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Department of
Environmental Conservation

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Hazard ID No.

Environmental Resources Management

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11 July 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: Circle S Quarterly Drinking Water Summary

Report, Chugiak, Alaska, BSUM Claim 105081

ADEC File Number 2106.26.004

Dear Mr. Weimer:

ERM Alaska, Inc. (ERM) performed 12 drinking water well sampling events on a monthly basis from 29 April 2015 to 21 April 2016 in the vicinity of the former Circle S Grocery site located at 22189 Birchwood Loop Road, Chugiak, Alaska (Figure 1, Attachment 1). The quarterly data reports were sent to Ms. Pomposa Porterfield, the property owner of 22179 Birchwood Loop and the associated drinking water well, and the Alaska Department of Environmental Conservation (ADEC).

This work was performed in response to a request by the Alaska Department of Environmental Conservation (ADEC) (ADEC 2015b) for monthly drinking water well sampling at 22179 Birchwood Loop, and to collect more information on the drinking water at the community well, located at 22208 Birchwood Loop.

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 (ADEC, 2013b) in 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 2014) requesting that the closest drinking water 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 were also requested (ADEC 2014).

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 (ADEC, 2015b) requesting that the closest drinking water well to the site be tested monthly for BTEX using USEPA 524.2 for a period of 1 year, starting in April 2015. ADEC also requested that the nearest community well, located at 22208 Birchwood Loop, be sampled for BTEX in April 2015.

In October 2015, ERM installed three groundwater 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 Alaska Administrative Code (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 2015a)
- 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:

- Collection of drinking water samples on a monthly basis during the period of 29 April 2015 to 21 April 2016, from Ms. Porterfield's well located at 22179 Birchwood Loop Road, and analyzed the samples for BTEX using USEPA Method 524.2.
- Collection of a single drinking water sample in April 2015 from the community well located at 22208 Birchwood Loop, and analyze 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 and the Birchwood Community Church) of the drinking water wells to request permission to sample their drinking water wells. 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) that has since been finalized 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 drinking water samples from the community well, located at 22208 Birchwood Loop, were collected from the faucet located in the church kitchen, per instructions of the church maintenance operator (Richard). 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 in order to minimize aeration of the water, 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 during each sampling event. 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 (i.e., 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 monthly drinking water sampling field efforts.

Analytical Results

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

Benzene was detected in samples collected from Ms. Porterfield's well in 11 of the 12 sampling events. Benzene concentrations were recorded above the MCL during the following four sampling events: January, February, March, and April of 2016. The groundwater cleanup level listed in 18 AAC 75 Table C was exceeded for benzene only

in the January 2016 sample. Benzene was not detected only in the sample collected in June 2015.

Toluene was detected in samples collected from Ms. Porterfield's well in 2 of the 12 sampling events. Toluene concentrations were recorded above the MCL only during the January 2016 sampling event. Toluene levels did not exceed the ADEC groundwater cleanup level in any samples.

Ethylbenzene was detected in samples collected from Ms. Porterfield's well in 10 of the 12 sampling events. Ethylbenzene concentrations were recorded above the MCL during the four sampling events: January, February, March, and April of 2016. The highest concentration recorded was in January 2016 samples. Ethylbenzene levels did not exceed the groundwater cleanup level listed in 18 AAC 75 Table C in any samples.

Xylenes (total) were detected in samples collected from Ms. Porterfield's well in 11 of the 12 sampling events. Xylenes (total) concentrations were recorded above the MCL during the four sampling events: January, February, March, and April of 2016. The highest concentration recorded was in January 2016 samples. Xylenes (total) levels did not exceed the groundwater cleanup level listed in 18 AAC 75 Table C in any samples.

BTEX was not detected in the community well sample collected in April 2015.

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 April, May and June 2015 water sampling events at the former Circle S Grocery site.

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) 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 1151703, 1152339 and 1153101.

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 DQOs were not affected. No results were rejected. Data quality meets DQOs 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 4.

CONCEPTUAL SITE MODEL

The conceptual site model (CSM) for the site was modified by ERM using the results of the April, May and June 2015 site investigations (ERM 2015) 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; however, the low concentrations measured in the groundwater samples do not pose a significant risk to human health. The CSM human health scoping form and graphical form are included in Attachment 5.

CONCLUSIONS AND RECOMMENDATIONS

Analytical results from 12 monthly sampling events (April 2015-April 2016) show detections of benzene, toluene, ethylbenzene, and total xylenes in the drinking water at Ms. Porterfield's residence located at 22179 Birchwood Loop. Concentrations appeared spike around the time of the January 2016 sampling event and decrease with each subsequent sampling event until the final event of April 2016.

Mr. Porterfield indicated in February 2016 that her residence had increased their water usage beginning in July 2015, with larger volume of laundry required daily. The increased demand for groundwater may have depressed the water level of the aquifer around the drinking water well, creating a cone of depression and drawing contaminants towards the well.

No analytes were detected in the neighboring well at 22208 Birchwood.

Due to the consistent presence of BTEX constituents and the spike seen during the seen during the January sampling event, ERM recommended in February 2016 that Ms. Porterfield obtain drinking water from an off-site source (e.g., drinking water vendor, etc.) until a new drinking water well can be installed.

ERM proposes that a new Class C drinking water well be installed to replace the existing well servicing both Ms. Porterfield's and the Circle S Grocery Site to mitigate the risk of

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benzene exposure. A proposal to install the new well is anticipated to be completed by August 2016 with an installation date in the fall of 2016.

Sincerely,

Joe Casey

Project Manager

Paul Douglass

Partner-in-Charge

CC:

Ms. Pomposa Porterfield, property owner

Mr. Daryl Gottilla, Berkley Specialty Underwriting Managers

Attachments:

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

REFERENCES

Alaska Department of Environmental Conservation (ADEC). 2009. Environmental Laboratory Data and Quality Assurance Requirements, Technical Memo-06-2002. March.

ADEC. 2010a. Draft Field Sampling Guidance. May.

ADEC. 2010b. Policy Guidance on Developing Conceptual Site Models. October.

ADEC. 2010c. Laboratory Data Review Checklist. January.

ADEC 2012. 18 Alaska Administrative Code (AAC) 80 Drinking Water. As amended on 20 August.

ADEC. 2013a. 18 AAC 78 Underground Storage Tanks. As revised 19 July 2013.

ADEC. 2013b. Letter from Mr. Robert Weimer to Ms. Pomposa Porterfield Regarding Circle S Grocery, Hazard ID No. 24797. 20 June.

ADEC. 2014. Letter from Mr. Robert Weimer to Ms. Pomposa Porterfield Regarding Circle S Grocery, Hazard ID No. 24797. 2 October.

ADEC. 2015a. 18 AAC 75 Oil and Other Hazardous Substances Pollution Control. As revised 17 June.

- ADEC. 2015b. Letter from Mr. Robert Weimer to Ms. Pomposa Porterfield Regarding Circle S Grocery, Hazard ID No. 24797. 7 April.
- ERM Alaska, Inc. (ERM). 2014. Circle S Grocery Site Investigation Report, Chugiak, Alaska, ADEC File No. 2106.26.004, ADEC Hazard ID 24797. May.
- ERM. 2015. Work Plan Drinking Water Well Sampling, Chugiak, Alaska, Berkley Specialty Underwriting Managers Claim No. 105081, ADEC File No. 2106.26.004, ADEC Hazard ID 24797. 24 April.
- United States Environmental Protection Agency (USEPA). 2008. Contract Laboratory Program National Functional Guidelines for Organic Superfund Data Review. June. (EPA 540-R-08-01).
- USEPA. 2014. Title 40, Code of Federal Regulations, Protection of Environment. As revised 1 July.

ATTACHMENT 1

Figures

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SOURCE: GOOGLE EARTH PRO 2010



ATTACHMENT 2

Tables

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TABLE 1: DRINKING WATER SAMPLE ANALYTICAL RESULTS DRINKING WATER WELL SAMPLING APRIL 2015 - APRIL 2016 FORMER CIRCLE'S GROCERY SITE, CHUGIAK, ALASKA

<u> </u>		0.4	OA/OC	Analytical Results (µg/L ¹)				
Sample Location	Sample Date	Sample ID	Sample (Y/N)?	Benzene (EPA 8021B)	Toluene (EPA 8021B)	Ethylbenzene (EPA 8021B)	Total Xylenes (EPA 8021B)	
	AD	EC Groundwater Cleanup	Level (µg/L)	5.0	1000	700	10000	
22179 Birchwood	4/29/2015	15-CSG-01-WG	N	0.29 J	0.25 U	0.48 [0.721	
22179 Birchwood	4/29/2015	15-CSG-02-WG	Y	0.30 J	0.25 U	0.47 J	0.62 J	
22208 Birchwood	4/29/2015	15-CSG-03-WG	N	0.25 U	0.25 U	0.25 U	0.25 U	
NA	4/29/2015	15-TB-01	Y	0.25 U	0.25 U	0.25 U	0.25 U	
22179 Birchwood	5/26/2015	15-CSG-04-WG	N	0.22 J	0.25 U	0.47 I	0.58 I	
22179 Birchwood	5/26/2015	15-CSG-05-WG	Y	0.23 J	0.25 U	0.47 T	0.59 J	
NA	5/26/2015	15-TB-02	Y	0.25 U	0.25 U	0.25 U	0.25 U	
22179 Birchwood	6/23/2015	15-CSG-06-WG	N	0.25 U	0.25 U	0.25 U	0.25 U	
22179 Birchwood	6/23/2015	15-CSG-07-WG	Y	0.25 U	0.25 U	0.21 [0.19 I	
NA	6/23/2015	15-TB-03	Y	0.25 U	0.25 U	0.25 U	0.25 U	
22179 Birchwood	7/27/2015	15-CSG-08-WG	N	0.30 J	0.25 U	0.46 [0.45 J	
22179 Birchwood	7/27/2015	15-CSG-09-WG	Y	0.30 J	0.25 J	0.46 [0.45 [
NA	7/27/2015	15-TB-04	Y	0.25 U	0.25 U	0.25 U	0.25 U	
22179 Birchwood	8/25/2015	15-CSG-10-WG	N	0.24 J	0.25 U	0.29 J	0.26 I	
22179 Birchwood	8/25/2015	15-CSG-11-WG	Y	0.30 I	0.25 U	0.35 J	0.30 J	
NA	8/25/2015	15-TB-05	Y	0.25 U	0.25 U	0.25 U	0.25 U	
22179 Birchwood	9/30/2015	15-CSG-12-WG	N	0.17 [0.25 U	0.25 U	0.25 U	
22179 Birchwood	9/30/2015	15-CSG-13-WG	Ý	0.16 J	0.25 U	0.25 U	0.16 J	
NA	9/30/2015	15-TB-06	Y	0.25 U	0.25 U	0.25 U	0.25 U	
22179 Birchwood	11/18/2015	15-CSG-14-WG	N	0.20 J	0.25 U	0.25 U	0.25 U	
22179 Birchwood	11/18/2015	15-CSG-15-WG	Y	0.21 J	0.25 U	0.25 U	0.25 U	
NA	11/19/2015	15-CSG-01-TB-1/TB-07	Y	0.25 U	0.25 U	0.25 U	0.25 U	
22179 Birchwood	12/7/2015	15-CSG-16-WG	N	0.29 J	0.25 U	0.21 J	0.19 J	
22179 Birchwood	12/7/2015	15-CSG-17-WG	Y	0.27 J	0.25 U	0.25 U	0.25 U	
NA NA	12/7/2015	TRIP BLANK	Y	0.25 U	0.25 U	0.25 U	0.25 U	
22179 Birchwood	1/26/2016	15-CSG-18-WG	N	19.30	0.98	18.30	77.30	
22179 Birchwood	1/26/2016	15-CSG-19-WG	Y	19.40	0.90	18.70	79.20	
NA	1/26/2016	TRIP BLANK	Y	0.25 U	0.25 U	0.25 U	0.25 U	
22179 Birchwood	2/23/2016	16-CSG-23-WG	N	3.01	0.25 U	5.03	15.20	
22179 Birchwood	2/23/2016	16-CSG-24-WG	Y	2.90	0.25 Û	4.94	15.20	
NA	2/23/2016	TRIP BLANK	Y	0.25 U	0.25 U	0.25 U	0.25 U	
22179 Birchwood	3/18/2016	16-CSG-25-WG	N	1.48	0.25 U	2.74	4.79	
22179 Birchwood	3/18/2016	16-CSG-26-WG	Y	1.39	0.25 U	2.61	4.46	
NA	3/18/2016	16-CSG-TB	Y	0.25 U	0.25 U	0.25 U	0.25 U	
22179 Birchwood	4/21/2016	16-CSG-27-WG	N	0.42 [0.25 U	0.61	0.69	
22179 Birchwood	4/21/2016	16-CSG-28-WG	Y	0.50	0.25 U	0.70	0.81	
NA	4/21/2016	16-CSG-TB	Y	0.25 U	0.25 U	0.25 U	0.25 U	

Notes

The indicated concentration exceeds the 18 AAC 75 Table C Groundwater Cleanup Level.



¹: Groundwater cleanup levels were taken from Title 18 of the Alaska Administrative Code (AAC), Chapter 75, as amended June 17, 2015 (ADEC 2015). J = Analyte detected above the MDL and below the MCL

U = Analytical result is not detected above the MDL

 $[\]mu g/L$ = Micrograms per liter = parts per billion (ppb).



ATTACHMENT 3

Laboratory Analytical Reports

(Provided Electronically - CD)

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ATTACHMENT 4

Quality Assurance Review and ADEC Checklists

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1. QUALITY ASSURANCE REVIEW

Laboratory quality assurance/quality control (QA/QC) data associated with the analysis of project samples has been reviewed to evaluate the usability of the analytical data generated from sampling on 29 April, 26 May and 23 June 2015 at two locations in the vicinity of the former Circle S Grocery site located at 22189 Birchwood Loop Road, Chugiak, Alaska.

A completeness check and data review was performed by ERM Alaska, Inc. and completed by an ERM Project Chemist. The data and usability review was performed using the United States EPA National Functional Guidelines for Superfund Organic Methods Data Review (EPA 2008) as a reference for qualification. The Alaska Department of Environmental Conservation (ADEC) laboratory data checklists were completed for this project (ADEC 2010).

All data were reviewed in accordance with United States EPA National Functional Guidelines for Organic Methods (EPA 2008) and ADEC regulatory guidance documents (ADEC 2009; 2012). This data review focuses on criteria for QA/QC parameters and their effect on the quality of data and usability.

All results are considered usable for project objectives. Some results are considered estimated due to quality control criteria not being met. The completeness for this project is 100%. The details of this review and qualification of the data are summarized in the following sections.

1.1. Sample Handling and Chain of Custody

Samples were collected, reported, and shipped in general accordance with the sampling plan requirements. Sample analysis was performed by Alaska Department of Environmental Conservation (ADEC) certified laboratories for applicable analytical methods.

Drinking water samples were analyzed for the following:

• Benzene, toluene, ethylbenzene, and xylenes (BTEX), EPA Method 524.2.

Samples were delivered to SGS North America, Inc. (SGS) in Anchorage, Alaska. Results were reported in 3 sample delivery groups (SDG) 1151703, 1152339, and 1153101.

All sample coolers were shipped with custody seals intact. Chain of Custody (COC) forms, laboratory sample receipt forms, and case narratives were reviewed to evaluate the integrity of the samples and the quality of the associated data. All sample containers in the sample coolers were received at the laboratory intact and within the specified temperature range, with a few exceptions.

Several temperature blanks were reported as above the recommended temperature range of 4 ± 2 °C. No data required qualification.

ERM 1 8/14/2015

1.2. Holding Time Compliance

All samples were extracted, digested and analyzed within the holding time criteria for the applicable analytical methods and in accordance with work plan specifications.

1.3. Field QA/QC

Field QA/QC protocols are designed to measure for potential sample bias as a result of sampling procedures and possible contamination during collection and transport of samples. Collection and analysis of field duplicates facilitates an evaluation of precision that takes into account potential variables associated with sampling procedures, site heterogeneity and laboratory analyses. Trip blanks are used to monitor sample containers and possible cross-contamination of samples. During this sampling event, trip blanks, and field duplicates were submitted for analysis.

1.3.1. Trip Blanks

A trip blank was prepared by the laboratory, shipped to the site with the empty sample bottles/containers, stored with sample containers during the field event, and transported with the collected samples back to the laboratory for analysis.

A trip blank was placed in the cooler with associated matrix specific volatile organics samples (GRO/BTEX). Three trip blanks were submitted for analysis and analytes detected in the trip blank were not detected (U) above the limit of detection (LOD) for all analytes.

1.3.2. Field Duplicates

There were 4 primary samples, with three field duplicates submitted for analysis. When analytes were present in concentrations below the LOD in one or both samples, no valid comparison could be made. The primary sample and duplicate relative percent differences (RPDs) met ADEC applicable control limits of <30% between water samples. Overall, there was adequate comparability of field duplicate results to meet project data quality objectives with previously noted exceptions.

1.4. Laboratory QA/QC

1.4.1. Laboratory Blanks

Laboratory/ Method blanks were analyzed concurrent with an analytical batch of 20 or fewer primary samples for each of the analytical methods performed on project samples. Target analytes were not detected (ND) in any laboratory blanks.

1.4.2. Laboratory Control Samples

The laboratory monitors internal precision and accuracy for each analytical batch with a set of laboratory control samples (LCS/LCSD). A known quantity of target analytes are added to blank laboratory control samples prior to extraction and analysis and

recoveries are calculated. Acceptable recovery criteria vary with each analytical method and matrix. All LCS/LCSD samples met laboratory and project QC goals for target analytes.

1.4.3. Matrix Spikes

Extra volumes of primary field samples were collected and submitted to the laboratory for matrix spike/matrix spike duplicate (MS/MSD) analyses. Matrix spikes have a known quantity of target analytes are added (spiked) to field samples. Spike recoveries are calculated and are used to evaluate both site conditions and laboratory quality control. MS/MSD percent recoveries (%R) and relative percent differences (RPDs) were within limits.

1.4.4. Surrogates

System Monitoring Compounds (Surrogates) are specified for organic chromatographic analytical procedures. Surrogates are compounds similar to target analytes and are added to each sample prior to collection or extraction. Subsequent surrogate recovery indicates overall method performance. Surrogate recoveries were within prescribed control limits for all primary samples, method blanks, LCS/LCSD, MS/MSD and other QA/QC samples.

1.4.5. Detection Limits (Sensitivity)

Detection limits (DLs) met or were below established criteria specified for all analyses in the project sampling plan and detection limits were also below the ADEC established cleanup levels.

1.5. Precision and Accuracy

Precision criteria monitor analytical reproducibility. Accuracy criteria monitor agreement of measured results with "true values" established by spiking applicable samples with a known quantity of analyte or surrogate. Precision and accuracy were evaluated by comparing LCS/LCSDs, MS/MSDs and field duplicate pairs for this project, with exceptions noted in above sections. Field duplicates and MS/MSD samples were collected in accordance with sampling plan specifications. Field duplicate RPDs met applicable control limits, with exceptions noted in above sections. Recoveries and RPDs for all LCS/LSCD and MS/MSD samples were within required limits, with exceptions noted in above sections.

1.5.1. Completeness

Data completeness is defined as the percentage of usable data (usable data divided by the total possible data). The overall project completeness goal is 90%:

% completeness = <u>number of valid (i.e., non-R flagged) results</u>
number of possible results

All requested analyses were performed in accordance with Work Plan specifications. No sample results were rejected. Completeness for this project is 100%.

1.5.2. Representativeness

Data representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or environmental condition. The number and selection of samples were specified in the sampling plan and verified in the field to account accurately for site variations and sample matrices. The DQO for representativeness was met.

1.5.3. Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared to another. Data produced for this project followed applicable field sampling techniques and specific analytical methodology. The DQO for comparability was met.

1.6. Data Summary

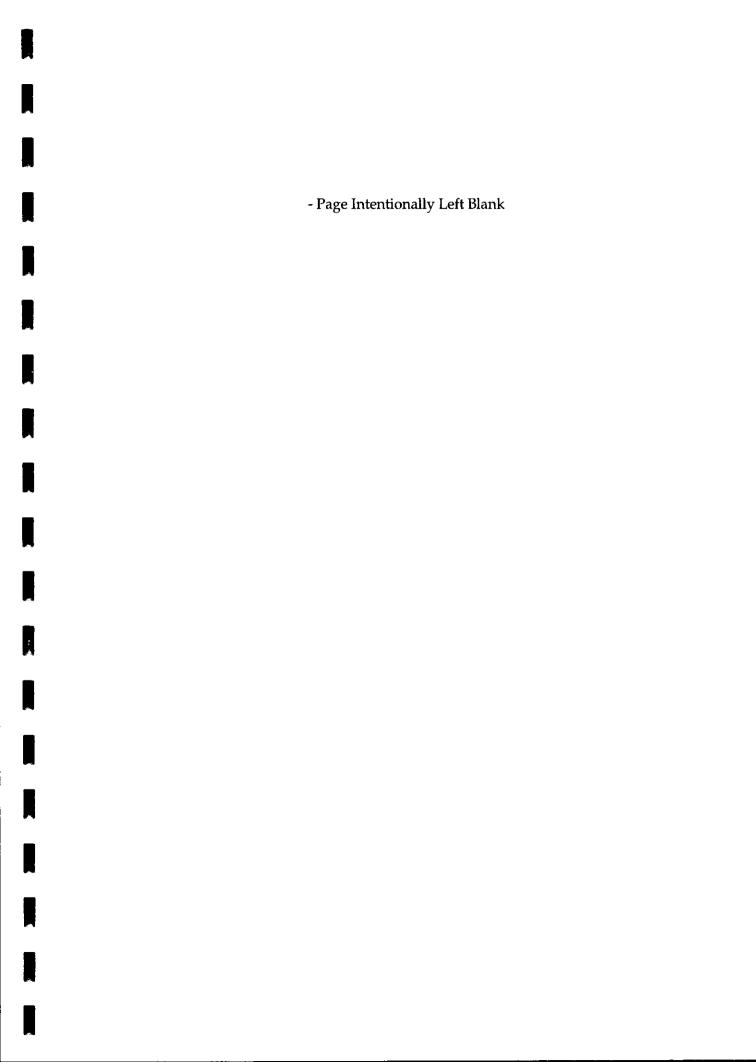
In general, the overall quality of the data was acceptable. The data quality was determined as acceptable. Acceptable data are associated with QC data that meet all QC criteria or with QC samples that did not meet QC criteria but data quality objectives were not affected. The EPA National Functional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

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2. REFERENCES

- ADEC. 2009. Technical Memorandum: Environmental Laboratory Data and Quality Assurance Requirements. March 2009.
- ADEC. 2010. Laboratory Data Review Checklist. January.
- ADEC. 2012. Technical Memorandum: Guidelines for Data Reporting, Data Reduction, and Treatment of Non-detect Values. June.
- EPA. 2008. Contract Laboratory Program National Functional Guidelines for Organic Data Review (EPA 540-R-08-01). June.
- EPA. 2010. Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (EPA 540-R-010-011). January.



