

Integrated Report
Human Health and Environmental Effects
Omya Verpol Facility — Florence, Vermont
Appendix C.9: Quality Assurance/Quality Control
—
Flotation Agent constituents and other analytes

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C.9. Quality Assurance/Quality Control

This appendix reports the results of the Quality Assurance/Quality Control (QA/QC) program implemented as part of our Phase II Study. This program included validation of all Section 5 laboratory analytical data by generally-accepted and well-documented protocols, a field audit of sampling activities, and a detailed evaluation of flotation agent (FA) constituent analysis. This appendix is organized as follows:

- Section C.9.1 provides a review of the FA analytical methods used on samples from Verpol and environs, and our procedure for interpreting FA results
- Section C.9.2 describes the validation procedures followed for all Section 5 data
- Section C.9.3 provides the results of all Tier II and Tier III data validation
- Section C.9.4 provides the results of our self-audit of field sampling procedures
- Section C.9.5 provides an inventory of deviations from the FSP and QAPP

C.9.1. Flotation Agent constituents

Flotation Agent constituents include tall oil hydroxyethyl imidazoline (TOHI, also termed IM [for imidazoline]; the major component), tall oil amido amine (TAA, the ring-opened form of TOHI), amine acetate (AA, a mixture of fatty acetates, added to FA as Duomeen-T, or DT), and aminoethylethanolamine (AEEA, present as a residual reactant). As noted in our Phase I Report (Appendix B), the detection and quantification of FA constituents in groundwater and surface water have been both important and challenging. The challenges arise because AEEA, TOHI, and AA are not priority pollutants; and, even though AEEA is a “high production volume chemical” (which means that more than one million pounds of it is produced or imported into the U.S. annually), neither U.S. EPA nor anyone else, to our knowledge, has developed an analytical method for detecting and quantifying it in environmental samples. Moreover, although fatty amines and acetates, such as TOHI and AA, are widely used commercial chemicals, they are also of low toxicity, and so not on any priority pollutant lists or otherwise of interest to environmental-analytical chemists. For the Verpol Site, however, sensitive, specific, precise, and accurate methods for FA constituents are critical to understanding the environmental impacts of tailings. Moreover, as noted in the Integrated Report and detailed in Appendix C.6, relatively small doses of AEEA are now known to cause birth defects in laboratory rats, and are presumed to pose a similar risk for other mammalian fetuses, including humans. (The other components of FA are, at environmental concentrations, of no toxicologic significance). Accordingly, Omya, its consultants, ANR and, starting in mid-2006, we have worked toward developing such methods for quantifying FA constituents in general, and, starting in the summer of 2007, AEEA in particular.

In late 2006, it became clear that the then-used method for FA constituent analysis, termed AG-24, yielded false-positive results, and was otherwise unreliable for analyzing samples of groundwater, drinking water, or surface water (see Appendix B for additional discussion). The AG-24 method uses “wet” analytical chemistry published at least since the 1960’s (see Metcalfe, 1984 for a review). It relies on the reaction of amines and amine salts, such as TOHI and related acetates, with anionic indicator dyes (typically bromophenol blue and bromocresol green) to form colored complexes: these complexes are extracted into an organic solvent, then detected

and quantified, spectrophotometrically, by dint of their absorbance of 425 nm wavelength light. Essentially no sample clean-up is involved, nor is there any chromatographic separation of constituents. The method is reasonably sensitive (capable of detecting and quantifying about 50 ppb of FA in water), but clearly not specific, since countless substances and mixtures *other* than TOHI and AA will complex with these dyes to form compounds that absorb 425 nm wavelength light (and some, of course, will be colored on their own, even in the absence of indicator dyes). More importantly, this is also not an optimal method for analysis for AEEA.

False positives generated by the use of AG-24 stimulated Omya to seek a more specific method for FA component analysis. This method development work was undertaken largely by a commercial laboratory (STL, now TestAmerica) in Sacramento, California. Unfortunately, since the focus then was still on TOHI (and its ring-opened form, TAA), and not on AEEA (a small volatile compound more suited to gas chromatography than liquid chromatography), the general approach was not optimal. The method uses high pressure liquid chromatography (HPLC) to separate FA components (not derivatized), followed by two mass spectrometers in series (tandem MS) to detect and quantify FA components. Tandem MS is sensitive and specific, but not widely available (because of the substantial costs of the machines) and may not be better than other less expensive methods that could be developed (and are being researched) for detecting and quantifying AEEA in environmental samples.

Our analysis of the HPLC/MS/MS chromatograms indicates that AEEA can be detected at concentrations as low as 2 ppb¹ in samples collected from the Site. We have also noted, however, that recovery of AEEA from environmental samples is not 100% efficient. In particular, when lab analysts “spike” a sample of groundwater with 100 ppb of AEEA, and then subject that sample to HPLC/MS/MS, typically only 50 – 60% of the added AEEA is detected. The reasons for this “matrix effect” are not known. Regardless, we have been compensating for this “masking” of AEEA in samples of groundwater or surface water as follows.

We have asked the lab to run a “matrix spike” sample (a sample of “clean groundwater²” spiked with AEEA to a concentration of 100 ppb) at the beginning and the end of each analytical run, and report the recovery of AEEA from each. For any given run, such recoveries might be, for example, 52% for the first matrix spike and 58% for the second. Suppose that of the ten or so groundwater samples analyzed within that run, one sample had an apparent concentration of AEEA of 5.43 ppb. We would divide that 5.43 ppb reported result by the average matrix recovery (55%), and conclude that the most likely value for the concentration of AEEA in that sample is 10 ppb. This process removes the bias from the reported result, and provides a better estimate of AEEA concentration in each sample, adequate for delineating its nature and extent at the Site, and assessing possible risks to health from drinking water, should any AEEA be detected therein.

¹ TestAmerica continues to consider the minimum reporting limit for this method to be 50 ppb, but the signal-to-noise ratios of chromatograms generated from standards with as little as 2 ppb AEEA are quite acceptable (that is, at least 10:1), and, combined with a reliable standard curve at concentrations of from 2 to 200 ppb, mean that detects as small as 2 ppb are likely to be both true positives and reasonably reliably quantified.

² That is, groundwater from the Site that is known not to contain any FA constituents.

C.9.2. Quality Control/Quality Assurance (QA/QC) practices for Section 5 data

For all of our Phase II sampling and analysis, we employed generally accepted Quality Control/Quality Assurance (QA/QC) practices. In particular, we followed U.S. EPA’s *Guidance on Systematic Planning Using the Data Quality Objectives Process* (EPA QA/G-4 (U.S. EPA, 2006; available at <http://www.epa.gov/QUALITY/qs-docs/g4-final.pdf>). Our QA/QC protocols are presented in our Field Sampling Plan (FSP) and Quality Assurance Project Plan (QAPP), provided as Attachments to Appendix C.2.

To determine whether our QA/QC program fulfilled data quality objectives (DQOs), we reviewed and validated Phase II laboratory data reports in accordance with EPA’s National Functional Guidelines for Inorganic Data and Organic Data Review (USEPA 2004; available at <http://www.epa.gov/superfund/programs/clp/download/inorgfg10-08-04.pdf>; and USEPA, 2005; available at <http://www.epa.gov/superfund/programs/clp/download/som/som12nfg.pdf>). Data validation is a process of reviewing laboratory- and field- quality control measures to determine if the associated data meet our DQOs. During sample collection, quality control samples are collected in the field for laboratory analysis to verify the integrity of the sampling, shipping, and handling process. The analytical laboratory also uses internal quality control samples to check and maintain the quality of the analytical procedure. Quality control samples and their purposes are summarized below:

Quality Control Information	Purpose
Field Quality Control Check Samples	
Trip Blanks	Determine if samples have been contaminated during transport from the site to the lab (Volatile organic compound analysis only)
Equipment Blanks	Determine if samples have been contaminated due to insufficiently cleaned sampling equipment
Field Duplicates	Determine the precision of the sampling method.
Laboratory Quality Control Check Samples	
Laboratory Duplicates	Determine the precision of the analytical method
Method Blanks	Determine whether contamination has been introduced to the samples during sample handling and preparation
Laboratory Control Samples (LCS)	Determine the accuracy of the analytical method for the parameters of interest from a non-environmental sample, such as distilled water.
Matrix Spike and Matrix Spike Duplicates (MS/MSD)	Determine if the sample matrix (e.g., groundwater or other environmental sample) has interfered with the recovery of the target analyte (such interference, if not corrected for, would bias the reported results low).
Calibration standards	Quantify instrument response and determine the acceptable concentration range of the analytical method and its reporting limit
Calibration checks standards	Determine whether the instrument response is stable over time
Surrogate standards	Determine the effectiveness of the sample preparation procedure on each individual sample, method blank and LCS by compound class

The following project documentation is also associated with data quality and systematic planning:

Quality Control Information	Purpose
Chain of Custody (COC) Documentation	Document the transfer of custody of samples among various parties including the sampler, shipper, a mobile laboratory, a fixed laboratory, or secure storage locations. The COC also transmits pertinent sample information (such as collection dates and times, and methods of sample preservation) and analytical test requirements to the lab.
Field Sampling Forms and Notes	Determine if FSP procedures were followed
Field Standard Operating Procedures	Ensure that specified field procedures are followed during the project.
Laboratory Standard Operating Procedures	Ensure that specified laboratory protocols are followed for project sample analysis
Training Documentation	Verification of project personnel qualifications

Field parameters (including pH, conductivity, temperature, ORP, and dissolved oxygen) were collected during groundwater and surface water sampling. Requirements for field instrument calibration and acceptable calibration criteria are listed in the QAPP and calibration frequency and results were recorded on the daily field forms.

