



100.26.023

Ms. Tamara Cardona-Marek
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Fairbanks, Alaska 99709

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Subject:

**Updated Preliminary Conceptual Site Model
Former Chevron Facility 211081 (former University Car Care)
4103 Geist Road
Fairbanks, Alaska
ADEC File Number: 100.26.023**

Environmental

Date:
May 31, 2011

Dear Ms. Cardona-Marek,

Contact:
Greg Montgomery

On behalf of Chevron Environmental Management Company (Chevron), ARCADIS U.S., Inc. (ARCADIS) has prepared this Updated Preliminary Conceptual Site Model (CSM) for Former Chevron Fuel Station #211081, located at 4103 Geist Road in Fairbanks, Alaska as shown on the site location map in Figure 1.

Phone:
206.726.4742

Email:
Gregory.Montgomery@
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Site Background

The site is located at the corner of Geist Road and Fairbanks Street in a mixed commercial/residential area just south of the University of Alaska, Fairbanks (UAF). When petroleum impacts were first observed in 1988, this site was operated as the University Car Care Center by Mr. Robert Decker. In 1992, the underground storage tanks (USTs) were removed, and the station building was demolished. The facility ceased operation as a Texaco station in 1992. The site is currently owned by Holiday Stationstores, Inc. Three USTs, which were installed in August 1996, are in use at the service station. The original USTs were located in approximately the same location as the current USTs. An aerial photo of the site is shown on Figure 2 and the site layout is shown on Figure 3.

Our ref:
B0045498

Impacted Soil and Groundwater Distribution

Groundwater is currently impacted by petroleum hydrocarbon impacts at the site. The constituents of concern (COCs) include gasoline range organics (GRO), diesel range organics (DRO), residual range organics (RRO), benzene, toluene,

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ethylbenzene, and total xylenes (BTEX), and 1,2-dibromoethane (EDB). The most recent groundwater analytical data for the site is shown on **Figure 4**.

The dissolved phase petroleum hydrocarbon plume is currently delineated by the existing groundwater monitoring well network. Recent groundwater analytical data presented on **Figures 5, 6 and 7** indicate a decreasing/stable trend in concentrations of benzene, GRO, and DRO. Groundwater monitoring analytical data presented in **Table 1** shows consistently decreasing levels of hydrocarbon concentrations in downgradient wells. Hydrographs for wells G-4, G-5, G-7, G-8, MW-301D, MW-302D, and MW-304D are in **Appendix A** and further demonstrate the decreasing concentration of hydrocarbons in each well.

Soil borings used to delineate the site began in November 1988. **Table 3** summarizes available soil boring analytical data from 1988 through November 1992. **Table 4** shows soil analytical data collected in 2006. Based on available soil data vertical extent of impacts are not defined including shallow impacts. The corresponding boring locations are shown in **Appendix B**, however not all borings shown on the historical maps have corresponding analytical data in **Table 3**.

Site Remediation Summary

In accordance with the 1994 Corrective Action Plan, operation of an air sparge/soil vapor extraction (AS/SVE) system was initiated at the site on October 19, 1994. AS and SVE wells are located in the footprint and downgradient of the former USTs and dispenser islands.

In October 2005, an electrical inspection noted several electrical and safety issues with the AS/SVE system. In telephone conversations and email correspondence on June 6, 2006, the Alaska Department of Environmental Conservation (ADEC) and ARCADIS determined that the AS/SVE system would remain shut down pending additional site assessment. **Figure 8** shows the remediation system piping and well layout.

Between October 1994 and June 2006, the system removed a total of approximately 127,000 pounds of total petroleum hydrocarbons. ARCADIS conducted remediation system upgrade activities between September 8, 2009 and startup on October 7, 2009. After the system upgrade, an additional 2,553 lbs of GRO were removed.

In the fourth quarter of 2010 the remediation system was shut down for a variety of reasons including:

- Mechanical problems with the AS/SVE system
- Asymptotic SVE effluent concentrations and mass removal rates.
- Declining dissolved-phase concentration trends in wells G-4 and G-8.
- The apparent ineffectiveness of system treatment at well G-3.

The groundwater at the site is monitored on a semi-annual basis.

Human Health Conceptual Model – Receptor Pathways

Petroleum hydrocarbon impacts at the site are believed to be limited to groundwater, and soil. The current potential receptors for contaminants are ingestion of groundwater, construction workers, commercial or industrial workers, and site visitors or trespassers.

The future potential receptors include ingestion of groundwater, construction workers, commercial or industrial workers, and site visitors or trespassers. In September 2006, ARCADIS conducted a well survey for potential production wells located on properties within 1,000 feet of the service station.

Wells GW-2 and GW-1B located on University of Alaska Fairbanks property are located downgradient from the site. Based on groundwater analytical data, the two wells are unlikely to be affected by migration of COCs in the groundwater.

Other potential receptors that were considered and ruled out include farmers and subsistence harvesters/consumers. These receptors were excluded because the site is an active service station and no farm or subsistence areas are nearby. An updated Alaska Department of Environmental Conservation (ADEC) CSM scoping form and graphic are included in **Appendix C**.

ARCADIS

Ms. Cardona-Marek
May 31, 2011

If you have any questions or require additional information, please contact Greg Montgomery at 206.726.4742.

Sincerely,

ARCADIS


Nelson Alger (for)
Environmental Engineer


Greg Montgomery
Project Scientist

Encl. (CD)

Copies:

Ms. Tamara Cardona-Marek, ADEC, Fairbanks, AK
Mr. Bruce Anthony, Holiday

Attachments:

Tables:

Table 1 – Historical TPH and BTEX Groundwater Analytical Data
Table 2 – Historical Groundwater VOC and RCRA Metals Analytical Data
Table 3 – Historical Soil Analytical Results
Table 4 – Historical Soil GRO and BTEX Analytical Results

Figures:

Figure 1 – Site Location Map
Figure 2 – Site Aerial Photo
Figure 3 – Site Plan
Figure 4 – Groundwater Analytical Summary Map September 25, 2010
Figure 5 – Benzene Concentrations in Groundwater May 2009 and September 2010
Figure 6 – GRO Concentration in Groundwater May 2009 and September 2010
Figure 7 – DRO Concentration in Groundwater May 2009 and September 2010
Figure 8 – Remediation System Piping and Well Layout

Appendices:

Appendix A – Hydrographs
Appendix B – Historical Boring Locations
Appendix C – Human Health CSM Scoping Form and Graphic

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Tables

TABLE 1
 Historical TPH and BTEX Groundwater Analytical Data
 Former Chevron Facility 211081
 4123 Coal Road
 Fairbanks, Alaska

Location	Sample Date	DRO	DHO	RHO	Benzene	Toluene	Ethylbenzene	Total Xylenes
0-1B	05/25/04	1,800	---	---	50	1.0	700	10,000
	06/04/04	700	---	---	13	0.0	100	1.0
	07/01/04	700	---	---	13	0.0	100	1.0
	08/07/04	1,700	400	700	47	10.0	80	2.0
	08/27/04	3,000	600	700	110	0.0	100	0.1
	09/01/04	100	---	---	---	---	---	---
	12/08/04	200	---	---	13	0.0	10	1.0
	08/26/04	30	---	---	27	0.0	20	1.0
	08/14/07	800	---	---	30	1.0	30	1.0
	08/15/07	800	---	---	23	0.0	20	1.0
	08/28/04	427	---	---	23	0.0	20	1.0
	08/29/04	50	---	---	---	---	---	---
	08/11/08	1,800	---	---	12.0	0.1	10.0	2.0
	08/16/08	20	---	---	11	0.0	0.0	1.0
	08/18/08	600	300	---	10.0	0.0	0.0	1.0
08/19/08	400	---	---	0.0	0.0	0.0	0.0	
08/21/08	100	---	---	0.0	0.0	0.0	0.0	
0-2	08/21/08	100	---	---	0.0	0.0	0.0	0.0
	08/28/08	10,000	3,000	---	10.0	0.0	10.0	1.0
	10/05/08	8,000	---	---	---	---	---	---
	08/18/10	10,000	27,000	---	---	---	---	---
0-3	08/28/08	21,000	12,000	12,000	40	400	300	2,000
	08/29/08	21,000	12,000	12,000	40	400	300	2,000
	08/29/08	21,000	12,000	12,000	40	400	300	2,000
	08/29/08	21,000	12,000	12,000	40	400	300	2,000
0-4	08/29/08	200	---	---	0.0	0.0	0.0	0.0
	12/02/04	10	0.0	0.0	0.0	0.0	0.0	0.0
	04/01/05	1.0	7.0	0.0	0.0	0.0	0.0	0.0
	08/27/04	0.000	700	100	0.0	0.0	0.0	0.0
	08/27/04	0.000	1,200	1,100	1.0	0.0	0.0	0.0
	08/29/04	0.000	---	---	---	---	---	---
	08/19/07	1,000	---	---	---	---	---	---
	01/09/09	---	---	---	---	---	---	---
	02/26/08	68,100	---	---	---	---	---	---
	08/04/08	1,000	---	---	---	---	---	---
	01/13/08	22,000	---	---	---	---	---	---
	06/11/08	21,000	---	---	---	---	---	---
	10/02/08	24,000	---	---	---	---	---	---
	08/17/10	1.0	---	---	---	---	---	---
	08/29/08	200	2,000	600	0.0	0.0	0.0	0.0
0-5	08/29/08	10,000	---	---	---	---	---	---
	08/29/04	110,000	---	---	---	---	---	---
	12/02/04	07,000	30,000	0,000	1.0	0.0	0.0	0.0
	04/01/05	13,000	3,000	0.0	0.0	0.0	0.0	0.0
	04/27/04	70,000	7,000	1,100	100	0.0	0.0	0.0
	08/29/04	30,000	0,000	11,000	7.0	0.0	0.0	0.0
	12/02/04	0.000	0,000	---	---	---	---	---
	08/29/08	30,000	2,000	---	---	---	---	---
	12/26/04	60,000	4,000	---	---	---	---	---
	02/14/07	40,000	2,000	200	0.0	0.0	0.0	0.0
	08/19/07	34,000	1,000	---	---	---	---	---
	01/19/07	60,000	21,000	---	---	---	---	---
	01/25/08	0.000	0.000	---	---	---	---	---
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
0-6	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	0-7	08/29/08	21,000	2,000	700	0.0	0.0	0.0
08/29/08		21,000	2,000	700	0.0	0.0	0.0	0.0
08/29/08		21,000	2,000	700	0.0	0.0	0.0	0.0
08/29/08		21,000	2,000	700	0.0	0.0	0.0	0.0
08/29/08		21,000	2,000	700	0.0	0.0	0.0	0.0
08/29/08		21,000	2,000	700	0.0	0.0	0.0	0.0
08/29/08		21,000	2,000	700	0.0	0.0	0.0	0.0
08/29/08		21,000	2,000	700	0.0	0.0	0.0	0.0
08/29/08		21,000	2,000	700	0.0	0.0	0.0	0.0
08/29/08		21,000	2,000	700	0.0	0.0	0.0	0.0
08/29/08		21,000	2,000	700	0.0	0.0	0.0	0.0
08/29/08		21,000	2,000	700	0.0	0.0	0.0	0.0
08/29/08		21,000	2,000	700	0.0	0.0	0.0	0.0
08/29/08		21,000	2,000	700	0.0	0.0	0.0	0.0
0-8		08/29/08	21,000	2,000	700	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	0-9	08/29/08	21,000	2,000	700	0.0	0.0	0.0
08/29/08		21,000	2,000	700	0.0	0.0	0.0	0.0
08/29/08		21,000	2,000	700	0.0	0.0	0.0	0.0
08/29/08		21,000	2,000	700	0.0	0.0	0.0	0.0
08/29/08		21,000	2,000	700	0.0	0.0	0.0	0.0
08/29/08		21,000	2,000	700	0.0	0.0	0.0	0.0
08/29/08		21,000	2,000	700	0.0	0.0	0.0	0.0
08/29/08		21,000	2,000	700	0.0	0.0	0.0	0.0
08/29/08		21,000	2,000	700	0.0	0.0	0.0	0.0
08/29/08		21,000	2,000	700	0.0	0.0	0.0	0.0
08/29/08		21,000	2,000	700	0.0	0.0	0.0	0.0
08/29/08		21,000	2,000	700	0.0	0.0	0.0	0.0
08/29/08		21,000	2,000	700	0.0	0.0	0.0	0.0
08/29/08		21,000	2,000	700	0.0	0.0	0.0	0.0
0-10		08/29/08	21,000	2,000	700	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0
	08/29/08	21,000	2,000	700	0.0	0.0	0.0	0.0

TABLE 1
 Historical TPH and BTEX Groundwater Analytical Data
 Former Chevron Facility 311081
 4102 Grand Road
 Fairbanks, Alaska

Location	Sample Date	ARO	ORO	RRO	Benzene	Toluene	Ethylbenzene	Total Xylenes
Site 101	08/18/01	30	1,300	1,100	0.3	0.00	0.00	0.00
	05/06/02	40.0	---	---	3.07	---	---	---
	05/13/02	1.0	---	---	---	---	---	---
	08/28/02	1.0	---	---	0.8	0.0	0.0	0.0
	08/18/03	1.0	---	---	0.5	0.0	0.0	0.0
Site 102	08/25/02	1.0	---	---	0.5	0.0	0.0	0.0
	09/28/02	1.0	---	---	0.8	0.0	0.0	0.0
	12/02/02	1.0	---	---	0.8	0.0	0.0	0.0
	04/08/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/27/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/27/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/27/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/27/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/27/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/27/03	1.0	---	---	0.8	0.0	0.0	0.0
Site 103	08/28/02	1.0	---	---	0.8	0.0	0.0	0.0
	09/15/02	1.0	---	---	0.8	0.0	0.0	0.0
	02/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
Site 104	08/28/02	1.0	---	---	0.8	0.0	0.0	0.0
	09/15/02	1.0	---	---	0.8	0.0	0.0	0.0
	02/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
Site 105	08/28/02	1.0	---	---	0.8	0.0	0.0	0.0
	09/15/02	1.0	---	---	0.8	0.0	0.0	0.0
	02/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
Site 106	08/28/02	1.0	---	---	0.8	0.0	0.0	0.0
	09/15/02	1.0	---	---	0.8	0.0	0.0	0.0
	02/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
Site 107	08/28/02	1.0	---	---	0.8	0.0	0.0	0.0
	09/15/02	1.0	---	---	0.8	0.0	0.0	0.0
	02/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
Site 108	08/28/02	1.0	---	---	0.8	0.0	0.0	0.0
	09/15/02	1.0	---	---	0.8	0.0	0.0	0.0
	02/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
Site 109	08/28/02	1.0	---	---	0.8	0.0	0.0	0.0
	09/15/02	1.0	---	---	0.8	0.0	0.0	0.0
	02/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0
	08/28/03	1.0	---	---	0.8	0.0	0.0	0.0

