENT
   a. Flow rate 0.3 gpm
   b. Method of measurement Bottle & stopwatch

3. **WELL PURGING:**
   DATE _____ TIME _____
   WEATHER CONDITIONS _____
   a. Purge method _____
   b. Required purge volume at 3 well volumes _____

Pumping Duration	Volume Removed	pH	Sp Cond.	T(°C)	DO	ORP	Appearance

SP49-091404

4. **SAMPLE COLLECTION:**
   DATE 9-14-04 TIME 1620
   WEATHER CONDITIONS _____
   a. Collection method _____
   b. Meter calibration: Date Model
      multi-meter Horiba U-22
      other
   c. Sample information pH 6.61 Sp Cond. 0.560 T(°C) 7.6 DO 1.06 ORP 132

Analysis/Method	Containers	Sample Prep./Preservation
VOC's (EPA 8260)	2 X 40ml VOA	HCl
SVOCS (EPA 8270)	1 X 1L	—
GRO (AK 101)	1 X 40ml VOA	HCl
DRO (AK 102)	1 X 1L	
RRO (AK 103)	"	D. Metals

   d. Chain of custody form _____ COC tape _____
   e. Shipping container _____

5. **COMMENTS:** _____

The RETEC Group, Inc.
Groundwater Sampling Form

PROJECT ARCC
PROJECT NO. AKRC1-18277
WELL/SPRING NO. SP50
WELL OR SPRING?
SAMPLERS BS/JA

1. **WELL CONDITION CHECKLIST:**
   a. Bump Posts _____ Pro.casing/lock _____ Surface pad _____
   b. Well visibility (paint) _____
   c. Well label _____

2. **WATER LEVEL/SPRING FLOW MEASUREMENT:**
   DATE _____ TIME _____
   WELL – WATER LEVEL MEASUREMENT
   a. Location of measuring point _____
   b. Depth of water table from measuring point _____
   c. Height of measuring point above ground surface _____
   d. Total depth of well below measuring point _____
   e. Length of water column (line 2d-2b) _____
   SPRING – FLOW MEASUREMENT
   a. Flow rate 1 gal/min
   b. Method of measurement Sample Jar & Stop Watch

3. **WELL PURGING:**
   DATE _____ TIME _____
   WEATHER CONDITIONS _____
   a. Purge method _____
   b. Required purge volume at 3 well volumes _____

Pumping Duration	Volume Removed	pH	Sp Cond.	T(°C)	DO	ORP	Appearance

4. **SAMPLE COLLECTION:**
   DATE 9/14/04 TIME 1635
   WEATHER CONDITIONS _____
   a. Collection method _____
   b. Meter calibration: Date _____ Model _____
      multi-meter _____
      other _____
   c. Sample information pH 6.65 Sp Cond. 0.29 T(°C) 7.08 DO 1.99 ORP 167

Analysis/Method	Containers	Sample Prep./Preservation
VOC's (EPA 8260)	2 X 40ml VOA	
SVOCS (EPA 8270)	1 X 1L	
GRO (AK 101)	1 X 40ml	
DRO (AK 102)	1 X 1L	
RRO (AK 103)	"	D. Metals 250 ml Poly

   d. Chain of custody form _____ COC tape _____
   e. Shipping container _____

5. **COMMENTS:** _____

Chain of Custody Record

Nº 4471

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RETEC

Project Name: ARCC	Project Number: AKRG1-19677-221
Send Report To: Sue Mileen	Sampler (Print Name): Brian Seiler
Address: Above	Sampler (Print Name): Jennifer Anderson
	Shipment Method: Hand Delivery
	Airbill Number:
Phone:	Laboratory Receiving: Anchorage
Fax:	Anchorage AK

Page ____ of ____

Purchase Order #: _____

Field Sample ID	Sample Date	Sample Time	Sample Matrix	Number of Containers	Analysis Requested: VOCs 8260	SVOCs 8270	TPH - GRO	TPH - DRO	TPH - RRO	Comments, Special Instructions, etc.	Lab Sample ID (to be completed by lab)
SP01-091304	9/13/04	1300	H_2O	5	X	X	X	X	X		
SP07-091304	9/13/04	1340	H_2O	5	X	X	X	X	X		
SP10-091304	9/13/04	1420	H_2O	5	X	X	X	X	X		
SP12-091304	9/13/04	1440	H_2O	5	X	X	X	X	X		
SP16-091304	9/13/04	1500	H_2O	5	X	X	X	X	X		
SP19-091304	9/13/04	1515	H_2O	5	X	X	X	X	X		
SP24-091304	9/13/04	1540	H_2O	5	X	X	X	X	X		
Trip Blank #4471	9/13/04	—	H_2O	1	X						

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
		9/14/04	
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:

Sample Custodian Remarks (Completed By Laboratory):

QA/QC Level		Turnaround		Sample Receipt	
				Total # Containers Received?	
Level I	☐	Routine	☐	COC Seals Present?	
Level II	☐	24 Hour	☐	COC Seals Intact?	
Level III	☐	1 Week	☐	Received Containers Intact?	
Other	☐	Other _____		Temperature?	

White: Lab Copy Yellow: PM Copy Pink: Field Copy Gold: PM/QA/QC Copy

Chain of Custody Record

№ 4465

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RETEC

Project Name: ARCC	Project Number: AKRC1-19277
Send Report To: Sue Mikan	Sampler (Print Name): Bjorn Selvig
Address: Above	Sampler (Print Name): Jennifer Anderson
	Shipment Method: Hand Delivery
	Airbill Number:
Phone:	Laboratory Receiving: Analytica
Fax:	

Page 1 of 1

Purchase Order #:

Analysis Requested

Field Sample ID	Sample Date	Sample Time	Sample Matrix	Number of Containers	SVOCs 8270	TPH-DRO	TPH-RRO	Dissolved Metals	Comments, Special Instructions, etc.	Lab Sample ID (to be completed by lab)
SP26-071404	7/14/04	1000	H_2O	3	X	X	X	X	Lab Filter Me	
SP260-071404	7/14/04	1000	H_2O	3	X	X	X	X	Duplicate Dissolved Metals	
SP27-071404	7/14/04	1025	H_2O	3	X	X	X	X		
SP30-071404	7/14/04	1030	H_2O	3	X	X	X	X		
SP300-071404	7/14/04	1050	H_2O	3	X	X	X	X	Duplicate	

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
[signature]	[signature]		
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:

Sample Custodian Remarks (Completed By Laboratory):

QA/QC Level	Turnaround
Level I ☐	Routine ☐
Level II ☐	24 Hour ☐
Level III ☐	1 Week ☐
Other ☐	Other ______

Sample Receipt	
Total # Containers Received?	
COC Seals Present?	
COC Seals Intact?	
Received Containers Intact?	
Temperature?	

Chain of Custody Record

№ 4466

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RETEC

Project Name: ARRC	Project Number: ARRC1-18277-221
Send Report To: Sue McLean	Sampler (Print Name): Bryan Solvig
Address: Above	Sampler (Print Name): John C. Anderson
	Shipment Method: Hand Delivery
	Airbill Number:
Phone:	Laboratory Receiving: Analytica Anchorage AK
Fax:	

Analysis Requested: VOCs 8260; SVOC 8270; TPH-GRO AK 101; TPH-DRO AK 102; TPH-RRO AK 103; Dissolved Metals 6010

Page 1 of 2

Purchase Order #:

Field Sample ID	Sample Date	Sample Time	Sample Matrix	Number of Containers	VOCs 8260	SVOC 8270	TPH-GRO AK 101	TPH-DRO AK 102	TPH-RRO AK 103	Dissolved Metals 6010					Comments, Special Instructions, etc.	Lab Sample ID (to be completed by lab)
SP33 - 091404	9/14/04	1320	H_2O	6	X	X	X	X	X	X					Lab Filter	Use
SP34 - 091404	9/14/04	1340	H_2O	6	X	X	X	X	X	X					Dissolved	Metals
SP35 - 091404	9/14/04	1355	H_2O	6	X	X	X	X	X	X						
SP36 - 091404	9/14/04	1445	H_2O	6	X	X	X	X	X	X						
SP40 - 091404	9/14/04	1500	H_2O	6	X	X	X	X	X	X						
SP41 - 091404	9/14/04	1530	H_2O	6	X	X	X	X	X	X						
SP46 - 091404	9/14/04	1545	H_2O	6	X	X	X	X	X	X						
SP48 - 091404	9/14/04	1600	H_2O	6	X	X	X	X	X	X						
SP49 - 091404	9/14/04	1620	H_2O	6	X	X	X	X	X	X						
SP50 - 091404	9/14/04	1635	H_2O	6	X	X	X	X	X	X						
SP16 - 091404	9/14/04	1700	H_2O	1						X						
SP19 - 091404	9/14/04	1700	H_2O	1						X						
SP12 - 091404	9/14/04	1710	H_2O	1						X						
SP10 - 091404	9/14/04	1720	H_2O	1						X						
SP07 - 091404	9/14/04	1725	H_2O	1						X						
SP02 - 091404	9/14/04	1730	H_2O	1						X						
SP24 - 091404	9/14/04	1735	H_2O	1						X						

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
[signature]	Jenny Hess [signature]	[illegible]	[illegible]
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:

Sample Custodian Remarks (Completed By Laboratory):

QA/QC Level	Turnaround	Sample Receipt	
Level I ☐	Routine ☐	Total # Containers Received?	
Level II ☐	24 Hour ☐	COC Seals Present?	
Level III ☐	1 Week ☐	COC Seals Intact?	
Other ☐	Other ______	Received Containers Intact?	
		Temperature?	