In general, different levels or “tiers” of data validation (with Tier I being the most cursory, and Tier III the most complete) are applied to laboratory data depending on the requirements of a particular analytical program. In a Tier I level review, a “completeness evidence audit” is performed to ensure that all laboratory data and documentation are present. For Tier II and Tier III, progressively more detailed and extensive evaluation is performed, as described below. See <http://www.epa.gov/boston/oeme/ATTACHB.pdf> for additional details.

We validated all data at a Tier II level, which includes:

- verification of technical holding times;
- a completeness audit that all samples results are present as requested on the COC; and
- review of all QC sample results to determine if they meet criteria established in the QAPP

We completed Tier III data validation for 100% of the flotation agent (FA) analytical data, 100% of the arsenic data, and 100% of the perchlorate data collected during Phase II. We also validated a representative analytical data set for each of the remaining analytical tests at a Tier III validation level.

Tier III data validation includes:

- verification of technical holding times;
- a completeness audit to confirm that all samples results are present as requested on the COC;
- review of all QC sample results to determine whether they meet criteria established in the QAPP, analytical methods, and laboratory standard operating procedures (SOPs);

- review of all raw analytical data to identify any inconsistencies with method and laboratory SOP requirements;
- recalculation of reported concentration results (calibration, continuing calibration, sample results);
- verification of analyte identification/quantification; and
- review of laboratory results to identify transcription errors.

Possible outcomes of data validation include:

- Qualified, but usable data: data can be relied upon for their intended use, but the sample result may be estimated.
- Rejected, unusable data: quality defects are substantial. Data cannot be relied upon.
- Unqualified data: results meet the DQOs established in the QAPP as well as the various quality criteria established in the analytical method SOP and the laboratory SOP.
- Data were qualified pursuant to guidance provided by US EPA National Functional Guidelines for Data Review (USEPA, 2004; USEPA, 2005), laboratory standard operating procedures, and referenced analytical methods.

Validation results are presented by the laboratory report identification number. Each lab report includes all relevant information for a batch of samples including sample collection dates, lab receiving dates, analyses dates, chain of custody information, analyses results, lab qualifiers, QA/QC results, and raw data.

C.9.3. Tier II and Tier III Validation Results

We validated every laboratory report generated from the sampling and analysis of groundwater (including drinking water) and surface water in Phase II. As outlined above, we conducted full validation (Tier III) for selected analytical results from the following laboratory reports.

Laboratory Report	Analytes
G7H070370	TAA, IM, AEEA, and DT by HPLC/MS/MS
G7H090292	TAA, IM, AEEA, and DT by HPLC/MS/MS
H7H100405	TAA, IM, AEEA, and DT by HPLC/MS/MS
G7G200327	TAA, IM, AEEA, and DT by HPLC/MS/MS
G7G190543	TAA, IM, AEEA, and DT by HPLC/MS/MS
G7G190384	TAA, IM, AEEA, and DT by HPLC/MS/MS
G7F170312	TAA, IM, AEEA, and DT by HPLC/MS/MS
G7F070287	TAA, IM, AEEA, and DT by HPLC/MS/MS
G7F060165	TAA, IM, AEEA, and DT by HPLC/MS/MS
G7F010337	TAA, IM, AEEA, and DT by HPLC/MS/MS
0706027	8260B, 8270C, EPH, 6020/7470A. wet chemistry analyses, methylamine and 2-propanol (EPA Method 1671), acrylamide (modified EPA Method 8032A)
0706025	8260B, 8270C, EPH, 6020/7470A. wet chemistry analyses, methylamine and 2-propanol (EPA Method 1671), acrylamide (modified EPA Method 8032A)
0706021	8260B, 8270C, EPH, 6020/7470A. wet chemistry analyses, methylamine and 2-propanol (EPA Method 1671), acrylamide (modified EPA Method 8032A)
0706022	8260B, 8270C, EPH, 6020/7470A. wet chemistry analyses, methylamine and 2-propanol (EPA Method 1671), acrylamide (modified EPA Method 8032A)
0708100	arsenic by Method 6020
0708081	arsenic by Method 6020
0708070	arsenic by Method 6020
0708051	arsenic by Method 6020
0707104	arsenic by Method 6020
0707093	arsenic by Method 6020
0707077	arsenic by Method 6020
0707078	arsenic by Method 6020
0707022	perchlorate by Method 332.0
0708070	perchlorate by Method 332.0
0708081	perchlorate by Method 332.0
L0711562	perchlorate by Method 332.0
L0712002	perchlorate by Method 332.0

Sample qualifications resulting from our validation of the data are summarized by analyte and laboratory report below.

C.9.3.1. Flotation Agent Analyses

Test America in Sacramento, CA (formerly Severn Trent Laboratories, or STL) performed all of the analyses for flotation agent constituents: TOHI, TAA, AEEA, and AA (the laboratory uses the synonyms IM and DT for TOHI and AA, respectively). Data validation qualifications are summarized below.

Laboratory Reports: G7H070370, G7H090292, H7H100405

These reports include the following samples:

Client Sample ID

BROD-GW-08062007
FERRARO-GW-08062007
FERRARO-GW-08062007-DUP
EW-BARN-GW-08062007
EW-HOUSE-GW-08062007
SANDILLO-GW-08062007
PFWG-GW-08062007
LAFLAMME-GW-08062007
CHRUSCIEL SPRING-SW-08072007
ORVIS SPRING-SW-08072007
PO-2-SW-08072007
PIQ-SOUTH-SW-08072007
PIQ-PUMP-SW-08072007
PO-3-SW-08072007
PO-5-SW-08072007
FOX ROCK SPRING-SW-08072007
PIQ-PUMP-SW-08072007-DUP
VELCO-GW-08092007

Sample VELCO-GW-08092007 was analyzed as the matrix spike/matrix spike duplicate (MS/MSD) for report G7H100405. All compound recoveries and relative percent differences (RPD) were within the laboratory control limits. Sample FERRARO-GW-08062007 was analyzed as the MS/MSD for reports G7H070370 and G7H090292. The recovery of AEEA was low and outside the laboratory control limits. Therefore, the undetected concentration of AEEA in sample FERRARO-GW-08062007 is UJ qualified as undetected below the reporting limit.

Sample PIQ-PUMP-SW-08072007-DUP was collected, prepared and measured as a field duplicate sample. The RPD between the results was compared to a criterion of <30%. No compounds were detected above the reporting limits, with the exception of AEEA. The RPD criteria were not met for the duplicate pair; therefore, the concentrations of AEEA in samples PIQ-PUMP-SW-08072007 and PIQ-PUMP-SW-08072007-DUP are J qualified as estimated.

Sample ID	Compound	Laboratory Result (µg/L)	RPD	Validation Result (µg/L)
PIQ-PUMP-SW-08072007	AEEA	88.82	35	88.82 J
PIQ-PUMP-SW-08072007-DUP		125.98		125.98 J
PIQ-PUMP-SW-08072007	All other compounds	ND	0	NA
PIQ-PUMP-SW-08072007-DUP		N.D.		N.A.