Notes
 All results are reported in micrograms per liter (µg/L)
 Bold indicates data associated with initial report or current reporting period
 Highlighted cells indicate concentrations exceeds respective OCL
 (*) = indicates result did not exceed method reporting limit, an elevated reporting limit value
 Sample was blank
 ADEC = Alaska Department of Environmental Conservation
 D = Duplicate of preceding sample
 ORO = oil and grease organic hydrocarbon
 OCL = groundwater cleanup level based on ADEC 16 AAC 75
 ORO = gasoline range organic hydrocarbon
 RRO = residual range organic hydrocarbon
 -- = sample was not analyzed for this compound

TABLE 2
Historical Groundwater VOC and RCRA Metals Analytical Data
 Former Texaco Facility 211081
 4103 Geist Road
 Fairbanks, Alaska

Well ID	Date Sampled	EDB ¹	1, 1-DCA	1, 2-DCA	1,2-DCBP	Mercury	Arsenic	Selenium	Barium	Cadmium	Chromium	Lead	Silver	MTBE
ADEC GCL:		0.05	7,300	5	--	2	10	50	2,000	5	100	15	100	470
G-1R	12/02/04	<0.0098	--	<1	--	0.040	8.1	<5.9	174	<0.76	<2.5	<10.0	<2.0	--
	04/06/05	<0.0098	--	<0.5	--	<0.028	15.4	<5.9	187	1.2	<2.5	<10.0	<2.0	--
	04/06/05 ^o	<0.0098	--	<0.5	--	<0.028	17.8	<5.9	187	1.4	<2.5	<10.0	<2.0	--
	06/27/05	--	--	--	--	--	<9.3	--	--	<0.97	--	<8.4	--	--
	06/27/05 ^o	--	--	--	--	--	<9.3	--	--	<0.97	--	<8.4	--	--
	09/22/05	<0.0097	--	<0.5	--	<0.062	<9.3	<9.4	147	<0.97	<4.8	<8.4	<2.0	--
	09/22/05 ^o	<0.0097	--	<0.5	--	<0.062	<9.3	<9.4	146	<0.97	<4.8	<8.4	<2.0	--
	03/30/06	--	--	--	--	--	--	--	--	--	--	--	--	<20
	03/30/06 ^o	--	--	--	--	--	--	--	--	--	--	--	--	<10
G-2	06/27/05	<0.0097	--	<1	--	--	10.3	--	--	6.7	--	25.6	--	--
	03/30/06	--	--	--	--	--	--	--	--	--	--	--	--	<2.5
G-3	05/12/09	0.23	--	--	--	--	--	--	--	--	--	--	--	--
	06/17/10	0.60	--	--	--	--	--	--	--	--	--	1.8	--	--
	6/17/10 ^o	8.61	--	--	--	--	--	--	--	--	--	--	--	--
	09/25/10	3.9	--	--	--	--	--	--	--	--	--	6.2	--	--
G-4	12/02/04	<0.0098	--	<1	--	0.230	80	<5.9	399	1.6	16.3	30.6	<2.0	--
	04/06/05	<0.0098	--	<0.5	--	0.053	38.5	<5.9	301	2.2	16.0	25.0	<2.0	--
	06/27/05	--	--	--	--	--	<9.3	--	--	<0.97	--	<8.4	--	--
	09/22/05	0.065	--	<0.5	--	<0.062	11.1	<9.4	174	<0.97	<4.8	<8.4	<2.0	--
	06/08/06	<0.0095	--	--	--	--	--	--	--	--	--	--	--	--
	09/25/10	<0.0097	--	--	--	--	--	--	--	--	--	1.1	--	--
G-5	12/02/04	1.9	--	<100	--	0.30	159	6.7	1,240	2.7	95.2	437	<2.0	--
	04/06/05	1.2	--	<1	--	0.19	119	<5.9	1,090	11.0	88.2	239	<2.0	--
	06/27/05	2.14	--	--	--	--	37.7	--	--	<0.97	--	34.0	--	--
	09/23/05	1.2	--	<3	--	<0.062	30.0	<9.4	161	1.3	<4.8	15.1	<2.0	--
	12/07/05	2.3	<10	<5	--	--	--	--	--	--	--	20.90	--	<63
	03/30/06	0.95	<1	--	--	--	--	--	--	--	--	70.5	--	<100
	06/08/06	1.1	--	--	--	--	--	--	--	--	--	7.9	--	--
	09/26/06	0.69	--	--	--	--	--	--	--	--	--	8.9	--	--
	12/20/06	0.10	--	--	--	--	--	--	--	--	--	7.2	--	--
	03/31/07	0.05	--	--	--	--	--	--	--	--	--	8.9	--	--
	06/10/07	0.079	--	--	--	--	--	--	--	--	--	--	--	--
	09/15/07	0.024	--	--	--	--	--	--	--	--	--	--	--	--
	01/30/08 ^o	<0.0091	--	--	--	--	--	--	--	--	--	--	--	--
	01/30/08 ^o	<0.0089	--	--	--	--	--	--	--	--	--	--	--	--
	03/26/08	<0.01	--	--	--	<0.01	--	--	--	--	--	--	--	--
	03/26/08	<0.01	--	--	--	<0.01	--	--	--	--	--	--	--	--
	06/30/08	<0.0098	--	--	--	--	--	--	--	--	--	--	--	--
	06/30/08 ^o	<0.0098	--	--	--	--	--	--	--	--	--	--	--	--
	09/09/08	<0.0098	--	--	--	--	--	--	--	--	--	--	--	--
	01/13/09	<0.0096	--	--	--	--	--	--	--	--	--	--	--	--
	01/13/2009 ^o	<0.0098	--	--	--	--	--	--	--	--	--	--	--	--
	05/13/09	<0.0096	--	--	--	--	--	--	--	--	--	--	--	--
	10/01/09	<0.0098	--	--	--	--	--	--	--	--	--	--	--	--
	10/01/09 ^o	<0.0098	--	--	--	--	--	--	--	--	--	--	--	--
	06/17/10	<0.018	--	--	--	--	--	--	--	--	--	--	--	--
6/17/10 ^o	<0.017	--	--	--	--	--	--	--	--	--	--	--	--	
09/25/10	<0.0088	--	--	--	--	--	--	--	--	--	--	--	--	
09/25/10 ^o	--	--	--	--	--	--	--	--	--	--	--	--	--	
G-7	12/02/04	0.88	--	<2	--	0.052	31.8	<5.9	76.1	<0.76	<2.5	44.0	<2.0	--
	04/06/05	0.18	--	<1	--	<0.028	42.5	<5.9	61.5	1.0	<2.5	16.4	<2.0	--
	06/27/05	0.32	--	--	--	--	31.5	--	--	<0.97	--	9.1	--	--
	09/23/05	2.2	--	<1	--	<0.062	19.4	<9.4	100	<0.97	<4.8	<8.4	<2.0	--
	12/07/05	0.42	<5	<3	--	--	--	--	--	--	--	--	--	<10
	03/30/06	1.1	<2	--	--	--	--	--	--	--	--	--	--	<100
	06/08/06	<0.0095	--	--	--	--	--	--	--	--	--	--	--	--
	09/26/06	0.310	--	--	--	--	--	--	--	--	--	--	--	--
	12/20/06	0.036	--	--	--	--	--	--	--	--	--	--	--	--
	03/31/07	0.100	--	--	--	--	--	--	--	--	--	--	--	--
	06/10/07	0.060	--	--	--	--	--	--	--	--	--	--	--	--
	09/15/07	<0.0098	--	--	--	--	--	--	--	--	--	--	--	--
	03/26/08	<0.01	--	--	--	<0.01	--	--	--	--	--	--	--	--

TABLE 2
Historical Groundwater VOC and RCRA Metals Analytical Data
 Former Texaco Facility 211081
 4103 Geist Road
 Fairbanks, Alaska

Well ID	Date Sampled	EDB ¹	1, 1-DCA	1, 2-DCA	1,2-DBCp	Mercury	Arsenic	Selenium	Barium	Cadmium	Chromium	Lead	Silver	MTBE
ADEC GCL:		0.05	7,300	5	--	2	10	50	2,000	5	100	15	100	470
G-7 Cont.	03/25/08 ^b	<0.01	--	--	--	--	--	--	--	--	--	--	--	--
	06/06/08	<0.0097	--	--	<0.01	--	--	--	--	--	--	--	--	--
	06/06/08 ^b	<0.0097	--	--	--	--	--	--	--	--	--	--	--	20
	09/09/08	<0.0097	--	--	--	--	--	--	--	--	--	--	--	20
	01/13/09	<0.0098	--	--	--	--	--	--	--	--	--	--	--	--
	10/02/09	<0.0098	--	--	--	--	--	--	--	--	--	--	--	--
	06/16/10	<0.017	--	--	--	--	--	--	--	--	--	--	--	--
	5/16/10 ^d	<0.017	--	--	--	--	--	--	--	--	--	--	--	--
	09/25/10	<0.0096	--	--	--	--	--	--	--	--	--	--	--	--
09/25/10 ^e	--	--	--	--	--	--	--	--	--	--	--	--	--	
G-8	12/20/06	<0.0099	--	--	--	--	--	--	--	--	--	--	--	--
	03/31/07	<0.0097	--	--	--	--	--	--	--	--	--	--	--	--
	06/10/07	0.150	--	--	--	--	--	--	--	--	--	--	--	--
	09/15/07	<0.0097	--	--	--	--	--	--	--	--	--	--	--	--
	03/26/08	<0.01	--	--	0.024	--	--	--	--	--	--	--	--	--
	06/06/08	<0.0099	--	--	--	--	--	--	--	--	--	--	--	--
	09/09/08	<0.0099	--	--	--	--	--	--	--	--	--	--	--	6
	01/13/09	<0.01	--	--	--	--	--	--	--	--	--	--	--	--
	05/12/09	0.025	--	--	--	--	--	--	--	--	--	--	--	--
	10/01/09	<0.0098	--	--	--	--	--	--	--	--	--	--	--	--
	10/01/09 ^d	<0.0098	--	--	--	--	--	--	--	--	--	--	--	--
06/16/10	<0.017	--	--	--	--	--	--	--	--	--	--	--	--	
09/25/10	<0.0096	--	--	--	--	--	--	--	--	--	--	--	--	
MW-211	12/02/04	--	--	--	--	--	--	--	--	--	--	--	--	--
	04/06/05	<0.0097	--	<0.5	--	0.12	62.4	9.3	1,130	10.1	97.4	89.1	<2.0	--
	09/22/05	<0.0097	--	<0.5	--	<0.062	54.3	<9.4	463	4.5	92.0	57.9	<2.0	--
	03/29/06	--	--	--	--	--	--	--	--	--	--	--	--	<2.5
	09/25/10	--	--	--	--	--	--	--	--	--	--	<0.052	--	--
MW-301D	12/02/04	--	--	--	--	--	--	--	--	--	--	--	--	--
	04/06/05	<0.0097	--	<0.5	--	<0.028	29.7	<5.9	399	<0.76	<2.5	<10.0	<2.0	--
	06/27/05	<0.0094	--	<1	--	--	29.2	--	--	<0.97	--	<8.4	--	--
	09/22/05	<0.0097	--	<0.5	--	<0.062	30.5	<9.4	423	<0.97	<4.8	<8.4	<2.0	--
	03/29/06	--	--	--	--	--	--	--	--	--	--	--	--	<2.5
MW-301S	12/02/04	<0.0097	--	<1	--	0.091	159	<5.9	1,730	3.8	53.4	49.1	<2.0	--
	04/06/05	<0.0097	--	<0.5	--	0.041	91.3	<5.9	970	4.8	45.1	47.4	<2.0	--
	06/27/05	--	--	--	--	--	101	--	--	1.0	--	9.7	--	--
	09/22/05	<0.0096	--	<0.5	--	<0.062	56.7	<9.4	310	1.1	10.1	<8.4	<2.0	--
MW-302D	03/29/06	--	--	--	--	--	--	--	--	--	--	--	--	<2.5
	12/02/04	--	--	--	--	--	--	--	--	--	--	--	--	--
	04/06/05	<0.0095	--	<0.5	--	<0.028	33.4	<5.9	388.0	<0.76	<2.5	<10.0	<2.0	--
	06/27/05	<0.0096	--	<1	--	--	27.1	--	--	<0.97	--	<8.4	--	--
	09/22/05	<0.0096	--	<0.5	--	<0.062	36.7	<9.4	446	<0.97	<4.8	<8.4	<2.0	--
03/29/06	--	--	--	--	--	--	--	--	--	--	--	--	<2.5	
MW-302S	12/02/04	<0.0098	--	<1	--	0.075	94.5	<5.9	1,080	2.2	22.3	21.5	<2.0	--
	04/06/05	<0.0095	--	2	--	0.043	139	<5.9	852	2.2	37.3	36.7	<2.0	--
	06/27/05	--	--	2	--	--	50.9	--	--	<0.97	--	<8.4	--	--
	09/22/05	<0.0096	--	0.7	--	<0.062	33.3	<9.4	199	<0.97	<4.8	<8.4	<2.0	--
	03/29/06	--	--	--	--	--	--	--	--	--	--	--	--	<2.5
MW-303S	12/02/04	--	--	--	--	--	--	--	--	--	--	--	--	<2.5
	04/06/05	<0.0098	--	<0.5	--	<0.028	37.5	<5.9	582	5.2	29.8	35.2	<2.0	--
	03/30/06	--	--	--	--	--	--	--	--	--	--	--	--	<2.5
MW-304D	12/02/04	0.0098	--	<1	--	0.053	27.2	<5.9	365	<0.76	<2.5	<10.0	<2.0	--
	04/06/05	0.0098	--	<0.5	--	<0.028	25.2	<5.9	379	<0.76	<2.5	<10.0	<2.0	--
	06/27/05	--	--	--	--	--	25.7	--	--	<0.97	--	<8.4	--	--
	09/21/05	<0.0097	--	1	--	<0.062	31.0	<9.4	412	<0.97	<4.8	<8.4	<2.0	--
	03/29/06	--	--	--	--	--	--	--	--	--	--	--	--	<2.5

TABLE 2
Historical Groundwater VOC and RCRA Metals Analytical Data
 Former Texaco Facility 211081
 4103 Geist Road
 Fairbanks, Alaska