White: Lab Copy   Yellow: PM Copy   Pink: Field Copy   Gold: PM/QA/QC Copy

Chain of Custody Record

№ 4467

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(970) 493-3700 Phone • (970) 493-2326 Fax
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RETEC

Project Name: ARRC	Project Number: ARRC1 - 112777.221
Send Report To: Steve Mlay	Sampler (Print Name): Bryan Selvig
Address: Reno	Sampler (Print Name): Steve Mlay
	Shipment Method: Hand Drive
	Airbill Number:
Phone:	Laboratory Receiving: Anatek
Fax:	Anatek Reno

Page 2 of 2

Purchase Order #: _____

Field Sample ID	Sample Date	Sample Time	Sample Matrix	Number of Containers	Analysis Requested: VOCs 8260	Comments, Special Instructions, etc.	Lab Sample ID (to be completed by lab)
Trip Blank	—	—	H_2O	1	X	Lab to dispose of samples	
SP26-091404-MS	9/14/04	1003	H_2O	6	X		
SP26-091404-MSD	9/14/04	1003	H_2O	6	X		
SP26-091404	9/14/04	1003	H_2O	3	X		
SP260-091404	9/14/04	1003	H_2O	3	X	Duplicate	
SP27-091404	9/14/04	1025	H_2O	3	X		
SP30-091404	9/14/04	1050	H_2O	3	X		
SP300-091404	9/14/04	1050	H_2O	3	X	Duplicate	

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Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:

Sample Custodian Remarks (Completed By Laboratory):

QA/QC Level		Turnaround	
Level I	☐	Routine	☐
Level II	☐	24 Hour	☐
Level III	☐	1 Week	☐
Other	☐	Other _____	

Sample Receipt	
Total # Containers Received?	
COC Seals Present?	
COC Seals Intact?	
Received Containers Intact?	
Temperature?	

White: Lab Copy Yellow: PM Copy Pink: Field Copy Gold: PM/QA/QC Copy

Chain of Custody Record Nº 4468

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RETEC

Project Name: ARRC	Project Number: AKRC1-13277-221
Send Report To: Sue Aiken	Sampler (Print Name): [illegible]
Address: Above	Sampler (Print Name): [illegible]
	Shipment Method: Hand Delivery
	Airbill Number:
Phone:	Laboratory Receiving: [illegible] Anchorage AK
Fax:	

Page 1 of 1

Purchase Order #:

Analysis Requested: VOC 8260; SVOC 8270; TPH-GRO AK101; TPH-DRO AK102; TPH-RRO AK103; TAL Metals (6020)

Field Sample ID	Sample Date	Sample Time	Sample Matrix	Number of Containers	VOC 8260	SVOC 8270	TPH-GRO AK101	TPH-DRO AK102	TPH-RRO AK103	TAL Metals (6020)	Comments, Special Instructions, etc.	Lab Sample ID (to be completed by lab)
S010-091504-0001	9/15/04	1045	Soil	4	X	X	X	X	X	X		
S012-091504-0001	9/15/04	1120	Soil	4	X	X	X	X	X	X		
S024-091504-0001	9/15/04	1140	Soil	4	X	X	X	X	X	X		
S030-091504-0001	9/15/04	1155	Soil	4	X	X	X	X	X	X		
S034-0915-04-0203	9/15/04	1400	Soil	4	X	X	X	X	X	X		
S035-0915-04-0203	9/15/04	1415	Soil	4	X	X	X	X	X	X		Last four digits changed from 0203 to 0002 RWS 9/17/04
S0350-091504-0203	9/15/04	1415	Soil	4	X	X	X	X	X	X	Duplicate	
S035-091504-0203-MS	9/15/04	1415	Soil	4	X	X	X	X	X	X		
S035-091504-0203-MSD	9/15/04	1415	Soil	4	X	X	X	X	X	X		
Trip Blank	—	—	H_2O	2	X							
EB10-091504	9/15/04	1100	H_2O	6	X	X	X	X	X	X	Equip Blank	
FB10-091504	9/15/04	1110	H_2O	6	X	X	X	X	X	X	Field Blank	

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
[signature]	[signature]	[illegible]	1600
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:

Sample Custodian Remarks (Completed By Laboratory):

QA/QC Level	Turnaround	Sample Receipt	
Level I ☐	Routine ☐	Total # Containers Received?	
Level II ☐	24 Hour ☐	COC Seals Present?	
Level III ☐	1 Week ☐	COC Seals Intact?	
Other ☐	Other ______	Received Containers Intact?	
		Temperature?	

White: Lab Copy Yellow: PM Copy Pink: Field Copy Gold: PM/QA/QC Copy

RETEC ANALYTICAL DATA VERIFICATION CHECKLIST

Project Name: Alaska Railroad Corporation (ARRC)	Laboratory: Analytica International, Inc., Anchorage, AK (Analytica Alaska)
Project Reference: North Bluff sampling	Sample Matrix: Groundwater seep, Soil, Soil QC, and Water QC samples
RETEC Project: AKRC1-18277-302	Sample Start Date: 09/13/2004
Verified By/Date Verified: Sue Milcan 11/01/2004 completed	Sample End Date: 09/15/2004

Samples Analyzed:

Matrix	Sample ID		Sample Date/Time		Lab SDG and ID		COC Reference
Groundwater seep	SP01-091304		9/13/2004	13:00	A0409179	A0409179-01	4471
Groundwater seep	SP07-091304		9/13/2004	13:40	A0409179	A0409179-02	4471
Groundwater seep	SP10-091304		9/13/2004	14:20	A0409179	A0409179-03	4471
Groundwater seep	SP12-091304		9/13/2004	14:40	A0409179	A0409179-04	4471
Groundwater seep	SP16-091304		9/13/2004	15:00	A0409179	A0409179-05	4471
Groundwater seep	SP19-091304		9/13/2004	15:15	A0409179	A0409179-06	4471
Groundwater seep	SP24-091304		9/13/2004	15:40	A0409179	A0409179-07	4471
Water QC	Trip Blank-091304	Trip Blank	9/13/2004	-	A0409179	A0409179-08	4471
Groundwater seep	SP26-091404		9/14/2004	10:00	A0409189	A0409189-01*	4465, 4467
Groundwater seep	SP260-091404	SP26-091404 Dup	9/14/2004	10:00	A0409189	A0409189-02*	4465, 4467
Groundwater seep	SP27-091404		9/14/2004	10:25	A0409189	A0409189-03*	4465, 4467
Groundwater seep	SP30-091404		9/14/2004	10:50	A0409189	A0409189-04*	4465, 4467
Groundwater seep	SP300-091404	SP30-091404 Dup	9/14/2004	10:50	A0409189	A0409189-05*	4465, 4467
Groundwater seep	SP33-091404		9/14/2004	13:20	A0409200	A0409200-01	4466
Groundwater seep	SP34-091404		9/14/2004	13:40	A0409200	A0409200-02	4466
Groundwater seep	SP35-091404		9/14/2004	13:55	A0409200	A0409200-03	4466
Groundwater seep	SP36-091404		9/14/2004	14:45	A0409200	A0409200-04	4466
Groundwater seep	SP40-091404		9/14/2004	15:00	A0409200	A0409200-05	4466
Groundwater seep	SP41-091404		9/14/2004	15:30	A0409200	A0409200-06	4466
Groundwater seep	SP46-091404		9/14/2004	15:45	A0409200	A0409200-07	4466
Groundwater seep	SP48-091404		9/14/2004	16:10	A0409200	A0409200-08	4466
Groundwater seep	SP49-091404		9/14/2004	16:20	A0409200	A0409200-09	4466
Groundwater seep	SP50-091404		9/14/2004	16:35	A0409200	A0409200-10	4466
Groundwater seep	SP02-091404		9/14/2004	17:30	A0409200	A0409200-11	4466
Groundwater seep	SP07-091404		9/14/2004	17:25	A0409200	A0409200-12	4466
Groundwater seep	SP10-091404		9/14/2004	17:20	A0409200	A0409200-13	4466
Groundwater seep	SP12-091404		9/14/2004	17:10	A0409200	A0409200-14	4466
Groundwater seep	SP16-091404		9/14/2004	17:00	A0409200	A0409200-15	4466
Groundwater seep	SP19-091404		9/14/2004	17:00	A0409200	A0409200-16	4466
Groundwater seep	SP24-091404		9/14/2004	17:35	A0409200	A0409200-17	4466
Water QC	Trip Blank-091404	Trip Blank	9/14/2004	-	A0409200	A0409200-18	4467

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Matrix	Sample ID		Sample Date/Time		Lab SDG and ID		COC Reference
Soil	SO10-0-1-091504		9/15/2004	10:45	A0409201	A0409201-01	4468
Soil	SO12-0-1-091504		9/15/2004	11:20	A0409201	A0409201-02	4468
Soil	SO24-0-1-091504		9/15/2004	11:40	A0409201	A0409201-03	4468
Soil	SO30-0-1-091504		9/15/2004	11:55	A0409201	A0409201-04	4468
Soil	SO34-0-2-091504		9/15/2004	14:00	A0409201	A0409201-05	4468
Soil	SO35-0-2-091504		9/15/2004	14:15	A0409201	A0409201-06	4468
Soil	SO350-0-2-091504	SO35-0-2-091504 Dup	9/15/2004	14:15	A0409201	A0409201-07	4468
Soil QC	Trip BlankS-091504	Trip Blank	9/15/2004	-	A0409201	A0409201-08	4468
Water QC	EB10-091504	Equipment Rinse Blank	9/15/2004	11:00	A0409201	A0409201-09	4468
Water QC	FB10-091504	Field Blank	9/15/2004	11:10	A0409201	A0409201-10	4468
Water QC	Trip BlankW-091504	Trip Blank	9/15/2004	-	A0409201	A0409201-11	4468

* Non-volatile and metals results for these samples were reported under laboratory SDG A0409200 as samples 19-23 respectively.