ND-Not detected

NA-Not applicable

C.9.3.1.1. Laboratory Report: G7G200327

This report includes the following samples:

Client Sample ID

Well-D-GW-07182007
Well-J-GW-(154)-07182007
Well-E-GW-07182007

All laboratory control sample (LCS) recoveries were within laboratory acceptance limits, with the following exceptions. The samples were analyzed twice for IM, due to high continuing calibration verification (CCV) recoveries in the first analysis. The second analysis had acceptable CCV recoveries, but low LCS recoveries. Therefore, since the LCS recoveries in the second analysis were low and outside the laboratory acceptance criteria, the undetected concentrations of IM in the samples were UJ qualified as estimated less than the reporting limit. Additionally, the recovery of DT in the LCS was high and outside the laboratory control limits. However, since DT was not detected in the samples, no qualification was required.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-D-GW-07182007	IM	20 U	20 UJ
Well-J-GW-(154)-07182007	IM	20 U	20 UJ
Well-E-GW-07182007	IM	20 U	20 UJ

Sample Well-E-GW-07182007 was analyzed as the MS/MSD. The MS/MSD recoveries were acceptable, with the following exception; the samples were analyzed twice for IM, due to high CCV recoveries in the first analysis. The second analysis had low LCS recovery and acceptable MS/MSD recoveries. Additionally, the MS/MSD recoveries for AEEA were low and outside the laboratory control limits. Therefore, the concentration of AEEA in sample Well-E-GW-07182007 is UJ qualified as estimated below the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-E-GW-07182007	AEEA	20 U	20 UJ

C.9.3.1.2. Laboratory Report: G7G190543

This report includes the following samples:

Client Sample ID (previously reported as)

Well-2 (G7E300118-4)
Well-2-GW-105-150-06062007 (G7F070287-1)
Well-2-GW-61.5-81.5-06062007 (G7F070287-2)

A sample holding time was not defined in the laboratory SOP used for analysis; however, based on project established criteria, a 14 day holding time was used to evaluate the data. The samples

were reanalyzed 37 days, 34 days and 34 days, respectively, after the project specific holding time had expired. Therefore, the concentrations of IM are UJ qualified as estimated less than the reporting limit; the concentrations of AEEA are UJ qualified as estimated less than the reporting limit and J qualified as estimated.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-2	IM	20 U	20 UJ
Well-2-GW-105-150-06062007	IM	17.8 J	20 UJ
Well-2-GW-61.5-81.5-06062007	IM	20 U	20 UJ
Well-2	AEEA	31.1 J	31.1 J
Well-2-GW-105-150-06062007	AEEA	30.5 J	30.5 J
Well-2-GW-61.5-81.5-06062007	AEEA	20 U	20 UJ

The samples were analyzed twice for IM, due to high CCV recoveries in the first analysis. The second analysis had acceptable CCV recoveries, but low batch MS and LCS recoveries. Therefore, since the LCS recoveries in the second analysis were low and outside the laboratory acceptance criteria, the undetected concentrations of IM in the samples UJ qualified as estimated less than the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-2	IM	20 U	20 UJ
Well-2-GW-105-150-06062007	IM	17.8 J	20 UJ
Well-2-GW-61.5-81.5-06062007	IM	20 U	20 UJ

All compound identifications and quantifications were appropriate, with the following exception. The concentration of IM in sample Well-2-GW-105-150-06062007 was reported as 17.73 J µg/L. However, based on the information in the narrative and the low level standard, the lowest level of detection is 20 µg/L. Therefore, based on professional judgment, the concentration of IM in sample Well-2-GW-105-150-06062007 is 20 µg/L U qualified as undetected.

C.9.3.1.3. Laboratory Report: G7G190384

This report includes the following samples:

Client Sample ID

Well-A-GW 07172007
Well-H-GW 07172007
Well-H-GW 07172007 DUP
Well-C-GW 07172007
Well-96-2-GW 07172007
Well-F-GW 07172007
Well-M-GW 07172007
Well-96-1-GW 07172007
OGS-#192-07172007

Sample Well-H-GW 07172007 was analyzed as the MS/MSD. The recovery for AEEA in the MS was low and outside the laboratory control limits. Therefore, the concentration of AEEA in sample Well-H-GW 07172007 is UJ qualified as estimated below the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-H-GW 07172007	AEEA	20 U	20 UJ

C.9.3.1.4. Laboratory Report: G7F170312

This report includes the following samples:

Client Sample ID

Well-2-GW-07162007-107
Well-B-GW-07162007
Well-2-GW-07162007-71.5
Well-C-2-GW-07162007
EB-GW-07162007

Sample Well-C-2-GW-07162007 was analyzed as the MS/MSD. The recovery for AEEA in the MS was low and outside the laboratory control limits. The MS was analyzed twice with the similar recoveries. Therefore, the concentration of AEEA in sample Well-C-2-GW-07162007 is UJ qualified as estimated below the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-C-2-GW-07162007	AEEA	20 U	20 UJ

C.9.3.1.5. *Laboratory Report: G7F120356*

This report includes the following samples:

Client Sample ID
WELL B-86-96-06072007
WELL B-46-56-06072007

Sample Well-B-86-96-06072007 was analyzed as the MS. The recoveries of AEEA and DT in the MS were low and outside the laboratory control limits. Therefore, the concentrations of AEEA and DT in sample Well-B-86-96-06072007 are UJ qualified as estimated below the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-B-86-96-06072007	AEEA	20 U	20 UJ
	DT	20 U	20 UJ

C.9.3.1.6. *Laboratory Report: G7F070287*

This report includes the following samples:

Client Sample ID
Well-2-GW-105-150-06062007
Well-2-GW-61.5-81.5-06062007
Well-2-GW-27-47-06062007

All LCS recoveries were within laboratory acceptance limits, with the exception of the high LCS recovery outside of laboratory control limits for IM. Therefore, the concentrations of IM at or above the reporting limit in the samples are J qualified as estimated. The samples were reanalyzed 15 days after the holding time had expired, under a new initial calibration curve, with acceptable LCS recovery. The sample results analyzed under the new initial calibration curve (and acceptable LCS) had lower IM concentrations than those analyzed with the LCS with high recovery. The data analyzed outside the holding time were not evaluated.

Sample ID	Compound	Laboratory Result (ng/mL)	Validation Result (ng/mL)
Well-2-GW-105-150-06062007	IM	52.2	52.2 J
Well-2-GW-61.5-81.5-06062007	IM	20.0 J	20.0 J

C.9.3.1.7. Laboratory Report: G7F060165

This report includes the following samples:

Client Sample ID

Well-L-GW-112-128-06052007

Well-L-GW-48-64-06052007

There were no sample qualifications.

C.9.3.1.8. Laboratory Report: G7F010337

Client Sample ID

Well-K-GW-(204-214)-05302007

Well-K-GW-(49-64)-05302007

There were no sample qualifications.

C.9.3.2. Other Analyses

All analyses other than for flotation agent were performed as indicated in the table below:

Laboratory	Methods
Alpha Woods Hole Labs, Mansfield, Massachusetts	EPA Methods 8260B, 8270C, 6020, 7470A, 300.0, 376.2, 332.0, Standards Methods 2320B and 4500-Cl, EPH by laboratory specific method
Pacific Analytical, Carlsbad, California Bodycote Testing Group, Santa Fe Springs, California	methylamine and 2-propanol by EPA Method 1671 acrylamide by modified EPA Method 8032A

Sample qualifications are summarized below, by laboratory report and by analytical method.

C.9.3.2.1. Laboratory Report: 0708100

This report includes the following analyses and samples:

Analyses

8260B (Volatiles)

8270C (Semivolatiles)

Extractable Petroleum Hydrocarbons (EPH)

6020/7470A (Metals)

wet chemistry analyses

Client Sample ID

VELCO-GW-08092007

Trip Blank

The data from this sample set were validated to Tier II; additionally, full Tier III validation, including recalculation, was performed for the arsenic data.

Method 8260B**Calibration qualifications**

Appropriate initial calibrations were performed for each analyte. Based on the method of calibration, the laboratory calculated the percent relative standard deviation (%RSD). For all target analytes, the relative response factors (RRFs) met the method criteria; the RSDs met the method criteria for all compounds except 23 compounds. The RSDs were within the validation acceptance criteria for all compounds except Bromomethane, 2-Hexanone, Styrene, p-Isopropyltoluene, n-Butylbenzene, 1,2,4-Trichlorobenzene, Naphthalene, Methyl isothiocyanate and Ethyl acetate. Therefore, the undetected concentrations of Bromomethane, 2-Hexanone, Styrene, p-Isopropyltoluene, n-Butylbenzene, 1,2,4-Trichlorobenzene, Naphthalene, Methyl isothiocyanate and Ethyl acetate in the samples are UJ qualified as estimated below the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
VELCO-GW-08092007	bromomethane	2.0 U	2.0 UJ
	2-hexanone	2.0 U	2.0 UJ
	styrene	2.0 U	2.0 UJ
	p-isopropyltoluene	2.0 U	2.0 UJ
	n-butylbenzene	5.0 U	5.0 UJ
	1,2,4-trichlorobenzene	2.0 U	2.0 UJ
	naphthalene	2.0 U	2.0 UJ
	methyl isothiocyanate	5.0 U	5.0 UJ
	ethyl acetate	2.0 U	2.0 UJ
	Trip Blank	bromomethane	2.0 U
2-hexanone		2.0 U	2.0 UJ
styrene		2.0 U	2.0 UJ
p-isopropyltoluene		2.0 U	2.0 UJ
n-butylbenzene		5.0 U	5.0 UJ
1,2,4-trichlorobenzene		2.0 U	2.0 UJ
naphthalene		2.0 U	2.0 UJ
methyl isothiocyanate		5.0 U	5.0 UJ
ethyl acetate		2.0 U	2.0 UJ

Method 8270C**Calibration qualifications**

Stearic acid did not meet the %RSD criteria. EPA Method 8000 allows for the use a quadratic curve which requires an initial calibration consisting of six standards; the quadratic curve was used for sample quantification and consisted of only five standards. Evaluation of the quadratic curve used by the laboratory for Stearic acid resulted in the elevation of the reporting limit for stearic acid from 0.5 µg/L to 5.0 µg/L, based on professional judgment.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
VELCO-GW-08092007	stearic acid	0.50 U	5.0 U

Blank qualifications

There were no detections of the compounds of concern in the laboratory method blank, except for butylbenzylphthalate, which was detected at a concentration (0.60 µg/L) greater than the reporting limit (RL). The concentration of butylbenzylphthalate in the sample was greater than the RL. Therefore, the concentration of butylbenzylphthalate in the sample was U qualified as not detected at the sample concentration.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
VELCO-GW-08092007	butyl benzyl phthalate	1.6 B	1.6 U

B-Found in associated blank as well as sample.