Well ID	Date Sampled	EDB ¹	1, 1-DCA	1, 2-DCA	1,2-DBCP	Mercury	Arsenic	Selenium	Barium	Cadmium	Chromium	Lead	Silver	MTBE
ADEC GCL:		0.05	7,300	5	--	2	10	50	2,000	5	100	15	100	470
MW-304S	12/02/04	--	--	--	--	--	--	--	--	--	--	--	--	--
	04/06/05	<0.0094	--	<0.5	--	0.078	19.2	<5.9	1,020	4.7	40.5	38.0	<2.0	--
	03/29/06	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-305	12/02/04	--	--	--	--	--	--	--	--	--	--	--	--	<2.5
	04/06/05	<0.0094	--	<0.5	--	0.053	321	<5.9	743	3.1	36.6	35.8	<2.0	--
	03/30/06	--	--	--	--	--	--	--	--	--	--	--	--	<2.5
GW-1B ²	12/02/04	<0.0096	--	<1	--	0.053	39	<5.9	429	<0.76	<2.5	<10.0	<2.0	--
	12/02/04	<0.0096	--	<1	--	0.045	42	<5.9	431	<0.76	<2.5	<10.0	<2.0	--
	04/06/05	<0.0094	--	<0.5	--	<0.028	42.8	<5.9	424	<0.76	<2.5	<10.0	<2.0	--
	4/6/2005 ³	<0.0094	--	<0.5	--	<0.028	44.7	<5.9	433	<0.76	<2.5	<10.0	<2.0	--
	06/27/05	--	--	--	--	--	42.3	--	--	<0.97	--	<8.4	--	--
	06/27/05 ⁴	--	--	--	--	--	37.9	--	--	<0.97	--	<8.4	--	--
	09/21/05	<0.0096	--	<0.5	--	<0.062	45.3	<9.4	398	1.1	<4.8	10.4	<2.0	--
	09/21/05 ⁵	<0.0096	--	<0.5	--	<0.062	41.7	<9.4	426	0.99	<4.8	13.1	<2.0	--
	03/29/06	--	--	--	--	--	--	--	--	--	--	--	--	<2.5
	03/29/06 ⁶	--	--	--	--	--	--	--	--	--	--	--	--	<2.5
GW-2 ²	12/02/04	--	--	--	--	--	--	--	--	--	--	--	--	<3.0
	04/06/05	--	--	--	--	--	--	--	--	--	--	--	--	--
	06/27/05	<0.0096	--	<1	--	--	32.4	--	--	<0.97	--	<8.4	--	--
	09/21/05	<0.0097	--	<0.5	--	<0.062	37.9	<9.4	363	<0.97	<4.8	<8.4	<2.0	--
	03/29/06	--	--	--	--	--	--	--	--	--	--	--	--	<2.5
Trip Blank	06/27/05	<0.0095	--	<1	--	--	--	--	--	--	--	--	--	<3.0
	09/22/05	--	--	<0.5	--	--	--	--	--	--	--	--	--	--
	12/07/05	<0.0096	--	--	--	--	--	--	--	--	--	--	--	--
	03/30/06	--	<1	--	--	--	--	--	--	--	--	--	--	<2.5
	06/07/06	<0.0095	--	--	--	--	--	--	--	--	--	--	--	--
	09/26/06	<0.0095	--	--	--	--	--	--	--	--	--	--	--	--
	12/19/06	<0.0098	--	--	--	--	--	--	--	--	--	--	--	--
	06/08/07	<0.0099	--	--	--	--	--	--	--	--	--	--	--	--
	09/15/07	<0.0099	--	--	--	--	--	--	--	--	--	--	--	--
	01/30/08 ³	<0.0091	--	--	--	--	--	--	--	--	--	--	--	--
06/06/08	<0.0097	--	--	--	--	--	--	--	--	--	--	--	--	

Notes:

All results are reported in micrograms per liter (µg/L).

(<) = Indicates result did not exceed method reporting limit; an elevated reporting limit indicates sample was diluted
 Bold type indicates results of the most recent sampling event.

¹ - EDB analyzed by EPA Method 504 from December 2004 through April 2005; analyzed by EPA Method 8011 from September 2005 to present.

² - Municipal supply well sampled from valve in wellhouse

³ - Fourth quarter 2007 sampling conducted on January 30, 2008.

⁴ - Sample analyzed after expiration of hold time

⁵ - Duplicate of preceding sample

DCA = dichloroethane

EDB = 1, 2-dibromoethane

DBCP = 1,2-dibromo-3-chloropropane

GCL = groundwater cleanup level

MTBE = methyl tertiary butyl ether

RCRA = Resource Conservation and Recovery Act; samples analyzed using EPA Method 6010B

VOC = volatile organic compounds; samples analyzed using EPA Method 8260B

-- = not sampled

na = not analyzed

Table 3: Historical Soil Analytical Results

Former Texaco Service Station 21-1081 (University Car Care Center)
 4103 Geist Road
 Fairbanks, Alaska

Sample Location	Depth below ground surface (feet)	Date Sampled	VPH	EPH	Benzene	Ethylbenzene	Toluene	Xylenes	Total BTEX
ADEC Soil Cleanup Level (Migration to groundwater)									
B-1-3	15.0-16.5	Nov-88	--	--	0.02	5.4	5.5	78	--
B-2-2	10.0-11.5	Nov-88	--	--	0.7	ND	1.1	0.8	--
B-2-3	15.0-16.5	Nov-88	--	--	1,500	1,500	7,000	7,100	--
B-3-2	10.0-11.5	Nov-88	--	--	10	5.4	21	22	--
B-3-3	15.0-16.5	Nov-88	--	--	20	110	278	440	--
B-4-3	15.0-16.5	Nov-88	--	--	82	190	540	760	--
B-5-3	15.0-16.5	Nov-88	--	--	0.8	0.3	0.4	1.2	--
B-6-2	10.0-11.5	Nov-88	--	--	47	55	160	260	--
B-6-3	15.0-16.5	Nov-88	--	--	1	12	5.2	21	--
MW-1-3	15.0-16.5	Nov-88	--	--	5.7	7.4	19	31	--
B-1 PF	15.0-16.5	Apr-92	ND	ND	1.3	1.5	4.1	6.5	ND
B-2	10.0-11.5	Apr-92	ND	ND	ND	--	--	--	ND
B-2 *	14.0-14.5	Apr-92	ND	ND	ND	--	--	--	0.064
B-3 PF	10.0-11.5	Apr-92	ND	ND	ND	--	--	--	ND
B-4 *	13.0-14.5	Apr-92	ND	ND	ND	--	--	--	ND
B-4 Dup	13.0-14.5	Apr-92	ND	ND	ND	--	--	--	ND
B-5-3	5.0-6.5	Apr-92	8,430	3,550	223	--	--	--	3,272
B-5-3	10.0-11.5	Apr-92	7,850	673	187	--	--	--	4,459
B-5 *	13.5-15.0	Apr-92	3,264	274	0.737	--	--	--	31,947
B-6	5.0-6.5	Apr-92	ND	ND	0.064	--	--	--	0.129

Table 3: Historical Soil Analytical Results
Former Texaco Service Station 21-1081 (University Car Care Center)
4103 Geist Road
Fairbanks, Alaska

Sample Location	Depth below ground surface (feet)	Date Sampled	VPH	EPH	Benzene	Ethylbenzene	Toluene	Xylenes	Total BTEX
ADEC Soil Cleanup Level (Migration to groundwater)									
B-6 *	13.0-14.5	Apr-92	0.485	ND	0.02	5.4	5.5	78	--
B-8	5.0-6.5	Apr-92	ND	ND	ND	--	--	--	0.071
B8 *	13.0-14.5	Apr-92	0.449	ND	ND	--	--	--	ND
B-8 Dup	13.0-14.5	Apr-92	1.46	ND	0.03	--	--	--	0.288
B-9	5.0-6.5	Apr-92	1.31	ND	0.269	--	--	--	0.591
B-9	10.0-11.5	Apr-92	5.04	10.5	1.53	--	--	--	0.868
B-9 Dup	14.5-16.0	Apr-92	16.300	1,160	588	--	--	--	2.876
6	4	Aug-92	2,780	2,050	75	--	--	--	9,426
7	10	Aug-92	14,500	18,800	833	--	--	--	2,034.7
9	10	Aug-92	5,540	ND	195	--	--	--	9,282
14	10	Aug-92	14,500	ND	610	--	--	--	2,948
2	12	Oct-92	21.8	19.3	0.808	--	--	--	9,840
4	12	Oct-92	3,250	372	106	--	--	--	13,215
5	6	Oct-92	3.89	10.5	0.078	--	--	--	1,794
6	12	Oct-92	1,600	3,070	6.42	--	--	--	1,258
7	6	Oct-92	11.2	21.3	0.261	--	--	--	214.52
8	12	Oct-92	3,450	413	28.6	--	--	--	2,245
TB G-5	9.0-10.5	Nov-92	<0.400	--	<0.020	--	--	--	1,631.6
TB G-5	14.5-16.0	Nov-92	19.7	--	4.08	--	--	--	0.172
TB MV209	14.0-15.5	Nov-92	<0.600	--	<0.030	--	--	--	613.68
									<0.030

Table 3: Historical Soil Analytical Results

Former Texaco Service Station 21-1081 (University Car Care Center)
 4103 Geist Road
 Fairbanks, Alaska

Sample Location	Depth below ground surface (feet)	Date Sampled	VPH	EPH	Benzene	Ethylbenzene	Toluene	Xylenes	Total BTEX
ADEC Soil Cleanup Level (Migration to groundwater)									
TB MW-210	14.5-16.0	Nov-92	<0.600	--	0.02	5.4	5.5	78	--
TB MW-210	17.5-18.5	Nov-92	<0.400	--	<0.030	--	--	--	<0.030
TB MW-211	22.0-23.0	Nov-92	0.856	--	<0.020	--	--	--	<0.020
TB MW-211*	12.5-14.0	Nov-92	<0.600	--	<0.025	--	--	--	0.075
TB 211*	12.5-14.0	Nov-92	<0.600	--	<0.030	--	--	--	<0.030

Notes:
 VPH = Volatile Petroleum Hydrocarbons (EPA Test Method 5030/8015 Mod)
 BTEX = Total Aromatic Volatile Organics (EPA Test Method 8020)
 -- = Not analyzed
 ND = Not Detected, detection limit not available
 All results are reported in milligrams per kilogram (mg/kg)
 < = not detected greater than the laboratory reporting limit
 Highlighted concentrations are greater than the applicable ADEC soil cleanup level for migration to groundwater, under 40-inch zone.
 * = @ Groundwater
 PF = Permafrost
 Dup = Duplicate

Table 4: Historical Soil GRO and BTEX Analytical Results

Former Texaco Service Station 211081
 4103 Geist Road
 Fairbanks, AK

Sample Location	Depth below ground surface (feet)	Date Sampled	GRO	DRO	RRO	Benzene ¹	Toluene	Ethylbenzene	Total Xylenes
ADEC Soil Cleanup Level (Migration to groundwater)									
G-8	10-12	09/19/06	<4.5	<5.4	28	<0.04	<0.04	<0.04	<0.1
G-8	16-18	09/19/06	3,500	24	22	0.8	5.3	73	400
G-8	16-18 Duplicate	09/19/06	2,300	21	18	<1.6	7.5	41	230
G-9	12-14	09/20/06	6	<5.0	<5.0	<0.03	0.05	<0.03	0.2
B-101	14-16	09/20/06	<4.4	<5.2	<5.2	<0.04	<0.04	<0.04	<0.1
B-102	12-14	09/20/06	12	26	23	0.8	0.07	0.2	2.5
B-102	14-16	09/20/06	6,600	20	22	24	380	200	1,300
B-103	7-8	09/20/06	<3.3	<4.1	15	<0.03	<0.03	<0.03	0.1
B-104	5.5-6.5	09/20/06	<2.8	<4.1	19	<0.03	<0.03	<0.03	<0.08
B-105	5-6	09/20/06	21	<4.3	12	<0.03	0.07	0.6	3.2
B-106	8-9	09/20/06	5.4	<4.9	<4.9	<0.04	0.05	<0.04	<0.1
B-107	7.5-8.5	09/20/06	<3.2	<4.3	17	<0.03	<0.03	<0.03	<0.1

Notes

All results are reported in milligrams per kilogram (mg/kg)
 Gasoline range organics (GRO) was analyzed by AK Method 101.

Benzene, toluene, ethylbenzene, and total xylenes (BTEX) were analyzed by EPA Method 8021

Highlighted concentrations are greater than the applicable ADEC soil cleanup level for migration to groundwater, under 40-inch zone.

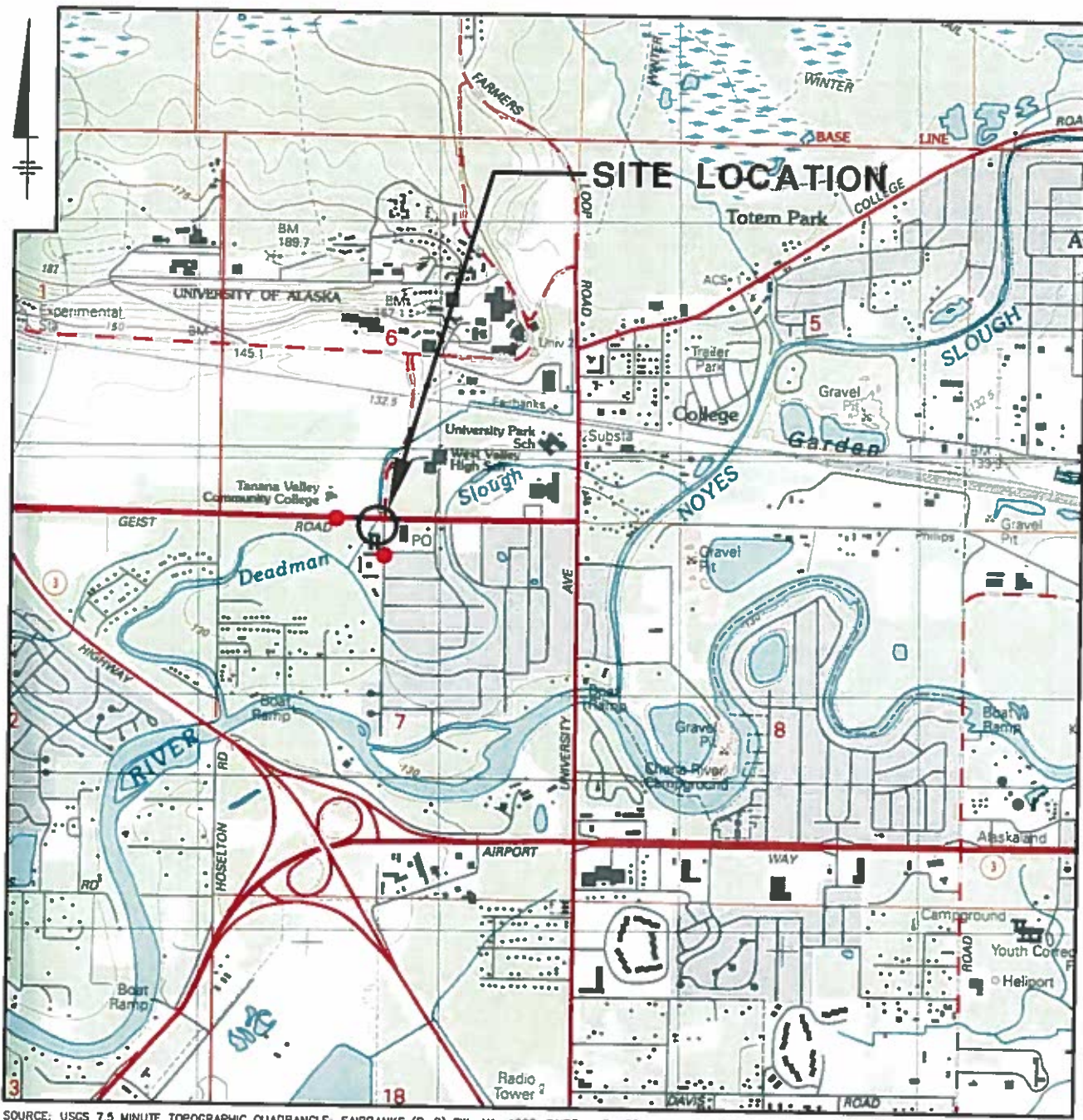
< = not detected greater than the laboratory reporting limit

¹The detection limit for benzene was greater than the ADEC cleanup level for all of the samples, due to methanol preservation and foaming of the samples.

