

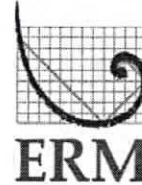
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**Environmental
Resources
Management**

825 West 8th Avenue
Anchorage, AK 99501
(907) 258-4880
(907) 258-4033 (fax)
www.ermalaska.com

18 March 2016

Mr. Robert Weimer
Alaska Department of Environmental Conservation
Contaminated Sites Program
555 Cordova Street, Anchorage, AK 99501
Via e-mail: robert_weimer@alaska.gov



Subject: Quarterly Drinking Water Well Sampling Report
November 2015 - January 2016
Chugiak, Alaska; BSUM Claim 105081
ADEC File Number 2106.26.004

Dear Mr. Weimer:

ERM Alaska, Inc. (ERM) performed drinking water well sampling events on 18 November 2015, 7 December 2015 and 26 January 2016 in the vicinity of the former Circle S Grocery site located at 22179 Birchwood Loop Road, Chugiak, Alaska (Attachment 1 - Figure 1). This work was performed in response to a request for monthly drinking water well sampling and more information on the drinking water at the community well located at 22208 Birchwood Loop, sent to Ms. Porterfield by the Alaska Department of Environmental Conservation (ADEC) (ADEC 2015).

SITE SUMMARY

In June 1995 two underground storage tanks (USTs), a 10,000-gallon gasoline UST and a 5,000-gallon diesel UST, were removed from the site. Fuel-contaminated soil was encountered during the UST removal effort. Laboratory analysis of soil samples collected from the bottom of the excavation indicated that remaining soil was impacted above applicable ADEC cleanup levels for petroleum hydrocarbons. The final excavation was approximately 15 feet deep and a fuel resistant liner was placed in the excavation prior to the installation of a new dual compartment UST and clean backfill.

Two soil boreholes were advanced to approximately 70 feet below ground surface (bgs) during an August 1999 site investigation. Laboratory results of soil samples collected from the boreholes indicated that benzene and gasoline-range organics (GRO) concentrations exceeded ADEC soil cleanup levels. Although no groundwater was encountered in the boreholes, groundwater monitoring wells were installed. The

monitoring wells were checked in September 1999 and no groundwater was detected in the wells.

In August 2012, the dual compartment UST was removed. The excavation conducted to remove the UST did not extend past the liner placed in 1995 when the tank was installed. Laboratory results for soil samples collected from the excavation bottom indicated that benzene and diesel-range organics (DRO) exceeded ADEC cleanup levels. Soil removed from the excavation was stockpiled and sampled. Review of results for the soil stockpile samples indicated that this soil was not impacted above ADEC cleanup levels. The closure report did not state what material was used to backfill the excavation.

In June 2013 ADEC sent a letter to Ms. Porterfield that outlined State of Alaska regulations concerning contaminated sites and her responsibilities as a landowner. The letter requested that a work plan be developed to define the nature and extent of the contamination, and that the plan be submitted to ADEC.

ERM performed a limited site investigation in January 2014 and found petroleum hydrocarbon concentrations in excess of ADEC soil cleanup levels in samples between 14 feet bgs and 82 feet bgs within the former UST footprint. Of particular concern was the benzene detection that exceeded the ADEC soil cleanup level in the sample collected at 82 feet bgs, as this represented a potentially complete exposure pathway to current receptors via ingestion of groundwater. ERM did not encounter groundwater in any of the three boreholes installed in January 2014.

In October 2014, ADEC sent a letter to Ms. Porterfield (ADEC 2014a) requesting that the closest well to the site be sampled for benzene, toluene, ethylbenzene, and total xylenes (BTEX) using United States Environmental Protection Agency (USEPA) Method 524.2, and that the depth to water be measured in that well. More information on the closest residential drinking water wells (e.g. location, copies of well logs, depth to water, etc.) to the site was also requested (ADEC 2014a).

In November 2014, ERM performed limited drinking water sampling at Ms. Porterfield's residence located at 22179 Birchwood Loop and found trace levels of benzene and ethylbenzene contamination. In April 2015, following the receipt of the results from this sampling event, ADEC sent a letter to Ms. Porterfield requesting that the closest well to the site be tested monthly for BTEX using USEPA 524.2 for a period of one year starting in April 2015. ADEC also requested that the nearest community well located at 22208 Birchwood Loop be sampled once for BTEX during April 2015.