LCS qualifications

All LCS recoveries were within the laboratory control limits, with the exception of low or no recoveries for 2-methyphenol, 4-methyphenol, 2,4-dimethylphenol, 4-Chloroaniline, Hexachlorobutadiene, n-Nitrosodiphenylamine, 3,3'-dichlorobenzidine and Aniline in the LCS and/or LCSD. All duplicate RPD results were acceptable, with the exception of high RPD results for 2-methyphenol, 4-methyphenol, 2,4-dimethylphenol and 4-Chloroaniline. No qualifications were required due to the high RPD. However, based on the low recoveries in the LCS and/or LCSD, the undetected concentrations of 4-methyphenol, hexachloropentadiene and n-nitrosodiphenylamine are UJ qualified as estimated less than the reporting limit; due to low (<10%) or no recoveries in the LCS/LCSD, 2-methyphenol, 2,4-dimethylphenol, 4-chloroaniline, 3,3'-dichlorobenzidine and aniline are R qualified as rejected. The samples were reextracted 20 days after collection; however, the reextracted data were not evaluated due to the missed holding times.

Stearic acid and orthophenylphenol were not spiked into the LCS/LCSD; therefore, the undetected concentrations of stearic acid and orthophenylphenol in the samples are UJ qualified as estimated below the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
VELCO-GW-08092007	2-methyphenol	0.52 U	0.52 R
	4-methyphenol	0.52 U	0.52 UJ
	2,4-dimethylphenol	0.52 U	0.52 R
	4-chloroaniline	0.52 U	0.52 R
	hexachlorobutadiene	0.52 U	0.52 UJ
	n-nitrosodiphenylamine	0.52 U	0.52 UJ
	3,3'-dichlorobenzidine	0.52 U	0.52 R
	aniline	0.52 U	0.52 R
	stearic acid	0.52 U	0.52 UJ
	orthophenylphenol	0.52 U	0.52 UJ

Method EPH (laboratory specific method)

LCS qualifications

All LCS recoveries were within the laboratory control limits, with the exception of low recoveries for n-nonane (C9) and n-decane (C10). Therefore, the following qualifications were made to the samples.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
VELCO-GW-08092007	C9-C18 aliphatics	34 U	34 UJ

Method 6020

Calibration qualifications

The interference check standards (ICSA/ICSAB) met all acceptance criteria for the metals analyses with the exception of calcium in the ICSAB standard associated with the total metals analyses and sodium in both the ICSA and ICSAB standards associated with the total and dissolved metals analyses. The recoveries of sodium in the ICSA and/or ICSAB standards analyzed with the metals samples were listed as 0% on the QC summary forms. According to the report narrative, the recoveries of sodium from the interference check samples were given as a zero percent recovery due to the channel being saturated at the concentration being measured. Therefore, the total calcium and the total and dissolved sodium concentrations in the sample are J qualified as estimated.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
VELCO-GW-08092007	total calcium	71000	71000 J
	total sodium	750	750 J
	dissolved sodium	1200	1200 J

Blank qualifications

Magnesium, nickel, thallium, vanadium and zinc were detected at low levels in the total method blank at concentrations less than the RL, but greater than the MDL. Antimony, calcium, mercury, selenium, thallium and vanadium were detected at low levels in the total ICBs and/or CCBs at concentrations less than the RL, but greater than the MDL. Antimony, calcium, selenium, thallium and vanadium were detected at low levels in the dissolved method blank at concentrations less than the RL, but greater than the MDL. Antimony, calcium, chromium, iron, mercury, selenium, thallium and vanadium were detected at low levels in the dissolved ICBs and CCBs at concentrations less than the RL, but greater than the MDL. Based on these blank concentrations, the following sample qualifications were made.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
VELCO-GW-08092007	total antimony	0.42 J	0.50 U
	total selenium	0.29 J	1.0 U
	total thallium	0.041 J	0.10 U
	total vanadium	0.17 J	5.0 U
	dissolved antimony	0.22 J	0.50 U
	dissolved selenium	0.26 J	1.0 U
	dissolved vanadium	1.3 J	5.0 U

C.9.3.2.2. Laboratory Report: 0708081

This report includes the following analyses and samples:

Analyses

8260B

8270C

EPH

6020/7470A

wet chemistry analyses

methylamine and 2-propanol (EPA Method 1671)

acrylamide (modified EPA Method 8032A)

Client Sample ID

CHRUSCIEL SPRING-SW-08072007
ORVIS SPRING-SW-08072007
PO-2-08072007
HB-2-08072007
HB-SUMP-08072007
HB-SEEP-08072007
HB-PUMP-08072007
PIQ-SOUTH-SW-08072007
PIQ-PUMP-SW-08072007
PO-3-SW-08072007
PO-5-SW-08072007
FOX ROCK SPRING-SW-08072007
SP-O-SW-08072007
HB-1-SW-08072007
HASETON POND-SW-08072007
EB-08072007
PIQ-PUMP-SW-08072007-DUP
TB-08072007
RB-08062007

The data from this sample set were validated to Tier II; additionally, full Tier III validation was performed for arsenic and perchlorate data.

The sample qualifications are summarized below, by laboratory method.

Method 8260B**Calibration qualifications**

Appropriate initial calibrations were performed for each analyte. Based on the method of calibration, the laboratory calculated the percent relative standard deviation (%RSD). For all target analytes, the RRFs met the method criteria; the RSDs met the method criteria for all compounds except 23 compounds. The RSDs were within the validation acceptance criteria for all compounds except bromomethane, 2-hexanone, styrene, p-isopropyltoluene, n-butylbenzene, 1,2,4-trichlorobenzene, naphthalene, methyl isothiocyanate and ethyl acetate. Therefore, the undetected concentrations of bromomethane, 2-hexanone, styrene, p-isopropyltoluene, n-butylbenzene, 1,2,4-trichlorobenzene, naphthalene, methyl isothiocyanate and ethyl acetate in all samples are UJ qualified as estimated below the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
CHRUSCIEL SPRING-SW-08072007	bromomethane	2.0 U	2.0 UJ
	2-hexanone	2.0 U	2.0 UJ
	styrene	2.0 U	2.0 UJ
	p-isopropyltoluene	2.0 U	2.0 UJ
	n-butylbenzene	5.0 U	5.0 UJ
	1,2,4-trichlorobenzene	2.0 U	2.0 UJ
	naphthalene	2.0 U	2.0 UJ
	methyl isothiocyanate	5.0 U	5.0 UJ
	ethyl acetate	2.0 U	2.0 UJ
	ORVIS SPRING-SW-08072007	bromomethane	2.0 U
2-hexanone		2.0 U	2.0 UJ
styrene		2.0 U	2.0 UJ
p-isopropyltoluene		2.0 U	2.0 UJ
n-butylbenzene		5.0 U	5.0 UJ
1,2,4-trichlorobenzene		2.0 U	2.0 UJ
naphthalene		2.0 U	2.0 UJ
methyl isothiocyanate		5.0 U	5.0 UJ
ethyl acetate		2.0 U	2.0 UJ
PO-2-08072007		bromomethane	2.0 U
	2-hexanone	2.0 U	2.0 UJ
	styrene	2.0 U	2.0 UJ
	p-isopropyltoluene	2.0 U	2.0 UJ
	n-butylbenzene	5.0 U	5.0 UJ
	1,2,4-trichlorobenzene	2.0 U	2.0 UJ
	naphthalene	2.0 U	2.0 UJ
	methyl isothiocyanate	5.0 U	5.0 UJ
	ethyl acetate	2.0 U	2.0 UJ
	PIQ-SOUTH-SW-08072007	bromomethane	2.0 U
2-hexanone		2.0 U	2.0 UJ
styrene		2.0 U	2.0 UJ
p-isopropyltoluene		2.0 U	2.0 UJ
n-butylbenzene		5.0 U	5.0 UJ
1,2,4-trichlorobenzene		2.0 U	2.0 UJ
naphthalene		2.0 U	2.0 UJ
methyl isothiocyanate		5.0 U	5.0 UJ
ethyl acetate		2.0 U	2.0 UJ
PIQ-PUMP-SW-08072007		bromomethane	2.0 U
	2-hexanone	2.0 U	2.0 UJ
	styrene	2.0 U	2.0 UJ
	p-isopropyltoluene	2.0 U	2.0 UJ
	n-butylbenzene	5.0 U	5.0 UJ
	1,2,4-trichlorobenzene	2.0 U	2.0 UJ
	naphthalene	2.0 U	2.0 UJ
	methyl isothiocyanate	5.0 U	5.0 UJ
	ethyl acetate	2.0 U	2.0 UJ
	PO-3-SW-08072007	bromomethane	2.0 U
2-hexanone		2.0 U	2.0 UJ
styrene		2.0 U	2.0 UJ
p-isopropyltoluene		2.0 U	2.0 UJ
n-butylbenzene		5.0 U	5.0 UJ
1,2,4-trichlorobenzene		2.0 U	2.0 UJ
naphthalene		2.0 U	2.0 UJ
methyl isothiocyanate		5.0 U	5.0 UJ
ethyl acetate		2.0 U	2.0 UJ