ARCADIS

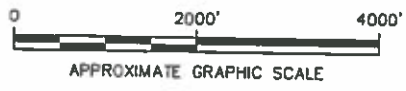
Figures

CITY (Road) DNUGROUP (Road) DB (Road) LD (Opt) PIC (Opt) PML (Shed) TM (OH) LVR (Opt) OH+ OFF+REF+
 G:\ENVC\DOT\mapa-bk\CTB004548 211001000400001\UPPCSM 2011\8004548\01.dwg LAYOUT: 15AVED 5/25/2011 2:00 PM ACADYVER 18.05 (LMS TECH) PAGESETUP PDF-APPL01STYLETABLE PLT\FULLCTB.PLOTTED 5/25/2011 2:00 PM BY RICHARDS, JM
 XREFS ALASKA.DWG PROJECTNAME: Fairbanks-SW.dwg



SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE: FAIRBANKS (D-2) SW, AK., 1992, FAIRBANKS NORTH STAR BOROUGH, SECTION: 7, TOWNSHIP: 15, RANGE: 1W

LEGEND
 ● POTABLE WELL



SITE LOCATION



FORMER CHEVRON FACILITY #211081
 4103 GEIST ROAD, FAIRBANKS, ALASKA
 UPDATED PRELIMINARY CONCEPTUAL SITE MODEL

SITE LOCATION MAP



FIGURE
 1



Google

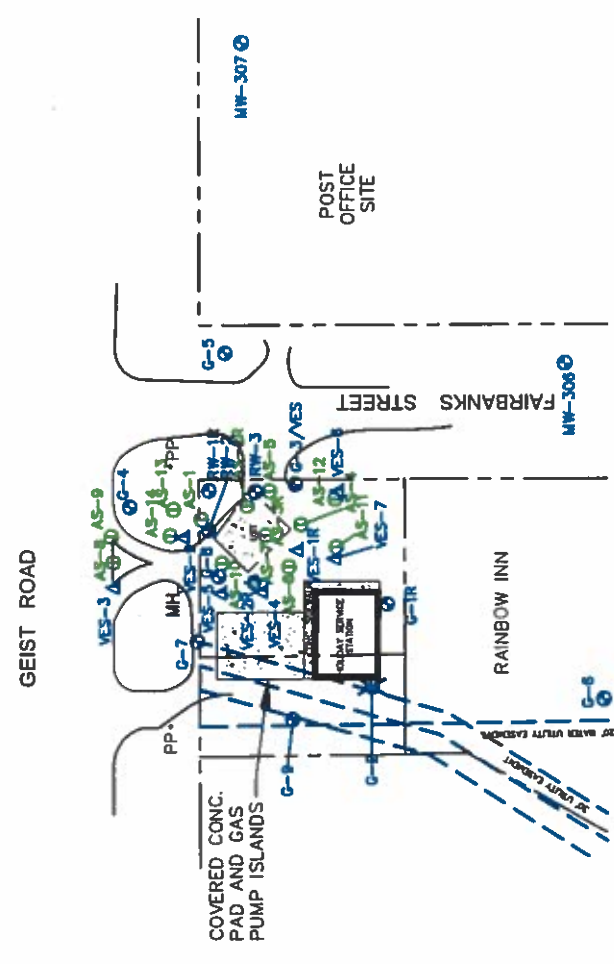
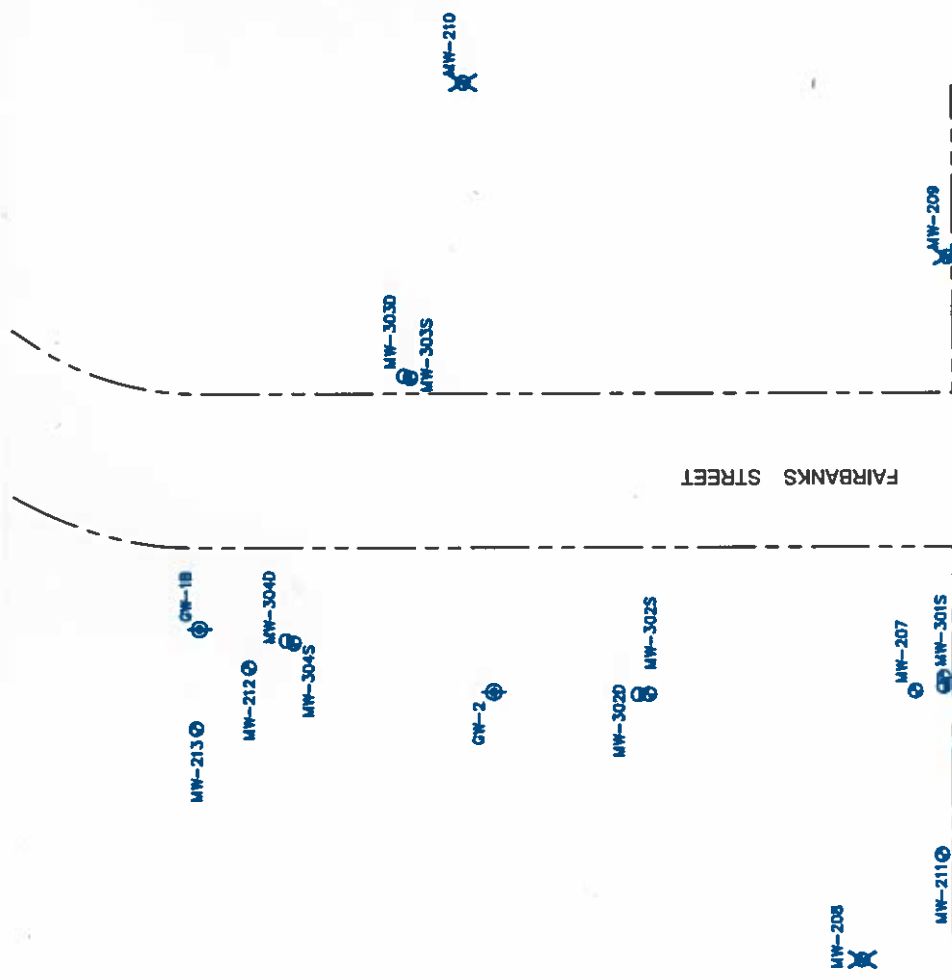
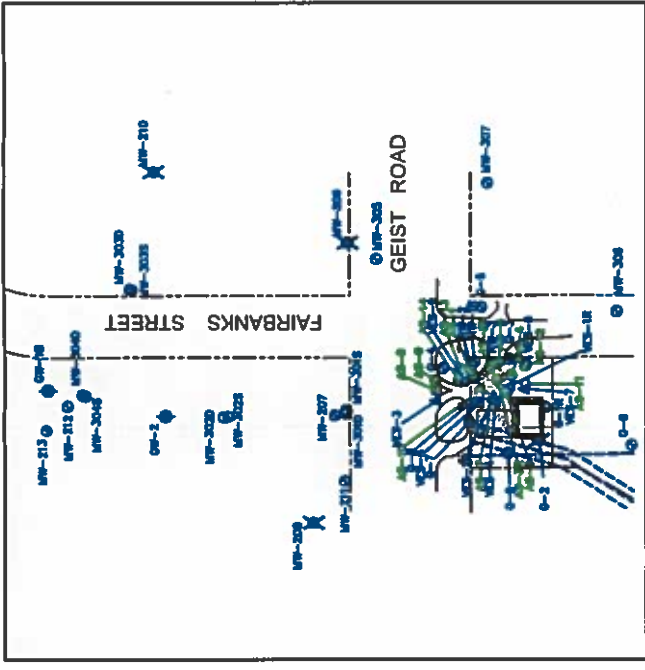
FORMER CHEVRON FACILITY #211081
4103 GEIST ROAD, FAIRBANKS, ALASKA
UPDATED PRELIMINARY CONCEPTUAL SITE MODEL

SITE AERIAL PHOTO



FIGURE
2

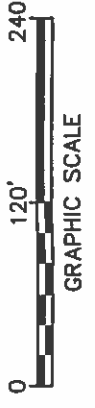
SOURCE:
1. Aerial photograph obtained March 16, 2010
from GOOGLE EARTH PRO.



LEGEND:

- MONITORING WELL
- DEEP MONITORING WELL
- ⊕ UAF WATER SUPPLY WELL
- ✕ DESTROYED/ABANDONED MONITORING WELL
- AIR SPARGE WELL
- ▲ SOIL VAPOR EXTRACTION WELL

NOTES:
 1. BASE MAP PROVIDED BY KARABELNIKOFF SURVEYING (907) 337-3434, MAP DRAWN FULL SCALE, 11/6/06.

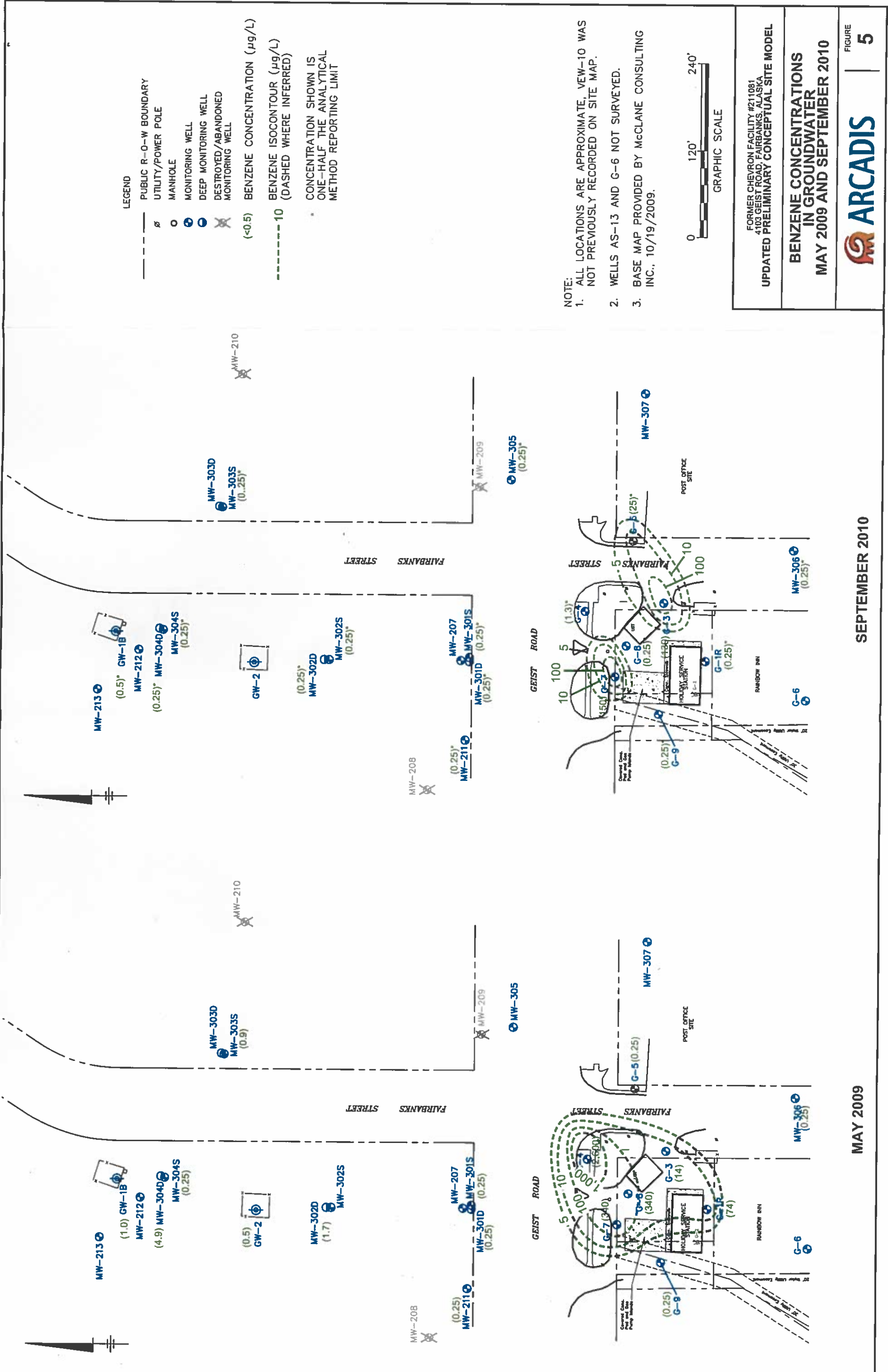


FORMER CHEVRON FACILITY #211081
 4105 GEIST ROAD, FAIRBANKS, ALASKA
UPDATED PRELIMINARY CONCEPTUAL SITE MODEL

SITE PLAN

ARCADIS

FIGURE **3**

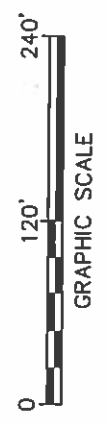


LEGEND

- PUBLIC R-O-W BOUNDARY
- ⊕ UTILITY/POWER POLE
- MANHOLE
- ⊕ MONITORING WELL
- ⊖ DEEP MONITORING WELL
- ⊗ DESTROYED/ABANDONED MONITORING WELL
- (<0.5) BENZENE CONCENTRATION (µg/L)
- 10 BENZENE ISOCONTOUR (µg/L) (DASHED WHERE INFERRED)
- CONCENTRATION SHOWN IS ONE-HALF THE ANALYTICAL METHOD REPORTING LIMIT

NOTE:

1. ALL LOCATIONS ARE APPROXIMATE, VIEW-10 WAS NOT PREVIOUSLY RECORDED ON SITE MAP.
2. WELLS AS-13 AND G-6 NOT SURVEYED.
3. BASE MAP PROVIDED BY McCLANE CONSULTING INC., 10/19/2009.