Laboratory Data Review Checklist

Completed by:	Melissa Pike				
Title:	Project Chemis	st		Date:	Jul 20, 2015
CS Report Name:	· ·	ry, Quarterly Drinking W ort Chugiak, Alaska	Report Date:	July 2015	
Consultant Firm:	ERM Alaska, l	nc.	and the second s		
Laboratory Name:	SGS North Am	nerica, Inc. Labor	atory Report Nu	ımber: 1153101	
ADEC File Number:	2106.26.004	ADE	C RecKey Numl	per:	
1. <u>Laboratory</u>					
a. Did an	ADEC CS appro	oved laboratory receive ar	nd <u>perform</u> all o	f the submitted	sample analyses?
• Yes		○ NA (Please expla		Comments:	
		sferred to another "netwo ratory performing the ana			d to an alternate
← Yes	∩ No	NA (Please explain)	Comments:	
No samples wer	e transferred or	subcontracted to another	network laborat	ory.	
2. Chain of Custody	(COC)				
a. COC infor	mation complete	ed, signed, and dated (inc	luding released/	received by)?	
	○ No	← NA (Please explair)	Comments:	
b. Correct an	alyses requested	!?	·	<u></u>	
	∩ No	← NA (Please expla	n)	Comments:	
3. <u>Laboratory Sample</u> a. Sample/coo	_	nentation documented and within i	ange at receipt	(4° ± 2° C)?	
← Yes	No No	○ NA (Please expla		Comments:	
Samples were re	ceived at 6.5°C	No data was qualified du	e to temperatur	e.	

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Yes	← No	○ NA (Please explain)	Comments:
(• res	(NO	(IVA (I lease explain)	Comments.
c. Sample con-		nted - broken, leaking (Methanol),	zero headspace (VOC vials)?
• Yes	⊂ No	○ NA (Please explain)	Comments:
amples arrived i	in good conditi	on, unbroken and with zero headsp	pace.
	•		r example, incorrect sample contain insufficient or missing samples, etc.
← Yes	∩ No	NA (Please explain)	Comments:
A. There were n	o discrepancies	3.	
e. Data quality	or usability af	fected? (Please explain)	
	•	• •	Comments:
Data quality and	usability is not	affected with respect to the labora	tory sample receipt documentation.
Data quality and	usability is not	affected with respect to the labora	tory sample receipt documentation
Data quality and see Narrative	usability is not	affected with respect to the labora	tory sample receipt documentation.
se Narrative	usability is not		tory sample receipt documentation
se Narrative			comments:
se Narrative a. Present and	understandable	e?	
a. Present and Yes	understandable	e?	
a. Present and Yes	understandable	e? (*) NA (Please explain)	
a. Present and Yes b. Discrepance	understandable No ies, errors or Q	e? (*) NA (Please explain) C failures identified by the lab?	Comments:
a. Present and Yes b. Discrepance Yes	understandable No ies, errors or Q No no discrepancie	C failures identified by the lab? NA (Please explain) NA (Please explain) es, errors or QC failures.	Comments:
a. Present and Yes b. Discrepance Yes	understandable No ies, errors or Q	C failures identified by the lab? NA (Please explain) NA (Please explain) es, errors or QC failures.	Comments:
a. Present and Yes b. Discrepanc Yes NA. There were c. Were all co	understandable No No ies, errors or Q No no discrepancie rrective actions No	C failures identified by the lab? NA (Please explain) NA (Please explain) es, errors or QC failures. documented? NA (Please explain)	Comments:
a. Present and Yes b. Discrepance Yes NA. There were: c. Were all co	understandable No No ies, errors or Q No no discrepancie rrective actions No	C failures identified by the lab? NA (Please explain) NA (Please explain) es, errors or QC failures. documented? NA (Please explain)	Comments:
a. Present and Yes b. Discrepance Yes NA. There were: c. Were all co Yes	understandable No No ies, errors or Q No no discrepancie rrective actions No no corrective a	C failures identified by the lab? NA (Please explain) NA (Please explain) es, errors or QC failures. documented? NA (Please explain)	Comments: Comments:

•	Yes	← No	○ NA (Please explain)	Comments:
		ole holding tim		
<u>•</u>	Yes	← No	○ NA (Please explain)	Comments:
c. All s	soils rep	orted on a dry	weight basis?	
\subset	Yes	○ No	NA (Please explain)	Comments:
. Ther	e are no	soil analyses.		
d. Are project	_	orted PQLs les	ss than the Cleanup Level or the mini	mum required detection level for the
(• ·	Yes	C No	○ NA (Please explain)	Comments:
e. Data	quality	or usability a	ffected? (Please explain)	Comments:
			ffected? (Please explain) t affected with respect to the reported	
ta quali	ity and the second seco	usability is not		l sample results.
ta quali	ity and the second seco	usability is not k thod blank rep	t affected with respect to the reported	l sample results.
Sample . Methori.	es od Blan One me	usability is not k thod blank rep	t affected with respect to the reported	d sample results. mples?
Sample . Methori.	es od Blan One me	usability is not k thod blank rep No	orted per matrix, analysis and 20 sar	d sample results. mples?

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∨. Do the	No No	NA (Please explain)	Comments:
NA. All method	blank results	were below PQL.	
v. Data qu	ıality or usabil	lity affected? (Please explain)	Comments:
Data quality and	d usability is n	ot affected with respect to the repo	orted method blank results.
b. Laboratory	Control Samp	ole/Duplicate (LCS/LCSD)	
_		CCSD reported per matrix, analysi equired per SW846)	s and 20 samples? (LCS/LCSD required
• Yes	← No	○ NA (Please explain)	Comments:
			·
ii. Metals, samples?	/Inorganics - (One LCS and one sample duplicate	e reported per matrix, analysis and 20
← Yes	⊂ No	• NA (Please explain)	Comments:
NA. There are n	o metal or ino	rganic analyses.	
project sp	ecified DQOs	` / -	within method or laboratory limits? And thods: AK101 60%-120%, AK102 laboratory QC pages)
• Yes	○ No	○ NA (Please explain)	Comments:
limits? A	nd project spec	cified DQOs, if applicable. RPD re	erted and less than method or laboratory eported from LCS/LCSD, MS/DMSD, and is; all other analyses see the laboratory QC
• Yes	⊂ No	○ NA (Please explain)	Comments:
v. If %R o	or RPD is outs	side of acceptable limits, what sam	aples are affected? Comments:
NA. All %R and	d RPDs are wi	thin acceptable limits.	

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vi	. Do the	affected samp	eles(s) have data flags? If so, are the	data flags clearly defined?
C	Yes	∩ No	NA (Please explain)	Comments:
NA. All	%R and	RPDs are wi	thin acceptable limits.	
vi	i. Data qı	uality or usab	ility affected? (Please explain)	Comments:
Data qu	ality and	usability is n	ot affected with respect to the repor	ted LCS/LCSD results.
_				
	•	Organics On	•	
		-	es reported for organic analyses - fie	
(•)	Yes	⊂ No	○NA (Please explain)	Comments:
pr	oject spe	-	if applicable. (AK Petroleum metho	nin method or laboratory limits? And ods 50-150 %R; all other analyses see
	• Yes	∩ No	○ NA (Please explain)	Comments:
			and the second s	And the second s
	. Do the s		s with failed surrogate recoveries ha	ve data flags? If so, are the data flags
\subset	Yes	⊂ No	• NA (Please explain)	Comments:
A. The	re are no	failed surroga	ate recoveries.	
iv.	Data qu	ality or usabil	lity affected? (Use the comment box	to explain.). Comments:
ata qua	lity and	usability is no	ot affected with respect to the report	ed surrogate results.
Soil i. (One trip l		d per matrix, analysis and for each c	hlorinated Solvents, etc.): Water and ooler containing volatile samples?
(•)	Yes	⊂ No	○ NA (Please explain.)	Comments:
			ransport the trip blank and VOA san blaining why must be entered below	nples clearly indicated on the COC?
(•	Yes	○ No	← NA (Please explain.)	Comments:
~				

• Yes	∩ No	← NA (Please explain.)	Comments:
iv. If abov	ve PQL, what	samples are affected?	
			Comments:
A. All trip blar	nk results are le	ess than PQL.	
v. Data qu	ıality or usabil	ity affected? (Please explain.)	
			Comments:
ta quality and	l usability is n	ot affected with respect to the repor	ted trip blank results.
. Field Duplic	eate		
i. One fiel	d duplicate sul	omitted per matrix, analysis and 10	project samples?
• Yes	∩ No	○ NA (Please explain)	Comments:
imary 15-CSC	G-06-WG with	duplicate 15-CSG-07-WG	
ii. Submi	tted blind to la	b?	
• Yes	← No	○ NA (Please explain.)	Comments:
		The state of the s	
		ve percent differences (RPD) less the water, 50% soil)	han specified DQOs?
	mmended: 30%	% water, 50% soil)	
	mmended: 30%	•	R ₂) x 100
(Reco	mmended: 30° $R_1 = \text{Sample C}$	% water, 50% soil) RPD (%) = Absolute Value of: $(R_{1+}R_{1+}R_{1+}R_{1+}R_{2+}R_$	R ₂) x 100
(Reco	mmended: 30° $R_1 = \text{Sample C}$	% water, 50% soil) RPD (%) = Absolute Value of: $(R_{1+} R_{1+} R_{1+}$	R ₂) x 100
(Recon	mmended: 30° $R_1 = \text{Sample C}$	% water, 50% soil) RPD (%) = Absolute Value of: $(R_{1+}R_{1+}R_{1+}R_{1+}R_{2+}R_$	R ₂) x 100
(Reco	mmended: 309 $R_1 = Sample C$ $R_2 = Field Dup$	% water, 50% soil) RPD (%) = Absolute Value of: (R_{1-}) ((R_{1+} R) oncentration licate Concentration	$\frac{R_2}{x_2/2} \times 100$
Where I	mmended: 30° $R_1 = \text{Sample C}$ $R_2 = \text{Field Dup}$ $ \bigcirc \text{No}$	% water, 50% soil) RPD (%) = Absolute Value of: $(R_{1}-R_{1}-R_{2})$ concentration licate Concentration $(NA \text{ (Please explain)})$	$\frac{R_2}{x}$ x 100 $\frac{R_2}{2}$
Where I	mmended: 30° $R_1 = \text{Sample C}$ $R_2 = \text{Field Dup}$ $ \bigcirc \text{No}$	% water, 50% soil) RPD (%) = Absolute Value of: (R_{1-}) ((R_{1+} R) oncentration licate Concentration	R ₂) x 100 (2 ₂)/2) Comments:

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f. Decontamin	ation or Equip	ment Blank (if applicable)	
← Yes	⊂ No	• NA (Please explain)	Comments:
Decontamination	or equipment	blanks were not required. All samp	pling equipment was disposable.
i. All resul	ts less than PC	DL?	
← Yes	∩ No	• NA (Please explain)	Comments:
Decontamination	or equipment	blanks were not required. All samp	oling equipment was disposable.
ii. If above	PQL, what sa	mples are affected?	
			Comments:
NA. Decontamina	ation or equipm	nent blanks were not required. All	sampling equipment was disposable.
		ity affected? (Please explain.)	Comments:
NA. Decontamina	ition or equipn	nent blanks were not required. All s	sampling equipment was disposable.
ther Data Flags/Quant a. Defined and		E, AFCEE, Lab Specific, etc.)	
• Yes	∩ No	○ NA (Please explain)	Comments:
Defined within th	e SGS laborat	ory data package.	

7.

Laboratory Data Review Checklist

Completed by:	Melissa Pike				
Γitle:	Project Chemist			Date:	Jul 20, 2015
S Report Name:	Circle S Grocery, Quarterly Drinking Water Well Sampling Report Chugiak, Alaska			Report Date:	July 2015
Consultant Firm:	ERM Alaska, I	nc.			
aboratory Name:	SGS North Am	nerica, Inc.	Laboratory Repor	t Number: 1152339	9
ADEC File Number:	: 2106.26.004 ADEC RecKe		ADEC RecKey N	lumber:	
1. <u>Laboratory</u>					
•	ADEC CS appro	oved laboratory i	eceive and <u>perform</u>	all of the submitted	l sample analyses?
€ Ye	s C No	○ NA (Plea	ase explain.)	Comments:	
			er "network" laborate ng the analyses ADE		ed to an alternate
← Yes	← No	NA (Pleas	se explain)	Comments:	
No samples w	ere transferred or	subcontracted to	o another network la	boratory.	
2. <u>Chain of Custod</u>	y (COC)				
a. COC info	ormation complet	ed, signed, and o	lated (including relea	ased/received by)?	
	∩ No	← NA (Plea	se explain)	Comments:	
b. Correct a	analyses requeste	d?			
← Yes	⊂ No	← NA (Ple	ase explain)	Comments:	
3. <u>Laboratory Sam</u>	ple Receipt Docu	mentation			
a. Sample/c	ooler temperatur	e documented ar	nd within range at rec	ceipt $(4^{\circ} \pm 2^{\circ} C)$?	
← Yes	• No	○ NA (Ple	ease explain)	Comments:	
Samples were	received at 10.9°	°C. No data was	qualified due to temp	perature.	
}					

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•	Yes	← No	○ NA (Please explain)	Comments:
c. Sam	ple cond	lition docume	nted - broken, leaking (Methanol),	zero headspace (VOC vials)?
•	Yes	← No	○ NA (Please explain)	Comments:
amples a	arrived in	n good conditi	on, unbroken and with zero headsp	pace.
				r example, incorrect sample containers, nsufficient or missing samples, etc.?
\subset	Yes	⊂ No	NA (Please explain)	Comments:
A. There	were no	discrepancie	S.	
e. Data	quality	or usability at	ffected? (Please explain)	
				Comments:
Data qual	ity and u	sability is not	affected with respect to the labora	tory sample receipt documentation.
	<u>.</u>	inderstandable	e?	Comments:
b. Disc	repancie	es, errors or Q	C failures identified by the lab?	
\subset	Yes	⊂ No	NA (Please explain)	Comments:
JA. Ther	e were n	o discrepancie	es, errors or QC failures.	
	e all cori Yes	ective actions	documented? • NA (Please explain)	Comments:
				Comments.
A. Ther	e were n	o corrective a	ctions.	
d. Wha	it is the ϵ	effect on data	quality/usability according to the ca	ase narrative? Comments:

4.

	○ No	○ NA (Please explain)	Comments:
b. All applica	ible holding tim	es met?	
• Yes	∩ No	○ NA (Please explain)	Comments:
c. All soils re	ported on a dry	weight basis?	,
← Yes	⊂ No	NA (Please explain)	Comments:
IA. There are n	o soil analyses.		
d. Are the rep project?	oorted PQLs les	s than the Cleanup Level or the mir	nimum required detection level for
• Yes	○ No	○ NA (Please explain)	Comments:
ata quality and	l usability is not	affected with respect to the reporte	Comments:
a. Method Bla i. One m	ethod blank rep	oorted per matrix, analysis and 20 sa	•
a. Method Bla	ethod blank rep	•	amples? Comments:
a. Method Bla i. One m	ethod blank rep	•	•
i. One m	ethod blank repes No	← NA (Please explain)	•

	•	• • •	data flags clearly defined?
← Yes	⊂ No	• NA (Please explain)	Comments:
. All method	blank results	were below PQL.	
v. Data q	uality or usabi	lity affected? (Please explain)	Comments:
ata quality an	d usability is r	not affected with respect to the repor	rted method blank results.
b. Laboratory	Control Sam	ple/Duplicate (LCS/LCSD)	
-		LCSD reported per matrix, analysis required per SW846)	and 20 samples? (LCS/LCSD required
• Yes	⊂ No	○ NA (Please explain)	Comments:
ii. Metals samples?	/Inorganics - (One LCS and one sample duplicate r	reported per matrix, analysis and 20
← Yes	⊂ No	• NA (Please explain)	Comments:
A. There are n	o metal or ino	rganic analyses.	
project sp	ecified DQOs	ent recoveries (%R) reported and wi , if applicable. (AK Petroleum meth %-120%; all other analyses see the l	,
• Yes	⊂ No	○ NA (Please explain)	Comments:
• Yes	○ No	○ NA (Please explain)	Comments:
iv. Precis:	ion - All relati	ve percent differences (RPD) report	ed and less than method or laboratory orted from LCS/LCSD, MS/DMSD, an
iv. Precis: limits? Ar	ion - All relati	ve percent differences (RPD) report	
iv. Precisi limits? An or sample pages)	ion - All relati nd project spec /sample duplic	ve percent differences (RPD) report cified DQOs, if applicable. RPD rep cate. (AK Petroleum methods 20%;	ed and less than method or laboratory orted from LCS/LCSD, MS/DMSD, an all other analyses see the laboratory QC Comments:

	vi. Do the	affected samp	oles(s) have data flags? If so, are the	e data flags clearly defined?
	← Yes	⊂ No	NA (Please explain)	Comments:
NA.	. All %R and	l RPDs are wi	thin acceptable limits.	
	vii. Data q	uality or usab	ility affected? (Please explain)	Comments:
Dat	a quality and	l usability is r	not affected with respect to the repo	orted LCS/LCSD results.
c.	Surrogates -	Organics On	ly	
	i. Are surro	gate recoveri	es reported for organic analyses - f	ield, QC and laboratory samples?
	• Yes	⊂ No	CNA (Please explain)	Comments:
	project spe	-	, if applicable. (AK Petroleum meth	thin method or laboratory limits? And nods 50-150 %R; all other analyses see
	• Yes	∩ No	○ NA (Please explain)	Comments:
				anne anna de anna de Armande and Armanda and anna anna anna anna anna anna
	clearly def	-	-	nave data flags? If so, are the data flags
	← Yes	⊂ No	♠ NA (Please explain)	Comments:
NA.	There are no	failed surrog	ate recoveries.	
	iv. Data qı	ality or usabi	ility affected? (Use the comment bo	ox to explain.). Comments:
Data	a quality and	usability is n	ot affected with respect to the repor	rted surrogate results.
	<u>oil</u> i. One trip		d per matrix, analysis and for each	Chlorinated Solvents, etc.): Water and cooler containing volatile samples?
	• Yes	⊂ No	○ NA (Please explain.)	Comments:
			transport the trip blank and VOA sample transport the trip blank and VOA sample transport the trip blank and VOA sample transport to the trip blank and VOA sample transport to the trip blank and VOA sample transport to the trip blank and VOA sample transport transpo	amples clearly indicated on the COC? w)
	• Yes	∩ No	○ NA (Please explain.)	Comments:

	Yes	⊂ No	○ NA (Please explain.)	Comments:
	iv. If abov	e PQL, what	samples are affected?	
				Comments:
NA. A	All trip blan	k results are l	ess than PQL.	
	v. Data qu	ality or usabi	ity affected? (Please explain.)	
				Comments:
Data	quality and	usability is n	ot affected with respect to the report	ed trip blank results.
e. Fi	ield Duplica	ate		
	i. One field	duplicate su	omitted per matrix, analysis and 10 p	project samples?
	• Yes	⊂ No	○ NA (Please explain)	Comments:
Prima	ary 15-CSG	-04-WG with	duplicate 15-CSG-05-WG	
	ii. Submitt	ed blind to la	b?	
	• Yes	⊂ No	○ NA (Please explain.)	Comments:
		. 10000	THE	

			ve percent differences (RPD) less th	an specified DQOs?
	(Recom	mended: 30%	6 water, 50% soil)	
		I	RPD (%) = Absolute Value of: (R_{1-}) ((R_{1+})	
	Where R	= Sample Co	**	<i>)</i> (
		·	icate Concentration	
	• Yes	⊂ No	○ NA (Please explain)	Comments:
	iv Data on	ality or usabi	lity affected? (Use the comment box	to evaloin why or why ==4
	∩ Yes	No No	• NA (Please explain)	Comments:
	**		at offeeted with respect to the report	
Data c	quality and	usadiniy is no	ot affected with respect to the reported	ed field duplicate results.

	← Yes	← No	• NA (Please explain)	Comments:
Decon	taminati	on or equipmen	nt blanks were not required. All sample	
		sults less than F		
	← Yes	∩ No	• NA (Please explain)	Comments:
Decon	taminati	on or equipmer	nt blanks were not required. All sampl	ing equipment was disposable.
			samples are affected?	Comments:
NA. D	econtan	ination or equi	pment blanks were not required. All s	ampling equipment was disposable.
	iii. Data	quality or usat	pility affected? (Please explain.)	Comments:
NA. D	econtan	iination or equi	pment blanks were not required. All s	ampling equipment was disposable.
ther Da	ata Flags	/Qualifiers (AC	COE, AFCEE, Lab Specific, etc.)	
a. D	Defined a	and appropriate	?	
	• Yes	⊂ No	○ NA (Please explain)	Comments:

Laboratory Data Review Checklist

Completed by:	Melissa Pike				
Title:	Project Chemist			Date:	Jul 20, 2015
CS Report Name:	Circle S Grocery Sampling Report		inking Water Well ska	Report Date:	July 2015
Consultant Firm:	ERM Alaska, Inc	J.			
Laboratory Name:	SGS North America, Inc.		Laboratory Report Nu	mber: 1151703	
ADEC File Number:	2106.26.004		ADEC RecKey Number:		
1. <u>Laboratory</u>					
a. Did an	ADEC CS approv	ed laboratory 1	receive and perform all of	the submitted	sample analyses?
	∩ No	○ NA (Plea	ase explain.)	Comments:	
	=		er "network" laboratory or ng the analyses ADEC CS		d to an alternate
← Yes	⊂ No	NA (Pleas	se explain)	Comments:	
No samples wer	re transferred or su	ubcontracted to	another network laborate	ory.	
2. Chain of Custody	(COC)				
a. COC infor	mation completed	l, signed, and d	lated (including released/	received by)?	
	← No	○ NA (Pleas	se explain)	Comments:	
b. Correct an	alyses requested?				
	← No	○ NA (Ple	ase explain)	Comments:	
				- 100	
3. <u>Laboratory Sampl</u>	e Receipt Docume	entation			
a. Sample/co	oler temperature d	locumented an	d within range at receipt ($(4^{\circ} \pm 2^{\circ} \text{ C})$?	
← Yes	No No	○ NA (Ple	ease explain)	Comments:	
Samples were re	eceived at 8.5°C.	No data was qu	nalified due to temperatur	e.	

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	servation accep lorinated Solve		preserved VOC soil (GRO, BTEX,
• Yes	← No	○ NA (Please explain)	Comments:
c. Sample con	dition documer	nted - broken, leaking (Methanol),	zero headspace (VOC vials)?
• Yes	∩ No	○ NA (Please explain)	Comments:
Samples arrived	in good conditi	on, unbroken and with zero headsp	pace.
	•	· · · · · · · · · · · · · · · · · · ·	or example, incorrect sample containers/insufficient or missing samples, etc.?
← Yes	← No	• NA (Please explain)	Comments:
NA. There were n	o discrepancies	3.	
e. Data quality	y or usability af	fected? (Please explain)	
			Comments:
Data quality and	usability is not	affected with respect to the labora	atory sample receipt documentation.
Case Narrative			
a. Present and	understandable	??	
	← No	← NA (Please explain)	Comments:
b. Discrepance	ies, errors or Q	C failures identified by the lab?	
← Yes	⊂ No	• NA (Please explain)	Comments:
NA. There were	no discrepancie	es, errors or QC failures.	
c Were all co	rrective actions	dacumented?	
C. Wele all co	∩ No	• NA (Please explain)	Comments:
NA. There were	no corrective as	ctions.	
d. What is the	effect on data	quality/usability according to the c	case narrative? Comments:
Data quality and	usability in not	effected with respect to the case i	narrative report.