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
PO-5-SW-08072007	bromomethane	2.0 U	2.0 UJ
	2-hexanone	2.0 U	2.0 UJ
	styrene	2.0 U	2.0 UJ
	p-isopropyltoluene	2.0 U	2.0 UJ
	n-butylbenzene	5.0 U	5.0 UJ
	1,2,4-trichlorobenzene	2.0 U	2.0 UJ
	naphthalene	2.0 U	2.0 UJ
	methyl isothiocyanate	5.0 U	5.0 UJ
	ethyl acetate	2.0 U	2.0 UJ
	FOX ROCK SPRING-SW-08072007	bromomethane	2.0 U
2-hexanone		2.0 U	2.0 UJ
styrene		2.0 U	2.0 UJ
p-isopropyltoluene		2.0 U	2.0 UJ
n-butylbenzene		5.0 U	5.0 UJ
1,2,4-trichlorobenzene		2.0 U	2.0 UJ
naphthalene		2.0 U	2.0 UJ
methyl isothiocyanate		5.0 U	5.0 UJ
ethyl acetate		2.0 U	2.0 UJ
EB-08072007		bromomethane	2.0 U
	2-hexanone	2.0 U	2.0 UJ
	styrene	2.0 U	2.0 UJ
	p-isopropyltoluene	2.0 U	2.0 UJ
	n-butylbenzene	5.0 U	5.0 UJ
	1,2,4-trichlorobenzene	2.0 U	2.0 UJ
	naphthalene	2.0 U	2.0 UJ
	methyl isothiocyanate	5.0 U	5.0 UJ
	ethyl acetate	2.0 U	2.0 UJ
	PIQ-PUMP-SW-08072007-DUP	bromomethane	2.0 U
2-hexanone		2.0 U	2.0 UJ
styrene		2.0 U	2.0 UJ
p-isopropyltoluene		2.0 U	2.0 UJ
n-butylbenzene		5.0 U	5.0 UJ
1,2,4-trichlorobenzene		2.0 U	2.0 UJ
naphthalene		2.0 U	2.0 UJ
methyl isothiocyanate		5.0 U	5.0 UJ
ethyl acetate		2.0 U	2.0 UJ
TB-08072007		bromomethane	2.0 U
	2-hexanone	2.0 U	2.0 UJ
	styrene	2.0 U	2.0 UJ
	p-isopropyltoluene	2.0 U	2.0 UJ
	n-butylbenzene	5.0 U	5.0 UJ
	1,2,4-trichlorobenzene	2.0 U	2.0 UJ
	naphthalene	2.0 U	2.0 UJ
	methyl isothiocyanate	5.0 U	5.0 UJ
	ethyl acetate	2.0 U	2.0 UJ
	RB-08062007	bromomethane	2.0 U
2-hexanone		2.0 U	2.0 UJ
styrene		2.0 U	2.0 UJ
p-isopropyltoluene		2.0 U	2.0 UJ
n-butylbenzene		5.0 U	5.0 UJ
1,2,4-trichlorobenzene		2.0 U	2.0 UJ
naphthalene		2.0 U	2.0 UJ
methyl isothiocyanate		5.0 U	5.0 UJ
ethyl acetate		2.0 U	2.0 UJ

Blank qualifications

Acetone and methylene chloride were detected in the equipment blank and rinse blank; acetone was detected at a concentration of 18 µg/L and methylene chloride was detected at a concentration of 1.6 J µg/L (estimated, below the RL, above the MDL). Methylene chloride was not detected in any of the associated samples. Therefore, the following qualifications were made to the associated sample results for acetone.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
CHRUSCIEL SPRING-SW-08072007	acetone	8.0	18 U
PIQ-SOUTH-SW-08072007	acetone	5.5	18 U
PIQ-PUMP-SW-08072007	acetone	5.7	18 U
PO-5-SW-08072007	acetone	2.7 J	5.0 U
PIQ-PUMP-SW-08072007-DUP	acetone	4.8 J	5.0 U

Instrument performance check qualifications

An instrument performance check sample was analyzed at the beginning of each 12-hour period during sample analysis. All ion abundance criteria were met for bromofluorobenzene (BFB). Sample PO-5-SW-08072007 was analyzed outside the 12-hour tune period. Therefore, the concentrations of the undetected compounds in Sample PO-5-SW-08072007 are R qualified as rejected.

Method 8270C

Calibration qualifications

Stearic acid did not meet the %RSD criteria for the initial calibration. EPA Method 8000 allows for the use a quadratic curve which requires an initial calibration consisting of six standards; the quadratic curve was used for sample quantification and consisted of only five standards. Evaluation of the quadratic curve used by the laboratory for stearic acid resulted in the elevation of the reporting limit for stearic acid from 0.5 µg/L to 5.0 µg/L, based on professional judgment.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
ORVIS SPRING-SW-08072007	stearic acid	0.52 U	5.2 U
PO-2-08072007	stearic acid	0.53 U	5.3 U
PO-3-SW-08072007	stearic acid	0.53 U	5.3 U
FOX ROCK SPRING-SW-08072007	stearic acid	0.53 U	5.3 U

Internal standard qualifications

All internal standard retention times are within ±30 seconds of the associated continuing calibration internal standard retention time. All internal standard area counts were within the acceptance criteria (>50% and <150%) of the associated continuing calibration internal standard area counts, with the exception of low recoveries for internal standard perylene-d12 in samples CHRUSCIEL SPRING-SW-08072007, PIQ-SOUTH-SW-08072007, PIQ-PUMP-SW-

08072007, PO-5-SW-08072007 and PIQ-PUMP-SW-08072007-DUP. Therefore, the associated undetected concentrations of the compounds associated with internal standard perylene-d12 in samples CHRUSCIEL SPRING-SW-08072007, PIQ-SOUTH-SW-08072007, PIQ-PUMP-SW-08072007, PO-5-SW-08072007 and PIQ-PUMP-SW-08072007-DUP are R qualified as rejected.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
CHRUSCIEL SPRING-SW-08072007	di-n-octylphthalate	0.52 U	0.52 R
	benzo(b)fluoranthene	0.52 U	0.52 R
	benzo(k)fluoranthene	0.52 U	0.52 R
	benzo(a)pyrene	0.52 U	0.52 R
	indeno(1,2,3-cd)pyrene	0.52 U	0.52 R
	dibenz(a,h)anthracene	0.52 U	0.52 R
PIQ-SOUTH-SW-08072007	benzo(g,h,i)perylene	0.52 U	0.52 R
	di-n-octylphthalate	0.52 U	0.52 R
	benzo(b)fluoranthene	0.52 U	0.52 R
	benzo(k)fluoranthene	0.52 U	0.52 R
	benzo(a)pyrene	0.52 U	0.52 R
	indeno(1,2,3-cd)pyrene	0.52 U	0.52 R
PIQ-PUMP-SW-08072007	dibenz(a,h)anthracene	0.52 U	0.52 R
	benzo(g,h,i)perylene	0.52 U	0.52 R
	di-n-octylphthalate	0.53 U	0.53 R
	benzo(b)fluoranthene	0.53 U	0.53 R
	benzo(k)fluoranthene	0.53 U	0.53 R
	benzo(a)pyrene	0.53 U	0.53 R
PO-5-SW-08072007	indeno(1,2,3-cd)pyrene	0.53 U	0.53 R
	dibenz(a,h)anthracene	0.53 U	0.53 R
	benzo(g,h,i)perylene	0.53 U	0.53 R
	di-n-octylphthalate	0.52 U	0.52 R
	benzo(b)fluoranthene	0.52 U	0.52 R
	benzo(k)fluoranthene	0.52 U	0.52 R
PIQ-PUMP-SW-08072007-DUP	benzo(a)pyrene	0.52 U	0.52 R
	indeno(1,2,3-cd)pyrene	0.52 U	0.52 R
	dibenz(a,h)anthracene	0.52 U	0.52 R
	benzo(g,h,i)perylene	0.52 U	0.52 R
	di-n-octylphthalate	0.54 U	0.54 R
	benzo(b)fluoranthene	0.54 U	0.54 R
	benzo(k)fluoranthene	0.54 U	0.54 R
	benzo(a)pyrene	0.54 U	0.54 R
	indeno(1,2,3-cd)pyrene	0.54 U	0.54 R
	dibenz(a,h)anthracene	0.54 U	0.54 R
	benzo(g,h,i)perylene	0.54 U	0.54 R

Blank qualifications

There were no detections of the compounds of concern in the laboratory method blank, except for butylbenzylphthalate, which was detected at a concentration greater than the RL (0.60 µg/L). The concentrations of butylbenzylphthalate in all samples were greater than the RL. Therefore, the concentrations of butylbenzylphthalate in the samples are U qualified as not detected at either the method blank concentration or at the sample concentration (if greater than the method blank concentration).