In October 2015, ERM installed three monitoring wells at the site to depths of approximately 120 feet, to further characterize potential impacts to the drinking water aquifer. This work is addressed in a separate report.

PROJECT OBJECTIVE

The primary objective of this field effort was to assess the water quality in the closest drinking water well to the former Circle S Grocery site to fully evaluate potential exposure pathways to current and future receptors.

REGULATORY FRAMEWORK

The regulatory framework for this project was developed using the following regulations and guidance documents:

- 18 AAC 80, *Drinking Water* (ADEC 2012)
- 18 AAC 78, *Underground Storage Tanks* (ADEC 2013)
- 18 AAC 75, *Oil and Other Hazardous Substances Pollution Control* (ADEC 2015)
- Title 40 of the Code of Federal Regulations (CFR), *Protection of the Environment*, Chapter 141 (USEPA 2014)
- ADEC *Draft Field Sampling Guidance* (ADEC 2010a)
- ADEC *Policy Guidance on Developing Conceptual Site Models* (ADEC 2010b)

Analytical results for drinking water samples collected as part of this field effort were compared to maximum contaminant levels (MCLs) set forth in 40 CFR 141.61 (USEPA 2014), as adopted by reference in 18 AAC 80.010(a)(10)(A) (ADEC 2012).

FIELD ACTIVITIES

The field effort was performed by one ERM engineer/scientist, who meets the definition of "qualified person" as per 18 AAC 75.990(100). The work was performed in accordance with the ADEC-approved project work plan (ERM 2015). Field work at the former Circle S Grocery site consisted of the following work elements:

- Collected a drinking water sample in November and December 2015 and January 2016 from Ms. Pomposa Porterfield's well, located at 22179 Birchwood Loop Road, and analyzed the sample for BTEX using USEPA Method 524.2.

Pre-Field Activities

Following ADEC approval of the Work Plan (ERM 2015), ERM contacted the property owners (Ms. Porterfield) of the drinking water well to request permission to sample her well. Sample kits were obtained from the project laboratory (SGS North America, Inc. [SGS] of Anchorage, Alaska) and ERM notified the ADEC project manager, Mr. Robert Weimer, prior to conducting the field effort.

Well Sampling

Drinking water sample collection followed procedures outlined in ADEC's *Draft Field Sampling Guidance* (ADEC 2010a) and those found on the following ADEC Drinking

Water Program's website:

<http://dec.alaska.gov/eh/docs/dw/brochures/VOC%204.pdf>. The drinking water samples collected from Ms. Porterfield's residence were collected from the faucet closest to the pressure tank (located in the kitchen of the residence). The screen, hoses, aerators, and any other treatment devices were removed from the faucets prior to sample collection. ERM ran the tap at one-half to three quarters flow for approximately 10 minutes to allow for water to be purged from the pressure tank. Once the water was purged from the pressure tank, the flow was reduced to a trickle to minimize aeration of the sample and the sample was collected in accordance with the procedures specified in the project Work Plan (ERM 2015).

One duplicate sample was collected for quality control (QC) purposes. All samples were placed into a chilled cooler immediately. A chain-of-custody form was completed and accompanied the samples to the project laboratory.

Investigation-Derived Waste Handling

Investigation-derived waste for this project consisted of personal protective equipment (PPE; sampling gloves). Waste was placed in a garbage bag, taped shut, and disposed of in an on-site trash receptacle.

RESULTS

The following subsections discuss the findings of the November and December 2015 and January 2016 field efforts.

Analytical Results

A summary of the analytical data for drinking water samples collected from April 2015 to January 2016 is provided in Table 1 (Attachment 2) and the associated laboratory reports for November 2015 through January 2016 is included in Attachment 3. The results of the drinking water samples were compared to the MCLs for organic contaminants specified in 40 Code of Federal Regulations (CFR) Part 141.61 (USEPA 2014), adopted by reference in 18 AAC 80 (ADEC 2012).