Parameters Analyzed: Volatile Organic Compounds (VOCs) by SW-846 GC/MS method 8260B; Semivolatile Organic Compounds (SVOCs) by SW-846 GC/MS method 8270C; Gasoline Range Organics (GRO) by ADEC method AK101; Diesel Rage Organics (DRO) and Residual Range Organics (RRO) by ADEC method AK102/103; Dissolved Metals by SW-846 ICP method 6010B and CVAA method 7470A: and percent moisture by ASTM method D2216.

Most/all methods 7470A, 6010B, 8260B, and 8270C were subcontracted to the Analytica, Thornton, CO location.

Not all samples were analyzed for every parameter. Refer to Chain of Custody records for the exact analyses requested.

Laboratory Project IDs/Sample Delivery Groups (SDGs): A0409179, A0409189, A0409200, A0409201.

PRECISION, ACCURACY, METHOD COMPLIANCE, AND COMPLETENESS ASSESSMENT

Precision:	**X**	Acceptable		Unacceptable	SM	Initials

Comments: Precision is the measure of variability of individual sample measurements. Field precision was determined by comparison of field duplicate sample results. Laboratory precision was determined by examination of laboratory duplicate results. Evaluation of laboratory duplicates for precision was done using the Relative Percent Difference (RPD). The RPD is defined as the difference between two duplicate samples divided by the mean and expressed as a percent. RPD limits referenced EPA published or laboratory control charted QC limits. Although some data require qualification based on field duplicate RPDs (item 21), overall field and laboratory precision is acceptable since a majority of the data is unqualified, and since sample heterogeneity, a common occurrence for soil matrices, is indicated for the soil samples. Precision measurements are reviewed in items 17 and 21.

Accuracy:	**X**	Acceptable		Unacceptable	SM	Initials

Comments: Field accuracy, a measure of the sampling bias, was determined by reviewing equipment rinse blank, field blank, and trip blank results for evidence of sample contamination stemming from field activities or sample transport. Laboratory accuracy, a measure of the system bias, was measured by evaluating laboratory control sample, laboratory control sample duplicate (LCS, LCSD), matrix spike/matrix spike duplicate (MS/MSD), and organic system monitoring compounds (surrogate) percent recoveries (%Rs). LCS and LCSD %Rs demonstrated overall analytical performance. MS/MSD %Rs provided information on sample matrix interferences. System monitoring compound or surrogate recoveries measured system performance and efficiency during organic analysis.

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%Rs were compared to EPA published QC limits or laboratory control charted QC limits. Although some data require qualification or rejection based on evidence of transport contamination (item 12), surrogate %Rs (item 14), LCS, LCSD %Rs (item 15), and/or MS/MSD %Rs (item 16), overall laboratory accuracy is acceptable, especially when considering that that a majority of the data is unqualified, and overriding laboratory or field accuracy concerns are not demonstrated. Accuracy measurements are reviewed in items 12, 14, 15, 16, and 20.

Method Compliance:	X	Acceptable		Unacceptable	SM	Initials

Comments: For this data set, method compliance was determined by evaluating sample integrity, holding time, reporting limits, and laboratory blanks against method specified requirements. Additionally, specific laboratory case narrative comments regarding instrument calibration and GC/MS internal standard areas were reviewed and considered, although supporting documentation to fully evaluate the laboratory comments was not provided for this level of data deliverables. Although some data require qualification based on concentrations reported below the reporting limit (item 6), laboratory contamination (item 11), and/or internal standard area outliers (item 19), overall method compliance is acceptable based on the data submitted since a majority of the data is unqualified based on these measurements. Method compliance measurements are reviewed in items 4, 6, 8, 11, 13, 18, 19, 20, and 22.

Completeness:	X	Acceptable		Unacceptable	SM	Initials

Comments: Completeness is the overall ratio of the number of samples planned versus the number of samples with valid analyses. Completeness goals were set at 90-100%. Determination of completeness during this data verification procedure included a review of chain of custody records, laboratory analytical methods and detection limits, laboratory case narratives, and project requirements. Completeness also included 100% review of the laboratory sample data results and QC summary reports. Electronic data deliverables (EDDs) were QA'd 100% for positive target analytes and 10% for reporting limits. EDD corrections/additions were made by the data validator during this review procedure as outlined in item 23. All of the data reported were usable, except for seven rejected data points for undetected benzidine results due to extremely low system bias in method 8270C QC batch T040917011 (see item 15). Of a total of 4817 data points, 4810 data points were determined to be usable, some with qualification. Completeness of the data set was calculated to be 99.8% and is acceptable.

VALIDATION CRITERIA CHECK

Data validation qualifiers assigned in this review:

J – estimated concentration

J+ - estimated concentration, high bias indicated

R – rejected data due to severe QAQC noncompliance

U – evaluated to be undetected at either the reported concentration (false positive), or at the reporting limit due to evidence of contamination

UJ – undetected, reporting limit is estimated

The following comments identifying sample results requiring qualification are in bold type. The other comments are of interest, but qualification of the sample results was not necessary.

Refer to the Table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified.

1. Did the laboratory identify any non-conformances related to the analytical results?	X	Yes		No	SM	Initials

Explanation: Various instrument calibration, internal standard area, surrogate, MS/MSD, and LCS outliers were noted in the case narratives. Method blank contamination was also noted. Additionally, assigned laboratory flags were considered during the data verification procedure.

Data qualification, if any, related to the laboratory comments and assigned flags are discussed in the following sections.

2. Were sample Chain-of-Custody forms complete?	**X**	Yes		No	SM	Initials
Comments: COC records from field to laboratory were complete, and custody was maintained as evidenced by field and laboratory personnel signatures, dates, and times of receipt.						
3. Were all the analyses requested for the samples on the COCs completed by the laboratory?	**X**	Yes		No	SM	Initials
Comments: All requested analyses as documented on the original COCs were completed by the laboratory.						
4. Were samples received in good condition and at the appropriate temperature?	**X**	Yes		No	SM	Initials
Comments: Samples were hand delivered to the laboratory by RETEC personnel and were received intact, on ice, and in good condition with cooler temperatures of 1.0°C to 5.8°C as noted in the supplied case narratives and Cooler Receipt Forms. Cooler temperatures of less than 2°C are determined to be acceptable since sample containers were intact and samples themselves were not frozen. Individual sample containers that were sent to the Analytica, Thornton, CO location for subcontract analysis were received intact, on ice, and in good condition with cooler temperatures of 4.2°C to 5.9°C as noted in the supplied case narratives. SDG A0409179: Note that small air bubbles were noticed in some vials designated for volatile analysis. Since the laboratory did not qualify the associated method 8260B and/or AK101 data based on the minimal amount of air present, professional judgment determines that sample integrity was not compromised. No action is required other than to note this observation.						
5. Were the requested analytical methods in compliance with WP/QAPP, permit, or COC?	**X**	Yes		No	SM	Initials
Comments: Reported methods were in compliance to those requested on the COC records.						
6. Were detection limits in accordance with WP/QAPP, permit, or method?	**X**	Yes		No	SM	Initials
Comments: Reported detection limits are achievable by the quoted methods. Some samples required analysis at diluted levels due to high target analyte concentrations. Soil sample results were reported on a dry weight basis. Reporting limits were adjusted appropriately to reflect dilution factors and percent moisture content as applicable. All Methods - **Sample results reported at concentrations greater than or equal to the method detection limit (MDL) but less than the practical quantitation limit/reporting limit (PQL/RL) require J qualifiers to indicate estimated concentrations. The analyte cannot be accurately quantitated at this concentration level.** **Refer to the Table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified.**						
7. Do the laboratory reports include only those constituents requested to be reported for a specific analytical method?	**X**	Yes		No	SM	Initials
Comments: Specific target analyte lists (TALs) were not requested for the organics analyses. The supplied TALs are appropriate for the reported methods. It should be noted however, that the method 8260B TALs differ slightly amongst each other depending on the sample matrix reported. No action is required other than to note this observation. The appropriate metals target analytes, as applicable to COC and correspondence directives, were reported.						
8. Were sample holding times met?	**X**	Yes		No	SM	Initials
Comments: Extraction and/or analytical holding times were met for all samples and analyses, according to the respective method protocols.						

9. Were correct concentration units reported?	**X**	Yes		No	SM	Initials
Comments: Correct concentration units were reported. For aqueous samples, methods 8260B, 8270C, and AK101 were reported as µg/L (ppb) while metals and methods AK102/103 were reported as mg/L (ppm). For soil samples, methods 8260B and 8270C were reported as µg/kg (ppb) while metals and methods AK101, AK102/103 were reported as mg/kg (ppm). No action is required other than to alert the data user to these varying units of measure.						
10. Were the reporting requirements for flagged data met?	**X**	Yes		No	SM	Initials
Comments: Laboratory flags were reviewed and considered during the data verification procedure. Data validation qualifiers override assigned laboratory flags.						
11. Were laboratory blank samples free of target analyte contamination?		Yes	**X**	No	SM	Initials

Comments: Reported laboratory method blank samples were free of target analyte contamination, or were associated with undetected project sample results, except as noted.

Method 8260B – Qualification of Results <RL -

Note: Organic data validation guidance states that if a sample result is less than the RL, and is also less than the 5x or 10x multiple of the blank result (whichever is appropriate), the sample result should be reported as being undetected at the reporting limit due to evidence of contamination (qualified as <RL U). The criteria of reporting the sample result as undetected at the reported concentration is not true for sample results that are <RL. For these samples, the initial concentrations reported by the laboratory were maintained in the result_comment field of the EDD for informational purposes only. Applying this guidance, the following qualifiers were assigned:

SDG 0409201: The QC batch T040928004 method blank reported methylene chloride below the RL at 13 µg/kg. An action limit of ten times the method blank concentration was established and compared to associated project sample results. Samples with reported methylene chloride concentrations below the action level and below the RL were corrected to read <RL U µg/kg in the EDD and in the table of Qualified Analytical Results to show that the results were evaluated to be undetected at the RL due to evidence of laboratory contamination and false positive detections below the RL (as detailed above).