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
CHRUSCIEL SPRING-SW-08072007	butylbenzylphthalate	1.0 B	1.0 U
ORVIS SPRING-SW-08072007	butylbenzylphthalate	1.3 B	1.3 U
PO-2-08072007	butylbenzylphthalate	1.4 B	1.4 U
PIQ-SOUTH-SW-08072007	butylbenzylphthalate	0.94 B	0.94 U
PIQ-PUMP-SW-08072007	butylbenzylphthalate	1.0 B	1.0 U
PO-3-SW-08072007	butylbenzylphthalate	0.85 B	0.85 U
PO-5-SW-08072007	butylbenzylphthalate	1.9 B	1.9 U
FOX ROCK SPRING-SW-08072007	butylbenzylphthalate	1.3 B	1.3 U
PIQ-PUMP-SW-08072007-DUP	butylbenzylphthalate	2.0 B	2.0 U

B-Found in associated blank as well as sample.

Surrogate qualifications

All surrogate recoveries met laboratory acceptance limits, with the exception of six samples. There were low (<10%) and no recoveries outside of laboratory control limits for the two or three phenolic surrogate compounds in samples CHRUSCIEL SPRING-SW-08072007, PIQ-SOUTH-SW-08072007, PIQ-PUMP-SW-08072007, PO-3-SW-08072007, PO-5-SW-08072007 and PIQ-PUMP-SW-08072007-DUP. Therefore, the undetected concentrations of the associated phenolic compounds in these samples are R qualified as rejected.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
CHRUSCIEL SPRING-SW-08072007	phenol	0.52 U	0.52 R
	2-chlorophenol	0.52 U	0.52 R
	2-methylphenol	0.52 U	0.52 R
	4-methylphenol	0.52 U	0.52 R
	2-nitrophenol	0.52 U	0.52 R
	2, 4-dimethylphenol	0.52 U	0.52 R
	2, 4-dichlorophenol	0.52 U	0.52 R
	4-chloro-3-methylphenol	0.52 U	0.52 R
	2,4,6-trichlorophenol	0.52 U	0.52 R
	2,4,5-trichlorophenol	0.52 U	0.52 R
	2, 4-dinitrophenol	0.52 U	0.52 R
	4-nitrophenol	0.52 U	0.52 R
	4,6-dinitro-2-methylphenol	0.52 U	0.52 R
	pentachlorophenol	0.52 U	0.52 R
PIQ-SOUTH-SW-08072007	phenol	0.52 U	0.52 R
	2-chlorophenol	0.52 U	0.52 R
	2-methylphenol	0.52 U	0.52 R
	4-methylphenol	0.52 U	0.52 R
	2-nitrophenol	0.52 U	0.52 R
	2, 4-dimethylphenol	0.52 U	0.52 R
	2, 4-dichlorophenol	0.52 U	0.52 R
	4-chloro-3-methylphenol	0.52 U	0.52 R
	2,4,6-trichlorophenol	0.52 U	0.52 R
	2,4,5-trichlorophenol	0.52 U	0.52 R
	2, 4-dinitrophenol	0.52 U	0.52 R
	4-nitrophenol	0.52 U	0.52 R

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
PIQ-PUMP-SW-08072007	4,6-dinitro-2-methylphenol	0.52 U	0.52 R
	pentachlorophenol	0.52 U	0.52 R
	phenol	0.53 U	0.53 R
	2-chlorophenol	0.53 U	0.53 R
	2-methylphenol	0.53 U	0.53 R
	4-methylphenol	0.53 U	0.53 R
	2-nitrophenol	0.53 U	0.53 R
	2, 4-dimethylphenol	0.53 U	0.53 R
	2, 4-dichlorophenol	0.53 U	0.53 R
	4-chloro-3-methylphenol	0.53 U	0.53 R
	2,4,6-trichlorophenol	0.53 U	0.53 R
	2,4,5-trichlorophenol	0.53 U	0.53 R
	2, 4-dinitrophenol	0.53 U	0.53 R
	4-nitrophenol	0.53 U	0.53 R
PO-3-SW-08072007	4,6-dinitro-2-methylphenol	0.53 U	0.53 R
	pentachlorophenol	0.53 U	0.53 R
	phenol	0.53 U	0.53 R
	2-chlorophenol	0.53 U	0.53 R
	2-methylphenol	0.53 U	0.53 R
	4-methylphenol	0.53 U	0.53 R
	2-nitrophenol	0.53 U	0.53 R
	2, 4-dimethylphenol	0.53 U	0.53 R
	2, 4-dichlorophenol	0.53 U	0.53 R
	4-chloro-3-methylphenol	0.53 U	0.53 R
	2,4,6-trichlorophenol	0.53 U	0.53 R
	2,4,5-trichlorophenol	0.53 U	0.53 R
	2, 4-dinitrophenol	0.53 U	0.53 R
	4-nitrophenol	0.53 U	0.53 R
PO-5-SW-08072007	4,6-dinitro-2-methylphenol	0.53 U	0.53 R
	pentachlorophenol	0.53 U	0.53 R
	phenol	0.52 U	0.52 R
	2-chlorophenol	0.52 U	0.52 R
	2-methylphenol	0.52 U	0.52 R
	4-methylphenol	0.52 U	0.52 R
	2-nitrophenol	0.52 U	0.52 R
	2, 4-dimethylphenol	0.52 U	0.52 R
	2, 4-dichlorophenol	0.52 U	0.52 R
	4-chloro-3-methylphenol	0.52 U	0.52 R
	2,4,6-trichlorophenol	0.52 U	0.52 R
	2,4,5-trichlorophenol	0.52 U	0.52 R
	2, 4-dinitrophenol	0.52 U	0.52 R
	4-nitrophenol	0.52 U	0.52 R
PIQ-PUMP-SW-08072007-DUP	4,6-dinitro-2-methylphenol	0.52 U	0.52 R
	pentachlorophenol	0.52 U	0.52 R
	phenol	0.54 U	0.54 R
	2-chlorophenol	0.54 U	0.54 R
	2-methylphenol	0.54 U	0.54 R
	4-methylphenol	0.54 U	0.54 R
	2-nitrophenol	0.54 U	0.54 R
	2, 4-dimethylphenol	0.54 U	0.54 R
	2, 4-dichlorophenol	0.54 U	0.54 R
	4-chloro-3-methylphenol	0.54 U	0.54 R
	2,4,6-trichlorophenol	0.54 U	0.54 R
	2,4,5-trichlorophenol	0.54 U	0.54 R

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
	2, 4-dinitrophenol	0.54 U	0.54 R
	4-nitrophenol	0.54 U	0.54 R
	4,6-dinitro-2-methylphenol	0.54 U	0.54 R
	pentachlorophenol	0.54 U	0.54 R

LCS qualifications

All LCS recoveries were within the laboratory control limits, with the exception of low or no recoveries for 2-methylphenol, 4-methylphenol, 2,4-dimethylphenol, 4-chloroaniline, hexachloropentadiene, n-nitrosodiphenylamine, 3,3'-dichlorobenzidine and aniline in the LCS and/or LCSD. All duplicate RPD results were acceptable, with the exception of high RPD results for 2-methylphenol, 4-methylphenol, 2,4-dimethylphenol and 4-chloroaniline. No qualifications were required due to the high RPDs. However, based on the low (<10%) or no recoveries in the LCS and/or LCSD, the undetected concentrations of 2-methylphenol, 2,4-dimethylphenol, 4-chloroaniline, 3,3'-dichlorobenzidine and aniline are R qualified as rejected; 4-methylphenol, hexachloropentadiene and n-nitrosodiphenylamine are UJ qualified as estimated less than the reporting limit in all samples.

The samples were reextracted 22 days after collection; however, the reextracted data were not evaluated due to the missed holding times.