• Yes	∩ No	○ NA (Please explain)	Comments:
b. All applical	ole holding tim	nes met?	
• Yes	← No	○ NA (Please explain)	Comments:
c. All soils rep	orted on a dry	weight basis?	
← Yes	○ No	NA (Please explain)	Comments:
A. There are no	soil analyses.		
d. Are the repo	orted PQLs les	ss than the Cleanup Level or the mini	imum required detection level for the
• Yes	⊂ No	○NA (Please explain)	Comments:
e. Data quality	or usability a	ffected? (Please explain)	Comments:
			Comments:
		ffected? (Please explain) t affected with respect to the reported	
	usability is not		
ata quality and Samples a. Method Blan	usability is not		d sample results.
ata quality and Samples a. Method Blan	usability is not	t affected with respect to the reported ported per matrix, analysis and 20 sar	d sample results.
Samples a. Method Blan i. One me	usability is not k thod blank rep No	orted per matrix, analysis and 20 sar	d sample results. mples?
Samples a. Method Blan i. One me	usability is not k thod blank rep No	orted per matrix, analysis and 20 sar (NA (Please explain)	d sample results. mples? Comments:
Samples a. Method Blan i. One me	usability is not k thod blank rep No	orted per matrix, analysis and 20 sar	d sample results. mples?
Samples a. Method Blan i. One me ii. All methor	usability is not k thod blank rep No nod blank resu No	orted per matrix, analysis and 20 sar (NA (Please explain)	d sample results. mples? Comments:

← Ye		mple(s) have data flags? If so, are to NA (Please explain)	Comments:
NA. All met	hod blank result	s were below PQL.	
v. Dat	a quality or usal	bility affected? (Please explain)	Comments:
Data quality	and usability is	s not affected with respect to the re	eported method blank results.
b. Labora	tory Control Sar	mple/Duplicate (LCS/LCSD)	
_		S/LCSD reported per matrix, analy S required per SW846)	sis and 20 samples? (LCS/LCSD required
€ Y€	es C No	○ NA (Please explain)	Comments:
ii. Me sampl	•	- One LCS and one sample duplica	ate reported per matrix, analysis and 20
\cap Ye	es C No	NA (Please explain)	Comments:
NA. There a	re no metal or in	norganic analyses.	
projec	t specified DQ0		l within method or laboratory limits? And nethods: AK101 60%-120%, AK102 he laboratory QC pages)
€ Y6	es C No	○ NA (Please explain)	Comments:
limits	? And project sp nple/sample dup	pecified DQOs, if applicable. RPD	ported and less than method or laboratory reported from LCS/LCSD, MS/DMSD, and 9%; all other analyses see the laboratory QC
€ Y6	es C No	○ NA (Please explain)	Comments:
v. If %	∕aR or RPD is οι	atside of acceptable limits, what sa	imples are affected? Comments:
NA. All %R	and RPDs are	within acceptable limits.	

vi. Do the	affected samp	ples(s) have data flags? If so, are the	e data flags clearly defined?
← Yes	⊂ No	NA (Please explain)	Comments:
NA. All %R and	d RPDs are wi	thin acceptable limits.	
vii. Data c	quality or usab	vility affected? (Please explain)	Comments:
Data quality and	d usability is r	not affected with respect to the repo	rted LCS/LCSD results.
c. Surrogates	- Organics On	lv	
•	Ū	es reported for organic analyses - fi	eld, OC and laboratory samples?
• Yes	○ No	CNA (Please explain)	Comments:
project spe		, if applicable. (AK Petroleum meth	chin method or laboratory limits? And nods 50-150 %R; all other analyses see
• Yes	⊂ No	○ NA (Please explain)	Comments:
		44044	
iii. Do the clearly det	-	s with failed surrogate recoveries ha	ave data flags? If so, are the data flags
← Yes	⊂ No	• NA (Please explain)	Comments:
IA. There are no	failed surrog	ate recoveries.	
iv. Data qı	ıality or usabi	lity affected? (Use the comment bo	x to explain.). Comments:
Data quality and	usability is no	ot affected with respect to the repor	ted surrogate results.
<u>Soil</u> i. One trip		d per matrix, analysis and for each o	Chlorinated Solvents, etc.): Water and cooler containing volatile samples?
• Yes	⊂ No	NA (Please explain.)	Comments:
		ransport the trip blank and VOA sar plaining why must be entered below	mples clearly indicated on the COC?
• Yes	⊂ No	○ NA (Please explain.)	Comments:

• Yes	○ No	○ NA (Please explain.)	Comments:
iv. If abo	ve PQL, what	samples are affected?	
			Comments:
NA. All trip bla	nk results are l	ess than PQL.	
v. Data q	uality or usabil	lity affected? (Please explain.)	
			Comments:
Data quality and	d usability is ne	ot affected with respect to the repor	rted trip blank results.
e. Field Duplie	cate		
i. One fiel	d duplicate sul	bmitted per matrix, analysis and 10	project samples?
• Yes	⊂ No	○ NA (Please explain)	Comments:
Primary 15-CS	G-01-WG with	duplicate 15-CSG-02-WG	
ii. Submi	tted blind to la	b?	
• Yes	⊂ No	○ NA (Please explain.)	Comments:
	mmended: 30%	ve percent differences (RPD) less to water, 50% soil)	• •
	j	RPD (%) = Absolute Value of: $(R_1 - (R_1 + R_2))$, 11 100
	$R_1 = Sample Co$ $R_2 = Field Duple$	oncentration licate Concentration	
Yes	○ No	○NA (Please explain)	Comments:
			
	juality or usab	ility affected? (Use the comment bo	ox to explain why or why not.)
	quality or usab	ility affected? (Use the comment bo • NA (Please explain)	ox to explain why or why not.) Comments:

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	← Yes	○ No	NA (Please explain)	Comments:
Deco	ontamination	or equipment	blanks were not required. All samp	oling equipment was disposable.
	i. All resul	ts less than PC	QL?	
	← Yes	⊂ No	• NA (Please explain)	Comments:
NA.	Decontamina	ation or equip	ment blanks were not required. All	sampling equipment was disposable
	ii. If above	PQL, what sa	amples are affected?	Comments:
NA.	Decontamina	ation or equip	ment blanks were not required. All	sampling equipment was disposable
.			lity affected? (Please explain.)	Comments:
NA.	Decontamina	ation or equip	ment blanks were not required. All	sampling equipment was disposable
ther I	Data Flags/Q	ualifiers (ACC	DE, AFCEE, Lab Specific, etc.)	
	Defined and	appropriate?		
a.	G Vac	⊂ No	○ NA (Please explain)	Comments:
a.	• Yes			

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A1. DATA VALIDATION REPORT SUMMARY

Laboratory quality assurance/quality control (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 through August drinking water monitoring for the community well located at 22208 Birchwood Loop, the former site of Circle S Grocery, in Chugiak, Alaska.

Samples were collected, reported and shipped in general accordance with ADEC regulatory and guidance documents and an ADEC approved work plan (ERM 2015). Sample analysis was performed by an Alaska Department of Environmental Conservation (ADEC) certified laboratory for applicable analytical methods.

Samples were analyzed for the following:

• Volatile organic compounds (specifically, BTEX - benzene; ethylbenzene; toluene; m&p-xylene, and o-xylene), EPA Method 524.2.

Collected samples were submitted to SGS Environmental, Inc. located in Anchorage, Alaska for analysis.

In July 2015, sample results were reported in sample delivery group (SDG) 1153946.

In August 2015, sample results were reported in SDG 1154780.

In September 2015, sample results were reported in SDG 1155766.

The data validation and usability review was performed using the *National Functional Guidelines for Organic Data Review* (USEPA 2008), and ADEC regulatory guidance documents (ADEC, 2009; 2012) as references for qualification.

Data review was performed by an Environmental Resources Management (ERM) Project Chemist. An Alaska Department of Environmental Conservation (ADEC) laboratory data checklist (ADEC, 2010) was completed for this project.

Most results are considered usable for project objectives. The details of this review and qualification of the data are summarized in the following sections.

A1.1. Sample Handling and Chain of Custody

All sample coolers were shipped with custody seals intact. Chain of custody (CoC) forms, laboratory sample receipt forms, and case narratives were reviewed to evaluate the integrity of the samples and the quality of the associated data. All sample containers in the sample coolers were received at the laboratory intact and within the specified temperature range of 4 degrees Celsius ($^{\circ}$ C) +/- 2 $^{\circ}$ C.

A1.2. Holding Time Compliance

All samples were extracted, digested and analyzed within the holding time criteria for the applicable analytical methods and in accordance with work plan specifications.

A1.3. Field QA/QC

Field QA/QC protocols are designed to measure for potential sample bias as a result of sampling procedures and possible contamination during collection and transport of samples. Trip blanks are used to monitor sample containers and possible crosscontamination of samples. Collection and analysis of field duplicates facilitates an evaluation of precision that takes into account potential variables associated with sampling procedures, site heterogeneity and laboratory analyses. During this sampling event, a trip blank, and a field duplicate were submitted for analysis.

A1.3.1. Trip Blank

During each sampling event, a trip blank was prepared by the laboratory, shipped to the site with the empty sample bottles/containers, stored with sample containers during the field events, and transported with the collected samples back to the laboratory for analysis. The trip blank was placed in the cooler with associated matrix-specific VOC samples. No target analytes were detected in the trip blank, with one exception.

SDG 1155766: Methylene chloride was present in the trip blank at 0.000510 mg/L. Assoicated sample results were 15-CSG-12-WG and 15-CSG-13-WG. All associated methylene chloride results were not detected a the limit of detection (LOD). Data did not require qualification.

A1.3.2. Field Duplicate

Out of a total of 3 primary samples, there were 3 field duplicate samples submitted. The frequency of field duplicate sample collection met the 10 percent (%) frequency requirements specified in the work plan.

Relative percent differences (RPDs) were calculated between the primary and duplicate samples, and met the ADEC recommended limits of <30% in water samples. When analytes were present in concentrations below the detection limit (DL), or not detected at the limit of detection (LOD), in one or both samples, no valid comparison could be made.

July 2015, 1153946: One primary, 15-CSG-08-WG, with one duplicate, 15-CSG-09-WG, were collected. The primary sample and duplicate RPDs met applicable control limits.

August 2015, 1154780: One primary, 15-CSG-10-WG, with one duplicate, 15-CSG-11-WG, were collected. The primary sample and duplicate relative percent differences (RPD) met applicable control limits.

September 2015, 1155766: One primary, 15-CSG-12-WG, with one duplicate, 15-CSG-13-WG, were collected. The primary sample and duplicate relative percent differences (RPD) met applicable control limits.

Overall, there was adequate comparability of field duplicate results to meet project data quality objectives.

A1.4. Laboratory QA/QC

A1.4.1. Laboratory Blanks

Laboratory method blanks were analyzed concurrent with an analytical batch of 20 or fewer primary samples for each of the analytical methods performed on project samples. Target analytes were not detected (ND) in the laboratory blanks.

A1.4.2. Laboratory Control Samples

The laboratory monitors internal precision and accuracy for each analytical batch with a set of laboratory control samples (LCS/LCSD). A known quantity of target analytes are added to blank laboratory control samples before extraction and analysis and recoveries are calculated. Acceptable recovery criteria vary with each analytical method and matrix. All LCS/LCSD samples met laboratory and project QC goals for target analytes, with the following exceptions.

1155766: The LCS percent recovery (%R) was outside of the quality control criteria in the following analytes: 1,1-dichloroethene; 1,2-dibromo-3-chloropropane; carbon tetrachloride; dichlorodifluoromethane; trichlorofluoromethane. The LCSD %R was outide of the quality control limits in the following analytes: 1,1,1-Trichloroethane; 1,1-dichloroethene; 2,2- dichloropropane; carbon tetrachloride; dichlorodifluoromethane; trichlorofluoromethane. All samples within this SDG are potentially impacted; however, all sample results were not detected at the LOD. Therefore, no qualifications were required.

A1.4.3. Surrogates

System Monitoring Compounds (Surrogates) are specified for organic chromatographic analytical procedures. Surrogates are compounds similar to target analytes and are added to each sample prior to collection or extraction. Subsequent surrogate recovery indicates overall method performance. Surrogate recoveries were within prescribed control limits for all primary samples, method blanks, LCS/LCSD and other QA/QC samples.

A1.4.4. Detection Limits (Sensitivity)

Detection Limits (DL) provided adequate sensitivity needed to meet project objectives. All not detected results were reported as not detected (U) at the limit of detection (LOD), which is half of the limit of quantitation (LOQ).

A1.5. Precision and Accuracy

Precision criteria monitor analytical reproducibility. Accuracy criteria monitor agreement of measured results with "true values" established by spiking applicable samples with a known quantity of analyte or surrogate. Precision and accuracy were evaluated by comparing LCS/LCSDs and field duplicate pairs for this project. Field

duplicates samples were collected in accordance with work plan specifications. Field duplicate RPDs met applicable control limits. Recoveries and RPDs for all LCS/LSCD samples were within required limits, with any exceptions noted in previous sections.

A1.5.1. Data Completeness

Data completeness is defined as the percentage of usable data (usable data divided by the total possible data). The overall project completeness goal is 90%:

% completeness = <u>number of valid (i.e., non-rejected flagged) results</u> number of possible results

All requested analyses were performed in accordance with Work Plan specifications. No results were qualified as unusable (i.e., flagged as rejected with an "R"). Data completeness for this project is 100%.

A1.5.2. Representativeness

Data representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or environmental condition. The number and selection of samples were specified in the work plan and verified in the field to accurately account for site variations and sample matrices. The data quality objective (DQO) for representativeness was met.

A1.5.3. Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared to another. Data produced for this project followed applicable field sampling techniques and specific analytical methodology. The DQO for comparability was met.

A1.6. Data Quality Summary

In general, the overall quality of the data was acceptable. The USEPA National Functional Guidelines (USEPA 2008) were used to evaluate the acceptability of the data. The data quality was individually determined as acceptable or estimated. 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. Estimated results, flagged with "J," are considered inaccurate due to a bias created by QC acceptance criteria which were not met. No results were rejected.

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A2. REFERENCES

- Alaska Department of Environmental Conservation (ADEC). 2009. Technical Memorandum: Environmental Laboratory Data and Quality Assurance Requirements. March.
- ADEC. 2010. Laboratory Data Review Checklist. January.
- ADEC. 2012. Technical Memorandum: Guidelines for Data Reporting, Data Reduction, and Treatment of Non-detect Values. June.
- ERM. 2015. Work Plan Drinking Water Well Sampling, Chugiak, Alaska, BSUM Claim No. 105081, ADEC File No. 2106.26.004, ADEC Hazard ID 24797. 24 April.
- USEPA. 2008. Contract Laboratory Program National Functional Guidelines for Organic Superfund Data Review. June. (EPA 540-R-08-01).

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Laboratory Data Review Checklist

rterly Drinking Water Wel ember 2015 giak, Alaska; BSUM Clair A Alaska, Inc. North America, Inc. 6.26.004 C CS approved laboratory No	Laboratory Report Nu ADEC RecKey Numb	er:	
ember 2015 giak, Alaska; BSUM Clair A Alaska, Inc. North America, Inc. 6.26.004 C CS approved laboratory	Laboratory Report Nu ADEC RecKey Numb	mber: 1153946 er:	5
North America, Inc. 5.26.004 C CS approved laboratory	ADEC RecKey Numb	er:	
5.26.004 C CS approved laboratory	ADEC RecKey Numb	er:	
C CS approved laboratory	receive and perform all of	L	sample analyses?
	-	the submitted	sample analyses?
	-	the submitted	sample analyses?
○ No ○ NA (Ple			
	ease explain.)	Comments:	• •
• •	ng the analyses ADEC CS		d to an alternate
	*		
	icted to another network la	boratory.	
<u>C)</u>			
on completed, signed, and	dated (including released/	received by)?	
No NA (Plea	ase explain)	Comments:	
es requested?			
_	ease explain)	Comments:	
			-
	md sydthin nomao at nagaint	(40 ± 20 C)2	
_			
NO (NA (PI	lease explain)	Comments.	
.9°C.			'
	No NA (Please transferred or subcontract) n completed, signed, and No NA (Please requested? No NA (Please requested? No NA (Please requested) eipt Documentation emperature documented a	No NA (Please explain) of transferred or subcontracted to another network land completed, signed, and dated (including released/ No NA (Please explain) s requested? No NA (Please explain) eipt Documentation emperature documented and within range at receipt	transferred or subcontracted to another network laboratory. In completed, signed, and dated (including released/received by)? No NA (Please explain) Comments: Some requested? No NA (Please explain) Comments: Comments: Comments: Comments: Comments:

• Yes	← No	○ NA (Please explain)	Comments:
c. Sample con	idition docume	nted - broken, leaking (Methanol),	zero headspace (VOC vials)?
• Yes	∩ No	○ NA (Please explain)	Comments:
amples arrived	in good condit	ion, unbroken and free of headspac	e.
	• •	• • • • • • • • • • • • • • • • • • •	r example, incorrect sample contain insufficient or missing samples, etc.
← Yes	⊂ No	NA (Please explain)	Comments:
A. There were n	o discrepancie	S.	
e. Data quality	y or usability a	ffected? (Please explain)	
		-	Comments:
Data quality and	usability is no	affected with respect to the sample	e receipt documentation.
			-
se Narrative			
a. Present and	understandable	e?	
• Yes	⊂ No	○ NA (Please explain)	Comments:
		.	
		<u> </u>	
	ies, errors or Q	C failures identified by the lab?	
b. Discrepance		0374 (8)	Communication
b. Discrepance	⊂ No	NA (Please explain)	Comments:
← Yes		(• NA (Please explain) es, errors or QC failures.	Comments:
Yes JA. There were	no discrepancio	es, errors or QC failures.	Comments:
Yes JA. There were		es, errors or QC failures.	Comments:
Yes IA. There were to the control of the control o	no discrepancions rrective actions No	es, errors or QC failures. s documented? NA (Please explain)	
Yes IA. There were a c. Were all co	no discrepancions rrective actions No	es, errors or QC failures. s documented? NA (Please explain)	
C Yes IA. There were a c. Were all con C Yes IA. There were a	no discrepancions rrective actions No no corrective a	es, errors or QC failures. s documented? NA (Please explain) ctions.	Comments:
C Yes IA. There were a c. Were all con C Yes IA. There were a	no discrepancions rrective actions No no corrective a	es, errors or QC failures. s documented? NA (Please explain)	Comments:

• Yes	∩ No	○ NA (Please explain)	Comments:
b. All applica	ble holding tim	es met?	
• Yes	← No	← NA (Please explain)	Comments:
c. All soils re	ported on a dry	weight basis?	
← Yes	⊂ No		Comments:
IA. There are n	o soil samples v	vithin this data set.	
d. Are the rep project?	oorted PQLs les	s than the Cleanup Level or the mir	nimum required detection level for t
• Yes	⊂ No	(C) (D) (1.1.)	
		(NA (Please explain)	Comments:
e. Data quali	y or usability a		Comments:
e. Data qualio	y or usability a	ffected? (Please explain)	Comments:
e. Data quali	y or usability a	ffected? (Please explain)	Comments:
e. Data quality and C Samples a. Method Bla	y or usability a	ffected? (Please explain)	Comments:
e. Data quality and C Samples a. Method Bla	y or usability a	ffected? (Please explain) affected with respect to the reported per matrix, analysis and 20 sa	Comments:
e. Data quality and C Samples a. Method Bla i. One m	y or usability a	ffected? (Please explain) affected with respect to the reported per matrix, analysis and 20 sa	Comments: ed sample results. amples?
e. Data quality and C Samples a. Method Bla i. One m	y or usability a lusability is not usability as usability is not usability as usability is not usability as usability as usability is not usabil	ffected? (Please explain) affected with respect to the reported per matrix, analysis and 20 sa	Comments: ed sample results. amples?
e. Data quality and C Samples a. Method Bla i. One m	ey or usability as lusability is not usability is not usa	ffected? (Please explain) affected with respect to the reporter orted per matrix, analysis and 20 sa (NA (Please explain)	Comments: ed sample results. amples?
e. Data quality and C Samples a. Method Bla i. One m	ey or usability as lusability is not usability is not usa	ffected? (Please explain) affected with respect to the reported per matrix, analysis and 20 sa NA (Please explain)	Comments: ed sample results. amples? Comments:

	iv. Do the	affected samp	ple(s) have data flags? If so, are the	data flags clearly defined?
	← Yes	⊂ No	♠ NA (Please explain)	Comments:
4 . <i>A</i>	All the resul	lts were repor	ted as not detected at the limit of de	tection (LOD).
	v Data du	ality or neabi	lity affected? (Please explain)	Comments:
			· · · · · · · · · · · · · · · · · · ·	
pata	quality and	usability is r	ot affected with respect to the repor	rted method blank results.
b. I	Laboratory	Control Samp	ole/Duplicate (LCS/LCSD)	
	i. Organics	s - One LCS/I	CSD reported per matrix analysis	and 20 samples? (LCS/LCSD required
	-		equired per SW846)	and 20 samples. (Deep Deep required
	• Yes	⊂ No	○ NA (Please explain)	Comments:
			The second secon	and the state of t
	samples?	inorganics - C	one LCS and one sample duplicate r	reported per matrix, analysis and 20
	-			
	← Yes	∩ No	○ NA (Please explain)	Comments:
Δ Т	here were	no metal or ir	norganic analyses.	
. 1. 1	Here were	no metar or n	lorganic analyses.	
	iii. Accura	cy - All perce	ent recoveries (%R) reported and wi	thin method or laboratory limits? And
		•	, if applicable. (AK Petroleum meth	· · · · · · · · · · · · · · · · · · ·
	75%-125%	6, AK103 60%	%-120%; all other analyses see the la	aboratory QC pages)
	• Yes	⊂ No	○ NA (Please explain)	Comments:
	iv Precisio	nn - All relativ	ve nercent differences (RPD) report	ed and less than method or laboratory
				orted from LCS/LCSD, MS/DMSD, an
				all other analyses see the laboratory Q
	pages)	1 1		
	© V	⊘ N-	CNA (Plane and Lin)	Comments.
	• Yes	⊂ No	○ NA (Please explain)	Comments:
			- 11-27-	
	v. If %R or	r RPD is outs	ide of acceptable limits, what sampl	es are affected?
	v. If %R or	r RPD is outs	ide of acceptable limits, what sampl	es are affected? Comments:
			ide of acceptable limits, what sampl	

	vi. Do the	affected samp	bles(s) have data flags? If so, are the	data flags clearly defined?
	← Yes	⊂ No	NA (Please explain)	Comments:
NA	. All %R and	RPDs were v	within acceptable limits.	
	vii. Data q	uality or usab	ility affected? (Please explain)	Comments:
Dat	ta quality and	l usability was	s not affected with respect to the LC	S/LCSD results.
c.	Surrogates -	Organics On	ly	
	i. Are surro	gate recoveri	es reported for organic analyses - fie	eld, QC and laboratory samples?
	• Yes	← No	CNA (Please explain)	Comments:
	project spe	-	if applicable. (AK Petroleum metho	nin method or laboratory limits? And ods 50-150 %R; all other analyses see
	Yes	⊂ No	○ NA (Please explain)	Comments:
Γ				
<u> </u>				
	iii. Do the clearly def	-	s with failed surrogate recoveries ha	ve data flags? If so, are the data flags
	← Yes	⊂ No	• NA (Please explain)	Comments:
NA.	There were	no failed surro	ogate recoveries.	
	iv. Data qı	ıality or usabi	lity affected? (Use the comment box	to explain.). Comments:
Data	a quality and	usahility is n	ot affected with respect to the report	
Date	a quality and	usability is in	ot affected with respect to the report	ed surrogate results.
	-	- Volatile ana	lyses only (GRO, BTEX, Volatile C	hlorinated Solvents, etc.): Water and
<u>5</u>	-	blank reporte er explanation	d per matrix, analysis and for each c n below.)	cooler containing volatile samples?
	• Yes	⊂ No		Comments:
·				
			ransport the trip blank and VOA san plaining why must be entered below	mples clearly indicated on the COC?
	← Yes	• No	← NA (Please explain.)	Comments:
Trip	blank not inc	licated on the	COC; however Trip Blank results a	re included within the data package.