Benzene was detected in both the primary and duplicate samples collected from Ms. Porterfield's drinking water well. Benzene concentrations during the November and December sampling events ranged from 0.20 µg/L (November) to 0.29 µg/L (December). In January, benzene was detected at elevated levels, not previously seen, at concentrations of 19.40 µg/L, approximately 4 times the ADEC cleanup level.

Toluene, ethylbenzene and total xylenes were not detected above the MRL during either the November or December 2015 sampling events. During the January 2016 sampling event toluene was observed at 0.98 µg/L; ethylbenzene at 18.30 µg/L; and, total xylenes at 77.30 µg/L. All concentrations of toluene, ethylbenzene, and total xylenes during this sampling event are below ADEC groundwater cleanup levels.

DATA QUALITY REVIEW

Laboratory quality assurance (QA)/QC data associated with the analysis of project samples has been reviewed to evaluate the usability of the analytical data generated during the July, August, and September 2015 water sampling events at the former Circle S Grocery site. The ADEC Laboratory Data Checklists are provided in Attachment 4.

Samples were collected, reported, and shipped in general accordance with the Work Plan. Sample analysis was performed by an ADEC-certified laboratory for applicable analytical methods.

All data were reviewed in accordance with USEPA National Functional Guidelines for Organic Methods (USEPA 2008), analytical methodology and ADEC regulatory guidance documents (ADEC 2009; 2010c). This data review focused on the following QC parameters and impact on data quality objectives (DQOs): usability; sample handling and chain-of-custody documentation; holding time compliance; field QC (trip blanks, field duplicates); laboratory QC (method blanks, laboratory control samples [LCS] and LCS duplicates [LCSD]), surrogates; method reporting limits; and completeness.

Samples were delivered to SGS in Anchorage, Alaska. The water samples were analyzed for BTEX by USEPA Method E524.2. Sample results were reported in SGS work orders 1153946, 1154780 and 1155766.

In general, the overall quality of the data was acceptable. The data quality was determined as acceptable. Acceptable data are associated with QC data that meet all QC criteria or with QC samples that did not meet QC criteria but data quality objectives were not affected. The EPA National Functional Guidelines (EPA 2008) were used to evaluate the acceptability of the data.

Data quality meets established DQO established for this project. All data are suitable for their intended use. The details of this review and qualification of the data are summarized in Attachment 5.

CONCEPTUAL SITE MODEL

The conceptual site model (CSM) for the site was modified by ERM using the results of the January 2016 drinking water sampling event and ADEC's *Policy Guidance on Developing Conceptual Site Models* (ADEC 2010b). The CSM conservatively assumes that there are completed exposure pathways between remaining contamination identified in site soils and future site receptors through incidental soil ingestion and inhalation of outdoor air. The results from the sampling events demonstrate that the human exposure pathway to groundwater is complete. The human exposure pathway to air is not completed due to the fact that impacted groundwater is at a depth of more than 100 feet. The CSM human health scoping form and graphical form are included in Attachment 6.

CONCLUSIONS AND RECOMMENDATIONS

The November and December 2015 analytical results indicated trace amounts of benzene, ethylbenzene and total xylenes in the drinking water with none of the constituents exceeding their applicable MCLs. The January 2016 analytical results indicated detectable levels of benzene, toluene, ethylbenzene and total xylenes, with benzene above the applicable MCL.

Upon receipt of the January 2016 analytical results, ERM began work, with authorization from our client, to determine an alternate water source for the Site. The logistics around a water holding tank, granular activated carbon system and new drinking water well are currently being researched. Until a new drinking water source can be provided, ERM has recommended that Ms. Porterfield cease drinking, cooking, or bathing with water from her onsite drinking water well.

ERM will continue with its monthly sampling in accordance with the work plan through April 2016 to document any seasonal variability in BTEX concentrations. Quarterly groundwater monitoring will continue to occur in tandem with drinking water sampling until November 2016.

Sincerely,

Anne Kranawetter

Anne Kranawetter
Project Manager



Paul Douglass
Partner

cc:

Ms. Pomposa Porterfield, property owner
Mr. Daryl Gottilla, BSUM

Attachments:

1. Figures
2. Tables
3. Laboratory Analytical Reports
4. Quality Assurance Report and ADEC Checklists
5. Conceptual Site Model