Stearic acid and orthophenylphenol were not spiked into the LCS/LCSD; therefore, the undetected concentrations of stearic acid and orthophenylphenol in the samples are UJ qualified as estimated below the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
CHRUSCIEL SPRING-SW-08072007	2-methylphenol	0.52 U	0.52 R
	4-methylphenol	0.52 U	0.52 UJ
	2,4-dimethylphenol	0.52 U	0.52 R
	4-chloroaniline	0.52 U	0.52 R
	hexachloropentadiene	0.52 U	0.52 UJ
	n-nitrosodiphenylamine	0.52 U	0.52 UJ
	3,3'-dichlorobenzidine	0.52 U	0.52 R
	aniline	0.52 U	0.52 R
	stearic acid	17	17 J
ORVIS SPRING-SW-08072007	orthophenylphenol	0.52 U	0.52 UJ
	2-methylphenol	0.52 U	0.52 R
	4-methylphenol	0.52 U	0.52 UJ
	2,4-dimethylphenol	0.52 U	0.52 R
	4-chloroaniline	0.52 U	0.52 R
	hexachloropentadiene	0.52 U	0.52 UJ
	n-nitrosodiphenylamine	0.52 U	0.52 UJ
	3,3'-dichlorobenzidine	0.52 U	0.52 R
	aniline	0.52 U	0.52 R
PO-2-08072007	stearic acid	0.52 U	0.52 UJ
	orthophenylphenol	0.52 U	0.52 UJ
	2-methylphenol	0.53 U	0.53 R
	4-methylphenol	0.53 U	0.53 UJ
	2,4-dimethylphenol	0.53 U	0.53 R
	4-chloroaniline	0.53 U	0.53 R
	hexachloropentadiene	0.53 U	0.53 UJ

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
PIQ-SOUTH-SW-08072007	n-nitrosodiphenylamine	0.53 U	0.53 UJ
	3,3'-dichlorobenzidine	0.53 U	0.53 R
	aniline	0.53 U	0.53 R
	stearic acid	0.53 U	0.53 UJ
	orthophenylphenol	0.53 U	0.53 UJ
	2-methyphenol	0.52 U	0.52 R
	4-methyphenol	0.52 U	0.52 UJ
	2,4-dimethylphenol	0.52 U	0.52 R
	4-chloroaniline	0.52 U	0.52 R
	hexachloropentadiene	0.52 U	0.52 UJ
	n-nitrosodiphenylamine	0.52 U	0.52 UJ
	3,3'-dichlorobenzidine	0.52 U	0.52 R
	aniline	0.52 U	0.52 R
	stearic acid	8.5	8.5 J
PIQ-PUMP-SW-08072007	orthophenylphenol	0.52 U	0.52 UJ
	2-methyphenol	0.53 U	0.53 R
	4-methyphenol	0.53 U	0.53 UJ
	2,4-dimethylphenol	0.53 U	0.53 R
	4-chloroaniline	0.53 U	0.53 R
	hexachloropentadiene	0.53 U	0.53 UJ
	n-nitrosodiphenylamine	0.53 U	0.53 UJ
	3,3'-dichlorobenzidine	0.53 U	0.53 R
	aniline	0.53 U	0.53 R
	stearic acid	8.1	8.1 J
	orthophenylphenol	0.53 U	0.53 UJ
	2-methyphenol	0.53 U	0.53 R
	4-methyphenol	0.53 U	0.53 UJ
	2,4-dimethylphenol	0.53 U	0.53 R
PO-3-SW-08072007	4-chloroaniline	0.53 U	0.53 R
	hexachloropentadiene	0.53 U	0.53 UJ
	n-nitrosodiphenylamine	0.53 U	0.53 UJ
	3,3'-dichlorobenzidine	0.53 U	0.53 R
	aniline	0.53 U	0.53 R
	stearic acid	0.53 U	0.53 UJ
	orthophenylphenol	0.53 U	0.53 UJ
	2-methyphenol	0.52 U	0.52 R
	4-methyphenol	0.52 U	0.52 UJ
	2,4-dimethylphenol	0.52 U	0.52 R
	4-chloroaniline	0.52 U	0.52 R
	hexachloropentadiene	0.52 U	0.52 UJ
	n-nitrosodiphenylamine	0.52 U	0.52 UJ
	3,3'-dichlorobenzidine	0.52 U	0.52 R
PO-5-SW-08072007	aniline	6.7	6.7 J
	stearic acid	0.52 U	0.52 UJ
	orthophenylphenol	0.52 U	0.52 UJ
	2-methyphenol	0.53 U	0.53 R
	4-methyphenol	0.53 U	0.53 UJ
	2,4-dimethylphenol	0.53 U	0.53 R
	4-chloroaniline	0.53 U	0.53 R
	hexachloropentadiene	0.53 U	0.53 UJ
	n-nitrosodiphenylamine	0.53 U	0.53 UJ
	3,3'-dichlorobenzidine	0.53 U	0.53 R
	aniline	0.53 U	0.53 R
	stearic acid	0.53 U	0.53 UJ
	orthophenylphenol	0.53 U	0.53 UJ
	FOX ROCK SPRING-SW-08072007	orthophenylphenol	0.53 U

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
PIQ-PUMP-SW-08072007-DUP	2-methyphenol	0.54 U	0.54 R
	4-methyphenol	0.54 U	0.54 UJ
	2,4-dimethylphenol	0.54 U	0.54 R
	4-chloroaniline	0.54 U	0.54 R
	hexachloropentadiene	0.54 U	0.54 UJ
	n-nitrosodiphenylamine	0.54 U	0.54 UJ
	3,3'-dichlorobenzidine	0.54 U	0.54 R
	aniline	0.54 U	0.54 R
	stearic acid	7.6	7.6 J
	orthophenylphenol	0.54 U	0.54 UJ

Method EPH (laboratory specific method)

LCS qualifications

All LCS recoveries were within the laboratory control limits, with the exception of low recoveries for n-nonane (C9) and n-decane (C10). Therefore, the following qualification was made to the sample.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
PIQ-SOUTH-SW-08072007	C9-C18 aliphatics	32 U	32 UJ

Method 6020

Calibration qualifications

The interference check standards (ICSA/ICSAB) met all acceptance criteria for the metals analyses with the exception of sodium in the ICSAB standard associated with the diluted (1:10 dilutions) total metals analyses and Sodium in both the ICSA and ICSAB standards associated with the dissolved metals analyses. The recoveries of sodium in the ICSA and/or ICSAB standards analyzed with the metals samples were listed as 0% on the QC summary forms. According to the report narrative, the recoveries of sodium from the interference check samples were given as a zero percent recovery due to the channel being saturated at the concentration being measured. Therefore, the total and dissolved sodium concentrations in the samples are J qualified as estimated.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
CHRUSCIEL SPRING-SW-08072007	dissolved sodium	4200	4200 J
ORVIS SPRING-SW-08072007	dissolved sodium	2200	2200 J
PO-2-08072007	dissolved sodium	33000	33000 J
PIQ-SOUTH-SW-08072007	total sodium	180000 E	180000 J
	dissolved sodium	180000	180000 J
PIQ-PUMP-SW-08072007	total sodium	190000 E	190000 J
	dissolved sodium	180000	180000 J
PO-3-SW-08072007	dissolved sodium	37000	37000 J
PO-5-SW-08072007	total sodium	55000 E	55000 J
	dissolved sodium	48000	48000 J
FOX ROCK SPRING-SW-08072007	dissolved sodium	2300	2300 J
PIQ-PUMP-SW-08072007-DUP	total sodium	180000 E	180000 J
	dissolved sodium		

E- Estimated due to interferences

Blank qualifications

Barium, copper, magnesium, potassium, selenium, sodium, thallium, vanadium and zinc were detected at low levels in the total metals method blank at concentrations less than the RL, but greater than the MDL. Antimony, arsenic, calcium, chromium, mercury, sodium, selenium and vanadium were detected at low levels in the total metals Initial Calibration Blanks (ICBs) and/or CCBs at concentrations less than the RL, but greater than the MDL.

Antimony, arsenic, thallium and vanadium were detected at low levels in the dissolved metals method blank at concentrations less than the RL, but greater than the MDL. Antimony, arsenic, cadmium, calcium, chromium, mercury, iron, potassium, selenium, silver, thallium and vanadium were detected at low levels in the dissolved metals ICBs and CCBs at concentrations less than the RL, but greater than the MDL.