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iii. All rest	ılts less than I	PQL?	
• Yes	∩ No	← NA (Please explain.)	Comments:
iv. If abov	e PQL, what	samples are affected?	
			Comments:
NA. All trip blan	k results were	not detected at the LOD.	
v. Data qu	ality or usabil	ity affected? (Please explain.)	
			Comments:
Data quality and	usability is no	ot affected with respect to the report	ted trip blank results.
e. Field Duplic	ate		
i. One field	l duplicate sub	omitted per matrix, analysis and 10 j	project samples?
• Yes	⊂ No	← NA (Please explain)	Comments:
,			Confidents.
Primary 15-CSC	i-u8-wG with	duplicate 15-CSG-09-WG.	
ii. Submit	ted blind to la	b?	
• Yes	○ No	○ NA (Please explain.)	Comments:
		· · · · · · · · · · · · · · · · · · ·	
	<u></u>		
		ve percent differences (RPD) less the water, 50% soil)	nan specified DQOs?
	F	$APD(\%) = Absolute Value of: (R_1-1)$	$\frac{R_2}{x_100}$
		$((R_{1+}R_{2})^{2})$	
	= Sample Co		
R_2	= Field Dupl	icate Concentration	
• Yes	⊂ No	○ NA (Please explain)	Comments:
			MATA.
: D-4-		E4. aff 4. 19 /T - d	
iv. Data qu	iality or usabi	lity affected? (Use the comment box	x to explain why or why not.) Comments:
Data quality and	usability is no	t affected with respect to the report	ed field duplicate results.

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f. I	Decontam	ination or E	quipment Blank (if applicable)	
	← Yes	\cap N	o • NA (Please explain)	Comments:
NA. I	Decontam	ination and	equipment blanks were not require	d. All sampling equipment was disposable.
	i. All res	sults less tha	n PQL?	
	← Yes	⊂ No	NA (Please explain)	Comments:
NA. I	Decontam	ination and	equipment blanks were not require	d. All sampling equipment was disposable.
	ii. If abo	ove PQL, wh	nat samples are affected?	Comments:
NA. I	Decontam	ination and	equipment blanks were not require	d. All sampling equipment was disposable.
NA. I			sability affected? (Please explain.) equipment blanks were not require	Comments: d. All sampling equipment was disposable.
		/Qualifiers (ACOE, AFCEE, Lab Specific, etc.	
	• Yes	∩ No		Comments:
Defin	ned withir	the laborat	ory qualifier section of the laborato	ory report.

Laboratory Data Review Checklist

Completed by:	Melissa Pike				
Title:	Project Chemis	st		Date:	Nov 9, 2015
CS Report Name:	Quarterly Drin September 201 Chugiak, Alasl	Sampling Report July -	Report Date:	November 2015	
Consultant Firm:	ERM Alaska, l	nc.	and the second s		
Laboratory Name:	SGS North America, Inc. Laboratory Report Number: 1154780				
ADEC File Number:	2106.26.004		ADEC RecKey Numb	per:	
1. <u>Laboratory</u>					
a. Did an	ADEC CS appro	oved laboratory r	eceive and perform all of	f the submitted	sample analyses?
• Yes	⊂ No	○ NA (Plea	ase explain.)	Comments:	
					-
	-		or "network" laboratory og the analyses ADEC CS		d to an alternate
← Yes	C No	NA (Pleas	e explain)	Comments:	
NA. Samples w	ere not transferi	ed or subcontrac	ted to another network la	boratory.	
2. Chain of Custody	(COC)				
a. COC infor	mation complet	ed, signed, and d	ated (including released/	received by)?	
• Yes	← No	← NA (Pleas	e explain)	Comments:	
b. Correct an	alyses requested				
• Yes	∩ No	○ NA (Plea	ase explain)	Comments:	
3. <u>Laboratory Sampl</u>	-				
a. Sample/co	oler temperature	documented and	d within range at receipt		
• Yes	○ No	○ NA (Ple	ase explain)	Comments:	
Samples arrived Version 2.7	at 4.5°C.	Dago	Tot 7		
CISIOH 2.7		rage	1 01 /		01

• Yes	∩ No	○ NA (Please explain)	Comments:
c. Sample con		nted - broken, leaking (Methanol),	zero headspace (VOC vials)?
• Yes	∩ No	○ NA (Please explain)	Comments:
Samples arrived	in good conditi	ion, unbroken and free of headspac	e.
	•		or example, incorrect sample contain insufficient or missing samples, etc.
← Yes	C No	• NA (Please explain)	Comments:
A. There were n	o discrepancie	S.	
e. Data quality	y or usability a	ffected? (Please explain)	
			Comments:
			
Data quality and	usability is not	t affected with respect to the sampl	e receipt documentation.
Data quality and see Narrative	usability is not	t affected with respect to the sampl	le receipt documentation.
se Narrative	usability is not	•	e receipt documentation.
se Narrative	•	•	e receipt documentation. Comments:
se Narrative a. Present and	understandable	e?	· · · · · · · · · · · · · · · · · · ·
a. Present and Yes b. Discrepanc	understandable No ies, errors or Q	e? C NA (Please explain) C failures identified by the lab?	· · · · · · · · · · · · · · · · · · ·
se Narrative a. Present and • Yes	understandable	e? ∩ NA (Please explain)	· · · · · · · · · · · · · · · · · · ·
a. Present and Yes b. Discrepanc Yes	understandable No ies, errors or Q	e? C NA (Please explain) C failures identified by the lab?	Comments:
a. Present and Yes b. Discrepanc Yes	understandable No ies, errors or Q No no discrepancie	e? (**NA (Please explain) (**OK failures identified by the lab? (**NA (Please explain)	Comments:
a. Present and Yes b. Discrepanc Yes	understandable No ies, errors or Q No no discrepancie	e? (*) NA (Please explain) (*) C failures identified by the lab? (*) NA (Please explain) es, errors or QC failures.	Comments:
a. Present and Yes b. Discrepanc Yes NA. There were c. Were all co	understandable No No ies, errors or Q No no discrepancies rrective actions No	e? (**NA (Please explain) (**ONA (Please explain) (**ONA (Please explain) (**ONA (Please explain) (**ONA (Please explain)	Comments:
a. Present and Yes b. Discrepanc Yes NA. There were c. Were all co Yes	understandable No No No No no discrepancie rective actions No no corrective a	e? (*) NA (Please explain) (*) NA (Please explain) (*) NA (Please explain) es, errors or QC failures. s documented? (*) NA (Please explain) actions.	Comments: Comments:
a. Present and Yes b. Discrepanc Yes NA. There were c. Were all co Yes	understandable No No No No no discrepancie rective actions No no corrective a	e? (**NA (Please explain) (**ONA (Please explain) (**ONA (Please explain) (**ONA (Please explain) (**ONA (Please explain)	Comments: Comments:

	C No	○ NA (Please explain)	Comments:
b. All applical	ole holding time	s met?	
• Yes	C No	← NA (Please explain)	Comments:
c. All soils rep	oorted on a dry v	weight basis?	
← Yes	∩ No	• NA (Please explain)	Comments:
. There are no	soil samples w	ithin this data set.	
d. Are the report	orted PQLs less	than the Cleanup Level or the mini	imum required detection level for the
• Yes	⊂ No	○ NA (Please explain)	Comments:
			4,000,000
e. Data quality	or usability aff	ected? (Please explain)	
e. Data quality	or usability aff	ected? (Please explain)	Comments:
	-	ected? (Please explain)	
ta quality and	usability is not a		
ta quality and Samples . Method Blar	usability is not a	affected with respect to the reported	d sample results.
ta quality and Samples . Method Blar	usability is not a k thod blank repo		d sample results.
ta quality and Samples . Method Blar	usability is not a k thod blank repo	affected with respect to the reported	d sample results.
ta quality and Samples Method Blan i. One me	usability is not a k thod blank repo	affected with respect to the reported	d sample results. mples?
Samples Method Blan i. One me	usability is not a k thod blank repo	affected with respect to the reported orted per matrix, analysis and 20 sar	d sample results. mples?
Samples . Method Blan i. One me • Ye	usability is not a k thod blank repo	affected with respect to the reported arted per matrix, analysis and 20 sar (NA (Please explain))	d sample results. mples? Comments:
Samples Method Blan i. One me	usability is not a k thod blank repo	affected with respect to the reported orted per matrix, analysis and 20 sar	d sample results. mples?
Samples . Method Blan i. One me • Ye	usability is not a k thod blank repo	affected with respect to the reported arted per matrix, analysis and 20 sar (NA (Please explain))	d sample results. mples? Comments:

IV. DO the	arrected samp	ble(s) have data mags? It so, are the	data mags clearly defined?
← Yes	⊂ No	• NA (Please explain)	Comments:
NA. All the resu	ılts were repor	ted as not detected at the limit of de	etection (LOD).
v. Data qı	uality or usabi	lity affected? (Please explain)	Comments:
Data quality an	d usability is r	not affected with respect to the repor	rted method blank results.
b. Laboratory	Control Sam	ple/Duplicate (LCS/LCSD)	
_		LCSD reported per matrix, analysis required per SW846)	and 20 samples? (LCS/LCSD required
€ Yes	⊂ No	← NA (Please explain)	Comments:
ii. Metals samples?	-	One LCS and one sample duplicate	reported per matrix, analysis and 20
← Yes	○ No	○ NA (Please explain)	Comments:
NA. There were	no metal or in	norganic analyses.	
project sp	ecified DQOs	ent recoveries (%R) reported and way, if applicable. (AK Petroleum meth %-120%; all other analyses see the l	· · · · · · · · · · · · · · · · · · ·
• Yes	← No	○ NA (Please explain)	Comments:
limits? A	nd project spe	cified DQOs, if applicable. RPD rep	ted and less than method or laboratory ported from LCS/LCSD, MS/DMSD, and all other analyses see the laboratory QC
• Yes	← No	○ NA (Please explain)	Comments:
v. If %R	or RPD is outs	side of acceptable limits, what samp	les are affected? Comments:
NA. All %R an	d RPDs were v	within acceptable limits.	

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vi. Do the	affected samp	ples(s) have data flags? If so, are the	e data flags clearly defined?
← Yes	○ No	NA (Please explain)	Comments:
All %R and	RPDs were	within acceptable limits.	
vii. Data q	uality or usab	pility affected? (Please explain)	Comments:
quality and	l usability wa	s not affected with respect to the LO	CS/LCSD results.
_			
•	· ·	•	
	_		
• Yes	← No	CNA (Please explain)	Comments:
project spe	cified DQOs	, if applicable. (AK Petroleum meth	
• Yes	⊂ No	○ NA (Please explain)	Comments:
	······································		and the second s
	_	s with failed surrogate recoveries h	ave data flags? If so, are the data flags
← Yes	⊂ No	NA (Please explain)	Comments:
here were i	no failed surro	ogate recoveries.	
iv. Data qu	ality or usabi	lity affected? (Use the comment bo	x to explain.). Comments:
quality and	usability is no	ot affected with respect to the repor	ted surrogate results.
<u>l</u> i. One trip	blank reporte	d per matrix, analysis and for each	*
Yes	○ No	○ NA (Please explain.)	Comments:
			The state of the s
		ransport the trip blank and VOA sar plaining why must be entered below	mples clearly indicated on the COC?
	All %R and vii. Data quality and Gurrogates - i. Are surrogates - ii. Accuracy project spet the laborat	All %R and RPDs were wii. Data quality or usable quality and usability was surrogates - Organics On it. Are surrogate recovering Yes No ii. Accuracy - All percent project specified DQOs the laboratory report paragraph of Yes No iii. Do the sample result clearly defined? Yes No There were no failed surrogate iv. Data quality or usability is not puality and usability and usability is not puality and usability and usability and usability and usab	All %R and RPDs were within acceptable limits. vii. Data quality or usability affected? (Please explain) quality and usability was not affected with respect to the Leasurogates - Organics Only i. Are surrogate recoveries reported for organic analyses - fi Yes No NA (Please explain) ii. Accuracy - All percent recoveries (%R) reported and wir project specified DQOs, if applicable. (AK Petroleum methalaboratory report pages) Yes No NA (Please explain) iii. Do the sample results with failed surrogate recoveries had clearly defined? Yes No NA (Please explain) There were no failed surrogate recoveries. iv. Data quality or usability affected? (Use the comment boundarily and usability is not affected with respect to the reportance of the plank - Volatile analyses only (GRO, BTEX, Volatile Color of the plank reported per matrix, analysis and for each (If not, enter explanation below.)

• Yes	← No	○ NA (Please explain.)	Comments:
iv. If abo	ve PQL, what	samples are affected?	
			Comments:
A. All trip bla	nk results were	not detected at the LOD.	
v. Data qı	uality or usabil	ity affected? (Please explain.)	
			Comments:
ata quality and	d usability is n	ot affected with respect to the repor	ted trip blank results.
e. Field Duplic i. One fiel		omitted per matrix, analysis and 10	
• Yes	∩ No	← NA (Please explain)	Comments:
rimary 15-CS	G-10-WG with	duplicate 15-CSG-11-WG.	
:: Ch:	tted blind to la	b?	
ii. Submi	tica offica to ta		
• Yes	∩ No	← NA (Please explain.)	Comments:
		← NA (Please explain.)	Comments:
	ion - All relati	Ve percent differences (RPD) less the water, 50% soil)	
	ion - All relati	ve percent differences (RPD) less the water, 50% soil) RPD (%) = Absolute Value of: (R ₁ -	han specified DQOs?
iii. Precis	ion - All relati	ve percent differences (RPD) less the water, 50% soil) RPD (%) = Absolute Value of: (R ₁ -)	han specified DQOs?
iii. Precis (Reco	ion - All relati mmended: 30%	ve percent differences (RPD) less the water, 50% soil) RPD (%) = Absolute Value of: (R ₁ -)	han specified DQOs?
iii. Precis (Reco	ion - All relati mmended: 30% R ₁ = Sample Co	ve percent differences (RPD) less the water, 50% soil) RPD (%) = Absolute Value of: (R_{1-}) ((R_{1+} Representation)	han specified DQOs? R ₂) x 100 R ₂)/2)
iii. Precis (Reco	ion - All relati mmended: 30%	ve percent differences (RPD) less the water, 50% soil) RPD (%) = Absolute Value of: (R_{1-}) ((R_{1+} Representation)	han specified DQOs?
iii. Precis (Reco:	ion - All relati mmended: 30% R ₁ = Sample Co R ₂ = Field Dupl	ve percent differences (RPD) less the water, 50% soil) RPD (%) = Absolute Value of: (R_{1-}) ((R_{1+} Representation)	han specified DQOs? $\frac{R_2}{x_2} \times 100$ $\frac{R_2}{x_2} \times 100$ Comments:

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	← Yes	∩ No	NA (Please explain)	Comments:
NA.	Decontamina	ation and equi	pment blanks were not required. All	sampling equipment was disposable
	i. All result	ts less than PC	L?	
	← Yes	⊂ No	• NA (Please explain)	Comments:
NA.	Decontamina	tion and equi	oment blanks were not required. All	sampling equipment was disposable
			mples are affected?	Comments:
INA.	Decomanina	mon and equi	Sment blanks were not required. An	sampling equipment was disposable.
	iii. Data qu	ality or usabil	ity affected? (Please explain.)	Comments:
NA.	Decontamina	tion and equip	oment blanks were not required. All	sampling equipment was disposable.
ther I	Data Flags/Qu	ualifiers (ACC	DE, AFCEE, Lab Specific, etc.)	
	Data Flags/Qu Defined and	,	PE, AFCEE, Lab Specific, etc.)	
		,	OE, AFCEE, Lab Specific, etc.) (NA (Please explain)	Comments:

Laboratory Data Review Checklist

ompleted by:	Melissa Pike	·			
tle:	Project Chemis	t		Date:	Nov 9, 2015
S Report Name:	Quarterly Drink September 2015 Chugiak, Alask	5	Sampling Report July - n 105081	Report Date:	November 2015
onsultant Firm:	ERM Alaska, Iı	nc.			
aboratory Name:	SGS North Am	erica, Inc.	Laboratory Report Nu	mber: 1155766	5
DEC File Number:	2106.26.004		ADEC RecKey Number	per:	
1. <u>Laboratory</u>					
a. Did an	ADEC CS appro	ved laboratory	receive and perform all or	f the submitted	sample analyses?
Yes	⊂ No	← NA (Ple	ase explain.)	Comments:	
		·	***		
	-		er "network" laboratory on the analyses ADEC CS see explain)		u to an alternate
NA. Samples w	ere not transferre	ed or subcontrac	cted to another network la	aboratory.	
2. Chain of Custody	(COC)				
•	,	ed, signed, and o	lated (including released	received by)?	
• Yes	← No	← NA (Plea	se explain)	Comments:	
b. Correct ar	nalyses requested	1?			
• Yes	← No	← NA (Ple	ase explain)	Comments:	
3. <u>Laboratory Samp</u>	le Receipt Docur	nentation			
a. Sample/co	oler temperature	documented ar	nd within range at receipt	$(4^{\circ} \pm 2^{\circ} \text{ C})$?	
• Yes	○ No	⊂ NA (Pl	ease explain)	Comments:	
Samples arrived	d at 1.6°C.				
ersion 2.7		rag	e I of 7		

← Yes	← No	○ NA (Please explain)	Comments:
c. Sample cor		nted - broken, leaking (Methanol),	zero headspace (VOC vials)?
• Yes	C No	○ NA (Please explain)	Comments:
Samples arrived	in good conditi	ion, unbroken and free of headspac	e.
			r example, incorrect sample containe insufficient or missing samples, etc.?
○ Yes	⊂ No	• NA (Please explain)	Comments:
A. There were r	o discrepancie	S.	
e. Data qualit	y or usability a	ffected? (Please explain)	
			Comments:
Data quality and	usability is not	affected with respect to the sample	e receipt documentation.
se Narrative			
	understandable	e?	
	understandable	e? NA (Please explain)	Comments:
a. Present and			Comments:
a. Present and • Yes	C No		Comments:
a. Present and • Yes	C No	○ NA (Please explain)	Comments:
a. Present and Yes b. Discrepanc	← No ies, errors or Q ← No	C failures identified by the lab?	
a. Present and Yes b. Discrepanc Yes NA. There were	← No ies, errors or Q ← No	C failures identified by the lab? NA (Please explain) NA (Please explain) es, errors or QC failures.	
a. Present and Yes b. Discrepanc Yes NA. There were	ies, errors or Q No no discrepancie	C failures identified by the lab? NA (Please explain) NA (Please explain) es, errors or QC failures.	
a. Present and Yes b. Discrepanc Yes NA. There were c. Were all co	ies, errors or Q No no discrepancie rrective actions No	C NA (Please explain) C failures identified by the lab? NA (Please explain) es, errors or QC failures. documented? NA (Please explain)	Comments:
a. Present and Yes b. Discrepanc Yes NA. There were c. Were all co Yes NA. There were	ies, errors or Q No no discrepancie rrective actions No no corrective ac	C NA (Please explain) C failures identified by the lab? NA (Please explain) es, errors or QC failures. s documented? NA (Please explain) ctions.	Comments:
a. Present and Yes b. Discrepanc Yes NA. There were c. Were all co Yes NA. There were	ies, errors or Q No no discrepancie rrective actions No no corrective ac	C NA (Please explain) C failures identified by the lab? NA (Please explain) es, errors or QC failures. documented? NA (Please explain)	Comments:

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€ Ye	s (` No	← NA (Please explain)	Comments:
b. All appl	licable h	olding time	es met?	
	s C	` No	← NA (Please explain)	Comments:
c. All soils	s reporte	d on a dry v	weight basis?	
← Ye	es (^ No		Comments:
A. There ar	e no soil	samples w	ithin this data set.	
d. Are the project?	reported	l PQLs less	than the Cleanup Level or the min	nimum required detection level for t
• Yes		` No	CNA (Please avaleia)	C
e. Data qu	***************************************		C NA (Please explain) fected? (Please explain)	Comments:
	ality or ı	usability aff		Comments:
Pata quality :	ality or ı	usability aff	fected? (Please explain)	Comments:
	ality or u	usability aff	fected? (Please explain)	Comments:
Oata quality and C Samples a. Method	ality or u and usab Blank	usability aff	fected? (Please explain)	Comments:
Oata quality a C Samples a. Method 1 i. One	ality or u and usab Blank	usability aff	fected? (Please explain) affected with respect to the reported per matrix, analysis and 20 sa	Comments:
Oata quality a C Samples a. Method 1 i. One	ality or usaband usab	usability aff	fected? (Please explain) affected with respect to the reported per matrix, analysis and 20 sa	Comments: ed sample results. amples?
Oata quality : C Samples a. Method 1 i. One	ality or u and usab Blank e method	usability aff	fected? (Please explain) affected with respect to the reported per matrix, analysis and 20 sa	Comments: ed sample results. amples?
Data quality : C Samples a. Method l i. One	ality or u and usab Blank e method	usability aff	fected? (Please explain) affected with respect to the reported per matrix, analysis and 20 sa	Comments: ed sample results. amples?
Data quality : C Samples a. Method l i. One	ality or u and usab Blank e method Yes	usability afficility is not a	fected? (Please explain) affected with respect to the reported per matrix, analysis and 20 satisfies a content of the content	Comments: ample results. Comments:

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iv. De	the af	fected samp	ble(s) have data flags? If so, are the	e data flags clearly defined?
\cap Y	es	∩ No	♠ NA (Please explain)	Comments:
IA. All the	results	were repor	ted as not detected at the limit of de	etection (LOD).
v. Da	ta quali	ty or usabil	ity affected? (Please explain)	Comments:
Data qualit	y and u	sability is n	ot affected with respect to the repo	orted method blank results.
		•		
b. Labora	itory Co	ontrol Samp	ole/Duplicate (LCS/LCSD)	
			CSD reported per matrix, analysis equired per SW846)	and 20 samples? (LCS/LCSD required
© Ye	es	⊂ No	○ NA (Please explain)	Comments:
ii. Me samp		organics - C	One LCS and one sample duplicate	reported per matrix, analysis and 20
	es	⊂ No	○ NA (Please explain)	Comments:
IA. There v	vere no	metal or in	organic analyses.	
projec	et speci	fied DQOs,	nt recoveries (%R) reported and w if applicable. (AK Petroleum meth 6-120%; all other analyses see the	
C Ye	es	• No	○ NA (Please explain)	Comments:
CS: 1,1-di	chloroe	thene; 1,2-c	libromo-3-chloropropane; carbon t	etrachloride; dichlorodifluoromethane;
	-Trichl	loroethane;	1,1-dichloroethene; 2,2- dichlorop lorofluoromethane.	ropane; carbon tetrachloride;
limits	? And p	project spec	ified DQOs, if applicable. RPD rep	ted and less than method or laboratory ported from LCS/LCSD, MS/DMSD, and all other analyses see the laboratory QC
€ Y€	es	⊂ No	○ NA (Please explain)	Comments:
v. If %	6R or R	LPD is outsi	de of acceptable limits, what samp	les are affected? Comments:
All samples	within	the data pac	ckage are potentially impacted.	