Method 8270C – Qualification of Results <RL -

See above data qualification note under method 8260B for guidance.

SDG 0409200: The QC batch T040922002 method blank reported benzyl alcohol below the RL of 10 µg/L at 1.2 µg/L. An action limit of five times the method blank concentration was established and compared to associated project sample results. Sample SP48-091404 reported benzyl alcohol below the action level and below the RL at 3.5 µg/L. Consequently, this result has been corrected to read <10 U µg/L in the EDD and in the table of Qualified Analytical Results to show that the result has been evaluated to be undetected at the RL due to evidence of laboratory contamination and false positive detections below the RL (as detailed above).

Refer to the Table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (attached at the end of this Checklist).

12. Were trip blank, field blank, and/or equipment rinse blank samples free of target analyte contamination?		Yes	**X**	No	SM	Initials

Comments: The field blank and equipment rinse blank samples associated with the soil samples, and the reported trip blanks were either free of target analyte contamination, were associated with undetected project sample results, or project sample results exceeded five to ten times the reported blank concentration (whichever was appropriate) and could therefore not be attributed to field contamination, except as noted.

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Method 8260B – Qualification of Results >/= PQL/RL –

Note: Data validation guidance states that if a sample result is greater than or equal to the PQL/RL, but less than the 5x or 10x multiple of the blank result (whichever is appropriate), the sample result should be reported as being undetected at the reported concentration (false positive) due to evidence of contamination (qualified as concentration U). Applying this guidance, the following qualifiers were assigned:

SDG A0409201: Analyte 2-butanone was reported at 130 µg/kg in soil QC sample Trip BlankS-091504. An action limit of five times the trip blank concentration was established and compared to reported associated project sample results. Associated project sample SO30-0-1-091504 reported 2-butanone at a concentration that was below the action limit but was greater than the stated RL. Consequently, this result has been assigned a U qualifier to show that the result is considered to be a false positive due to evidence of possible transport contamination.

Method 8260B – Qualification of Results < PQL/RL -

Note: Data validation guidance states that if a sample result is less than the PQL/RL, and is also less than the 5x or 10x multiple of the blank result (whichever is appropriate), the sample result should be reported as being undetected at the reporting limit due to evidence of contamination (qualified as < RL U). The criteria of reporting the sample result as undetected at the reported concentration is not true for sample results that are < RL. For these samples, the initial concentrations reported by the laboratory were maintained in the result_comment field of the EDD for informational purposes only. Applying this guidance, the following qualifiers were assigned:

SDG A0409179: A trace amount of acetone (3.8 µg/L) was reported below the RL of 50 µg/L in sample Trip Blank-091304. An action limit of ten times the trip blank concentration was established and compared to reported associated project sample results. Some associated project samples reported acetone at concentrations that were below the action limit and were also less than the stated RL. Consequently, these results have been corrected to read < 50 U µg/L in the laboratory EDD and in the table of Qualified Analytical Results to show that these results have been evaluated to be undetected at the RL due to evidence of possible transport contamination and false positive detection below the RL (as detailed above).

SDG A0409201: Analyte 2-butanone was reported at 130 µg/kg in soil QC sample Trip BlankS-091504. An action limit of five times the trip blank concentration was established and compared to reported associated project sample results. Some associated project samples reported 2-butanone at concentrations that were below the action limit and were also less than the stated RL. Consequently, these results have been corrected to read < RL U µg/kg in the laboratory EDD and in the table of Qualified Analytical Results to show that these results have been evaluated to be undetected at the RL due to evidence of possible transport contamination and false positive detection below the RL (as detailed above).

Refer to the Table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified.

13. Were instrument calibrations within method control limits?		Yes		No	SM	Initials
Comments: Not applicable for this level of data verification – Instrument calibration data were not supplied in analytical laboratory reports and were therefore not included in this data review. It should be noted however, that general comments in laboratory case narratives stated instrument calibrations were compliant or met acceptable criteria for all analyses.						
14. Were surrogate recoveries within control limits?		Yes	**X**	No	SM	Initials

Comments: Surrogate %Rs for organic analyses that were associated with the reported target analytes were within laboratory control-charted QC limits for all project samples and associated laboratory QC samples, or met the following requirements, except as noted. Method 8270C allows for one surrogate per fraction (acid or base/neutral) to be outside QC limits as long as the recovery is greater than or equal to 10%. Sample analyses meeting this requirement did not require qualification.

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Method 8260B –

SDG A0409201: Various surrogate %Rs for p-bromofluorobenzene were low outside of the 85-120 QC limits at 42-61% in the soil samples. Professional judgment determined tat method 8260B data did not require qualification based on %Rs in this one surrogate since all %Rs for the three other surrogate spikes were compliant within QC limits of 73-115%. An overall matrix interference or low bias is not indicated for these samples, and no action is required other than to note this observation.

Method AK101 –

SDG A0409201: Surrogate bromofluorobenzene %Rs were low outside of the 50-150% QC limits in samples SO10-0-1-091504 (35%), SO12-0-1-091504 (16%), SO24-0-1-091504 (35%), SO30-0-1-091504 (38%), and SO35-0-2-091504 (47%). GRO results for these samples require J/UJ qualifiers to indicate estimated concentrations, possibly biased low, or undetected results at estimated reporting limits due to suspected matrix interference.

Refer to the Table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (attached at the end of this Checklist).

15. Were laboratory control sample recoveries within control limits?		Yes	**X**	No	SM	Initials

Comments: Reported LCS and LCSD %Rs were within data validation QC limits (70-130% for organics; 80-120% for metals), or organic LCS, LCSD %Rs were within laboratory control charted QC limits as allowed by SW-846 methods for all target analytes, except as noted. High %Rs associated with undetected sample results did not initiate sample qualification since the indicated high system bias was not realized. Note that LCS, LCSD outliers were not applied to target analytes in field QC blank samples that were not identified as potential field contaminants, since the purpose of field QC blank samples is solely to assess possible field contamination affecting environmental sample results.

Method 8270C -

SDG A0409179: The QC batch T040917011 LCS/LCSD extracted on 09/15/2004 reported low %Rs for 1,3-dichlorobenzene (48.4-51%), hexachloroethane (44-47.4%), and 2,4-dinitrophenol (48.8-50.6%). Benzidine was not recovered (0-0%). A project-specific MS/MSD analysis was not available to demonstrate analytical accuracy for this batch due to limited sample volume supplied. Consequently, target analytes associated with low %Rs require UJ qualifiers to indicate undetected results at estimated reporting limits due to demonstrated low system bias. Associated benzidine results require R qualifiers to indicate rejected data since the noncompliance is severe and system accuracy for this analyte cannot be confirmed.

SDG A0409189/A0409200: The QC batch T040922002 LCS/LCSD extracted on 09/18/2004 reported low %Rs for 1,3-dichlorobenzene (53-53.6%), hexachloroethane (52-52%), 2,4-dinitrophenol (51.2%-LCSD only), and benzidine (11.1-13.1%). The project-specific MS/MSD analysis of spiked sample SP26-091404 showed acceptable %Rs for these analytes with the exception of low benzidine %Rs. Professional judgment determines that analytes 1,3-dichlorobenzene, hexachloroethane, and 2,4-dinitrophenol do not require qualification based on the LCS/LCSD %Rs since acceptable accuracy for these analytes was demonstrated in the MS/MSD analysis. **Analyte benzidine, which recovered low in both the LCS/LCSD and MS/MSD requires UJ qualifiers in associated batch samples to indicate undetected results at estimated reporting limits due to demonstrated low system bias and/or confirmed matrix interference. Benzidine results were not rejected since the LCS/LCSD %Rs are greater than 10%.**

SDG A0409201: The QC batch T040922005 LCS extracted on 09/22/2004 reported low %Rs for 3,3'-dichlorobenzidine (40.9%) and benzyl alcohol (20.6%). The project-specific MS/MSD analysis of spiked sample SO35-0-2-091504 also showed low %Rs for these analytes. **These analytes, that recovered low in both the LCS and MS/MSD require UJ qualifiers in associated batch samples to indicate undetected results at estimated reporting limits due to demonstrated low system bias and/or confirmed matrix interference.**

Refer to the Table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (attached at the end of this Checklist).

16. Were matrix spike recoveries within control limits?		Yes	**X**	No	SM	Initials

Comments: Project specific MS and MSD recoveries for target analytes were within data validation or laboratory control-charted QC limits, or met the following requirements, except as noted. MS/MSD %Rs were not applicable if source sample concentrations exceeded four times the spiked amount. High MS/MSD %Rs associated with undetected source sample results did not initiate qualification since the indicated high bias was not realized. Organic MS/MSD %Rs must both be outside of QC limits in order for organic results to be qualified based on matrix. If organic matrix effect was not confirmed (either MS or MSD was compliant), data did not require qualification and are not outlined in this report. MS and MSD spike recoveries for non-project samples were not provided, and would not have initiated project data qualification since matrix similarity to project samples could not be guaranteed. In cases where MS/MSD data was not available, provided LCS/LCSD recoveries were evaluated to assess project data accuracy.

Method 8260B –

SDG A0409201: The MS/MSD %Rs for 1,2,4-trimethylbenzene (433.1-439.6%) were high outside of laboratory QC limits in the spiked analysis of sample SO35-0-2-091504. This analyte requires a J qualifier in the source sample to indicate an estimated concentration, possibly biased high, due to confirmed matrix interference.