FORMER CHEVRON FACILITY #211081
 4103 GEIST ROAD, FAIRBANKS, ALASKA
UPDATED PRELIMINARY CONCEPTUAL SITE MODEL

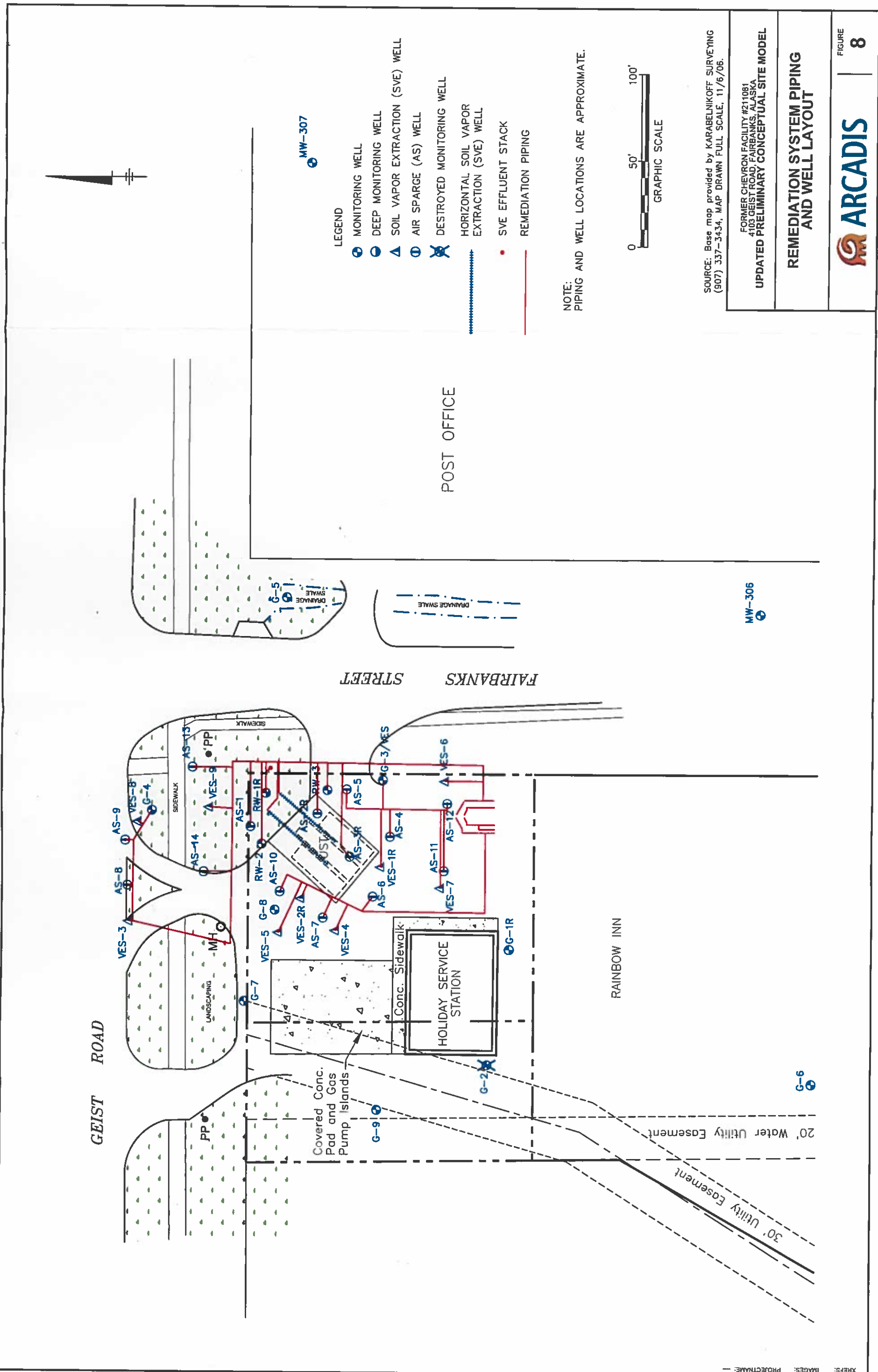
**BENZENE CONCENTRATIONS
 IN GROUNDWATER
 MAY 2009 AND SEPTEMBER 2010**

ARCADIS

FIGURE 5

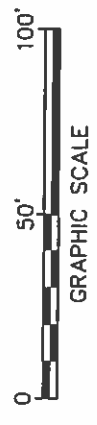
SEPTEMBER 2010

MAY 2009



- LEGEND**
- MONITORING WELL
 - DEEP MONITORING WELL
 - ▲ SOIL VAPOR EXTRACTION (SVE) WELL
 - ⊕ AIR SPARGE (AS) WELL
 - ✕ DESTROYED MONITORING WELL
 - HORIZONTAL SOIL VAPOR EXTRACTION (SVE) WELL
 - SVE EFFLUENT STACK
 - REMEDIATION PIPING

NOTE: PIPING AND WELL LOCATIONS ARE APPROXIMATE.



SOURCE: Base map provided by KARABELNIKOFF SURVEYING (907) 337-3434, MAP DRAWN FULL SCALE, 11/6/06.

FORMER CHEVRON FACILITY #211081
4103 GEIST ROAD, FAIRBANKS, ALASKA
UPDATED PRELIMINARY CONCEPTUAL SITE MODEL

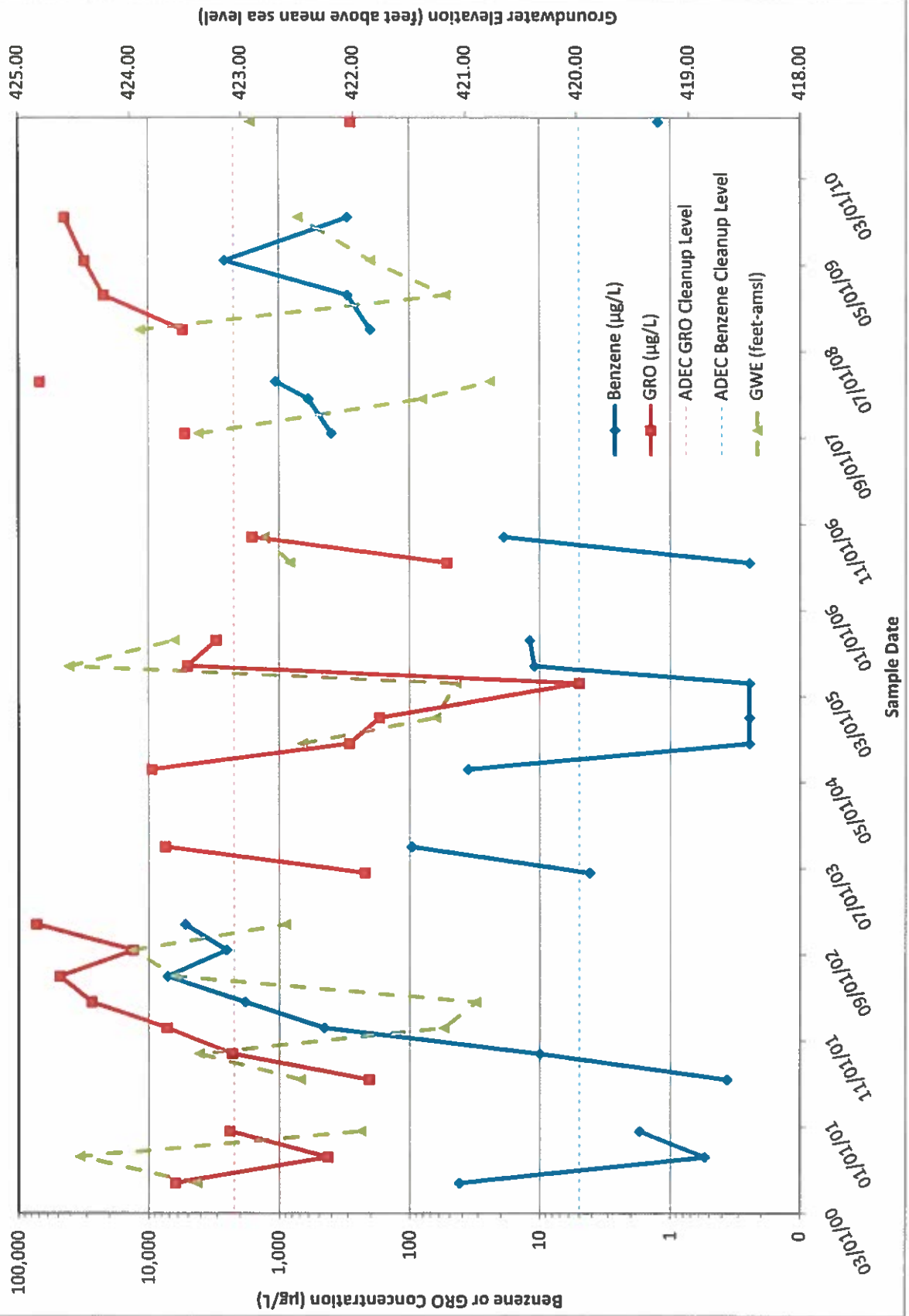
REMEDIATION SYSTEM PIPING AND WELL LAYOUT