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• Yes	⊂ No	les(s) have data flags? If so, are the NA (Please explain)	Comments:
vii. Data	quality or usab	ility affected? (Please explain)	Comments:
		s not affected with respect to the LC ssociated samples. Data did not requ	S/LCSD results. All associated results uire qualification.
c. Surrogates	- Organics On	ly	
i. Are sur	ogate recoveri	es reported for organic analyses - fie	eld, QC and laboratory samples?
• Yes	⊂ No	○NA (Please explain)	Comments:
project sp	•	if applicable. (AK Petroleum metho	nin method or laboratory limits? And ods 50-150 %R; all other analyses see
• Yes	← No	○ NA (Please explain)	Comments:
•••		The Management of the second o	ed all second and an
iii. Do the	_	s with failed surrogate recoveries ha	ive data flags? If so, are the data flags
← Yes	⊂ No	• NA (Please explain)	Comments:
A. There were	no failed surro	ogate recoveries.	
iv. Data o	quality or usabi	lity affected? (Use the comment box	x to explain.). Comments:
Data quality an	d usability is n	ot affected with respect to the report	ed surrogate results.
Soil i. One tri		d per matrix, analysis and for each of	Chlorinated Solvents, etc.): Water and cooler containing volatile samples?
	⊂ No	○ NA (Please explain.)	Comments:
		ransport the trip blank and VOA san plaining why must be entered below	mples clearly indicated on the COC?
Yes	← No	← NA (Please explain.)	Comments:

	iii. All res	ults less than	PQL?	
	← Yes	€ No	○ NA (Please explain.)	Comments:
1ethy	lene chlori	de (0.000510	mg/L)	
	iv. If abov	e PQL, what	samples are affected?	
				Comments:
15-CS	SG-12-WG	and 15-CSG-	13-WG	
	v. Data qu	ality or usabi	lity affected? (Please explain.)	
				Comments:
			ot affected with respect to the repore limit of detection (LOD). No data	ted trip blank results. All associated required qualification.
	ield Duplic i. One field		bmitted per matrix, analysis and 10	project samples?
	• Yes	⊂ No	○ NA (Please explain)	Comments:
Prima	ary 15-CSC	6-12-WG with	duplicate 15-CSG-13-WG.	
	ii. Submit	ted blind to la	b?	
	• Yes	← No	← NA (Please explain.)	Comments:
			ve percent differences (RPD) less th 6 water, 50% soil)	an specified DQOs?
		1	RPD (%) = Absolute Value of: (R_{1-})	
	Where R	= Sample Co	oncentration	
	R_2	= Field Dupl	icate Concentration	
	← Yes	⊂ No	○ NA (Please explain)	Comments:
····		~ _	——————————————————————————————————————	
	iv. Data qu	ality or usabi	lity affected? (Use the comment box \(\cap \text{NA (Please explain)} \)	k to explain why or why not.) Comments:
Data c	quality and	usability is no	ot affected with respect to the report	ed field duplicate results.
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			NA (Please explain)	Comments:
NA. De	contamina	ation and equip	oment blanks were not required. All	sampling equipment was disposable
i.	All result	ts less than PQ	L?	
(Yes	C No	NA (Please explain)	Comments:
NA. De	contamina	tion and equip	oment blanks were not required. All	sampling equipment was disposable
			mples are affected?	Comments:
NA. De	contamina	ation and equip	oment blanks were not required. All	sampling equipment was disposable
			ity affected? (Please explain.)	Comments:
NA. De	contamina	tion and equip	oment blanks were not required. All	sampling equipment was disposable
		·	E, AFCEE, Lab Specific, etc.)	
	fined and Yes	appropriate?	○ NA (Please explain)	Comments:
Defined	l within th	e laboratory q	ualifier section of the laboratory rep	oort.

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1. QUALITY ASSURANCE REVIEW

Laboratory quality assurance/quality control (QA/QC) data associated with the analysis of project samples has been reviewed to evaluate the usability of the analytical data generated from drinking well water sampling in November 2015, December 2015 and January 2016 at 22179 Birchwood Loop Road, Chugiak, Alaska.

A completeness check and data review was performed by ERM Alaska, Inc. and completed by an ERM Project Chemist. The data and usability review was performed using the United States EPA National Functional Guidelines for Superfund Organic Methods Data Review (EPA 2008) as a reference for qualification. The Alaska Department of Environmental Conservation (ADEC) laboratory data checklists were completed for this project (ADEC 2010).

All data were reviewed in accordance with United States EPA National Functional Guidelines for Organic Methods (EPA 2008) and ADEC regulatory guidance documents (ADEC 2009; 2010; 2012). This data review focuses on criteria for QA/QC parameters and their effect on the quality of data and usability.

All results are considered usable for project objectives. Some results are considered estimated due to quality control criteria not being met. The completeness for this project is 100%. The details of this review and qualification of the data are summarized in the following sections.

1.1. Sample Handling and Chain of Custody

Samples were collected, reported, and shipped in general accordance with the sampling plan requirements. Sample analysis was performed by Alaska Department of Environmental Conservation (ADEC) certified laboratories for applicable analytical methods.

Drinking water samples were analyzed for Benzene, toluene, ethylbenzene, and xylenes (BTEX), EPA Method 524.2.

Samples were delivered to SGS North America, Inc. (SGS) in Anchorage, Alaska. Results were reported in 3 sample delivery groups (SDG).

November 2015 results were reported in SDG 1156817. December 2015 results were reported in SDG 1157036. January 2016 results were reported in SDG 1160332.

All sample coolers were shipped with custody seals intact. Chain of Custody (COC) forms, laboratory sample receipt forms, and case narratives were reviewed to evaluate the integrity of the samples and the quality of the associated data. All sample containers in the sample coolers were received at the laboratory intact and within the specified temperature range.

1.2. Holding Time Compliance

All samples were extracted, digested and analyzed within the holding time criteria for the applicable analytical methods and in accordance with work plan specifications.

1.3. Field QA/QC

Field QA/QC protocols are designed to measure for potential sample bias as a result of sampling procedures and possible contamination during collection and transport of samples. Collection and analysis of field duplicates facilitates an evaluation of precision that takes into account potential variables associated with sampling procedures, site heterogeneity and laboratory analyses. Trip blanks are used to monitor sample containers and possible cross-contamination of samples. During this sampling event, a trip blank and a field duplicate were submitted for analysis.

1.3.1. Trip Blanks

A trip blank was prepared by the laboratory, shipped to the site with the empty sample bottles/containers, stored with sample containers during the field event, and transported with the collected samples back to the laboratory for analysis.

A trip blank was placed in the cooler with associated matrix specific volatile organics samples (BTEX). The trip blanks were submitted for analysis and analytes detected in the trip blank were not detected (U) above the limit of detection (LOD) for all analytes.

1.3.2. Field Duplicates

There were 3 primary samples and 3 field duplicates submitted for analysis.

- November 2105: primary sample 15-CSG-14-WG with duplicate 15-CSG-15-WG.
- December 2015: primary sample 15-CSG-16-WG with duplicate 15-CSG-17-GW.
- January 2016: primary sample 15-CSG-18-WG with duplicate 15-CSG-19-GW.

When analytes were present in concentrations below the LOD in one or both samples, no valid comparison could be made. The primary sample and duplicate relative percent differences (RPDs) met ADEC applicable control limits of <30% between water samples. Overall, there was adequate comparability of field duplicate results to meet project data quality objectives with previously noted exceptions.

1.4. Laboratory QA/QC

1.4.1. Laboratory Blanks

Laboratory/ Method blanks were analyzed concurrent with an analytical batch of 20 or fewer primary samples for each of the analytical methods performed on project samples. Target analytes were not detected (ND) in any laboratory blanks.

1.4.2. Laboratory Control Samples

The laboratory monitors internal precision and accuracy for each analytical batch with a set of laboratory control samples (LCS/LCSD). A known quantity of target analytes are added to blank laboratory control samples prior to extraction and analysis and recoveries are calculated. Acceptable recovery criteria vary with each analytical method and matrix. All LCS/LCSD samples met laboratory and project QC goals for target analytes.

1.4.3. Surrogates

System Monitoring Compounds (Surrogates) are specified for organic chromatographic analytical procedures. Surrogates are compounds similar to target analytes and are added to each sample prior to collection or extraction. Subsequent surrogate recovery indicates overall method performance. Surrogate recoveries were within prescribed control limits for all primary samples, method blanks, LCS/LCSD and other QA/QC samples.

1.4.4. Detection Limits (Sensitivity)

Detection limits (DLs) met or were below established criteria specified for all analyses in the project sampling plan and detection limits were also below the ADEC established cleanup levels.

1.5. Precision and Accuracy

Precision criteria monitor analytical reproducibility. Accuracy criteria monitor agreement of measured results with "true values" established by spiking applicable samples with a known quantity of analyte or surrogate. Precision and accuracy were evaluated by comparing LCS/LCSDs and field duplicate pairs for this project. Field duplicates samples were collected in accordance with sampling plan specifications. Field duplicate RPDs met applicable control limits. Recoveries and RPDs for all LCS/LSCD samples were within required limits.

1.5.1. Completeness

Data completeness is defined as the percentage of usable data (usable data divided by the total possible data). The overall project completeness goal is 90%:

% completeness = <u>number of valid (i.e., non-R flagged) results</u>

number of possible results

All requested analyses were performed in accordance with Work Plan specifications. No sample results were rejected. Completeness for this project is 100%.

1.5.2. Representativeness

Data representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or environmental condition. The number and selection of samples were specified in the sampling plan and verified in the field to account accurately for site variations and sample matrices. The DQO for representativeness was met.

1.5.3. Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared to another. Data produced for this project followed applicable field sampling techniques and specific analytical methodology. The DQO for comparability was met.

1.6. Data Summary

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.

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2. REFERENCES

- ADEC. 2009. Technical Memorandum: Environmental Laboratory Data and Quality Assurance Requirements. March 2009.
- ADEC. 2010. Laboratory Data Review Checklist. January.
- ADEC. 2012. Technical Memorandum: Guidelines for Data Reporting, Data Reduction, and Treatment of Non-detect Values. June.
- EPA. 2008. Contract Laboratory Program National Functional Guidelines for Organic Data Review (EPA 540-R-08-01). June.

Laboratory Data Review Checklist

Completed by:	Melissa Pike				
Title:	Project Chemist			Date:	Feb 12, 2016
S Report Name:	Quarterly Drinki November 2015		Sampling Report	Report Date:	February 2016
Consultant Firm:	ERM Alaska, Ind	2.			
Laboratory Name:	SGS North Amer	rica, Inc.	Laboratory Report Nu	ımber: 1156817	
ADEC File Number:	2106.26.004		ADEC RecKey Num	ber:	· · · · · · · · · · · · · · · · · · ·
1. <u>Laboratory</u>					
a. Did an A	ADEC CS approv	ed laboratory r	eceive and <u>perform</u> all o	f the submitted	sample analyses?
	⊂ No	← NA (Plea	se explain.)	Comments:	
	-		r "network" laboratory og g the analyses ADEC CS		d to an alternate
← Yes	C No	• NA (Pleas	e explain)	Comments:	
Samples were n	ot transferred or s	subcontracted to	o another laboratory.		
2. Chain of Custody	(COC)				
a. COC infor	mation completed	l, signed, and d	ated (including released	received by)?	
	← No	← NA (Pleas	e explain)	Comments:	
b. Correct an	alyses requested?				
	← No	← NA (Plea	ase explain)	Comments:	
3. <u>Laboratory Sampl</u>	e Receipt Docum	entation			
a. Sample/co	oler temperature o	documented and	d within range at receipt	(4° ± 2° C)?	
	← No	○NA (Ple	ase explain)	Comments:	
Samples were re	eceived at 5.6°C.				

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← Yes	← No	○ NA (Please explain)	Comments:
			-
c. Sample con		nted - broken, leaking (Methanol),	zero headspace (VOC vials)?
• Yes	C No	○ NA (Please explain)	Comments:
Samples arrived volume.	in good condit	ion with zero headspace. Two GRC	D/BTEX sample vials contained limite
			r example, incorrect sample containers nsufficient or missing samples, etc.?
• Yes	⊂ No	← NA (Please explain)	Comments:
emaining sample	vials.	ontained limited volume. Enough s	sample volume was present in the
e. Data quanty	y or usability a	ffected? (Please explain)	Comments:
1.			
	1 '1', '		111
	usability is not	affected with respect to the reporte	ed laboratory sample reciept
nformation.	usability is not	affected with respect to the reporte	ed laboratory sample reciept
	usability is not	affected with respect to the reporte	ed laboratory sample reciept
nformation. se Narrative	usability is not		ed laboratory sample reciept
nformation. se Narrative			ed laboratory sample reciept Comments:
nformation. se Narrative a. Present and	understandable	e?	
nformation. se Narrative a. Present and Yes	understandable	e?	
nformation. se Narrative a. Present and Yes	understandable	e? ← NA (Please explain)	
nformation. se Narrative a. Present and Yes b. Discrepance Yes	understandable No ies, errors or Q	e? NA (Please explain) C failures identified by the lab?	Comments:
nformation. se Narrative a. Present and Yes b. Discrepance Yes	understandable No les, errors or Q No no discrepancie	e? C NA (Please explain) C failures identified by the lab? NA (Please explain) es, errors or QC failures.	Comments:
b. Discrepance Yes NA. There were a c. Were all con	understandable No ies, errors or Q No no discrepancie	C NA (Please explain) C failures identified by the lab? NA (Please explain) es, errors or QC failures.	Comments:
b. Discrepance C. Were all con	understandable No No ies, errors or Q No no discrepancie rrective actions No	e? C NA (Please explain) C failures identified by the lab? NA (Please explain) es, errors or QC failures. documented? NA (Please explain)	Comments:
b. Discrepance Yes NA. There were a c. Were all con	understandable No No ies, errors or Q No no discrepancie rrective actions No	e? C NA (Please explain) C failures identified by the lab? NA (Please explain) es, errors or QC failures. documented? NA (Please explain)	Comments:
b. Discrepance C. Were all concepts Yes	understandable No No No No no discrepancie rrective actions No no corrective ac	e? C NA (Please explain) C failures identified by the lab? NA (Please explain) es, errors or QC failures. documented? NA (Please explain)	Comments: Comments:

• Yes	∩ No	○ NA (Please explain)	Comments:
b. All applical	ble holding time	es met?	
• Yes	← No	○ NA (Please explain)	Comments:
c. All soils rep	ported on a dry	weight basis?	
← Yes	⊂ No	NA (Please explain)	Comments:
NA. There are no	soil samples w	rithin this data package.	
d. Are the rep project?	orted PQLs less	than the Cleanup Level or the mir	nimum required detection level for the
• Yes	○ No	○ NA (Please explain)	Comments:
		fected? (Please explain)	Comments:
Data quality and C Samples	usability are no	fected? (Please explain) It affected with respect to the repor	
Data quality and C Samples a. Method Blar	usability are no	t affected with respect to the repor	ted sample results.
Data quality and C Samples a. Method Blar	usability are no	orted per matrix, analysis and 20 sa	ted sample results.
Data quality and C Samples a. Method Blan i. One me	usability are no	orted per matrix, analysis and 20 sa	ted sample results.
Data quality and C Samples a. Method Blan i. One me	usability are no	orted per matrix, analysis and 20 so NA (Please explain)	ted sample results.
Data quality and C Samples a. Method Blar i. One me	usability are no	orted per matrix, analysis and 20 so NA (Please explain)	ted sample results. amples? Comments:

• Yes	∩ No	○ NA (Please explain)	Comments:
v. Data qı	uality or usabil	lity affected? (Please explain)	Comments:
ata quality an	d usability is n	not affected with respect to the repor	rted method blank results.
b. Laboratory	Control Samp	ole/Duplicate (LCS/LCSD)	
		CCSD reported per matrix, analysis equired per SW846)	and 20 samples? (LCS/LCSD required
• Yes	○ No	○ NA (Please explain)	Comments:
samples? C Yes A. There were	○ No	NA (Please explain)	
	ecified DQOs,	, if applicable. (AK Petroleum meth	thin method or laboratory limits? And ods: AK101 60%-120%, AK102
	/ ATZ100 /00	/ 1000/ 11 41 1 41 1	1 / 00
	%, AK103 60%	%-120%; all other analyses see the la	aboratory QC pages) Comments:
75%-125% • Yes iv. Precisi limits? Ar	On - All relative	NA (Please explain) ve percent differences (RPD) reporte	Comments: ed and less than method or laboratory orted from LCS/LCSD, MS/DMSD, and
iv. Precisi limits? Ar or sample.	On - All relative	NA (Please explain) ve percent differences (RPD) reporte	Comments: ed and less than method or laboratory orted from LCS/LCSD, MS/DMSD, an
iv. Precisi limits? Ar or sample, pages) • Yes	On - All relative on - All relative of project spectors of the control of the con	NA (Please explain) we percent differences (RPD) reported by the properties of the	Comments: ed and less than method or laboratory orted from LCS/LCSD, MS/DMSD, and all other analyses see the laboratory QC Comments:

vi. Do the	affected samp	les(s) have data flags? If so, are the	data flags clearly defined?
← Yes	⊂ No	NA (Please explain)	Comments:
NA. All %R and	l RPD were w	ithin limits.	
vii. Data q	uality or usab	ility affected? (Please explain)	Comments:
Data quality and	d usability is n	ot affected	
G ,	0 ! 0 !	1	
•	- Organics Onl	•	old OC and laboratory comples?
• Yes	No No	es reported for organic analyses - fie NA (Please explain)	Comments:
		1 /	
project spe	•	if applicable. (AK Petroleum metho	hin method or laboratory limits? And ods 50-150 %R; all other analyses see
• Yes	C No	○ NA (Please explain)	Comments:
iii. Do the clearly de	_	s with failed surrogate recoveries ha	eve data flags? If so, are the data flags
← Yes	⊂ No	NA (Please explain)	Comments:
NA. There are no	o failed surrog	ate recoveries.	
iv. Data q	uality or usabi	lity affected? (Use the comment box	x to explain.). Comments:
Data quality and	l usability is no	ot affected with respect to the report	ted surrogate results.
<u>Soil</u> i. One trip		d per matrix, analysis and for each of	Chlorinated Solvents, etc.): Water and cooler containing volatile samples?
• Yes	C No	○ NA (Please explain.)	Comments:
		ransport the trip blank and VOA sand plaining why must be entered below	mples clearly indicated on the COC? v)
• Yes	⊂ No	← NA (Please explain.)	Comments:
		V A	

• Yes	← No	○ NA (Please explain.)	Comments:
iv. If abov	ve PQL, what	samples are affected?	
			Comments:
NA. All results v	vere below PC	QL.	
v. Data qu	ıality or usabil	lity affected? (Please explain.)	
			Comments:
Data quality and	usability is n	ot affected with respect to the report	ted trip blank results.
e. Field Duplic			
1. One field	1 duplicate sul	bmitted per matrix, analysis and 10 j	project samples?
• Yes	∩ No	○ NA (Please explain)	Comments:
Primary 15-CSC FD.	3-14-WG with	duplicate 15-CSG-15-WG; and pri	mary with duplicate 15-CSG-01-WG-
	ted blind to la	b?	
• Yes	⊂ No	○ NA (Please explain.)	Comments:
			
		ve percent differences (RPD) less th	nan specified DQOs?
(Recon		% water, 50% soil)	
	ŀ	RPD (%) = Absolute Value of: (R_{1-}) ((R_{1+})	
Where R	a = Sample Co	**	-,
R	₂ = Field Dupl	icate Concentration	
	⊂ No	○ NA (Please explain)	Comments:
• Yes			
€ Yes		· · · · · · · · · · · · · · · · · · ·	
	ality or usabi	lity affected? (Use the comment box	x to explain why or why not.)
	uality or usabi	lity affected? (Use the comment box	x to explain why or why not.) Comments:

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	← Yes	← No	NA (Please explain)	Comments:
NA. I	Decontamin	ation and equi	pment blanks were not required as a	ll sampling equipment was disposable
	i. All resul	ts less than PC	QL?	
	← Yes	⊂ No	• NA (Please explain)	Comments:
NA. E	Decontamin	ation and equi	pment blanks were not required as al	ll sampling equipment was disposable
	ii. If above	e PQL, what sa	amples are affected?	Comments:
NA. I	Decontamin	ation and equi	pment blanks were not required as al	ll sampling equipment was disposable
	iii. Data g	uality or usabil	lity affected? (Please explain.)	
			· · · · · · · · · · · · · · · · · · ·	Comments:
NA. E			· · · · · · · · · · · · · · · · · · ·	
	Decontamin	ation and equi	· · · · · · · · · · · · · · · · · · ·	
ther D	Decontamin ata Flags/Q	ation and equi	pment blanks were not required as a	
ther D	Decontamin ata Flags/Q	ation and equi	pment blanks were not required as a	
other D	Decontamin ata Flags/Q Defined and • Yes	ation and equinalifiers (ACC) appropriate? No	pment blanks were not required as a DE, AFCEE, Lab Specific, etc.)	ll sampling equipment was disposable Comments:
other D	Decontamin ata Flags/Q Defined and • Yes	ation and equinalifiers (ACC) appropriate? No	pment blanks were not required as a DE, AFCEE, Lab Specific, etc.) \(\cap \text{NA} \text{ (Please explain)} \)	ll sampling equipment was disposable Comments:

Laboratory Data Review Checklist

	Melissa Pike		, , , , <u>_</u> , <u>_</u> ,,,	
itle:	Project Chemist		Date:	Feb 12, 2016
S Report Name:	Quarterly Drinking Water November 2015 - January		Report Date:	February 2016
onsultant Firm:	ERM Alaska, Inc.			
aboratory Name:	SGS North America, Inc.	Laboratory Report N	umber: 1157036)
DEC File Number:	2106.26.004	ADEC RecKey Num	ber:	
1. <u>Laboratory</u>				
a. Did an	ADEC CS approved laborat	ory receive and perform all o	of the submitted	sample analyses?
• Yes		(Please explain.)	Comments:	•
laborato	ry, was the laboratory perfo	nother "network" laboratory or rming the analyses ADEC Co		u to an anemate
/ Vac	C No C NA (1	Placea avaloia)	Comments	
← Yes	· · · · · · · · · · · · · · · · · · ·	Please explain)	Comments:	
	○ No		Comments:	-
	not transferred or subcontrac		Comments:	-
Samples were r	not transferred or subcontrac			
Samples were r	(COC) mation completed, signed, a	ted to another laboratory.		
Samples were r 2. Chain of Custody a. COC inform	(COC) mation completed, signed, a	ted to another laboratory.	/received by)?	
Samples were reconstruction of Custody a. COC information (*Yes**)	(COC) mation completed, signed, a	ted to another laboratory.	/received by)?	
Samples were reconstruction of Custody a. COC information (*Yes**)	(COC) mation completed, signed, a No NA (I	ted to another laboratory.	/received by)?	
Samples were r 2. Chain of Custody a. COC inform Yes b. Correct ar	(COC) mation completed, signed, a No NA (I	ted to another laboratory. and dated (including released Please explain)	/received by)? Comments:	
Samples were r 2. Chain of Custody a. COC inform (a) Yes b. Correct ar (b) Yes	not transferred or subcontract (COC) rmation completed, signed, a (No) NA (I	ted to another laboratory. and dated (including released Please explain)	/received by)? Comments:	
Samples were r 2. Chain of Custody a. COC inform (a) Yes b. Correct ar (b) Yes 3. Laboratory Samples	mot transferred or subcontract (COC) mation completed, signed, a No NA (I	ted to another laboratory. and dated (including released Please explain) (Please explain)	/received by)? Comments: Comments:	
Samples were r 2. Chain of Custody a. COC inform (a) Yes b. Correct ar (b) Yes 3. Laboratory Samples	not transferred or subcontract (COC) mation completed, signed, a No NA (I	ted to another laboratory. and dated (including released Please explain)	/received by)? Comments: Comments:	
Samples were r 2. Chain of Custody a. COC inform (a) Yes b. Correct ar (b) Yes 3. Laboratory Sample a. Sample/co (c) Yes	not transferred or subcontract (COC) mation completed, signed, a No NA (I	ted to another laboratory. and dated (including released Please explain) (Please explain)	/received by)? Comments: Comments:	

• Yes	← No	○ NA (Please explain)	Comments:
c. Sample cond	dition documer	nted - broken, leaking (Methanol),	zero headspace (VOC vials)?
• Yes	∩ No	○ NA (Please explain)	Comments:
Samples arrived i	n good conditi	on with zero headspace. Two GRC	D/BTEX sample vials contained limite
	-	· · · · · · · · · · · · · · · · · · ·	r example, incorrect sample container nsufficient or missing samples, etc.?
• Yes	⊂ No	○NA (Please explain)	Comments:
wo GRO/BTEX maining sample	_	ontained limited volume. Enough s	ample volume was present in the
e. Data quality	or usability at	fected? (Please explain)	
			Comments:
Data quality and unformation.	usability is not	affected with respect to the reporte	ed laboratory sample reciept
inormation.		· · · · · · · · · · · · · · · · · · ·	
se Narrative			
	understandable	e?	
se Narrative	understandable	e? (*) NA (Please explain)	Comments:
se Narrative a. Present and Yes	← No	← NA (Please explain)	Comments:
se Narrative a. Present and Yes b. Discrepanci	C No	C NA (Please explain) C failures identified by the lab?	
se Narrative a. Present and Yes	← No	← NA (Please explain)	Comments:
se Narrative a. Present and Yes b. Discrepanci Yes	← No es, errors or Q ← No	C NA (Please explain) C failures identified by the lab?	
se Narrative a. Present and Yes b. Discrepanci Yes NA. There were 1	es, errors or Q No no discrepancie	C NA (Please explain) C failures identified by the lab? NA (Please explain) es, errors or QC failures.	
se Narrative a. Present and Yes b. Discrepanci Yes NA. There were 1	es, errors or Q No no discrepancie	C NA (Please explain) C failures identified by the lab? NA (Please explain) es, errors or QC failures.	
a. Present and (• Yes b. Discrepanci (Yes NA. There were 1	es, errors or Q No no discrepancie	C NA (Please explain) C failures identified by the lab? NA (Please explain) es, errors or QC failures. documented? NA (Please explain)	Comments:
se Narrative a. Present and Yes b. Discrepanci Yes NA. There were rec. Were all con	es, errors or Q No no discrepancie	C NA (Please explain) C failures identified by the lab? NA (Please explain) es, errors or QC failures. documented? NA (Please explain)	Comments:
se Narrative a. Present and Yes b. Discrepanci Yes NA. There were to Yes NA. There were to Yes	es, errors or Q No no discrepancie rective actions No no corrective a	C NA (Please explain) C failures identified by the lab? NA (Please explain) es, errors or QC failures. documented? NA (Please explain)	Comments:

• Yes	∩ No	○ NA (Please explain)	Comments:
b. All applica	ble holding tim	es met?	
• Yes	C No	○ NA (Please explain)	Comments:
c. All soils rej	ported on a dry	weight basis?	
← Yes	⊂ No	• NA (Please explain)	Comments:
. There are no	o soil samples v	vithin this data package.	
d. Are the rep project?	orted PQLs les	s than the Cleanup Level or the mini	mum required detection level for the
• Yes	⊂ No	○ NA (Please explain)	Comments:
	····	707.00	
e Data analits	v or usability at	ffected? (Please explain)	
c. Data quanty	y or usaomity ar	rected: (Trease explain)	Comments:
a quality and	usability are no	ot affected with respect to the reporte	ed sample results.
Samples . Method Blar	ık	orted per matrix, analysis and 20 sar	
Samples . Method Blar	nk ethod blank rep		
Samples . Method Blar i. One me	nk ethod blank rep	orted per matrix, analysis and 20 sar	nples?
Samples . Method Blar i. One me	nk ethod blank rep s (No	orted per matrix, analysis and 20 sar	nples?
Samples . Method Blar i. One me	nk ethod blank rep s No hod blank resul	orted per matrix, analysis and 20 sar	nples?
Samples Method Blar i. One me Ye ii. All met	nk ethod blank rep s No hod blank resul	orted per matrix, analysis and 20 sar	nples? Comments:

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• Yes	⊂ No	○ NA (Please explain)	Comments:
v. Data q	uality or usabil	lity affected? (Please explain)	Comments:
ata quality an	d usability is n	ot affected with respect to the repor	ted method blank results.
b. Laboratory	Control Sam	ole/Duplicate (LCS/LCSD)	
_		CCSD reported per matrix, analysis equired per SW846)	and 20 samples? (LCS/LCSD requir
• Yes	∩ No	○ NA (Please explain)	Comments:
samples?		• •	reported per matrix, analysis and 20
← Yes	⊂ No	• NA (Please explain)	Comments:
A. There were	no metal or in	norganic analyses within this data pa	ackage.
project sp	ecified DQOs	ent recoveries (%R) reported and wi , if applicable. (AK Petroleum meth %-120%; all other analyses see the l	
• Yes	○ No		Comments:
	ion - All relati	ve percent differences (RPD) report	ed and less than method or laborator
limits? A	nd project spec	cified DQOs, if applicable. RPD rep	orted from LCS/LCSD, MS/DMSD
limits? A or sample	nd project spec	cified DQOs, if applicable. RPD rep	orted from LCS/LCSD, MS/DMSD
limits? A or sample pages)	nd project spec e/sample duplic	cified DQOs, if applicable. RPD repcate. (AK Petroleum methods 20%;	oorted from LCS/LCSD, MS/DMSD all other analyses see the laboratory
limits? A or sample pages) • Yes	nd project spece/sample duplic	cified DQOs, if applicable. RPD repcate. (AK Petroleum methods 20%;	corted from LCS/LCSD, MS/DMSD all other analyses see the laboratory Comments:

	vi. Do the	affected samp	oles(s) have data flags? If so, are the	e data flags clearly defined?
	← Yes	∩ No	• NA (Please explain)	Comments:
NA.	All %R and	l RPD were w	vithin limits.	
	vii. Data q	uality or usab	oility affected? (Please explain)	Comments:
Data	quality and	l usability is r	not affected	
c. S	Surrogates -	Organics On	ly	
	i. Are surro	gate recoveri	es reported for organic analyses - fi	eld, QC and laboratory samples?
	• Yes	← No	CNA (Please explain)	Comments:
	project spe		, if applicable. (AK Petroleum meth	hin method or laboratory limits? And ods 50-150 %R; all other analyses see
	• Yes	○ No	○ NA (Please explain)	Comments:
	iii. Do the clearly def		s with failed surrogate recoveries ha	ave data flags? If so, are the data flags
	← Yes	C No	NA (Please explain)	Comments:
NA. T	here are no	failed surrog	ate recoveries.	
	iv. Data qu	ality or usabi	lity affected? (Use the comment bo	x to explain.). Comments:
Data c	uality and	usability is no	ot affected with respect to the report	
<u>Soi</u>	<u>l</u> i. One trip		d per matrix, analysis and for each of	Chlorinated Solvents, etc.): Water and cooler containing volatile samples?
(Yes	⊂ No	○ NA (Please explain.)	Comments:
·-			ransport the trip blank and VOA sar	mples clearly indicated on the COC?
	• Yes	⊂ No	○ NA (Please explain.)	Comments:
(- +		•	Comments:

	∩ No	○ NA (Please explain.)	Comments:
iv. If abo	ve PQL, what	samples are affected?	
			Comments:
. All results	were below PC	QL.	
v. Data q	uality or usabil	lity affected? (Please explain.)	
			Comments:
ta quality an	d usability is n	ot affected with respect to the repor	ted trip blank results.
Field Dupli	cate		
i. One fie	ld duplicate sul	bmitted per matrix, analysis and 10	project samples?
• Yes	C No	○ NA (Please explain)	Comments:
mary 15-CS	G-16-WG with	duplicate 15-CSG-17-WG.	
ii. Submi	tted blind to la	b?	
• Yes	← No	○ NA (Please explain.)	Comments:
• Yes	C No		Comments:
• Yes	€ No	← NA (Please explain.)	Comments:
iii. Precis	sion - All relati	ve percent differences (RPD) less th	
iii. Precis	sion - All relati		
iii. Precis	sion - All relati mmended: 30%	ve percent differences (RPD) less the water, 50% soil) RPD (%) = Absolute Value of: (R ₁ -	nan specified DQOs?
iii. Precis (Reco	sion - All relati mmended: 30%	ve percent differences (RPD) less the water, 50% soil) RPD (%) = Absolute Value of: (R ₁ - ((R ₁ + R	nan specified DQOs?
iii. Precis (Reco	sion - All relati mmended: 30% l R ₁ = Sample Co	ve percent differences (RPD) less the water, 50% soil) RPD (%) = Absolute Value of: (R ₁ - ((R ₁ + R	nan specified DQOs?
iii. Precis (Reco	sion - All relati mmended: 30% R ₁ = Sample Co R ₂ = Field Dup	ve percent differences (RPD) less the water, 50% soil) RPD (%) = Absolute Value of: (R ₁ - ((R ₁ + R)) concentration licate Concentration	nan specified DQOs? R ₂) x 100 ₂)/2)
iii. Precis (Reco	sion - All relati mmended: 30% l R ₁ = Sample Co	ve percent differences (RPD) less the water, 50% soil) RPD (%) = Absolute Value of: (R ₁ - ((R ₁ + R)))	nan specified DQOs?
iii. Precis (Reco	sion - All relati mmended: 30% R ₁ = Sample Co R ₂ = Field Dup	ve percent differences (RPD) less the water, 50% soil) RPD (%) = Absolute Value of: (R ₁ - ((R ₁ + R)) concentration licate Concentration	nan specified DQOs? R ₂) x 100 ₂)/2)
iii. Precis (Reco Where I	sion - All relati mmended: 30% R ₁ = Sample Co R ₂ = Field Dup	ve percent differences (RPD) less the water, 50% soil) RPD (%) = Absolute Value of: (R ₁ - ((R ₁ + R)) concentration licate Concentration	nan specified DQOs? R ₂) x 100 ₂)/2) Comments:

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oment was disposable
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ment was disposable.
3:

7.

Laboratory Data Review Checklist

Comp	leted by:	Melissa Pike				
l Fitle:		Project Chemis			Date:	Feb 12, 2016
CS Re	port Name:	Quarterly Drink November 2015	-	Sampling Report	Report Date:	February 2016
Consu	ltant Firm:	ERM Alaska, Iı	nc.			
abora	atory Name:	SGS North Am	erica, Inc.	Laboratory Report	Number: 1160332	2
ADEC	File Number:	2106.26.004		ADEC RecKey Nu	ımber:	
$ig _{1.~ ext{L}_{2}}$	<u>aboratory</u>					
	··············	ADEC CS appro	ved laboratory 1	receive and perform al	l of the submitted	l sample analyses?
_	• Yes	⊂ No	○ NA (Plea	ase explain.)	Comments:	
		-		er "network" laborator ng the analyses ADEC	•	ed to an alternate
	← Yes	← No	NA (Pleas	se explain)	Comments:	
Г	Samples were 1	not transferred or	subcontracted t	to another laboratory.		
2. <u>Cł</u>	nain of Custody	(COC)				
1	a. COC info	rmation complete	ed, signed, and o	dated (including releas	sed/received by)?	
		← No	○ NA (Plea	se explain)	Comments:	
, -		A			 .	
4	b. Correct as	nalyses requested				
	• Yes	○ No	← NA (Ple	ease explain)	Comments:	· · · · · · · · · · · · · · · · · · ·
3. <u>L</u> a		le Receipt Docu				
	a. Sample/co	ooler temperature	e documented ar	nd within range at rece		
	← Yes	No No ■ No	← NA (Pl	ease explain)	Comments:	
	Samples were	received at 0.8°C	. No data requir	red qualification due to	o temperature.	

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• Yes	← No	○ NA (Please explain)	Comments:
c. Sample cor	idition docume	nted - broken, leaking (Methanol),	zero headspace (VOC vials)?
• Yes	C No	○ NA (Please explain)	Comments:
Samples arrived	in good conditi	on with zero headspace.	
			r example, incorrect sample container nsufficient or missing samples, etc.?
← Yes	⊂ No	• NA (Please explain)	Comments:
A. There were n	o receiving dis	crepancies.	
e. Data quality	y or usability af	fected? (Please explain)	
			Comments:
Data quality and nformation.	usability is not	affected with respect to the reporte	ed laboratory sample reciept
se Narrative			,
	understandable	ŋ	
• Yes	○ No	○ NA (Please explain)	Comments:
		·····	
b. Discrepance	ies, errors or Qo	C failures identified by the lab?	
← Yes	⊂ No	• NA (Please explain)	Comments:
IA. There were	no discrepancie	s, errors or QC failures.	
c. Were all co	rrective actions	documented?	
← Yes		• NA (Please explain)	Comments:
IA. There were i	no corrective ac	tions.	
		19. (1.11)	
J W/L-4!- 4		iliaitty/licability according to the or	ise narrative?
d. What is the	effect on data of	quanty/usaomity according to me ca	Comments:

• Yes	○ No	○ NA (Please explain)	Comments:
		(TAT (I lease explain)	
b. All applica	able holding tim	es met?	
• Yes	← No	← NA (Please explain)	Comments:
c. All soils re	eported on a dry	weight basis?	1200
← Yes	C No	• NA (Please explain)	Comments:
NA. There are n	o soil samples v	within this data package.	
d. Are the reproject?	ported PQLs less	s than the Cleanup Level or the min	nimum required detection level for th
• Yes	∩ No	○ NA (Please explain)	Comments:
e. Data quali	ty or usability at	ffected? (Please explain)	Comments:
		ffected? (Please explain) ot affected with respect to the repor	
		•	
Data quality and	l usability are no	•	
Data quality and C Samples a. Method Bla	l usability are no	•	rted sample results.
Data quality and C Samples a. Method Bla	l usability are no	ot affected with respect to the report	rted sample results.
Data quality and C Samples a. Method Bla i. One m	l usability are no	ot affected with respect to the report	rted sample results.
Data quality and C Samples a. Method Bla i. One m	l usability are no	ot affected with respect to the report corted per matrix, analysis and 20 seconds (Please explain)	rted sample results.
Data quality and C Samples a. Method Bla i. One m Y	I usability are not the lethod blank repetition of the lethod blank results the lethod blank res	ot affected with respect to the report footed per matrix, analysis and 20 so NA (Please explain)	amples? Comments:
Data quality and C Samples a. Method Bla i. One m	I usability are not the lethod blank repetition of the lethod blank results the lethod blank res	ot affected with respect to the report corted per matrix, analysis and 20 seconds (Please explain)	rted sample results.
Data quality and C Samples a. Method Bla i. One m Y ii. All me	I usability are not the less of the less o	ot affected with respect to the report footed per matrix, analysis and 20 so NA (Please explain)	amples? Comments:

• Yes	← No	← NA (Please explain)	Comments:
v. Data q	uality or usabil	ity affected? (Please explain)	Comments:
ta quality ar	nd usability is n	ot affected with respect to the repo	rted method blank results.
. Laboratory	y Control Samp	ole/Duplicate (LCS/LCSD)	
		CSD reported per matrix, analysis equired per SW846)	and 20 samples? (LCS/LCSD required
• Yes	← No	← NA (Please explain)	Comments:
samples?			reported per matrix, analysis and 20
← Yes	∩ No	NA (Please explain)	Comments:
There were	no metal or in	organic analyses within this data pa	ackage.
	_	nt recoveries (%R) reported and wi if applicable. (AK Petroleum meth	ithin method or laboratory limits? And
		%-120%; all other analyses see the l	•
		• • • • • • • • • • • • • • • • • • • •	•
75%-125	%, AK103 60%	%-120%; all other analyses see the l	aboratory QC pages)
75%-125 • Yes iv. Precis limits? A	%, AK103 60% No No ion - All relative and project specens	%-120%; all other analyses see the l NA (Please explain) ve percent differences (RPD) report ified DQOs, if applicable. RPD rep	aboratory QC pages)
75%-125 • Yes iv. Precis limits? A or sample	%, AK103 60% No No ion - All relative and project specens	%-120%; all other analyses see the l NA (Please explain) ve percent differences (RPD) report ified DQOs, if applicable. RPD rep	aboratory QC pages) Comments: ed and less than method or laboratory ported from LCS/LCSD, MS/DMSD, an
iv. Precis limits? A or sample pages) • Yes	%, AK103 60% No No No No No No	%-120%; all other analyses see the l (NA (Please explain) //e percent differences (RPD) report ified DQOs, if applicable. RPD repate. (AK Petroleum methods 20%;	aboratory QC pages) Comments: ed and less than method or laboratory ported from LCS/LCSD, MS/DMSD, an all other analyses see the laboratory QC Comments:

Comments: S/LCSD results.
S/LCSD results.
and laboratory samples?
Comments:
hod or laboratory limits? And 150 %R; all other analyses se
Comments:
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Comments: lain.). Comments:
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lain.). Comments: ogate results.
lain.). Comments: ogate results. ted Solvents, etc.): Water and
lain.). Comments: ogate results. ted Solvents, etc.): Water and

(• Yes	← No	○ NA (Please explain.)	Comments:
i	v. If abov	e PQL, what	samples are affected?	1180-811
				Comments:
JA. All	results w	ere below PC	L.	
v.	Data qua	ality or usabil	ity affected? (Please explain.)	
				Comments:
Data qu	ality and	usability is n	ot affected with respect to the repo	rted trip blank results.
	d Duplica		mitted per matrix, analysis and 10) project complet?
1.	One neru	duplicate sui	omitted per matrix, analysis and 10	project samples?
(• Yes	∩ No	○ NA (Please explain)	Comments:
Primary	y 15-CSG	-18-WG with	duplicate 15-CSG-19-WG.	
ii	i. Submitt	ed blind to la	b?	
(Yes	○ No	○ NA (Please explain.)	Comments:
·····				the the same of th
•				
ii			we percent differences (RPD) less to water, 50% soil)	han specified DQOs?
		F	$APD(\%) = Absolute Value of: (R_1-$	- R ₂) x 100
	uz p	6 1 6	((R ₁₊ R	$(R_2)/2)$
	_	= Sample Co = Field Dupl	icate Concentration	
	_	•		
<i>(</i>	Yes	⊂ No	○ NA (Please explain)	Comments:
iv	. Data qu	ality or usabi	lity affected? (Use the comment bo	ox to explain why or why not.)
_	Yes	No No	○ NA (Please explain)	Comments:
)ata qu	ality and	usability is no	affected with respect to the field	duplicate results.
			Page 6 of 7	

	← Yes	⊂ No	NA (Please explain)	Comments:
NA.	. Decontamin	ation and equi	ipment blanks were not required as a	all sampling equipment was disposab
	i. All resul	ts less than PC	QL?	
	← Yes	⊂ No	NA (Please explain)	Comments:
NA.	. Decontamin	ation and equi	pment blanks were not required as a	all sampling equipment was disposab
	ii. If above	e PQL, what sa	amples are affected?	Comments:
				Comments.
NA.	. Decontamin	ation and equi	pment blanks were not required as a	all sampling equipment was disposab
	iii. Data qı	uality or usabi	lity affected? (Please explain.)	all sampling equipment was disposab Comments:
	iii. Data qı	uality or usabi	lity affected? (Please explain.)	all sampling equipment was disposab
NA.	iii. Data qı . Decontamin	uality or usabi	lity affected? (Please explain.)	all sampling equipment was disposab Comments:
NA.	iii. Data qı . Decontamin Data Flags/Q	uality or usabi	lity affected? (Please explain.) pment blanks were not required as a	all sampling equipment was disposab Comments:
NA.	iii. Data qı . Decontamin Data Flags/Q	uality or usabilation and equi	lity affected? (Please explain.) pment blanks were not required as a	all sampling equipment was disposab Comments:

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1. QUALITY ASSURANCE REVIEW

Laboratory quality assurance/quality control (QA/QC) data associated with the analysis of project samples has been reviewed to evaluate the usability of the analytical data generated from drinking well water sampling in February, March and April 2016 at 22179 Birchwood Loop Road, Chugiak, Alaska.

A completeness check and data review was performed by ERM Alaska, Inc. and completed by an ERM Project Chemist. The data and usability review was performed using the United States EPA National Functional Guidelines for Superfund Organic Methods Data Review (EPA 2008) and ADEC regulatory guidance documents (ADEC 2009; 2010; 2012) as a reference for qualification. The Alaska Department of Environmental Conservation (ADEC) laboratory data checklists were completed for this project (ADEC 2010).

All results are considered usable for project objectives. Some results are considered estimated due to quality control criteria not being met. The completeness for this project is 100%. The details of this review and qualification of the data are summarized in the following sections.

1.1. Sample Handling and Chain of Custody

Samples were collected, reported, and shipped in general accordance with the sampling plan requirements. Sample analysis was performed by Alaska Department of Environmental Conservation (ADEC) certified laboratories for applicable analytical methods.

Drinking water samples were analyzed for volatile organic compounds benzene, toluene, ethylbenzene, and xylenes (BTEX), EPA Method 524.2.

Samples were delivered to SGS North America, Inc. (SGS) in Anchorage, Alaska. Results were reported in three sample delivery groups (SDG).

February2016 results were reported in SDG 1160809.

March 2016 results were reported in SDG1161241.

April 2016 results were reported in SDG 1161870.

All sample coolers were shipped with custody seals intact. Chain of Custody (COC) forms, laboratory sample receipt forms, and case narratives were reviewed to evaluate the integrity of the samples and the quality of the associated data. All sample containers in the sample coolers were received at the laboratory intact and within the specified temperature range.

1.2. Holding Time Compliance

All samples were extracted, digested and analyzed within the holding time criteria for the applicable analytical methods and in accordance with work plan specifications.