Method 8270C –

SDG A0409189: MS/MSD %Rs were low outside of laboratory QC limits in the spiked analysis of sample SP26-091404 for benzyl alcohol (44-45.8%), 2,4-dimethylphenol (52.2-56.2%), benzidine (10.8-11%), and 3,3'-dichlorobenzidine (8.8-11.6%). These analytes require UJ qualifiers in the source sample to indicate undetected results at estimated reporting limits due to confirmed matrix interference. Note that benzidine was also qualified based on low system bias (see item 15).

SDG A0409201: MS/MSD %Rs were low outside of laboratory QC limits in the spiked analysis of sample SO35-0-2-091504 for 1,3-dichlorobenzene (40.8-50.5%), 2,4,6-trichlorophenol (46.1-48%), 2,4-dimethylphenol (3.3-36.7%), 2,4-dinitrophenol (34.7-42.3%), 2,4-dinitrotoluene (3-4%), 2-methylphenol (20.8-40.3%), 3,3'-dichlorobenzidine (0-5.8%), 3-nitroaniline (21.9-38.3%), 4-chloroaniline (13.8-26.2%), 4-nitroaniline (23.4-36.3%), anthracene (50.1-57.8%), benzo(a)anthracene (47.3-53.3%), benzyl alcohol (18.9-33.8%), dimethylphthalate (49.3-57.8%), di-n-octylphthalate (46.5-57.8%), and hexachlorobutadiene (48.8-58.6%). These analytes require UJ qualifiers in the source sample to indicate undetected results at estimated reporting limits due to confirmed matrix interference. Note that 3,3'-dichlorobenzidine and benzyl alcohol were also qualified based on low system bias (see item 15).

Methods AK102/103 –

SDG A0409201: MS/MSD %Rs were low outside of laboratory QC limits in the spiked analysis of sample SO35-0-2-091504 for DRO (17.7-38.1%) and RRO (11.6-34%). These analytes require J qualifiers in the source sample to indicate estimated concentrations, possibly biased low, due to confirmed matrix interference.

Method 6010B –

SDG A0409201: The MS/MSD %Rs for chromium were high outside of the 75-125% data validation QC limits in the spiked analysis of sample SO35-0-2-091504 at 144-161.5%). All soil samples associated with QC batch T041015010 require J+ qualifiers to indicate estimated concentrations, likely biased high, due to confirmed matrix interference in the representative sample.

Refer to the Table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (attached at the end of this Checklist).

17. Were duplicate RPDs and/or serial dilution %Ds within control limits?	**X**	Yes		No	SM	Initials

Comments: Laboratory RPDs for target analytes in LCS/LCSD, project-specific MS/MSD, and laboratory duplicate samples were within data validation control limits, or met the following requirements. RPDs were not applicable if the analyte was undetected in both spiked samples. RPDs were not applicable if sample duplicate results were within ± the detection limit of each other. High RPDs associated with undetected project sample results did not initiate data qualification of reporting limits since the precision of the reporting limits was not in question. RPD data meeting these requirements are considered compliant and are not detailed in this report. Summarized serial dilution %Ds were within data validation QC limits or were not applicable due to undetected/lower sample results.

18. Were organic system performance criteria met?		Yes		No	SM	Initials

Comments: Not applicable for this level of data verification – Organic system performance data was not supplied in analytical laboratory reports and was therefore not included in this data review.

19. Were internal standards within method criteria for GC/MS sample analyses?		Yes	**X**	No	SM	Initials

Comments: Not applicable for this level of data verification – GC/MS method 8260B and 8270C internal standard data were not supplied in analytical laboratory reports and were therefore not included in this data review, unless specifically commented on in laboratory case narratives or flagged in laboratory reports as noted below.

Method 8270C –

SDG A0409179: The laboratory noted low internal standard area counts for perylene-d12 in both the initial analysis and reanalysis of samples SP01-091304, SP16-091304, and SP19-091304. Target analytes determined to be quantitated from this source standard require UJ qualifiers to indicate undetected results at estimated reporting limits due to decreased instrument sensitivity and response. The low area counts are likely due to matrix interference.

Refer to the Table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (attached at the end of this Checklist).

20. Were inorganic system performance criteria met?		Yes		No	SM	Initials

Comments: Not applicable for this level of data verification – Inorganic system performance data was not supplied in analytical laboratory reports and was therefore not included in this data review.

21. Were blind field duplicates collected? If so, discuss the precision (RPD) of the results.	**X**	Yes		No	SM	Initials

Duplicate Sample No.	SP260-091404	Primary Sample No.	SP26-091404
Duplicate Sample No.	SP300-091404	Primary Sample No.	SP30-091404
Duplicate Sample No.	SO350-0-2-091504	Primary Sample No.	SO35-0-2-091504

Comments: The field duplicate RPDs were within the 0-30% water QC limits or the 0-50% soil QC limits, or RPDs were not applicable due to results that were undetected in both samples, or results that were within +/- the reporting limit, except as identified in the table below. Field duplicate and native sample concentrations that were both undetected are not reflected in the table below since RPDs are not applicable.

The following field duplicate RPDs were calculated:

Matrix	Method	Units	Analyte	SP26-091404	SP260-091404	RPD	Qualifiers
Groundwater seep	8260B	µg/L	**Chloroform**	4.8	7.6	**45.2**	**J/J**
Groundwater seep	AK103	mg/L	Residual Range Organics	0.3	< 0.24	+/- RL	

Continued on next page

Matrix	Method	Units	Analyte	SP30-091404	SP300-091404	RPD	Qualifiers
Groundwater seep	6010	mg/L	Barium, dissolved	0.017	0.017	0.0	
Groundwater seep	8260B	µg/L	1,1,1-Trichloroethane	1.1	< 2.0	+/- RL	
Matrix	Method	Units	Analyte	SO35-0-2-091504	SO350-0-2-091504	RPD	Qualifiers
Soil	6010	mg/kg	Barium	58	72	21.5	
Soil	6010	mg/kg	Chromium	28	34	19.4	
Soil	6010	mg/kg	Lead	< 7.3	5.9	+/- RL	
Soil	7470	mg/kg	**Mercury**	0.08	0.14	**54.5**	**J/J**
Soil	8260B	µg/kg	**1,2,4-Trimethylbenzene**	1500	680	**75.2**	**J/J**
Soil	8260B	µg/kg	**1,3,5-Trimethylbenzene**	270	120	**76.9**	**J/J**
Soil	8260B	µg/kg	**4-Isopropyl toluene**	230	95	**83.1**	**J/J**
Soil	8260B	µg/kg	Acetone	33	< 93	+/- RL	
Soil	8260B	µg/kg	Benzene	< 7.5	2.4	+/- RL	
Soil	8260B	µg/kg	Ethylbenzene	34	21	47.3	
Soil	8260B	µg/kg	**Isopropylbenzene**	120	58	**69.7**	**J/J**
Soil	8260B	µg/kg	**m,p-Xylene**	220	120	**58.8**	**J/J**
Soil	8260B	µg/kg	**Naphthalene**	430	200	**73.0**	**J/J**
Soil	8260B	µg/kg	**n-Butylbenzene**	150	69	**74.0**	**J/J**
Soil	8260B	µg/kg	**n-Propylbenzene**	220	100	**75.0**	**J/J**
Soil	8260B	µg/kg	**sec-Butylbenzene**	150	65	**79.1**	**J/J**
Soil	8260B	µg/kg	**tert-Butylbenzene**	18	8.1	**75.9**	**J/J**
Soil	8270C	µg/kg	2-Methylnaphthalene	1100	1500	30.8	
Soil	8270C	µg/kg	Fluorene	64	93	36.9	
Soil	8270C	µg/kg	Naphthalene	730	920	23.0	
Soil	8270C	µg/kg	Phenanthrene	84	110	26.8	
Soil	AK101	mg/kg	GRO	6.7	10	39.5	
Soil	AK102	mg/kg	DRO	370	300	20.9	
Soil	AK103	mg/kg	RRO	250	210	17.4	
Soil	D2216	%	Percent Moisture	32	36	11.8	

The highlighted target analytes require J qualifiers in both the native and field duplicate sample to indicate estimated concentrations due to variability between field duplicate results.

Refer to the table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (attached at the end of this Checklist).

22. Were qualitative criteria for organic target analyte identification met?		Yes		No	SM	Initials

Comments: Not applicable - GC/MS quantitation reports and chromatograms were not supplied in analytical laboratory reports and were therefore not included in this data review. However, retention times and chromatography were reviewed by trained laboratory personnel in accordance with the laboratory's internal QA/QC program, and no identification/quantitation flags were assigned.

RETEC ANALYTICAL DATA VERIFICATION CHECKLIST (Continued)

23. Were 100% of the EDD concentrations and reporting limits compared to the hardcopy data reports?	**X**	Yes		No	SM	Initials

Comments: EDD QA/QC of 100% positive concentrations and 10% reporting limits was done as part of this data verification procedure.

Some significant figure discrepancies existed between the hardcopy reports and the entries in the reporting_detection_limit, method_detection_limit, and quantitation_limit fields. The data validator corrected the EDD entries as necessary to match the hardcopy report entries exactly, as per data validation procedures.

Sample results affected by laboratory or field contamination that were also detected below the PQL/RL are identified and discussed in items 11 and 12. For these samples, the detect_flag field was corrected to read "N" instead of "Y" and the result_value field was deleted. The original concentration that was < RL was maintained in the result_comment field for informational purposes only.

The updated EDD files, with corrections and data validation qualifiers added, was imported into the EQuIS project database on 11/02/2004.