ARCADIS

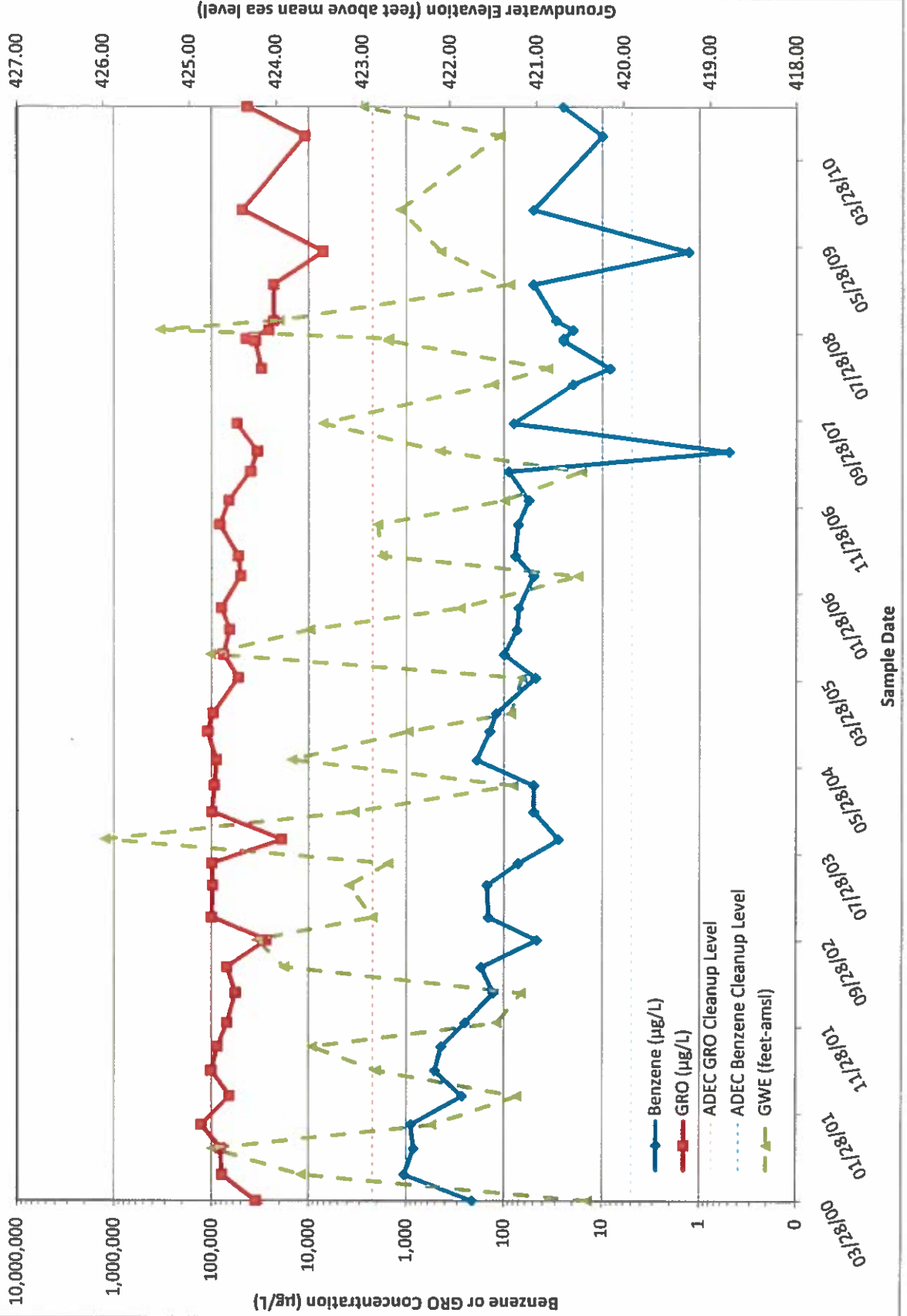
Appendix A

Hydrographs

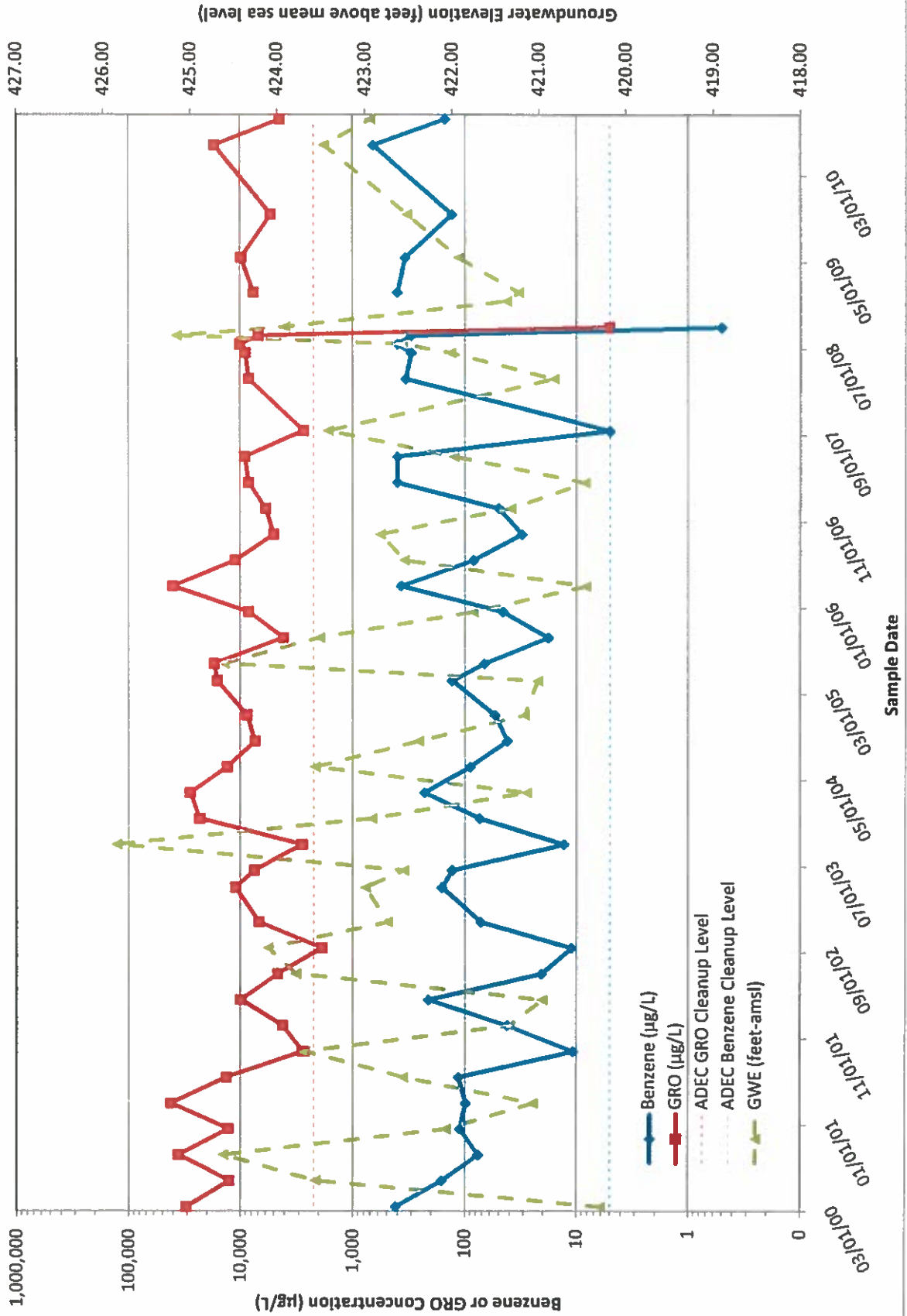
Well G-4 Hydrograph



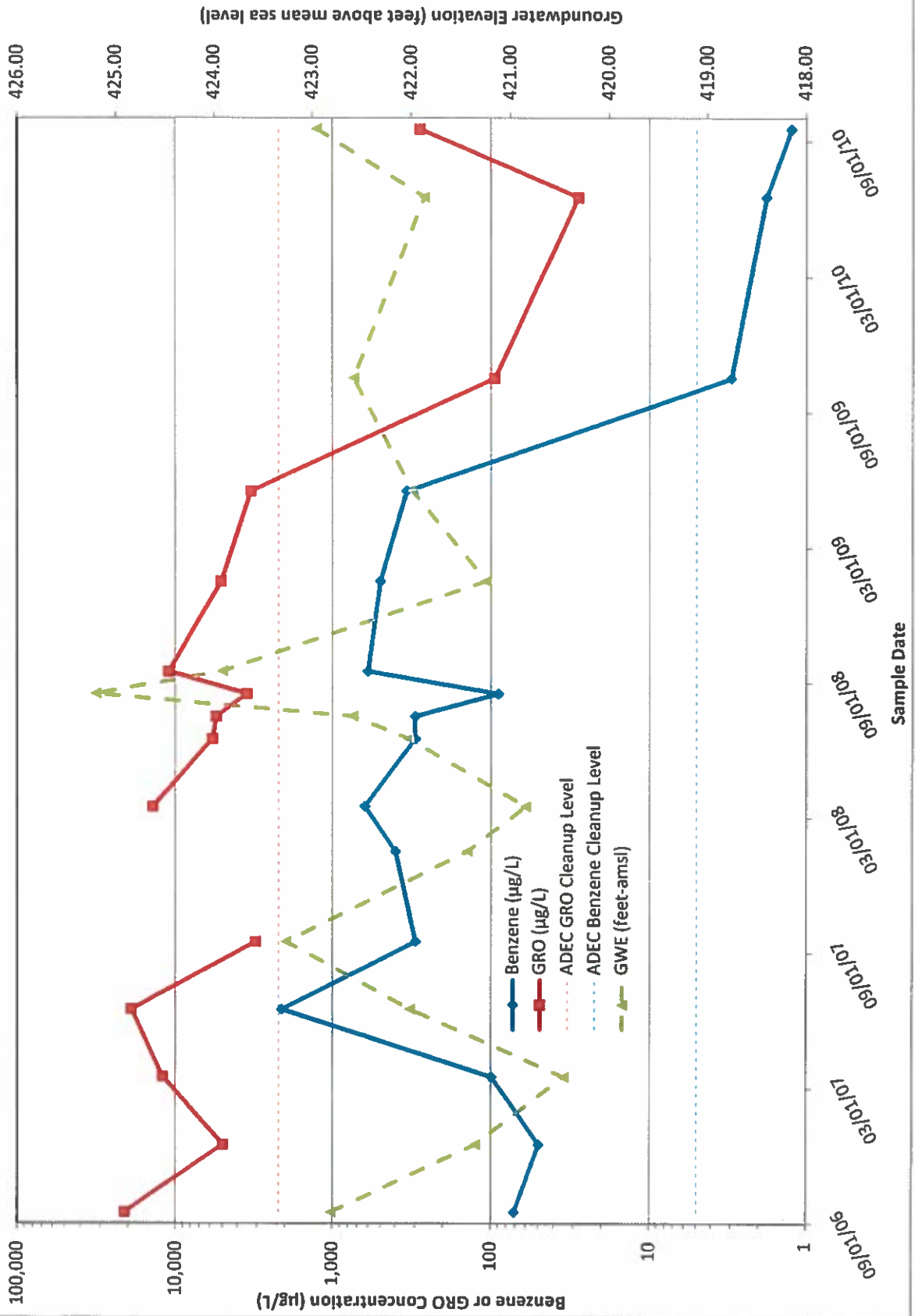
Well G-5 Hydrograph



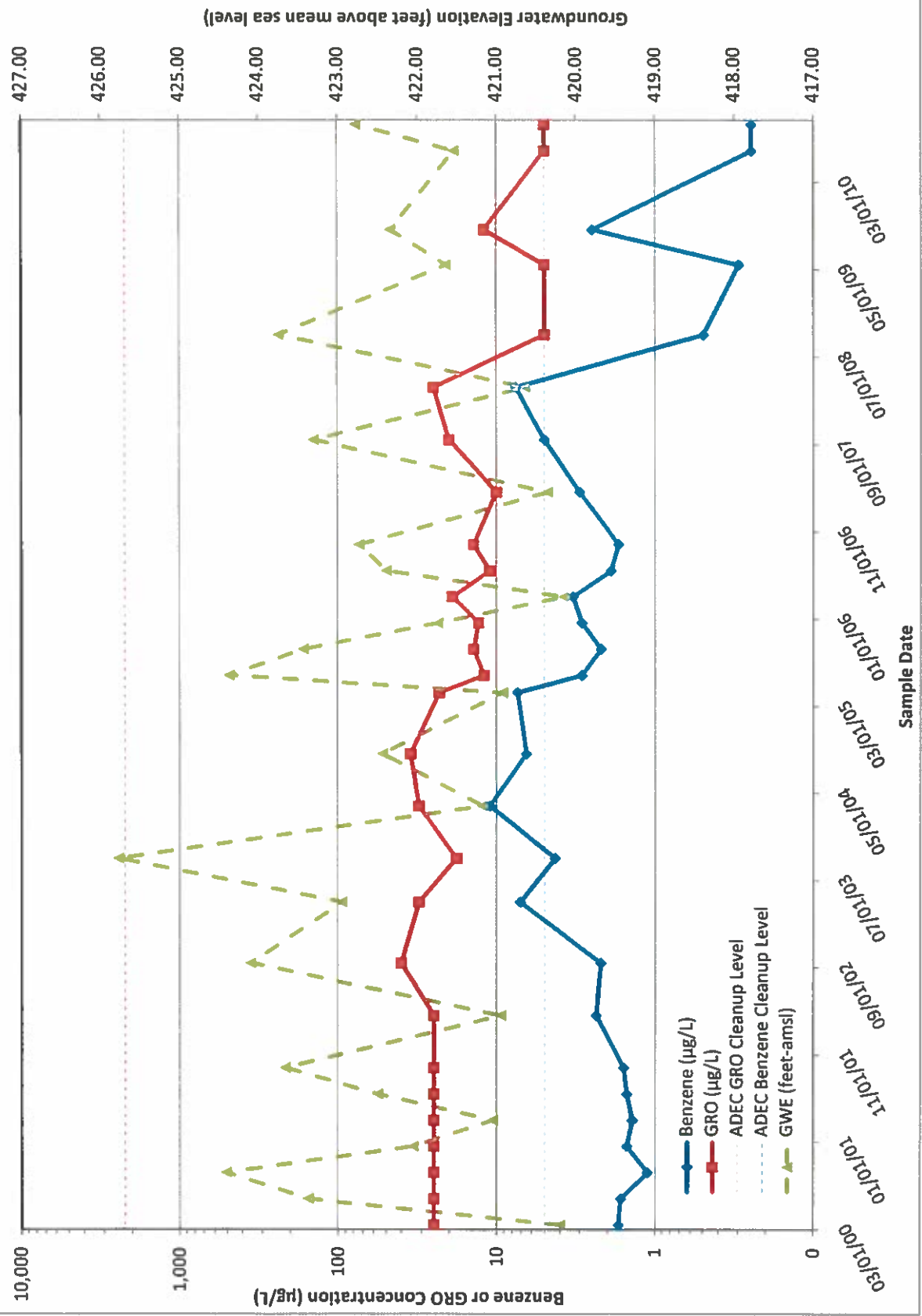
Well G-7 Hydrograph



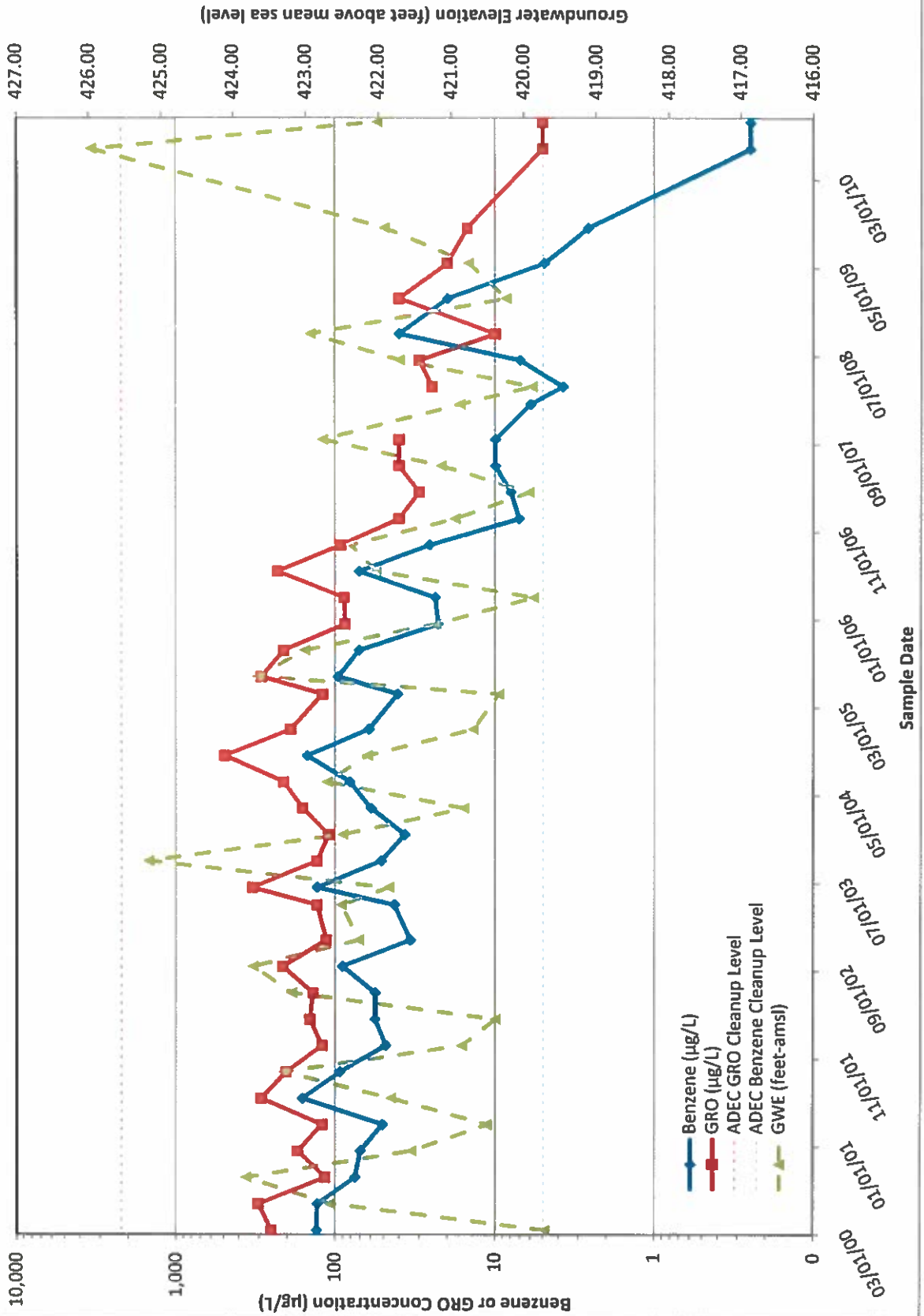
Well G-8 Hydrograph



Well MW-301D Hydrograph



Well MW-304D Hydrograph

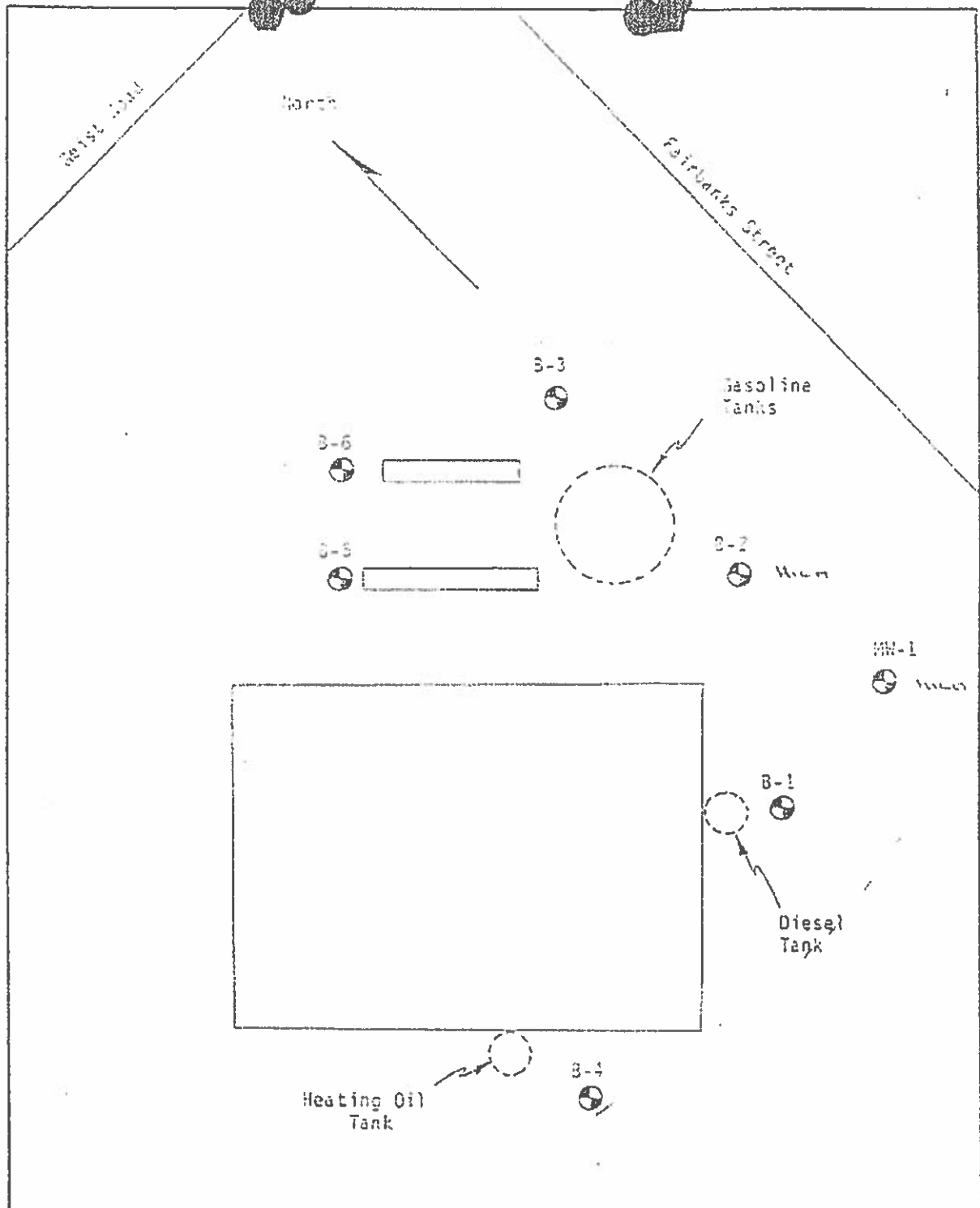


ARCADIS

Appendix B

Historical Boring Locations

00021



Scale: 1 inch = 20 feet

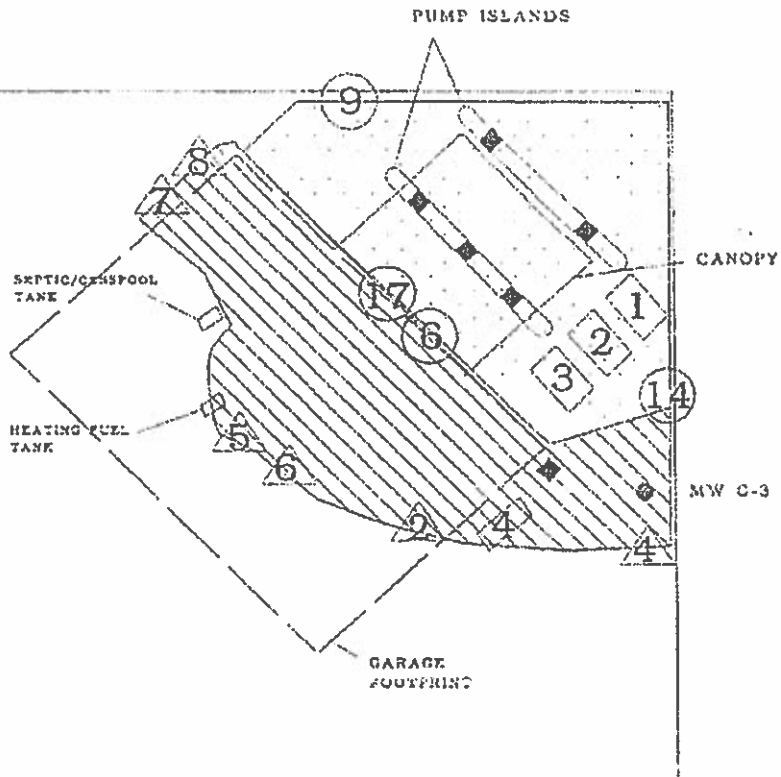
Note: Tank locations schematic and approximate

Soil Quality
 Fairbanks Street and Geist Road
 Fairbanks, Alaska
 BORING LOCATION PLAN
 November 1988 X-0151

DEC 6764

SHANNON & WILSON, INC.
 Geotechnical Consultants

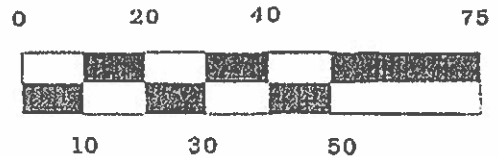
FIG. 1



LEGEND

- ⊙ EXISTING MONITOR WELLS INSTALLED BY GEL APRIL 1992
- DISPENSERS
- 2000 GALLON GASOLINE UST
- 4000 GALLON GASOLINE UST
- 4000 GALLON GASOLINE UST
- 1000 GALLON WASTE OIL UST
- ▨ AUGUST EXCAVATION AREA
- ▩ OCTOBER EXCAVATION AREA
- ⑥ AUGUST EXCAVATION - SAMPLE AT 4' BELOW GRADE
- ⑦ AUGUST EXCAVATION - SAMPLE AT 10' BELOW GRADE
- ⑨ AUGUST EXCAVATION - SAMPLE AT 10' BELOW GRADE
- ⑭ AUGUST EXCAVATION - SAMPLE AT 10' BELOW GRADE
- △② OCTOBER EXCAVATION - SAMPLE AT 12' BELOW GRADE
- △④ OCTOBER EXCAVATION - SAMPLE AT 12' BELOW GRADE
- △⑤ OCTOBER EXCAVATION - SAMPLE AT 6' BELOW GRADE
- △⑥ OCTOBER EXCAVATION - SAMPLE AT 12' BELOW GRADE
- △⑦ OCTOBER EXCAVATION - SAMPLE AT 6' BELOW GRADE
- △⑧ OCTOBER EXCAVATION - SAMPLE AT 12' BELOW GRADE

SCALE IN FEET



SITE PLAN OF SOIL EXCAVATION - UNIVERSITY CAR CARE CENTER

GILFILIAN ENGINEERING, INC.

Mat-Su Office: 1800 E. Parks Highway, Suite D-100, Wasilla, Alaska 99654
 Anchorage Office: 255 E. Fireweed Ln., Suite 102, Anchorage, Alaska 99503

DEC 5585

SCALE AS SHOWN

DATE: 1-18-93

PROJECT # 192038

CODE: B:192038EXC.GCD

11/06/92 10:40 2 987 373 5496

GILFILLIAN ENGR

P.02

MAN BIR WELLS
207

00350

83.89

Traffic
Island

WEST RD

372 3250

106 516

200 913

84.47

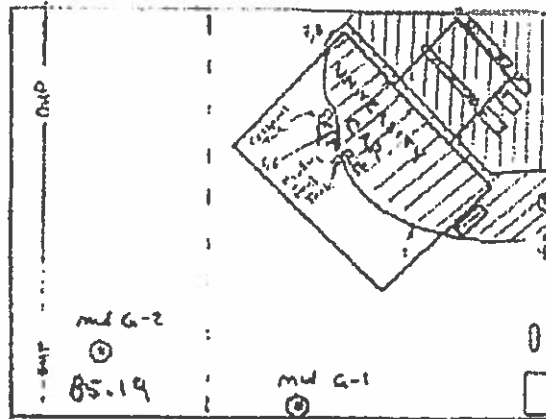
MW G-4

Conc Sidewalk

Conc

OMP OMP OMP OMP