1.3. Field QA/QC

Field QA/QC protocols are designed to measure for potential sample bias as a result of sampling procedures and possible contamination during collection and transport of samples. Collection and analysis of field duplicates facilitates an evaluation of precision that takes into account potential variables associated with sampling procedures, site heterogeneity and laboratory analyses. Trip blanks are used to monitor sample containers and possible cross-contamination of samples. During this sampling event, a trip blank and a field duplicate were submitted for analysis.

1.3.1. Trip Blanks

A trip blank was prepared by the laboratory, shipped to the site with the empty sample bottles/containers, stored with sample containers during the field event, and transported with the collected samples back to the laboratory for analysis.

A trip blank was placed in the cooler with associated matrix specific volatile organics samples (BTEX). The trip blanks were submitted for analysis and the target analytes (BTEX) were not detected in the trip blank above the limit of detection (LOD. In the trip blank associated with samples collected in March, chloromethane was detected above the detection limit (DL). The associated result for chloromethane in sample 16-CSG-26-GW was reported as estimated (J-B) and may be biased high due to contamination.

1.3.2. Field Duplicates

There were 3 primary samples and 3 field duplicates submitted for analysis.

- February 2016: primary sample 16-CSG-23-WG with duplicate 16-CSG-24-WG.
- March 2016: primary sample 16-CSG-25-WG with duplicate 16-CSG-26-GW.
- April2016: primary sample 16-CSG-27-WG with duplicate 16-CSG-28-GW.

When analytes were present in concentrations below the LOD in one or both samples, no valid comparison could be made. The primary sample and duplicate relative percent differences (RPD) met ADEC applicable control limits of <30% between water samples for all target compounds (BTEX). In the field duplicates collected in March, there was a high RPD for chloromethane results. The results for chloromethane in samples 16-CSG-25-WG and 16-CSG-26-GW were flagged J-D as estimated with a higher imprecision. Overall, there was adequate comparability of field duplicate results to meet project data quality objectives with previously noted exceptions.

1.4. Laboratory QA/QC

1.4.1. Laboratory Blanks

Laboratory/ Method blanks were analyzed concurrent with an analytical batch of 20 or fewer primary samples for each of the analytical methods performed on project samples. Target analytes were not detected (ND) in any laboratory blanks.

1.4.2. Laboratory Control Samples

The laboratory monitors internal precision and accuracy for each analytical batch with a set of laboratory control samples (LCS/LCSD). A known quantity of target analytes are added to blank laboratory control samples prior to extraction and analysis and recoveries are calculated. Acceptable recovery criteria vary with each analytical method and matrix. All LCS/LCSD samples met laboratory and project QC goals for target analytes.

1.4.3. Surrogates

System Monitoring Compounds (Surrogates) are specified for organic chromatographic analytical procedures. Surrogates are compounds similar to target analytes and are added to each sample prior to collection or extraction. Subsequent surrogate recovery indicates overall method performance. Surrogate recoveries were within prescribed control limits for all primary samples, method blanks, LCS/LCSD and other QA/QC samples.

1.5. Detection Limits (Sensitivity)

Detection limits (DLs) met or were below established criteria specified for all analyses in the project sampling plan and detection limits were also below the ADEC established cleanup levels.

1.6. Precision and Accuracy

Precision criteria monitor analytical reproducibility. Accuracy criteria monitor agreement of measured results with "true values" established by spiking applicable samples with a known quantity of analyte or surrogate. Precision and accuracy were evaluated by comparing LCS/LCSDs and field duplicate pairs for this project. Field duplicates samples were collected in accordance with sampling plan specifications. Field duplicate RPDs met applicable control limits for target compounds (BTEX). Recoveries and RPDs for all LCS/LSCD samples were within required limits.

1.7. Completeness

Data completeness is defined as the percentage of usable data (usable data divided by the total possible data). The overall project completeness goal is 90%:

% completeness = <u>number of valid (i.e., non-R flagged) results</u>

number of possible results

All requested analyses were performed in accordance with Work Plan specifications. No sample results were rejected. Completeness for this project is 100%.

1.8. Representativeness

Data representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or environmental condition. The number and selection of samples were specified in the sampling plan and verified in the field to account accurately for site variations and sample matrices. The DQO for representativeness was met.

1.9. Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared to another. Data produced for this project followed applicable field sampling techniques and specific analytical methodology. The DQO for comparability was met.

1.10. Data Summary

In general, the overall quality of the data was 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.

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2. REFERENCES

- ADEC. 2009. Technical Memorandum: Environmental Laboratory Data and Quality Assurance Requirements. March 2009.
- ADEC. 2010. Laboratory Data Review Checklist. January.
- ADEC. 2012. Technical Memorandum: Guidelines for Data Reporting, Data Reduction, and Treatment of Non-detect Values. June.
- EPA. 2008. Contract Laboratory Program National Functional Guidelines for Organic Data Review (EPA 540-R-08-01). June.

Laboratory Data Review Checklist

Comp	leted by:	Elsie King				
Title:		Project Chemis	st		Date:	May 10, 2016
S Re	port Name:	Circle S Drink	ing Water Report		Report Date:	May 10, 2016
Consu	ltant Firm:	ERM Alaska, l	nc.			
Labora	ntory Name:	SGS North An	nerica, Inc.	Laboratory Rep	oort Number: 1161870	
DEC	File Number:	principle of the second of the		ADEC RecKey	Number:	
1. <u>L</u> :	<u>aboratory</u>					
	a. Did an	ADEC CS appro	oved laboratory r	eceive and perform	n all of the submitted	sample analyses?
Λ,	• Yes	⊂ No	○ NA (Plea	nse explain.)	Comments:	
				 		
a R		_			atory or sub-contracted EC CS approved?	d to an alternate
	← Yes	○ No	NA (Pleas	se explain)	Comments:	
	Samples were r	not transferred to	another laborate	ory or subcontract	ed to an alternate labo	ratory.
2. <u>Ch</u>	ain of Custody	(COC)				
-	a. COC info	rmation complet	ted, signed, and d	lated (including re	leased/received by)?	
,	• Yes	∩ No	← NA (Pleas	se explain)	Comments:	
	b. Correct ar	nalyses requeste	d?			
	• Yes	∩ No	← NA (Ple	ase explain)	Comments:	
				m_vn		
3. <u>La</u>	boratory Samp	le Receipt Docu	mentation			
Ą	a. Sample/co	ooler temperatur	e documented an	d within range at	receipt $(4^{\circ} \pm 2^{\circ} C)$?	
1	← Yes	♠ No	⊂ NA (Ple	ease explain)	Comments:	
~ [Samples were i	received chilled,	within 1 hour of	sample collection	1.	

	Yes	← No	← NA (Please explain)	Comments:
- C	11	·	and had a last a Old a D	1 1 (1/00 11)
c. Samp		O No	nted - broken, leaking (Methanol), NA (Please explain)	Comments:
Samples ar	rived in §	good condition	on.	
		•	The state of the s	r example, incorrect sample contain insufficient or missing samples, etc.
C	Yes	⊂ No	NA (Please explain)	Comments:
A. There v	were no d	liscrepancies	S	
e. Data o	quality or	r usability af	fected? (Please explain)	
		•	• •	Comments:
Data qualit	v and usa	ability is not	affected with respect to the sample	e receipt condition
	y and asc	aumity is mot	arrected with respect to the sample	e receipt condition.
	y and asc	aomity is not	arrected with respect to the sample	e receipt condition.
se Narrativ	<u> </u>	ionity is not	arrected with respect to the sample	c receipt condition.
	/ <u>e</u>	derstandable		e receipt condition.
	<u>/e</u> nt and un	•		Comments:
a. Preser	<u>/e</u> nt and un	derstandable	??	
a. Preser	<u>/e</u> nt and un Yes	derstandable	? NA (Please explain)	
a. Preser	ve nt and une Yes epancies,	derstandable No errors or Q0	NA (Please explain) C failures identified by the lab?	Comments:
a. Preser	/e nt and une Yes epancies,	derstandable No errors or Qo	C failures identified by the lab? NA (Please explain)	
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a. Presert b. Discre NA. There c. Were C. Y	re and unergrees. Yes were no ell correctes were no ell correctes	derstandable No errors or Qo No discrepancie ctive actions No corrective ac	C NA (Please explain) C failures identified by the lab? NA (Please explain) s, errors or QC failures. documented? NA (Please explain)	Comments: Comments:

	• Yes	○ No	← NA (Please explain)	Comments:
L b.	All applicat	ole holding tin	nes met?	
	• Yes	○ No		Comments:
c.	All soils rep	oorted on a dry	weight basis?	
	← Yes	C No	• NA (Please explain)	Comments:
There	e are no soil	samples in thi	is data set.	
	Are the repo	orted PQLs les	ss than the Cleanup Level or the mir	nimum required detection level for
	• Yes	∩ No	○ NA (Please explain)	Comments:
	Data quality	, or weakility	offeeted? (Please explain)	
<u> </u>			affected? (Please explain)	Comments:
<u> </u>			affected? (Please explain) affected with respect to the reported	
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Data QC Sa	quality or usumples Method Blar	sability is not		sample results.
Data QC Sa	quality or usumples Method Blar	sability is not nk ethod blank re	affected with respect to the reported	sample results.
Data QC Sa	quality or use the second seco	sability is not	affected with respect to the reported	amples?
Data QC Sa	quality or unamples Method Blar i. One me	sability is not nk ethod blank report s	affected with respect to the reported ported per matrix, analysis and 20 satisfies a control of NA (Please explain)	amples? Comments:
Data QC Sa	quality or understanding amples Method Blanding i. One me	sability is not nk ethod blank report s	affected with respect to the reported ported per matrix, analysis and 20 satisfies a control of NA (Please explain)	amples?

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v. Data quality or usable. Data quality and usability is b. Laboratory Control Samilianii. Organics - One LCS/per AK methods, LCS Yes No NA. There were no metal or in iii. Accuracy - All percoproject specified DQOs 75%-125%, AK103 60 Yes No iv. Precision - All relationits? And project specified project specified DQOs 75%-125%, AK103 60	lity affected? (Please explain) not affected with respect to the repo	Comments: Comments: orted method blank results. s and 20 samples? (LCS/LCSD required
b. Laboratory Control Sam i. Organics - One LCS/ per AK methods, LCS ii. Metals/Inorganics - samples? Yes No NA. There were no metal or i iii. Accuracy - All perc project specified DQOs 75%-125%, AK103 60 Yes No iv. Precision - All relati limits? And project spe or sample/sample dupli pages)	lity affected? (Please explain) not affected with respect to the reported per matrix, analysis required per SW846)	orted method blank results.
b. Laboratory Control Sam i. Organics - One LCS/ per AK methods, LCS ii. Metals/Inorganics - samples? Yes No IA. There were no metal or i iii. Accuracy - All perc project specified DQOs 75%-125%, AK103 60 Yes No iv. Precision - All relatilimits? And project spec or sample/sample dupli pages)	ple/Duplicate (LCS/LCSD) LCSD reported per matrix, analysis required per SW846)	orted method blank results.
b. Laboratory Control Sam i. Organics - One LCS/ per AK methods, LCS ii. Metals/Inorganics - samples? Yes No NA. There were no metal or i iii. Accuracy - All perc project specified DQOs 75%-125%, AK103 60 Yes No iv. Precision - All relati limits? And project spe or sample/sample dupli pages)	ple/Duplicate (LCS/LCSD) LCSD reported per matrix, analysis required per SW846)	orted method blank results.
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ii. Metals/Inorganics - samples? Yes No NA. There were no metal or i iii. Accuracy - All perc project specified DQOs 75%-125%, AK103 60 Yes No iv. Precision - All relati limits? And project spe or sample/sample dupli pages)	required per SW846)	s and 20 samples? (LCS/LCSD required
ii. Metals/Inorganics - samples? Yes No NA. There were no metal or i iii. Accuracy - All perc project specified DQOs 75%-125%, AK103 60 Yes No iv. Precision - All relati limits? And project spe or sample/sample dupli pages)		
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samples? Yes No NA. There were no metal or i iii. Accuracy - All perc project specified DQOs 75%-125%, AK103 60 Yes No iv. Precision - All relate limits? And project specified or sample/sample duplications.		
iv. Precision - All relatilimits? And project spe or sample/sample dupli pages)	ent recoveries (%R) reported and w	vithin method or laboratory limits? And
iv. Precision - All relate limits? And project spet or sample/sample duplit pages)	%-120%; all other analyses see the	
limits? And project spe or sample/sample dupli pages)	○ NA (Please explain)	Comments:
limits? And project spe or sample/sample dupli pages)		1000
	cified DQOs, if applicable. RPD re	rted and less than method or laboratory ported from LCS/LCSD, MS/DMSD, and; all other analyses see the laboratory QC
	← NA (Please explain)	Comments:
v. If %R or RPD is out:		oles are affected? Comments:
NA. All %R and RPDs were	side of acceptable limits, what samp	

vi. Do the	affected samp	oles(s) have data flags? If so, are the	data flags clearly defined?
← Yes	⊂ No	NA (Please explain)	Comments:
NA. All %R and	d RPDs were v	within acceptable limits.	
vii. Data q	uality or usab	ility affected? (Please explain)	Comments:
Data quality and	d usability is r	not affected with respect to the repor	rted LCS/LCSD results.
c. Surrogates	•	•	
	_	es reported for organic analyses - fic	eld, QC and laboratory samples?
• Yes	C No	CNA (Please explain)	Comments:
-			
project spe	•	, if applicable. (AK Petroleum metho	hin method or laboratory limits? And ods 50-150 %R; all other analyses see
Yes	○ No	○ NA (Please explain)	Comments:
iii. Do the	_	s with failed surrogate recoveries ha	ave data flags? If so, are the data flags
← Yes	C No	• NA (Please explain)	Comments:
A. There were	no failed surr	ogate recoveries.	
iv. Data q	uality or usabi	ility affected? (Use the comment box	x to explain.). Comments:
121. 111. 111.			
Soil 1		alyses only (GRO, BTEX, Volatile C	Chlorinated Solvents, etc.): Water and cooler containing volatile samples?
-	ter explanatio		8
• Yes	⊂ No	○ NA (Please explain.)	Comments:
		transport the trip blank and VOA sar aplaining why must be entered below	mples clearly indicated on the COC?
• Yes	○ No	○ NA (Please explain.)	Comments:

● Y	es	⊂ No	C NA (Please explain.)	Comments:
iv. If	above	e PQL, what	samples are affected?	
			•	Comments:
NA. All trip	blank	c results were	e less than PQL.	
v Da	ta aus	ality or usabi	lity affected? (Please explain.)	
v. Bu	ia qua	inty of disabi	my affected: (1 lease explain.)	Comments:
Data quality	and 1	usability is n	ot affected with respect to the repor	
e. Field D	uplica	te		
	_		bmitted per matrix, analysis and 10	project samples?
⊚ Y	a c	⊂ No	○ NA (Please explain)	Comments:
		and 16-CSG		Comments.
ii. Su	bmitte	ed blind to la	b?	
€ Y	es	⊂ No	○ NA (Please explain.)	Comments:
iii. Pr	ecisio	n - All relati	ve percent differences (RPD) less th	nan specified DQOs?
(R	ecomi	mended: 30%	6 water, 50% soil)	
		F	RPD (%) = Absolute Value of: (R_{1-})	
Whe	re R ₁	= Sample Co		2)/2)
	R ₂ =	= Field Dupl	icate Concentration	
(● Ye	. c	○ No	C NA (Planca ayrdain)	Comments
(- 1 €	.s 	. 110	○ NA (Please explain)	Comments:
		,, <u>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>		
			lity affected? (Use the comment box	
		No	○ NA (Please explain)	Comments:
iv. Da			· · · · · · · · · · · · · · · · · · ·	

← Yes	nation or Equip	ment Blank (if applicable)		
(Yes	(100	• NA (Please explain)	Comments:	
NA. Decontami	nation or equip	ment blanks were not required.		
i. All resu	ılts less than PÇ	L?		
← Yes	C No	• NA (Please explain)	Comments:	
NA. Decontamin	nation or equipr	nent blanks were not required.		
ii. If abov	e PQL, what sa	mples are affected?	Comments:	
NA. Decontamin	nation or equipr	nent blanks were not required.		
iii. Data c	quality or usabil	ity affected? (Please explain.)	Comments:	
NA Decontami	nation or equipr	nent blanks were not required.		
1171. Decomann				
	Qualifiers (ACC	DE, AFCEE, Lab Specific, etc.)		
ther Data Flags/0	Qualifiers (ACC	DE, AFCEE, Lab Specific, etc.)		
ther Data Flags/0		OE, AFCEE, Lab Specific, etc.) (**NA (Please explain)	Comments:	

Laboratory Data Review Checklist

Completed by:	Elsie King				
Title:	Project Chemist			Date:	May 9, 2016
CS Report Name:	Circle S Drinkin	g Water Report		Report Date:	May 9, 2016
Consultant Firm:	ERM Alaska, Ind	c.			
Laboratory Name:	SGS North Ame	rica, Inc.	aboratory Report Nu	mber: 1161241	
ADEC File Number:		Α	DEC RecKey Numb	per:	
1. <u>Laboratory</u>					
·	ADEC CS approv	ed laboratory recei	ve and <u>perform</u> all of	f the submitted	sample analyses?
• Yes		○ NA (Please e		Comments:	1
			etwork" laboratory o e analyses ADEC CS		d to an alternate
← Yes	⊂ No	NA (Please ex	plain)	Comments:	
Samples were n	ot transferred to a	nother laboratory o	or subcontracted to an	n alternate labo	ratory.
2. Chain of Custody	(COC)				
a. COC infor	mation completed	l, signed, and dated	(including released/	received by)?	
← Yes	○ No	← NA (Please ex	plain)	Comments:	
			,		
	alyses requested?			C	
← Yes	← No	← NA (Please e	xplaın) ——————	Comments:	
3. Laboratory Sampl	e Receipt Docume	entation	<u>.</u>	·····	
			thin range at receipt ((4° + 2° C)2	
C Yes	• No	○ NA (Please e	-	Comments:	
Samples were re		(* *******			

(•	Yes	∩ No	○ NA (Please explain)	Comments:
a	1 12.5			
•		on docume No	nted - broken, leaking (Methanol), NA (Please explain)	,
(●	Yes (NO	(NA (Flease explain)	Comments:
Samples a	rrived in g	ood conditi	on within 8 hours of collection.	
			<u>-</u>	r example, incorrect sample contain nsufficient or missing samples, etc.
\subset	Yes	^ No	NA (Please explain)	Comments:
IA. There	were no di	screpancie	S.	
e Doto	quality or	ucability of	ffected? (Please explain)	
c. Data	quanty of	usaviiity ai	reced: (1 lease explain)	Comments:
				CARBUIGIUS
Doto anali	ty and use	hility is not	affacted with respect to the sample	
Data quali	ty and usa	bility is not	affected with respect to the sample	
•	•	bility is not	affected with respect to the sample	
se Narrati	ve		•	
se <u>Narrati</u> a. Prese	ve ent and und	lerstandable	e?	e receipt condition.
se <u>Narrati</u> a. Prese	ve ent and und		•	
se <u>Narrati</u> a. Prese	ve ent and und	lerstandable	e?	e receipt condition.
a. Prese	ve ent and und Yes	lerstandable	e?	e receipt condition.
a. Prese	ve ent and und Yes	lerstandable	e? (**) NA (Please explain)	e receipt condition.
a. Prese b. Discr	ve ent and und Yes repancies, Yes	errors or Q	e? (**NA (Please explain) (**C failures identified by the lab? (**NA (Please explain)	c receipt condition. Comments:
a. Prese b. Discr	ve ent and und Yes repancies, Yes	errors or Q	e? (**NA (Please explain) (**C failures identified by the lab?	c receipt condition. Comments:
b. Disco	yes (repancies, Yes (were no c	errors or Q	e? (**NA (Please explain) (**C failures identified by the lab? (**NA (Please explain)	c receipt condition. Comments:
b. Disco	yes (repancies, Yes (were no c	errors or Q	e? (**) (*	c receipt condition. Comments:
b. Disco	yes repancies, Yes e were no ce all correct Yes	errors or Q No liscrepancionstive actions	e? (**) NA (Please explain) (**) C failures identified by the lab? (**) NA (Please explain) es, errors or QC failures. s documented? (**) NA (Please explain)	Comments:
b. Disco	yes repancies, Yes e were no ce all correct Yes	errors or Q No liscrepancie tive actions	e? (**) NA (Please explain) (**) C failures identified by the lab? (**) NA (Please explain) es, errors or QC failures. s documented? (**) NA (Please explain)	Comments:
b. Disco	repancies, Yes e were no ce all correct Yes were no ce were no ce	errors or Q No liscrepancions No corrective a	e? (**) NA (Please explain) (**) C failures identified by the lab? (**) NA (Please explain) es, errors or QC failures. s documented? (**) NA (Please explain)	Comments: Comments:

• Yes	⊂ No	○ NA (Please explain)	Comments:
	t specify BTEX only		ave been reported. For this project, the
b. All applica	ble holding times	s met?	
• Yes	← No	○ NA (Please explain)	Comments:
c. All soils re	ported on a dry w	veight basis?	
← Yes	⊂ No	NA (Please explain)	Comments:
 Γhere are no soil	samples in this	data set.	-
d. Are the rep	orted PQLs less	than the Cleanup Level or the min	imum required detection level for the
• Yes	⊂ No	○ NA (Please explain)	Comments:
7.7.7			
- 19 (F. F 10 ft 10			
e. Data qualit	y or usability affe	ected? (Please explain)	Comments:
		ected? (Please explain) ected with respect to the reported	
Data quality or u C Samples a. Method Blan	sability is not aff		sample results.
Data quality or u C Samples a. Method Blan	sability is not aff	ected with respect to the reported	sample results.
Data quality or u C Samples a. Method Blan i. One me	sability is not aff hk ethod blank report No hod blank results	rected with respect to the reported reted per matrix, analysis and 20 sa	sample results. mples?

	⊂ No		Comments:
NA. All method	blank results	were below PQL.	
v. Data qu	ality or usabil	ity affected? (Please explain)	Comments:
Data quality and	l usability is n	ot affected with respect to the report	rted method blank results.
b. Laboratory	Control Samp	ole/Duplicate (LCS/LCSD)	
•		LCSD reported per matrix, analysis equired per SW846)	and 20 samples? (LCS/LCSD required
• Yes	○ No	○ NA (Please explain)	Comments:
ii. Metals/ samples?	Inorganics - C	One LCS and one sample duplicate i	reported per matrix, analysis and 20
← Yes	⊂ No	• NA (Please explain)	Comments:
NA. There were	no metal or ir	norganic analyses.	
project sp	ecified DQOs	ent recoveries (%R) reported and wi , if applicable. (AK Petroleum meth %-120%; all other analyses see the l	
• Yes	⊂ No	○ NA (Please explain)	Comments:
limits? Ar	nd project spec	cified DQOs, if applicable. RPD rep	ted and less than method or laboratory ported from LCS/LCSD, MS/DMSD, and all other analyses see the laboratory QC
• Yes	○ No	○ NA (Please explain)	Comments:
v. If %R o	or RPD is outs	side of acceptable limits, what samp	les are affected? Comments:
NA All %R and	l RPDs were v	within acceptable limits.	