24. General Comments: Data were evaluated based on validation criteria set forth in the USEPA Contract Laboratory Program National Functional Guidelines for Organic/Inorganic Data Review, document numbers EPA540/R-99/008 and EPA540/R-01/008 of October 1999 (Organic) and July 2002 (Inorganic), as they applied to the reported methodology. Field duplicate RPD control limits were taken from the USEPA Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses, February 1988, upheld in DRAFT 1993.

Refer to the table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (attached at the end of this Checklist).

Table of Qualified Analytical Results
Alaska Railroad Corporation (ARRC)
Groundwater Seep, Soil, Soil QC, and Water QC samples
Analytica International, Inc.(Analytica Alaska) Reports as listed
September 2004

Sample ID	Matrix	Sequence	Method	QC Batch	Analyte				Qualifier	Reason Code
SP01-091304	GWseep	A0409179	8270C	T040917011	1,3-Dichlorobenzene	<	5.4	µg/L	UJ	LCS
SP01-091304	GWseep	A0409179	8270C	T040917011	2,4-Dinitrophenol	<	110	µg/L	UJ	LCS
SP01-091304	GWseep	A0409179	8270C	T040917011	Benzidine	<	220	µg/L	R	LCS
SP01-091304	GWseep	A0409179	8270C	T040917011	Benzo(a)pyrene	<	5.4	µg/L	UJ	IS
SP01-091304	GWseep	A0409179	8270C	T040917011	Benzo(b)fluoranthene	<	5.4	µg/L	UJ	IS
SP01-091304	GWseep	A0409179	8270C	T040917011	Benzo(g,h,i)perylene	<	5.4	µg/L	UJ	IS
SP01-091304	GWseep	A0409179	8270C	T040917011	Benzo(k)fluoranthene	<	5.4	µg/L	UJ	IS
SP01-091304	GWseep	A0409179	8270C	T040917011	Dibenz(a,h)anthracene	<	5.4	µg/L	UJ	IS
SP01-091304	GWseep	A0409179	8270C	T040917011	Di-n-octylphthalate	<	5.4	µg/L	UJ	IS
SP01-091304	GWseep	A0409179	8270C	T040917011	Hexachloroethane	<	5.4	µg/L	UJ	LCS
SP01-091304	GWseep	A0409179	8270C	T040917011	Indeno(1,2,3-cd)pyrene	<	5.4	µg/L	UJ	IS
SP07-091304	GWseep	A0409179	8260B	T040921013	Acetone	<	50	µg/L	U	TB, < PQL, original result was 4.1 µg/L
SP07-091304	GWseep	A0409179	8270C	T040917011	1,3-Dichlorobenzene	<	5.2	µg/L	UJ	LCS
SP07-091304	GWseep	A0409179	8270C	T040917011	2,4-Dinitrophenol	<	100	µg/L	UJ	LCS
SP07-091304	GWseep	A0409179	8270C	T040917011	Benzidine	<	210	µg/L	R	LCS
SP07-091304	GWseep	A0409179	8270C	T040917011	Hexachloroethane	<	5.2	µg/L	UJ	LCS
SP10-091304	GWseep	A0409179	8260B	T040921013	Acetone	<	50	µg/L	U	TB, < PQL, original result was 5.1 µg/L
SP10-091304	GWseep	A0409179	8270C	T040917011	1,3-Dichlorobenzene	<	5.2	µg/L	UJ	LCS
SP10-091304	GWseep	A0409179	8270C	T040917011	2,4-Dinitrophenol	<	100	µg/L	UJ	LCS
SP10-091304	GWseep	A0409179	8270C	T040917011	Benzidine	<	210	µg/L	R	LCS
SP10-091304	GWseep	A0409179	8270C	T040917011	Benzyl alcohol		1.8	µg/L	J	< PQL
SP10-091304	GWseep	A0409179	8270C	T040917011	Hexachloroethane	<	5.2	µg/L	UJ	LCS
SP12-091304	GWseep	A0409179	8270C	T040917011	1,3-Dichlorobenzene	<	6.1	µg/L	UJ	LCS
SP12-091304	GWseep	A0409179	8270C	T040917011	2,4-Dinitrophenol	<	120	µg/L	UJ	LCS
SP12-091304	GWseep	A0409179	8270C	T040917011	Benzidine	<	240	µg/L	R	LCS
SP12-091304	GWseep	A0409179	8270C	T040917011	Hexachloroethane	<	6.1	µg/L	UJ	LCS
SP16-091304	GWseep	A0409179	8260B	T040921013	Chloroform		0.68	µg/L	J	< PQL
SP16-091304	GWseep	A0409179	8260B	T040921013	Trichlorofluoromethane		0.67	µg/L	J	< PQL
SP16-091304	GWseep	A0409179	8270C	T040917011	1,3-Dichlorobenzene	<	5.2	µg/L	UJ	LCS
SP16-091304	GWseep	A0409179	8270C	T040917011	2,4-Dinitrophenol	<	100	µg/L	UJ	LCS

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Table of Qualified Analytical Results
Alaska Railroad Corporation (ARRC)
Groundwater Seep, Soil, Soil QC, and Water QC samples
Analytica International, Inc.(Analytica Alaska) Reports as listed
September 2004

Sample ID	Matrix	Sequence	Method	QC Batch	Analyte				Qualifier	Reason Code
SP16-091304	GWseep	A0409179	8270C	T040917011	Benzidine	<	210	µg/L	R	LCS
SP16-091304	GWseep	A0409179	8270C	T040917011	Benzo(a)pyrene	<	5.2	µg/L	UJ	IS
SP16-091304	GWseep	A0409179	8270C	T040917011	Benzo(b)fluoranthene	<	5.2	µg/L	UJ	IS
SP16-091304	GWseep	A0409179	8270C	T040917011	Benzo(g,h,i)perylene	<	5.2	µg/L	UJ	IS
SP16-091304	GWseep	A0409179	8270C	T040917011	Benzo(k)fluoranthene	<	5.2	µg/L	UJ	IS
SP16-091304	GWseep	A0409179	8270C	T040917011	Dibenz(a,h)anthracene	<	5.2	µg/L	UJ	IS
SP16-091304	GWseep	A0409179	8270C	T040917011	Di-n-octylphthalate	<	5.2	µg/L	UJ	IS
SP16-091304	GWseep	A0409179	8270C	T040917011	Hexachloroethane	<	5.2	µg/L	UJ	LCS
SP16-091304	GWseep	A0409179	8270C	T040917011	Indeno(1,2,3-cd)pyrene	<	5.2	µg/L	UJ	IS
SP19-091304	GWseep	A0409179	8260B	T040921013	Chloroform		0.78	µg/L	J	< PQL
SP19-091304	GWseep	A0409179	8260B	T040921013	Trichlorofluoromethane		0.67	µg/L	J	< PQL
SP19-091304	GWseep	A0409179	8270C	T040917011	1,3-Dichlorobenzene	<	5.2	µg/L	UJ	LCS
SP19-091304	GWseep	A0409179	8270C	T040917011	2,4-Dinitrophenol	<	100	µg/L	UJ	LCS
SP19-091304	GWseep	A0409179	8270C	T040917011	Benzidine	<	210	µg/L	R	LCS
SP19-091304	GWseep	A0409179	8270C	T040917011	Benzo(a)pyrene	<	5.2	µg/L	UJ	IS
SP19-091304	GWseep	A0409179	8270C	T040917011	Benzo(b)fluoranthene	<	5.2	µg/L	UJ	IS
SP19-091304	GWseep	A0409179	8270C	T040917011	Benzo(g,h,i)perylene	<	5.2	µg/L	UJ	IS
SP19-091304	GWseep	A0409179	8270C	T040917011	Benzo(k)fluoranthene	<	5.2	µg/L	UJ	IS
SP19-091304	GWseep	A0409179	8270C	T040917011	Dibenz(a,h)anthracene	<	5.2	µg/L	UJ	IS
SP19-091304	GWseep	A0409179	8270C	T040917011	Di-n-octylphthalate	<	5.2	µg/L	UJ	IS
SP19-091304	GWseep	A0409179	8270C	T040917011	Hexachloroethane	<	5.2	µg/L	UJ	LCS
SP19-091304	GWseep	A0409179	8270C	T040917011	Indeno(1,2,3-cd)pyrene	<	5.2	µg/L	UJ	IS
SP24-091304	GWseep	A0409179	8260B	T040921013	Acetone	<	50	µg/L	U	TB, < PQL, original result was 5.0 µg/L
SP24-091304	GWseep	A0409179	8270C	T040917011	1,3-Dichlorobenzene	<	5.8	µg/L	UJ	LCS
SP24-091304	GWseep	A0409179	8270C	T040917011	2,4-Dinitrophenol	<	120	µg/L	UJ	LCS
SP24-091304	GWseep	A0409179	8270C	T040917011	Benzidine	<	230	µg/L	R	LCS
SP24-091304	GWseep	A0409179	8270C	T040917011	Hexachloroethane	<	5.8	µg/L	UJ	LCS
SP26-091404	GWseep	A0409189	8260B	T040928005	Chloroform		4.8	µg/L	J	FD
SP26-091404	GWseep	A0409189	8270C	T040922002	2,4-Dimethylphenol	<	29	µg/L	UJ	MS
SP26-091404	GWseep	A0409189	8270C	T040922002	3,3'-Dichlorobenzidine	<	24	µg/L	UJ	MS
SP26-091404	GWseep	A0409189	8270C	T040922002	Benzidine	<	240	µg/L	UJ	LCS, MS
SP26-091404	GWseep	A0409189	8270C	T040922002	Benzyl alcohol	<	12	µg/L	UJ	MS
SP260-091404	GWseep	A0409189	8260B	T040927018	Chloroform		7.6	µg/L	J	FD
SP260-091404	GWseep	A0409189	8270C	T040922002	Benzidine	<	250	µg/L	UJ	LCS
SP27-091404	GWseep	A0409189	8270C	T040922002	Benzidine	<	250	µg/L	UJ	LCS