SCALE: 1"=30'



CL FAIRBANKS ST

MW G-3

84.41

MW G-2

85.19

MW G-1

84.74

19.3 | 21.8

2.81 | 3.5

1.2 | 8.7

ppm

DEPTH GRAPH

B	T
E	X

Oct 13 '92

Gilfillian Engineering, Inc.
University Car Care 142053
11/6/92

||||| = Phase 1 Excavation (~1200 cu yds)

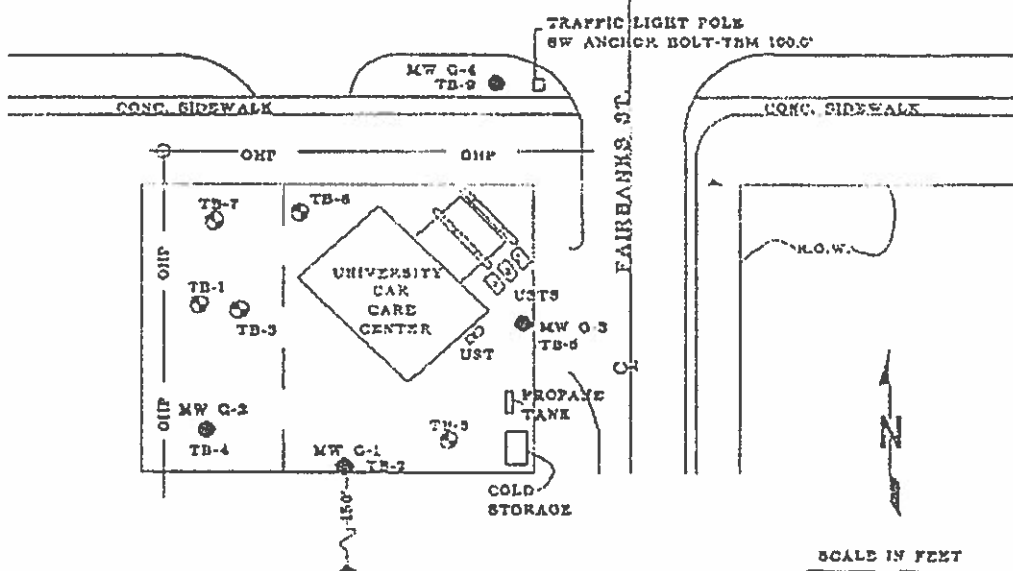
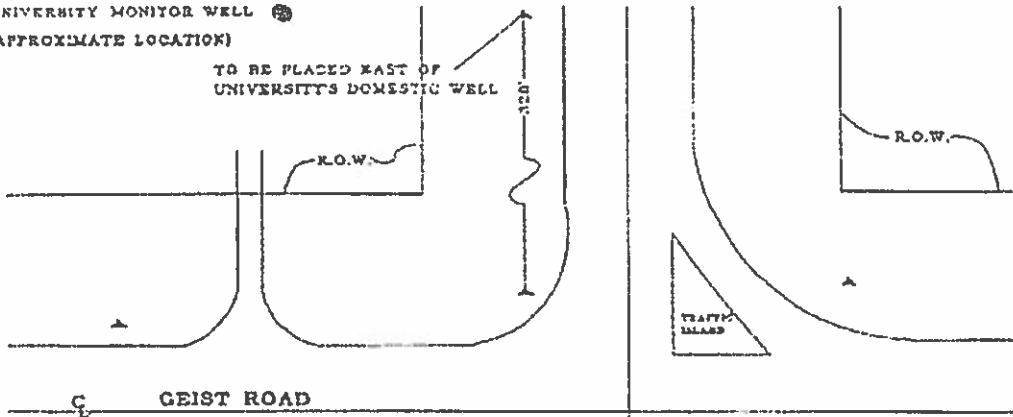
||||| = Phase 2 Excavation (~1500 cu yds)

2, 4, 5, 7 are soil sample locations - Samples 4, 5, 7 located 12' below Grade
Samples 1, 3 located 6' below Grade

DEC 6280

UNIVERSITY MONITOR WELL
(APPROXIMATE LOCATION)

TO BE PLACED EAST OF
UNIVERSITY'S DOMESTIC WELL



LEGEND

- -- EXISTING MONITOR WELLS
INSTALLED BY GEI, APRIL 1992
- ⊙ -- GEI SOIL TEST BORING, APRIL 1992
- ▲ -- PROPOSED MONITOR WELL LOCATIONS
- (with '2000') -- 2000 GALLON GASOLINE UST
- (with '4000') -- 4000 GALLON GASOLINE UST
- (with '4000') -- 4000 GALLON GASOLINE UST
- (with '1000') -- 1000 GALLON WASTE OIL UST

SITE PLAN - UNIVERSITY CAR CARE CENTER

GILFILIAN ENGINEERING, INC. DEC 6376

Mat-Su Office: 5761 Mayflower Ct., Wasilla, Alaska 99864
Anchorage Office: 258 E. Firwood Ln., Suite 102, Anchorage, Alaska 99503

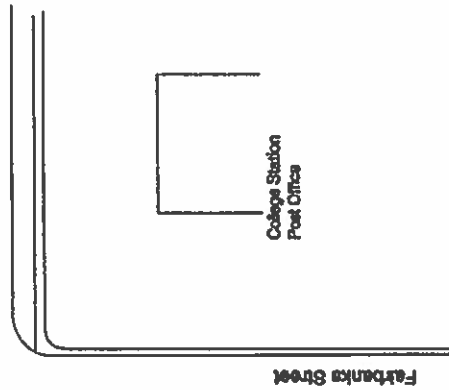
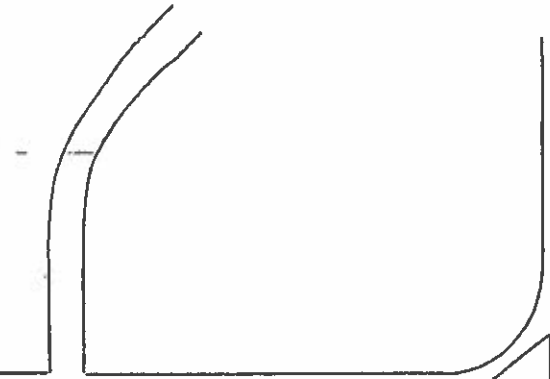
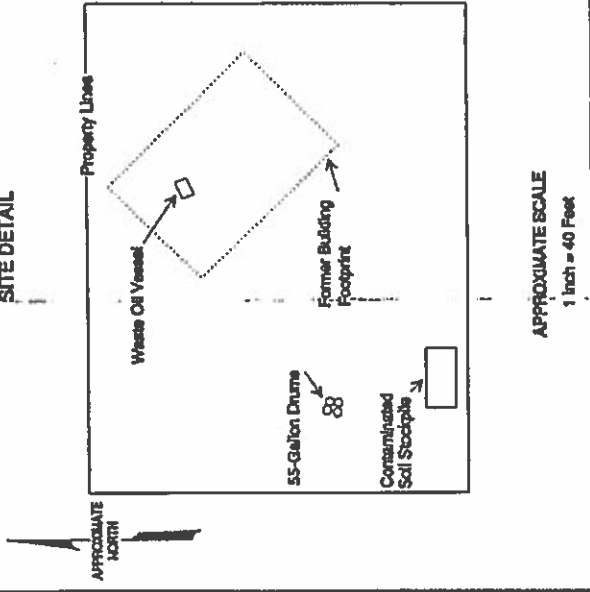
SCALE AS SHOWN

DATE: 5-14-92

GEI PROJECT # 102033

00175

SITE DETAIL



APPROXIMATE SCALE
1 inch = 100 Feet

University Car Care Center
Fairbanks, Alaska

SITE LOCATION AND
SITE PLAN

X-055B-1

Feb. 1963

SHANNON & WILSON, INC.
Geotechnical Consultants

Fig. 1

ARCADIS

Appendix C

**Human Health CSM Scoping Form
and Graphic**

Appendix A - Human Health Conceptual Site Model Scoping Form and Standardized Graphic

Site Name:
 File Number:
 Completed by:

Introduction

The form should be used to reach agreement with the Alaska Department of Environmental Conservation (DEC) about which exposure pathways should be further investigated during site characterization. From this information, summary text about the CSM and a graphic depicting exposure pathways should be submitted with the site characterization work plan and updated as needed in later reports.