← Yes		ples(s) have data flags? If so, are th	e data mago creamy dermica.
(IES	← No	NA (Please explain)	Comments:
A. All %R and	d RPDs were	within acceptable limits.	
vii. Data q	juality or usab	oility affected? (Please explain)	Comments:
Data quality and	d usability is r	not affected with respect to the repo	orted LCS/LCSD results.
c. Surrogates -	· ·	•	
		es reported for organic analyses - f	ield, QC and laboratory samples?
• Yes	⊂ No	○NA (Please explain)	Comments:
4			
project spe	cy - All percei ecified DQOs, tory report pag	if applicable. (AK Petroleum meth	thin method or laboratory limits? And nods 50-150 %R; all other analyses see
Yes	⊂ No	○ NA (Please explain)	Comments:
			and the state of t
;;; D = 41=	1 1	·	
clearly def	ined?		ave data flags? If so, are the data flags
		s with failed surrogate recoveries h NA (Please explain)	ave data flags? If so, are the data flags Comments:
clearly def	ined?		
clearly def Yes A. There were r	ined? No no failed surro	♠ NA (Please explain)	Comments:
clearly def Yes A. There were r	ined? No no failed surro	NA (Please explain)	Comments:
clearly def Yes A. There were 1	ined? No no failed surro	NA (Please explain)	Comments:
clearly def Yes A. There were r iv. Data qu d. Trip Blank - Soil	ined? No no failed surro nality or usabi Volatile anal	NA (Please explain) Ogate recoveries. lity affected? (Use the comment both	Comments: ox to explain.). Comments: Chlorinated Solvents, etc.): Water and
clearly def Yes A. There were r iv. Data qu d. Trip Blank - Soil i. One trip	ined? No no failed surro nality or usabi Volatile anal	NA (Please explain) ogate recoveries. lity affected? (Use the comment both both both both both both both bot	Comments: ox to explain.). Comments:
clearly def Yes A. There were r iv. Data qu d. Trip Blank - Soil i. One trip	ined? No No failed surro ality or usabi Volatile anal blank reported	NA (Please explain) ogate recoveries. lity affected? (Use the comment both both both both both both both bot	Comments: ox to explain.). Comments: Chlorinated Solvents, etc.): Water and
d. Trip Blank - Soil i. One trip (If not, ente	no failed surrousabite Volatile analytic er explanation No	NA (Please explain) Ogate recoveries. lity affected? (Use the comment both by the second of the comment both by the comment	Comments: Chlorinated Solvents, etc.): Water and cooler containing volatile samples? Comments:

m. m rese	lts less than P	QL?	
• Yes	∩ No	← NA (Please explain.)	Comments:
Chloromethane w	as detected be	elow the PQL, but above the DL. (0	.00022 J mg/L)
iv. If abov	e PQL, what	samples are affected?	
			Comments:
16-CSG-25-WG,	16-CSG-26-V	WG	
v. Data qu	ality or usabil	ity affected? (Please explain.)	
			Comments:
		5x the trip blank concentration (0.0 WG was reported as estimated (J-B)	0011 mg/L) may be biased high. The) and may be biased high due to
e. Field Duplica	ate		
i. One field	l duplicate sul	omitted per matrix, analysis and 10	project samples?
• Yes	← No	○ NA (Please explain)	Comments:
ii. Submit	ted blind to la	b?	Comments:
	116 000		Comments.
16-CSG-25-WG	and 16-CSG-	26-WG	
		ve percent differences (RPD) less the water, 50% soil)	han specified DQOs?
	I	RPD (%) = Absolute Value of: $(R_{1+} R)$. A 100
	1 = Sample Co		
\mathbf{R}_{j}	= Field Dupl	icate Concentration	
← Yes	No	○ NA (Please explain)	Comments:
	or chlorometh		

	iv. Data qu	ality or usabil	lity affected? (Use the comment box	to explain why or why not.)
	• Yes	○ No	○ NA (Please explain)	Comments:
16-CS	G-25 - WG a	and 16-CSG-2	are estimated and may be also be aff 26-WG were flagged J-D and have u ompound for this project.	fected by contamination. Results for incertain precision. However,
f. D	econtamina	tion or Equip	oment Blank (if applicable)	
	← Yes	⊂ No	NA (Please explain)	Comments:
NA. D	econtamina	tion or equip	ment blanks were not required.	
;	i. All result	s less than PC	QL?	
	○ Yes	⊂ No	• NA (Please explain)	Comments:
NA. De	econtamina	tion or equip	ment blanks were not required.	
	ii. If above	PQL, what sa	amples are affected?	Comments:
NA. De	econtamina	tion or equipi	ment blanks were not required.	
		*	lity affected? (Please explain.)	Comments:
NA. De	econtamina	tion or equip	ment blanks were not required.	
ther Da	ta Flags/Qu	alifiers (ACC	DE, AFCEE, Lab Specific, etc.)	
a. D	efined and	appropriate?		
	• Yes	○ No	○ NA (Please explain)	Comments:
			s section of the data report.	

Laboratory Data Review Checklist

ompleted by:	Elsie King					
tle:	Project Chemist				Date:	May 10, 2016
S Report Name:	Circle S Drinking Water Report				Report Date:	May 10, 2016
onsultant Firm:	ERM Alaska, Inc.					
boratory Name:	SGS North Am	erica, Inc.	Laboratory Re	eport Nun	nber: 1160809)
DEC File Number:			ADEC RecKe	y Numbe	er:	The state of the s
1. <u>Laboratory</u>		,				
·	ADEC CS appro	oved laboratory r	eceive and perfor	rm all of	the submitted	sample analyses?
• Yes		○ NA (Plea	-	<u></u> un 01	Comments:	minpro unury 500;
			• /	·		· · · · · · · · · · · · · · · · · · ·
	-		r "network" labor g the analyses Al	-		ed to an alternate
← Yes	○ No	• NA (Pleas	e explain)		Comments:	
Samples were n	ot transferred to	another laborate	ory or subcontrac	ted to an	alternate labo	oratory.
. Chain of Custody	(COC)					
a. COC infor	mation complete	ed, signed, and d	ated (including re	eleased/r	eceived by)?	
	○ No	○ NA (Pleas	e explain)		Comments:	
b. Correct an	alyses requested	1 ?				
• Yes	○ No	← NA (Plea	se explain)		Comments:	
3. <u>Laboratory Sampl</u> a. Sample/co	-		d within range at	t receipt (4° ± 2° C)?	
← Yes	No No		ase explain)		Comments:	
Samples were re	eceived at 6.5°C	. No data require	ed qualification.			

•	Yes	← No	○ NA (Please explain)	Comments:
c. San	nple cond	lition docume	nted - broken, leaking (Methanol),	zero headspace (VOC vials)?
(Yes	⊂ No	○ NA (Please explain)	Comments:
Samples	arrived i	n good conditi	on.	
				r example, incorrect sample containers/ insufficient or missing samples, etc.?
\cap	Yes	⊂ No	♠ NA (Please explain)	Comments:
JA. There	were no	discrepancies	3.	
e. Data	a quality	or usability at	fected? (Please explain)	
				Comments:
Data qual	lity and u	ısability is not	affected with respect to the sample	e receipt condition.
ase Narrat a. Pres		ınderstandable	?	
(6	Yes	○ No	○ NA (Please explain)	Comments:
		.		
b. Disc	crepancie	es, errors or Q	C failures identified by the lab?	
\subset	Yes	○ No	• NA (Please explain)	Comments:
NA. Ther	e were n	o discrepancie	s, errors or QC failures.	
c. Wer	e all con	ective actions	documented?	
\subset	Yes	← No	• NA (Please explain)	Comments:
-	e were n	o corrective ac	etions.	
NA. Ther	at is the ϵ	effect on data	quality/usability according to the ca	ase narrative? Comments:

4.

Yes	\cap No	○ NA (Please explain)	Comments:
b. All applicat	ole holding time	es met?	
• Yes	∩ No	← NA (Please explain)	Comments:
c. All soils rep	oorted on a dry v	weight basis?	
← Yes	⊂ No	• NA (Please explain)	Comments:
here are no soil	samples in this	data set.	
d. Are the repoproject?	orted PQLs less	than the Cleanup Level or the mini	mum required detection level for
• Yes	C No	○ NA (Please explain)	Comments:
		fected? (Please explain)	Comments:
		fected? (Please explain) ffected with respect to the reported s	
Data quality or us C Samples a. Method Blar	sability is not at	ffected with respect to the reported s	sample results.
Data quality or us C Samples a. Method Blar	sability is not at		sample results.
Data quality or us C Samples a. Method Blar	sability is not at	ffected with respect to the reported s	sample results.
Data quality or use C Samples a. Method Blandi. One me	sability is not at	orted per matrix, analysis and 20 sai	sample results. mples?
Data quality or use C Samples a. Method Blandi. One me	sability is not at the thod blank report No hod blank resul	frected with respect to the reported sorted per matrix, analysis and 20 sar	sample results. mples?
Data quality or us C Samples a. Method Blar i. One me	sability is not at the thod blank report No hod blank resul	frected with respect to the reported sorted per matrix, analysis and 20 sand (NA (Please explain))	sample results. mples? Comments:

iv. Do the			
← Yes	⊂ No	• NA (Please explain)	Comments:
. All method	blank results	were below PQL.	
v. Data q	uality or usabi	lity affected? (Please explain)	Comments:
		not affected with respect to the repo	
1		T	
b. Laboratory	Control Samp	ple/Duplicate (LCS/LCSD)	
		LCSD reported per matrix, analysis equired per SW846)	and 20 samples? (LCS/LCSD required
• Yes	⊂ No	○ NA (Please explain)	Comments:
		The state of the s	
samples?			
Yes There were	No metal or ir		ithin method or laboratory limits? And
Yes A. There were iii. Accur project sp	no metal or in acy - All perce	norganic analyses.	ithin method or laboratory limits? And nods: AK101 60%-120%, AK102
Yes A. There were iii. Accur project sp	no metal or in acy - All perce	norganic analyses. ent recoveries (%R) reported and w, if applicable. (AK Petroleum meth	ithin method or laboratory limits? And nods: AK101 60%-120%, AK102
Yes iii. Accur project sp. 75%-125 Yes iv. Precis limits? A	No metal or in acy - All perce becified DQOs No No No	ent recoveries (%R) reported and w, if applicable. (AK Petroleum meth %-120%; all other analyses see the land (NA (Please explain)) Ver percent differences (RPD) reported the land (RPD) reported th	ithin method or laboratory limits? And nods: AK101 60%-120%, AK102 laboratory QC pages)
Yes There were iii. Accur project sp 75%-125 Yes iv. Precis limits? An	No metal or in acy - All perce becified DQOs No No No	ent recoveries (%R) reported and w, if applicable. (AK Petroleum meth %-120%; all other analyses see the land (NA (Please explain)) Ver percent differences (RPD) reported the land (RPD) reported th	ithin method or laboratory limits? And nods: AK101 60%-120%, AK102 laboratory QC pages) Comments: ted and less than method or laboratory ported from LCS/LCSD, MS/DMSD, at
iii. Accur project sp. 75%-125% Yes iv. Precis limits? Ar or sample pages) Yes	no metal or in acy - All perce becified DQOs %, AK103 60% No No No No No No	ent recoveries (%R) reported and w, if applicable. (AK Petroleum meth %-120%; all other analyses see the land (NA (Please explain)) The property of the prope	ithin method or laboratory limits? And nods: AK101 60%-120%, AK102 laboratory QC pages) Comments: ted and less than method or laboratory ported from LCS/LCSD, MS/DMSD, at all other analyses see the laboratory Q Comments:

	vi. Do the	affected samp	oles(s) have data flags? If so, are the	data flags clearly defined?
	← Yes	∩ No	NA (Please explain)	Comments:
NA.	All %R and	RPDs were v	within acceptable limits.	
	vii. Data q	uality or usab	ility affected? (Please explain)	Comments:
Data	a quality and	l usability is n	ot affected with respect to the report	ted LCS/LCSD results.
c.	Surrogates -	Organics On	ly	
	i. Are surro	gate recoveri	es reported for organic analyses - fie	eld, QC and laboratory samples?
	• Yes	∩ No	CNA (Please explain)	Comments:
	project spe		if applicable. (AK Petroleum metho	nin method or laboratory limits? And ods 50-150 %R; all other analyses see
	Yes	○ No	○ NA (Please explain)	Comments:
	iii. Do the clearly def	-	s with failed surrogate recoveries ha	ve data flags? If so, are the data flags
	← Yes	⊂ No	NA (Please explain)	Comments:
NA.	There were i	no failed surro	ogate recoveries.	
	iv. Data qu	ıality or usabi	lity affected? (Use the comment box	k to explain.). Comments:
Γ				Comments.
L				
	•	- Volatile ana	lyses only (GRO, BTEX, Volatile C	chlorinated Solvents, etc.): Water and
<u>S</u>		blank reporte er explanation	d per matrix, analysis and for each c	cooler containing volatile samples?
	• Yes	⊂ No	○ NA (Please explain.)	Comments:
			ransport the trip blank and VOA sar plaining why must be entered below	mples clearly indicated on the COC?
	• Yes	⊂ No	○ NA (Please explain.)	Comments:
			4444	

• Yes	⊂ No	○ NA (Please explain.)	Comments:
iv. If abo	ove PQL, what	samples are affected?	
			Comments:
NA. All trip bla	nk results wer	e less than PQL.	
v. Data q	uality or usabi	lity affected? (Please explain.)	
·	·		Comments:
Data quality an	d usability is n	ot affected with respect to the repor	ted trip blank results.
e. Field Dupli	cate		
i. One fiel	ld duplicate su	bmitted per matrix, analysis and 10	project samples?
• Yes	⊂ No	○ NA (Please explain)	Comments:
16-CSG-23-W	G and 16-CSG	-24-WG	
ii. Submi	tted blind to la	ıb?	
	⊂ No		
		Tit (Flouse explaint)	Comments:
iii. Precis	ion - All relati	ve percent differences (RPD) less th	ian specified DOOs?
		% water, 50% soil)	an specified DQOs:
	I	RPD (%) = Absolute Value of: $(R_1$ -	R ₂) x 100
11 11		$((R_{1}+R_{2}+R_{3}+R_{4}+R_$	2)/2)
Where k	$R_1 = Sample Co$ $L_2 = Field Duple$	icate Concentration	
	2		
		○ NA (Please explain)	Comments:
	⊂ No	(TVI (Flease explain)	
R	○ No	(TVI (Trease explain)	
€ Yes		lity affected? (Use the comment box	
€ Yes			

← Yes ← No	• NA (Please explain)	Comments:
NA. Decontamination or equip	ment blanks were not required.	
i. All results less than PQ	L?	
← Yes ← No	♠ NA (Please explain)	Comments:
NA. Decontamination or equip	nent blanks were not required.	
ii. If above PQL, what sa	mples are affected?	Comment
TAD	. 1 1	Comments:
NA. Decontamination or equiprocessing the secondary of the second secondary of the secondar	ment blanks were not required.	
iii. Data quality or usabil	ity affected? (Please explain.)	Comments:
NA. Decontamination or equipr	nent blanks were not required.	
ner Data Flags/Qualifiers (ACC	E, AFCEE, Lab Specific, etc.)	
a. Defined and appropriate?		
	○ NA (Please explain)	Comments:
Within the laboratory qualifiers	section of the data report	

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ATTACHMENT 5

Conceptual Site Model

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HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

exposure pathway: Enter "C" for current receptors Current & Future Receptors 'F" for future receptors, "C/F" for both current and dentify the receptors potentially affected by each future receptors, or "I" for insignificant exposure. Subsistence consumers Farmers or Subsistence harvesters Instructions: Follow the numbered directions below. Do not consider contaminant concentrations or engineering/land Construction workers Sile visitors, trespassers, or recreational users \circ C Commercial or industrial workers O C Residents (adults or children) O O use controls when describing pathways. O C O Dermal Absorption of Contaminants in Surface Water Dermal Absorption of Contaminants in Groundwater ✓ Inhalation of Volatile Compounds in Tap Water Inhalation of Volatile Compounds in Tap Water Dermal Absorption of Contaminants from Soil Exposure Pathway/Route The pathways identified in this column must Check all pathways that could be complete. agree with Sections 2 and 3 of the Human Ingestion of Wild or Farmed Foods Health CSM Scoping Form Direct Contact with Sediment Ingestion of Surface Water Inhalation of Fugitive Dust Inhalation of Fugitive Dust Ingestion of Groundwater Inhalation of Outdoor Air Incidental Soil Ingestion Inhalation of Indoor Air Exposure Media media identified in (2) ☐ surface water Check all exposure ✓ groundwater sediment biota 3 soil air > check air check soil check groundwater check air check surface water check soil check air check biota check groundwater check sediment check surface water check sediment check surface water check groundwater check air check surface water check biota check sedimen check biota 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. Completed By: Joe Casey Environmental Technician Transport Mechanisms Resuspension, runoff, or erosion Uptake by plants or animals Flow to surface water body Direct release to subsurface soil Migration to groundwater Direct release to surface water Migration to groundwater Direct release to groundwater ADEC File No. 2106.26.004 Migration to subsurface Direct release to surface soil Direct release to sediment Runoff or erosion Flow to sediment Date Completed: 2/11/2016 Sedimentation Volatilization Volatilization ✓ Volatilization Volatilization Other (list): Other (list): Other (list): Other (list) Other (list) Site: Circle S Grocery could be directly affected by the release. Check the media that Subsurface (2-15 ft bgs) (0-2 ft bgs) Sediment Media Surface Surface Ground- $\overline{\Sigma}$

Other

Revised, 10/01/2010

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Print Form

Human Health Conceptual Site Model Scoping Form

Site Name:	Circle S Grocery			
File Number:	2106.26.004			······································
Completed by:	Joe Casey / Environmental Technician		-	
about which exposure summary text about	osure pathways should be further in	vestig g exp	gated dur osure pa	urtment of Environmental Conservation (DEC) ing site characterization. From this information thways should be submitted with the site
General Instruct	tions: Follow the italicized instruct	tions	in each	section below.
1. General II Sources (check)	nformation: potential sources at the site)			
⊠ USTs		Γ,	Vehicles	
☐ ASTs			Landfills	
⊠ Dispensers/fu	el loading racks	_ ·	Transfor	mers
☐ Drums	-	Г	Other:	
Release Mechan	isms (check potential release mech	anisn	ns at the	site)
☐ Spills			Direct di	scharge
⊠ Leaks		—]	Burning	
		Γ	Other:	
Impacted Media	a (check potentially-impacted media	at th	e site)	
Surface soil (Groundy	vater
	,		Surface	
⊠ Air	<i>5</i> /		Biota	
☐ Sediment			Other:	
Receptors (chec	k receptors that could be affected by	y coni	taminatio	on at the site)
□ Residents (ad	ult or child)	X	Site visit	or
⊠ Commercial of	or industrial worker	$\overline{\mathbf{X}}$	Trespass	er
□ Construction	worker		Recreati	onal user
☐ Subsistence h	arvester (i.e. gathers wild foods)		Farmer	
☐ Subsistence c	onsumer (i.e. eats wild foods)	Γ	Other:	
			,	

2.	Exposure Pathways: (The answers to the following questions will identify comexposure pathways at the site. Check each box where the answer to the question	•
a)	Direct Contact - 1. Incidental Soil Ingestion	
	Are contaminants present or potentially present in surface soil between 0 and 15 feet below to (Contamination at deeper depths may require evaluation on a site-specific basis.)	the ground surface?
	If the box is checked, label this pathway complete:	
	Comments:	
	Concentrations of DRO and benzene exceeded their applicable ADEC soil cleanup levels in one sample collected at a depth interval of 14 to 16 feet below ground surface (bgs).	
	2. Dermal Absorption of Contaminants from Soil	
	Are contaminants present or potentially present in surface soil between 0 and 15 feet below t (Contamination at deeper depths may require evaluation on a site specific basis.)	he ground surface?
	Can the soil contaminants permeate the skin (see Appendix B in the guidance document)?	Γ
	If both boxes are checked, label this pathway complete:	
	Comments:	
	The compounds detected in the soil samples collected at depths shallower than 15 feet bgs are not listed in Appendix B of the guidance document.	
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.	K
	If both boxes are checked, label this pathway complete:	
	Comments:	
	Groundwater was encountered in the 3 soil borings advanced to depths of approximately 120 feet bgs at the site in October 2015. Groundwater monitoring at the site conducted in November 2015 showed detectable levels of GRO, DRO and BTEX constituents in two of the monitoring wells. the monitoring well located closest to the on-site drinking water well showed benzene concentrations of 0.104 mg/L	

Could potentially affected surface water bodies be used, current drinking water source? Consider both public water systems and residential, recreational or subsistence activities).	
If both boxes are checked, label this pathway complete:	Incomplete
Comments:	
Surface water bodies are not present in close proximity to the site.	
3. Ingestion of Wild and Farmed Foods	
Is the site in an area that is used or reasonably could be used for harvesting of wild or farmed foods?	r hunting, fishing, or
Do the site contaminants have the potential to bioaccumulate (s document)?	ee Appendix C in the guidance
Are site contaminants located where they would have the poten biota? (i.e. soil within the root zone for plants or burrowing degroundwater that could be connected to surface water, etc.)	-
If all of the boxes are checked, label this pathway complete:	Incomplete
Comments:	
Site contaminants are not listed in Appendix C of the guidance documen	nt.
nhalation- 1. Inhalation of Outdoor Air	
Are contaminants present or potentially present in surface soil be ground surface? (Contamination at deeper depths may require of	
Are the contaminants in soil volatile (see Appendix D in the g	guidance document)?
If both boxes are checked, label this pathway complete:	Complete
Comments:	

2. Ingestion of Surface Water

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:

Incomplete

Comments:

The occupied building present at the site is located greater than 30 horizontal feet from the petroleum contaminated soil remaining at the site.

X

3. Additional Exposure Pathways: (Although there are no definitive questions proving these exposure pathways should also be considered at each site. Use the guidelines proving 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 particle. 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 construction. 	•
Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are assumed to be propathway.	rotective of this
Check the box if further evaluation of this pathway is needed:	Γ
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, washing. The contaminants of concern are volatile (common volatile contaminants are listed guidance document.)	C ,
Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are assumed to be propathway.	rotective of this
Check the box if further evaluation of this pathway is needed:	۲
Comments:	_

Inhala	ation of Fugitive Dust						
Inl	halation of fugitive dust may be a complete pathway if:						
0	Nonvolatile compounds are found in the top 2 centimeters of soil. The top 2 centimeters of soil are						
0	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						
0	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.						
beo inh roa wi	enerally, DEC direct contact soil cleanup levels in Table B1 of 18 AAC 75 are protective of this pathway cause it is assumed most dust particles are incidentally ingested instead of inhaled to the lower lungs. The halation pathway only needs to be evaluated when very small dust particles are present (e.g., along a dirt adway or where dusts are a nuisance). This is not true in the case of chromium. Site specific cleanup levels ll need to be calculated in the event that inhalation of dust containing chromium is a complete pathway a site.						
Ch	eck the box if further evaluation of this pathway is needed:						
Comn	nents:						
	•						
	·						
Direct	Contact with Sediment						
or i	is pathway involves people's hands being exposed to sediment, such as during some recreational, subsistence, industrial activity. People then incidentally ingest sediment from normal hand-to-mouth activities. In lition, dermal absorption of contaminants may be of concern if the the contaminants are able to permeate the n (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.						
Ger	nerally, DEC direct contact soil cleanup levels in 18 AAC 75, Table B1, are assumed to be protective of direct atact 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							
m.)							

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revised October 2010

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