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Table of Qualified Analytical Results
Alaska Railroad Corporation (ARRC)
Groundwater Seep, Soil, Soil QC, and Water QC samples
Analytica International, Inc.(Analytica Alaska) Reports as listed
September 2004

Sample ID	Matrix	Sequence	Method	QC Batch	Analyte				Qualifier	Reason Code
SP30-091404	GWseep	A0409189	8260B	T040928007	1,1,1-Trichloroethane		1.1	µg/L	J	< PQL
SP30-091404	GWseep	A0409189	8270C	T040922002	Benzidine	<	220	µg/L	UJ	LCS
SP300-091404	GWseep	A0409189	8270C	T040922002	Benzidine	<	220	µg/L	UJ	LCS
SP33-091404	GWseep	A0409200	8260B	T040927009	1,1-Dichloroethane		1.2	µg/L	J	< PQL
SP33-091404	GWseep	A0409200	8270C	T040922002	Benzidine	<	220	µg/L	UJ	LCS
SP34-091404	GWseep	A0409200	8260B	T040927009	Acetone		7.1	µg/L	J	< PQL
SP34-091404	GWseep	A0409200	8270C	T040922002	2-Methylphenol		2.4	µg/L	J	< PQL
SP34-091404	GWseep	A0409200	8270C	T040922002	Benzidine	<	200	µg/L	UJ	LCS
SP35-091404	GWseep	A0409200	8260B	T040928005	4-Isopropyl toluene		4.4	µg/L	J	< PQL
SP35-091404	GWseep	A0409200	8260B	T040928005	Acetone		8.5	µg/L	J	< PQL
SP35-091404	GWseep	A0409200	8260B	T040928005	n-Butylbenzene		2.2	µg/L	J	< PQL
SP35-091404	GWseep	A0409200	8260B	T040928005	sec-Butylbenzene		2.5	µg/L	J	< PQL
SP35-091404	GWseep	A0409200	8270C	T040922002	Benzidine	<	200	µg/L	UJ	LCS
SP35-091404	GWseep	A0409200	8270C	T040922002	Isophorone		1.7	µg/L	J	< PQL
SP36-091404	GWseep	A0409200	8260B	T040927009	Acetone		6.6	µg/L	J	< PQL
SP36-091404	GWseep	A0409200	8260B	T040927009	Naphthalene		2.1	µg/L	J	< PQL
SP36-091404	GWseep	A0409200	8270C	T040922002	Benzidine	<	200	µg/L	UJ	LCS
SP40-091404	GWseep	A0409200	8260B	T040927018	Acetone		3.1	µg/L	J	< PQL
SP40-091404	GWseep	A0409200	8260B	T040927018	cis-1,2-Dichloroethene		1.9	µg/L	J	< PQL
SP40-091404	GWseep	A0409200	8270C	T040922002	Benzidine	<	220	µg/L	UJ	LCS
SP41-091404	GWseep	A0409200	8270C	T040922002	Benzidine	<	200	µg/L	UJ	LCS
SP46-091404	GWseep	A0409200	8260B	T040927018	cis-1,2-Dichloroethene		1.9	µg/L	J	< PQL
SP46-091404	GWseep	A0409200	8260B	T040927018	trans-1,2-Dichloroethene		0.87	µg/L	J	< PQL
SP46-091404	GWseep	A0409200	8260B	T040927018	Trichloroethene		1.5	µg/L	J	< PQL
SP46-091404	GWseep	A0409200	8270C	T040922002	Benzidine	<	200	µg/L	UJ	LCS
SP48-091404	GWseep	A0409200	8260B	T040927018	Acetone		2.5	µg/L	J	< PQL
SP48-091404	GWseep	A0409200	8260B	T040927018	cis-1,2-Dichloroethene		1.6	µg/L	J	< PQL
SP48-091404	GWseep	A0409200	8270C	T040922002	Benzidine	<	200	µg/L	UJ	LCS
SP48-091404	GWseep	A0409200	8270C	T040922002	Benzyl alcohol	<	10	µg/L	U	MB, < PQL, original result was 3.5 µg/L
SP49-091404	GWseep	A0409200	8260B	T040927018	1,1-Dichloroethane		1.5	µg/L	J	< PQL
SP49-091404	GWseep	A0409200	8260B	T040927018	Acetone		3.7	µg/L	J	< PQL
SP49-091404	GWseep	A0409200	8260B	T040927018	cis-1,2-Dichloroethene		1.1	µg/L	J	< PQL
SP49-091404	GWseep	A0409200	8270C	T040922002	Benzidine	<	200	µg/L	UJ	LCS
SP50-091404	GWseep	A0409200	8260B	T040927018	1,1,1-Trichloroethane		1.6	µg/L	J	< PQL
SP50-091404	GWseep	A0409200	8270C	T040922002	Benzidine	<	180	µg/L	UJ	LCS

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Table of Qualified Analytical Results
Alaska Railroad Corporation (ARRC)
Groundwater Seep, Soil, Soil QC, and Water QC samples
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September 2004

Sample ID	Matrix	Sequence	Method	QC Batch	Analyte				Qualifier	Reason Code
SO10-0-1-091504	Soil	A0409201	6010	T041015010	Chromium		68	mg/kg	J+	MS
SO10-0-1-091504	Soil	A0409201	8260B	T040928004	2-Butanone	<	350	µg/kg	U	TB, < PQL, original result was 200 µg/kg
SO10-0-1-091504	Soil	A0409201	8260B	T040928004	Methylene chloride	<	170	µg/kg	U	MB, < PQL, original result was 120 µg/kg
SO10-0-1-091504	Soil	A0409201	8270C	T040922005	3,3'-Dichlorobenzidine	<	780	µg/kg	UJ	LCS
SO10-0-1-091504	Soil	A0409201	8270C	T040922005	Benzyl alcohol	<	780	µg/kg	UJ	LCS
SO10-0-1-091504	Soil	A0409201	AK101	A040920006	GRO	<	4.0	mg/kg	UJ	SUR
SO12-0-1-091504	Soil	A0409201	6010	T041015010	Chromium		58	mg/kg	J+	MS
SO12-0-1-091504	Soil	A0409201	8260B	T040928004	Methylene chloride	<	190	µg/kg	U	MB, < PQL, original result was 59 µg/kg
SO12-0-1-091504	Soil	A0409201	8270C	T040922005	3,3'-Dichlorobenzidine	<	1100	µg/kg	UJ	LCS
SO12-0-1-091504	Soil	A0409201	8270C	T040922005	Benzyl alcohol	<	1100	µg/kg	UJ	LCS
SO12-0-1-091504	Soil	A0409201	AK101	A040920006	GRO	<	11	mg/kg	UJ	SUR
SO24-0-1-091504	Soil	A0409201	6010	T041015010	Chromium		21	mg/kg	J+	MS
SO24-0-1-091504	Soil	A0409201	8260B	T040928004	2-Butanone	<	88	µg/kg	U	TB, < PQL, original result was 63 µg/kg
SO24-0-1-091504	Soil	A0409201	8260B	T040928004	Acetone		100	µg/kg	J	< PQL
SO24-0-1-091504	Soil	A0409201	8260B	T040928004	Methylene chloride	<	44	µg/kg	U	MB, < PQL, original result was 15 µg/kg
SO24-0-1-091504	Soil	A0409201	8260B	T040928004	Toluene		5.3	µg/kg	J	< PQL
SO24-0-1-091504	Soil	A0409201	8270C	T040922005	2,4-Dimethylphenol		77	µg/kg	J	< PQL
SO24-0-1-091504	Soil	A0409201	8270C	T040922005	3,3'-Dichlorobenzidine	<	290	µg/kg	UJ	LCS
SO24-0-1-091504	Soil	A0409201	8270C	T040922005	Benzyl alcohol	<	290	µg/kg	UJ	LCS
SO24-0-1-091504	Soil	A0409201	8270C	T040922005	Phenanthrene		68	µg/kg	J	< PQL
SO24-0-1-091504	Soil	A0409201	8270C	T040922005	Pyrene		74	µg/kg	J	< PQL
SO24-0-1-091504	Soil	A0409201	AK101	A040920006	GRO	<	3.0	mg/kg	UJ	SUR
SO30-0-1-091504	Soil	A0409201	6010	T041015010	Chromium		41	mg/kg	J+	MS
SO30-0-1-091504	Soil	A0409201	8260B	T040928004	2-Butanone		120	µg/kg	U	TB
SO30-0-1-091504	Soil	A0409201	8260B	T040928004	Methylene chloride	<	43	µg/kg	U	MB, < PQL, original result was 23 µg/kg
SO30-0-1-091504	Soil	A0409201	8270C	T040922005	2-Methylnaphthalene		66	µg/kg	J	< PQL
SO30-0-1-091504	Soil	A0409201	8270C	T040922005	3,3'-Dichlorobenzidine	<	220	µg/kg	UJ	LCS
SO30-0-1-091504	Soil	A0409201	8270C	T040922005	Benzyl alcohol	<	220	µg/kg	UJ	LCS

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Table of Qualified Analytical Results
Alaska Railroad Corporation (ARRC)
Groundwater Seep, Soil, Soil QC, and Water QC samples
Analytica International, Inc.(Analytica Alaska) Reports as listed
September 2004