General Instructions: Follow the italicized instructions in each section below.

1. General Information:

Sources (*check potential sources at the site*)

- | | |
|---|--|
| <input checked="" type="checkbox"/> USTs | <input type="checkbox"/> Vehicles |
| <input type="checkbox"/> ASTs | <input type="checkbox"/> Landfills |
| <input checked="" type="checkbox"/> Dispensers/fuel loading racks | <input type="checkbox"/> Transformers |
| <input type="checkbox"/> Drums | <input type="checkbox"/> Other: <input type="text"/> |

Release Mechanisms (*check potential release mechanisms at the site*)

- | | |
|--|--|
| <input checked="" type="checkbox"/> Spills | <input checked="" type="checkbox"/> Direct discharge |
| <input checked="" type="checkbox"/> Leaks | <input type="checkbox"/> Burning |
| | <input type="checkbox"/> Other: <input type="text"/> |

Impacted Media (*check potentially-impacted media at the site*)

- | | |
|---|--|
| <input checked="" type="checkbox"/> Surface soil (0-2 feet bgs*) | <input checked="" type="checkbox"/> Groundwater |
| <input checked="" type="checkbox"/> Subsurface soil (>2 feet bgs) | <input type="checkbox"/> Surface water |
| <input checked="" type="checkbox"/> Air | <input type="checkbox"/> Biota |
| <input type="checkbox"/> Sediment | <input type="checkbox"/> Other: <input type="text"/> |

Receptors (*check receptors that could be affected by contamination at the site*)

- | | |
|--|--|
| <input checked="" type="checkbox"/> Residents (adult or child) | <input checked="" type="checkbox"/> Site visitor |
| <input checked="" type="checkbox"/> Commercial or industrial worker | <input checked="" type="checkbox"/> Trespasser |
| <input checked="" type="checkbox"/> Construction worker | <input type="checkbox"/> Recreational user |
| <input type="checkbox"/> Subsistence harvester (i.e. gathers wild foods) | <input type="checkbox"/> Farmer |
| <input type="checkbox"/> Subsistence consumer (i.e. eats wild foods) | <input type="checkbox"/> Other: <input type="text"/> |

* bgs - below ground surface

2. Exposure Pathways: *(The answers to the following questions will identify complete exposure pathways at the site. Check each box where the answer to the question is "yes".)*

a) Direct Contact -

1. Incidental Soil Ingestion

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site-specific basis.)

If the box is checked, label this pathway complete:

Complete

Comments:

Site is paved with an active service station operating. .

2. Dermal Absorption of Contaminants from Soil

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.)

Can the soil contaminants permeate the skin (see Appendix B in the guidance document)?

If both boxes are checked, label this pathway complete:

Incomplete

Comments:

Contaminants are deeper than 2 ft below surface. Site is capped with asphalt pavement. Potentially complete.

b) Ingestion -

1. Ingestion of Groundwater

Have contaminants been detected or are they expected to be detected in the groundwater, or are contaminants expected to migrate to groundwater in the future?

Could the potentially affected groundwater be used as a current or future drinking water source? Please note, only leave the box unchecked if DEC has determined the groundwater is not a currently or reasonably expected future source of drinking water according to 18 AAC 75.350.

If both boxes are checked, label this pathway complete:

Complete

Comments:

This exposure pathway is typically complete for most areas in Fairbanks since they have only one aquifer and the potential is there for contamination of the aquifer. There are two downgradient production wells for UAF. Impacts have been detected in wells. UAF has treatment system and monitors regularly

2. Ingestion of Surface Water

Have contaminants been detected or are they expected to be detected in surface water, or are contaminants expected to migrate to surface water in the future?

Could potentially affected surface water bodies be used, currently or in the future, as a drinking water source? Consider both public water systems and private use (i.e., during residential, recreational or subsistence activities).

If both boxes are checked, label this pathway complete:

Incomplete

Comments:

No contamination on surface water possible due to contaminant source being a previously buried UST and site paved with asphalt.

3. Ingestion of Wild and Farmed Foods

Is the site in an area that is used or reasonably could be used for hunting, fishing, or harvesting of wild or farmed foods?

Do the site contaminants have the potential to bioaccumulate (see Appendix C in the guidance document)?

Are site contaminants located where they would have the potential to be taken up into biota? (i.e. soil within the root zone for plants or burrowing depth for animals, in groundwater that could be connected to surface water, etc.)

If all of the boxes are checked, label this pathway complete:

Incomplete

Comments:

No farming occurs on or near the site. The same goes for wild food and gathering activities.

c) Inhalation-

1. Inhalation of Outdoor Air

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.)

Are the contaminants in soil volatile (see Appendix D in the guidance document)?

If both boxes are checked, label this pathway complete:

Complete

Comments:

2. Inhalation of Indoor Air

Are occupied buildings on the site or reasonably expected to be occupied or placed on the site in an area that could be affected by contaminant vapors? (within 30 horizontal or vertical feet of petroleum contaminated soil or groundwater; within 100 feet of non-petroleum contaminated soil or groundwater; or subject to "preferential pathways," which promote easy airflow like utility conduits or rock fractures)

Are volatile compounds present in soil or groundwater (see Appendix D in the guidance document)?

If both boxes are checked, label this pathway complete:

Complete

Comments:

The site is an operating Holiday service station

3. Additional Exposure Pathways: *(Although there are no definitive questions provided in this section, these exposure pathways should also be considered at each site. Use the guidelines provided below to determine if further evaluation of each pathway is warranted.)*

Dermal Exposure to Contaminants in Groundwater and Surface Water

Dermal exposure to contaminants in groundwater and surface water may be a complete pathway if:

- Climate permits recreational use of waters for swimming.
- Climate permits exposure to groundwater during activities, such as construction.
- Groundwater or surface water is used for household purposes, such as bathing or cleaning.

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are assumed to be protective of this pathway.

Check the box if further evaluation of this pathway is needed:



Comments:

Inhalation of Volatile Compounds in Tap Water

Inhalation of volatile compounds in tap water may be a complete pathway if:

- The contaminated water is used for indoor household purposes such as showering, laundering, and dish washing.
- The contaminants of concern are volatile (common volatile contaminants are listed in Appendix D in the guidance document.)

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are assumed to be protective of this pathway.

Check the box if further evaluation of this pathway is needed:



Comments:

Inhalation of Fugitive Dust

Inhalation of fugitive dust may be a complete pathway if:

- Nonvolatile compounds are found in the top 2 centimeters of soil. The top 2 centimeters of soil are likely to be dispersed in the wind as dust particles.
- Dust particles are less than 10 micrometers (Particulate Matter - PM₁₀). Particles of this size are called respirable particles and can reach the pulmonary parts of the lungs when inhaled.
- Chromium is present in soil that can be dispersed as dust particles of any size.

Generally, DEC direct contact soil cleanup levels in Table B1 of 18 AAC 75 are protective of this pathway because it is assumed most dust particles are incidentally ingested instead of inhaled to the lower lungs. The inhalation pathway only needs to be evaluated when very small dust particles are present (e.g., along a dirt roadway or where dusts are a nuisance). This is not true in the case of chromium. Site specific cleanup levels will need to be calculated in the event that inhalation of dust containing chromium is a complete pathway at a site.

Check the box if further evaluation of this pathway is needed:



Comments:

Direct Contact with Sediment

This pathway involves people's hands being exposed to sediment, such as during some recreational, subsistence, or industrial activity. People then incidentally ingest sediment from normal hand-to-mouth activities. In addition, dermal absorption of contaminants may be of concern if the contaminants are able to permeate the skin (see Appendix B in the guidance document). This type of exposure should be investigated if:

- Climate permits recreational activities around sediment.
- The community has identified subsistence or recreational activities that would result in exposure to the sediment, such as clam digging.

Generally, DEC direct contact soil cleanup levels in 18 AAC 75, Table B1, are assumed to be protective of direct contact with sediment.

Check the box if further evaluation of this pathway is needed:



Comments:

4. Other Comments *(Provide other comments as necessary to support the information provided in this form.)*

The Site is an active service station. There are two drinking water production wells for the University of Alaska-Fairbanks (UAF) located approximately 500 and 650 feet downgradient from the site. Low concentrations of benzene have been detected in the raw water from these wells; However, due to generally poor water quality in this area, UAF treats the water with a water treatment system. Effluent water samples are collected following treatment on a monthly basis. Benzene has never been detected greater than laboratory detection limits. Benzene concentrations in the monitoring wells in the vicinity of the UAF wells have decreased to below ADEC cleanup levels.

HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

Site: Chevron Facility 211081- Geist

Completed By: Nelson Alger- Environmental Engineer

Date Completed: 5/13/11

Instructions: Follow the numbered directions below. Do not consider contaminant concentrations or engineering/land use controls when describing pathways.

(5)

Identify the receptors potentially affected by each exposure pathway. Enter "C" for current receptors, "F" for future receptors, "C/F" for both current and future receptors, or "I" for insignificant exposure.

Current & Future Receptors

(3) Check all exposure media identified in (2).

(4) Check all pathways that could be complete. The pathways identified in this column must agree with Sections 2 and 3 of the Human Health CSM Scoping Form.

Exposure Media

Exposure Pathway/Route

Residents (adults or children)
Commercial or Industrial workers
Site visitors, trespassers or recreational users
Construction workers
Farmers or subsistence harvesters
Subsistence consumers
Other

<input checked="" type="checkbox"/> soil	<input type="checkbox"/> Incidental Soil Ingestion	I	I	I	I				
	<input checked="" type="checkbox"/> Dermal Absorption of Contaminants from Soil	I	C/F	I	C/F				
	<input type="checkbox"/> Inhalation of Fugitive Dust								
<input checked="" type="checkbox"/> groundwater	<input checked="" type="checkbox"/> Ingestion of Groundwater	C/F	C/F	C/F	C/F				
	<input checked="" type="checkbox"/> Dermal Absorption of Contaminants in Groundwater	C/F	C/F	C/F	C/F				
	<input checked="" type="checkbox"/> Inhalation of Volatile Compounds in Tap Water	I	I	I	I				
<input checked="" type="checkbox"/> air	<input checked="" type="checkbox"/> Inhalation of Outdoor Air	I	I	I	I				
	<input checked="" type="checkbox"/> Inhalation of Indoor Air	I	I	I	I				
	<input type="checkbox"/> Inhalation of Fugitive Dust								
<input type="checkbox"/> surface water	<input type="checkbox"/> Ingestion of Surface Water								
	<input type="checkbox"/> Dermal Absorption of Contaminants in Surface Water								
	<input type="checkbox"/> Inhalation of Volatile Compounds in Tap Water								
<input type="checkbox"/> sediment	<input type="checkbox"/> Direct Contact with Sediment								
<input type="checkbox"/> biota	<input type="checkbox"/> Ingestion of Wild or Farmed Foods								

(1) Check the media that could be directly affected by the release.

(2) For each medium identified in (1), follow the top arrow and check possible transport mechanisms. Check additional media under (1) if the media acts as a secondary source.

Transport Mechanisms

<input type="checkbox"/> Surface Soil (0-2 ft bgs)	<input type="checkbox"/> Direct release to surface soil <small>check soil</small>	<input type="checkbox"/> Migration to subsurface <small>check soil</small>	<input type="checkbox"/> Migration to groundwater <small>check groundwater</small>	<input type="checkbox"/> Volatilization <small>check air</small>	<input type="checkbox"/> Runoff or erosion <small>check surface water</small>	<input type="checkbox"/> Uptake by plants or animals <small>check biota</small>	<input type="checkbox"/> Other (list): _____
<input checked="" type="checkbox"/> Subsurface Soil (2-15 ft bgs)	<input type="checkbox"/> Direct release to subsurface soil <small>check soil</small>	<input checked="" type="checkbox"/> Migration to groundwater <small>check groundwater</small>	<input type="checkbox"/> Volatilization <small>check air</small>	<input type="checkbox"/> Uptake by plants or animals <small>check biota</small>	<input type="checkbox"/> Other (list): _____		
<input checked="" type="checkbox"/> Ground-water	<input type="checkbox"/> Direct release to groundwater <small>check groundwater</small>	<input checked="" type="checkbox"/> Volatilization <small>check air</small>	<input type="checkbox"/> Flow to surface water body <small>check surface water</small>	<input type="checkbox"/> Flow to sediment <small>check sediment</small>	<input type="checkbox"/> Uptake by plants or animals <small>check biota</small>	<input type="checkbox"/> Other (list): _____	
<input type="checkbox"/> Surface Water	<input type="checkbox"/> Direct release to surface water <small>check surface water</small>	<input type="checkbox"/> Volatilization <small>check air</small>	<input type="checkbox"/> Sedimentation <small>check sediment</small>	<input type="checkbox"/> Uptake by plants or animals <small>check biota</small>	<input type="checkbox"/> Other (list): _____		
<input type="checkbox"/> Sediment	<input type="checkbox"/> Direct release to sediment <small>check sediment</small>	<input type="checkbox"/> Resuspension, runoff, or erosion <small>check surface water</small>	<input type="checkbox"/> Uptake by plants or animals <small>check biota</small>	<input type="checkbox"/> Other (list): _____			