Sample ID	Matrix	Sequence	Method	QC Batch	Analyte				Qualifier	Reason Code
SO30-0-1-091504	Soil	A0409201	8270C	T040922005	Phenanthrene		69	µg/kg	J	< PQL
SO30-0-1-091504	Soil	A0409201	AK101	A040920006	GRO		0.91	mg/kg	J	< PQL, SUR
SO34-0-2-091504	Soil	A0409201	6010	T041015010	Chromium		33	mg/kg	J+	MS
SO34-0-2-091504	Soil	A0409201	8260B	T040928004	2-Butanone	<	48	µg/kg	U	TB, < PQL, original result was 31 µg/kg
SO34-0-2-091504	Soil	A0409201	8260B	T040928004	Methylene chloride	<	24	µg/kg	U	MB, < PQL, original result was 8.7 µg/kg
SO34-0-2-091504	Soil	A0409201	8270C	T040922005	3,3'-Dichlorobenzidine	<	240	µg/kg	UJ	LCS
SO34-0-2-091504	Soil	A0409201	8270C	T040922005	Benzyl alcohol	<	240	µg/kg	UJ	LCS
SO34-0-2-091504	Soil	A0409201	AK101	A040920006	GRO		1.1	mg/kg	J	< PQL
SO35-0-2-091504	Soil	A0409201	6010	T041015010	Chromium		28	mg/kg	J+	MS
SO35-0-2-091504	Soil	A0409201	7470	T040923016	Mercury		0.08	mg/kg	J	FD
SO35-0-2-091504	Soil	A0409201	8260B	T040928004	1,2,4-Trimethylbenzene		1500	µg/kg	J	MS, FD
SO35-0-2-091504	Soil	A0409201	8260B	T040928004	1,3,5-Trimethylbenzene		270	µg/kg	J	FD
SO35-0-2-091504	Soil	A0409201	8260B	T040928004	2-Butanone	<	57	µg/kg	U	TB, < PQL, original result was 52 µg/kg
SO35-0-2-091504	Soil	A0409201	8260B	T040928004	4-Isopropyl toluene		230	µg/kg	J	FD
SO35-0-2-091504	Soil	A0409201	8260B	T040928004	Acetone		33	µg/kg	J	< PQL
SO35-0-2-091504	Soil	A0409201	8260B	T040928004	Isopropylbenzene		120	µg/kg	J	FD
SO35-0-2-091504	Soil	A0409201	8260B	T040928004	m,p-Xylene		220	µg/kg	J	FD
SO35-0-2-091504	Soil	A0409201	8260B	T040928004	Methylene chloride	<	28	µg/kg	U	MB, < PQL, original result was 12 µg/kg
SO35-0-2-091504	Soil	A0409201	8260B	T040928004	Naphthalene		430	µg/kg	J	FD
SO35-0-2-091504	Soil	A0409201	8260B	T040928004	n-Butylbenzene		150	µg/kg	J	FD
SO35-0-2-091504	Soil	A0409201	8260B	T040928004	n-Propylbenzene		220	µg/kg	J	FD
SO35-0-2-091504	Soil	A0409201	8260B	T040928004	sec-Butylbenzene		150	µg/kg	J	FD
SO35-0-2-091504	Soil	A0409201	8260B	T040928004	tert-Butylbenzene		18	µg/kg	J	FD
SO35-0-2-091504	Soil	A0409201	8270C	T040922005	1,3-Dichlorobenzene	<	300	µg/kg	UJ	MS
SO35-0-2-091504	Soil	A0409201	8270C	T040922005	2,4,6-Trichlorophenol	<	250	µg/kg	UJ	MS
SO35-0-2-091504	Soil	A0409201	8270C	T040922005	2,4-Dimethylphenol	<	250	µg/kg	UJ	MS
SO35-0-2-091504	Soil	A0409201	8270C	T040922005	2,4-Dinitrophenol	<	1600	µg/kg	UJ	MS
SO35-0-2-091504	Soil	A0409201	8270C	T040922005	2,4-Dinitrotoluene	<	250	µg/kg	UJ	MS
SO35-0-2-091504	Soil	A0409201	8270C	T040922005	2-Methylphenol	<	250	µg/kg	UJ	MS
SO35-0-2-091504	Soil	A0409201	8270C	T040922005	3,3'-Dichlorobenzidine	<	250	µg/kg	UJ	LCS, MS
SO35-0-2-091504	Soil	A0409201	8270C	T040922005	3-Nitroaniline	<	250	µg/kg	UJ	MS
SO35-0-2-091504	Soil	A0409201	8270C	T040922005	4-Chloroaniline	<	400	µg/kg	UJ	MS

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RETEC ANALYTICAL DATA VERIFICATION CHECKLIST (Continued)

Table of Qualified Analytical Results
Alaska Railroad Corporation (ARRC)
Groundwater Seep, Soil, Soil QC, and Water QC samples
Analytica International, Inc.(Analytica Alaska) Reports as listed
September 2004

Sample ID	Matrix	Sequence	Method	QC Batch	Analyte				Qualifier	Reason Code
SO35-0-2-091504	Soil	A0409201	8270C	T040922005	4-Nitroaniline	<	250	µg/kg	UJ	MS
SO35-0-2-091504	Soil	A0409201	8270C	T040922005	Anthracene	<	250	µg/kg	UJ	MS
SO35-0-2-091504	Soil	A0409201	8270C	T040922005	Benzo(a)anthracene	<	250	µg/kg	UJ	MS
SO35-0-2-091504	Soil	A0409201	8270C	T040922005	Benzyl alcohol	<	250	µg/kg	UJ	LCS, MS
SO35-0-2-091504	Soil	A0409201	8270C	T040922005	Dimethylphthalate	<	250	µg/kg	UJ	MS
SO35-0-2-091504	Soil	A0409201	8270C	T040922005	Di-n-octylphthalate	<	250	µg/kg	UJ	MS
SO35-0-2-091504	Soil	A0409201	8270C	T040922005	Fluorene		64	µg/kg	J	< PQL
SO35-0-2-091504	Soil	A0409201	8270C	T040922005	Hexachlorobutadiene	<	300	µg/kg	UJ	MS
SO35-0-2-091504	Soil	A0409201	8270C	T040922005	Phenanthrene		84	µg/kg	J	< PQL
SO35-0-2-091504	Soil	A0409201	AK101	A040920006	GRO		6.7	mg/kg	J	SUR
SO35-0-2-091504	Soil	A0409201	AK102	A040924002	DRO		370	mg/kg	J	MS
SO35-0-2-091504	Soil	A0409201	AK103	A040924002	RRO		250	mg/kg	J	MS
SO350-0-2-091504	Soil	A0409201	6010	T041015010	Chromium		34	mg/kg	J+	MS
SO350-0-2-091504	Soil	A0409201	7470	T040923016	Mercury		0.14	mg/kg	J	FD
SO350-0-2-091504	Soil	A0409201	8260B	T040928004	1,2,4-Trimethylbenzene		680	µg/kg	J	FD
SO350-0-2-091504	Soil	A0409201	8260B	T040928004	1,3,5-Trimethylbenzene		120	µg/kg	J	FD
SO350-0-2-091504	Soil	A0409201	8260B	T040928004	4-Isopropyl toluene		95	µg/kg	J	FD
SO350-0-2-091504	Soil	A0409201	8260B	T040928004	Benzene		2.4	µg/kg	J	< PQL
SO350-0-2-091504	Soil	A0409201	8260B	T040928004	Isopropylbenzene		58	µg/kg	J	FD
SO350-0-2-091504	Soil	A0409201	8260B	T040928004	m,p-Xylene		120	µg/kg	J	FD
SO350-0-2-091504	Soil	A0409201	8260B	T040928004	Methylene chloride	<	23	µg/kg	U	MB, < PQL, original result was 7.3 µg/kg
SO350-0-2-091504	Soil	A0409201	8260B	T040928004	Naphthalene		200	µg/kg	J	FD
SO350-0-2-091504	Soil	A0409201	8260B	T040928004	n-Butylbenzene		69	µg/kg	J	FD
SO350-0-2-091504	Soil	A0409201	8260B	T040928004	n-Propylbenzene		100	µg/kg	J	FD
SO350-0-2-091504	Soil	A0409201	8260B	T040928004	sec-Butylbenzene		65	µg/kg	J	FD
SO350-0-2-091504	Soil	A0409201	8260B	T040928004	tert-Butylbenzene		8.1	µg/kg	J	FD
SO350-0-2-091504	Soil	A0409201	8270C	T040922005	3,3'-Dichlorobenzidine	<	260	µg/kg	UJ	LCS
SO350-0-2-091504	Soil	A0409201	8270C	T040922005	Benzyl alcohol	<	260	µg/kg	UJ	LCS
SO350-0-2-091504	Soil	A0409201	8270C	T040922005	Fluorene		93	µg/kg	J	< PQL
SO350-0-2-091504	Soil	A0409201	8270C	T040922005	Phenanthrene		110	µg/kg	J	< PQL
EB10-091504	Water QC	A0409201	8260B	T040928005	Acetone		2.7	µg/L	J	< PQL

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RETEC ANALYTICAL DATA VERIFICATION CHECKLIST (Continued)

Qualifier definitions:

J - estimated concentration

J+ - estimated concentration, high bias indicated

R - rejected due to severe QAQC noncompliance

U - evaluated to be undetected at the reported concentration (false positive) or at the reporting limit

UJ - undetected , reporting limit is estimated

Reason Codes:

< PQL - concentration reported is >/= the MDL but < the RL/PQL

FD - variability between field duplicate results; field precision outlier

IS - Internal standard area outlier, quantitation of analyte affected

LCS - laboratory control sample outlier, possible system bias

MB - analyte was also detected in the associated method blank; evidence of laboratory contamination

MS - matrix spike outlier, matrix interference indicated or confirmed

SUR - surrogate recovery outlier, possible matrix interference

TB - analyte was also detected in the associated trip blank; evidence of transport contamination