Based on these blank concentrations, the following sample qualifications were made.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
CHRUSCIEL SPRING-SW-08072007	total antimony	0.36 J	0.50 U
	total copper	1.9 J	2.0 U
	total selenium	0.40 J	1.0 U
	total thallium	0.050 J	0.10 U
	total vanadium	1.5 J	5.0 U
	dissolved antimony	0.34 J	0.50 U
	dissolved mercury	0.0068 J	0.050 U
	dissolved vanadium	1.6 J	5.0 U
ORVIS SPRING-SW-08072007	total antimony	0.15 J	0.50 U
	total arsenic	0.21 J	0.50 U
	total copper	0.40 J	2.0 U
	total vanadium	0.29 J	5.0 U
	total zinc	1.7 J	5.0 U
	dissolved antimony	0.30 J	0.50 U
	dissolved arsenic	0.21 J	0.50 U
	dissolved silver	0.043 J	0.10 U
	dissolved thallium	0.044 J	0.10 U
	dissolved vanadium	0.64 J	5.0 U

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
PO-2-08072007	total antimony	0.16 J	0.50 U
	total copper	0.65 J	2.0 U
	total selenium	0.50 J	1.0 U
	total thallium	0.069 J	0.10 U
	total vanadium	0.76 J	5.0 U
	total zinc	3.9 J	5.0 U
	dissolved antimony	0.18 J	0.50 U
	dissolved thallium	0.039 J	0.10 U
	dissolved vanadium	1.1 J	5.0 U
PIQ-SOUTH-SW-08072007	total antimony	0.21 J	0.50 U
	total selenium	0.24 J	1.0 U
	total thallium	0.057 J	0.10 U
	total vanadium	2.0 J	5.0 U
	dissolved antimony	0.24 J	0.50 U
	dissolved selenium	0.54 J	1.0 U
PIQ-PUMP-SW-08072007	dissolved vanadium	2.5 J	5.0 U
	total antimony	0.19 J	0.50 U
	total selenium	0.26 J	1.0 U
	total thallium	0.044 J	0.10 U
	total vanadium	2.3 J	5.0 U
	dissolved antimony	0.23 J	0.50 U
PO-3-SW-08072007	dissolved selenium	0.45 J	1.0 U
	dissolved vanadium	3.1 J	5.0 U
	total antimony	0.087 J	0.50 U
	total selenium	0.53 J	1.0 U
	total thallium	0.076 J	0.10 U
	total vanadium	1.7 J	5.0 U
PO-5-SW-08072007	dissolved antimony	0.086 J	0.50 U
	dissolved vanadium	1.9 J	5.0 U
	total antimony	0.097 J	0.50 U
	total selenium	0.36 J	1.0 U
	total thallium	0.079 J	0.10 U
FOX ROCK SPRING-SW-08072007	total vanadium	3.6 J	5.0 U
	dissolved antimony	0.074 J	0.50 U
	dissolved vanadium	1.9 J	5.0 U
	total antimony	0.17 J	0.50 U
	total copper	0.26 J	2.0 U
	total selenium	0.44 J	1.0 U
	total thallium	0.031 J	0.10 U
	total vanadium	0.42 J	5.0 U
	total zinc	1.3 J	5.0 U
	dissolved arsenic	0.30 J	0.50 U
	dissolved selenium	0.32 J	1.0 U
EB-08072007	dissolved thallium	0.036 J	0.10 U
	dissolved vanadium	0.90 J	5.0 U
	total magnesium	2.3 JE	10 U
	total potassium	54 JE	100 U
	total sodium	39 JE	50 U
	total vanadium	0.24 J	5.0 U
	total zinc	1.2 J	5.0 U

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
PIQ-PUMP-SW-08072007-DUP	total antimony	0.19 J	0.50 U
	total selenium	0.58 J	1.0 U
	total thallium	0.036 J	0.10 U
	total vanadium	2.2 J	5.0 U
	dissolved antimony	0.18 J	0.50 U
RB-08062007	dissolved vanadium	3.3 J	5.0 U
	total antimony	0.066 J	0.50 U
	total chromium	0.66 J	0.50 U
	total magnesium	4.8 JE	10 U
	total potassium	52 JE	100 U
	total vanadium	0.24 J	5.0 U
	total zinc	1.2 J	5.0 U

Matrix spike qualifications

Sample CHRUSCIEL SPRING-SW-08072007 was analyzed as the MS. All MS recoveries were within laboratory acceptance limits, with the exception of low recovery of dissolved calcium. Therefore, the concentration of dissolved calcium in CHRUSCIEL SPRING-SW-08072007 is J qualified as estimated low.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
CHRUSCIEL SPRING-SW-08072007	dissolved calcium	96000 N	96000 J-

N-Spike recovery outside of control limits

Serial dilution qualifications

The serial dilution of sample CHRUSCIEL SPRING-SW-08072007 for total metals analysis did not meet the percent difference criteria for aluminum, antimony, arsenic, chromium, magnesium, potassium and sodium. The laboratory flagged the serial dilution results for magnesium, potassium and sodium as estimated due to interference. Additionally, the sample concentrations of aluminum, antimony, arsenic and chromium are <50 times the MDL; no qualifications of these total metals results are required. Therefore, the total magnesium, potassium and sodium concentrations for sample CHRUSCIEL SPRING-SW-08072007 are J qualified as estimated.

The serial dilution of sample CHRUSCIEL SPRING-SW-08072007 for dissolved metals analysis did not meet the percent difference criteria for antimony, arsenic, chromium, iron, nickel, thallium, vanadium and zinc. The laboratory flagged the serial dilution results for iron as estimated due to interference. Additionally, the sample concentrations of antimony, arsenic, chromium, nickel, thallium, vanadium and zinc are <50 times the MDL; no qualifications of these total metals results are required. Therefore, the dissolved iron concentration for sample CHRUSCIEL SPRING-SW-08072007 is J qualified as estimated.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
CHRUSCIEL SPRING-SW-08072007	total magnesium	24000 E	24000 J
	total potassium	2300 E	2300 J
	total sodium	3600 E	3600 J
	dissolved iron	1100 E	1100 J

E- Estimated due to interference

Methylamine and 2-propanol (EPA Method 1671)

Duplicate qualifications

One field duplicate (sample PIQ-PUMP-SW-08072007-DUP) was collected, prepared and measured with this data set. The results for sample PIQ-PUMP-SW-08072007 was undetected for both compounds; the results for the field duplicate were detected for methylamine and undetected for 2-propanol. Therefore, the concentration of methylamine in the sample and duplicate are J qualified as estimated.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
PIQ-PUMP-SW-08072007	methylamine	2 U	2 UJ
PIQ-PUMP-SW-08072007-DUP		10	10 J

C.9.3.2.3. Laboratory Report: 0708070

This report includes the following analyses and samples:

Analyses

8260B
8270C
EPH
6020/7470A
wet chemistry analyses

Client Sample ID

BROD-GW-08062007
FERRARO-GW-08062007
FERRARO-GW-08062007-DUP
EW-BARN-GW-08062007
EW-HOUSE-GW-08062007
SANDILLO-GW-08062007
PFWD-GW-08062007
LAFLAMME-GW-08062007
TB-08062007

The data from this sample set were validated to Tier II; additionally, full Tier III validation was performed for arsenic and perchlorate data.

The sample qualifications are summarized below, by laboratory method.

Method 8260B

Calibration qualifications

Appropriate initial calibrations were performed for each analyte. Based on the method of calibration, the laboratory calculated the percent relative standard deviation (%RSD). For all target analytes, the RRFs met the method criteria; the RSDs met the method criteria for all compounds except 23 compounds. The RSDs were within the validation acceptance criteria for all compounds except bromomethane, 2-hexanone, styrene, p-isopropyltoluene, n-butylbenzene, 1,2,4-trichlorobenzene, naphthalene, methyl isothiocyanate and ethyl acetate. Therefore, the undetected concentrations of bromomethane, 2-hexanone, styrene, p-isopropyltoluene, n-butylbenzene, 1,2,4-trichlorobenzene, naphthalene, methyl isothiocyanate and ethyl acetate in all samples are UJ qualified as estimated below the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
BROD-GW-08062007	bromomethane	2.0 U	2.0 UJ
	2-hexanone	2.0 U	2.0 UJ
	styrene	2.0 U	2.0 UJ
	p-isopropyltoluene	2.0 U	2.0 UJ
	n-butylbenzene	5.0 U	5.0 UJ
	1,2,4-trichlorobenzene	2.0 U	2.0 UJ
	naphthalene	2.0 U	2.0 UJ
	methyl isothiocyanate	5.0 U	5.0 UJ
	ethyl acetate	2.0 U	2.0 UJ
	FERRARO-GW-08062007	bromomethane	2.0 U
2-hexanone		2.0 U	2.0 UJ
styrene		2.0 U	2.0 UJ
p-isopropyltoluene		2.0 U	2.0 UJ
n-butylbenzene		5.0 U	5.0 UJ
1,2,4-trichlorobenzene		2.0 U	2.0 UJ
naphthalene		2.0 U	2.0 UJ
methyl isothiocyanate		5.0 U	5.0 UJ
ethyl acetate		2.0 U	2.0 UJ
FERRARO-GW-08062007-DUP		bromomethane	2.0 U
	2-hexanone	2.0 U	2.0 UJ
	styrene	2.0 U	2.0 UJ
	p-isopropyltoluene	2.0 U	2.0 UJ
	n-butylbenzene	5.0 U	5.0 UJ
	1,2,4-trichlorobenzene	2.0 U	2.0 UJ
	naphthalene	2.0 U	2.0 UJ
	methyl isothiocyanate	5.0 U	5.0 UJ
	ethyl acetate	2.0 U	2.0 UJ
	EW-BARN-GW-08062007	bromomethane	2.0 U
2-hexanone		2.0 U	2.0 UJ
styrene		2.0 U	2.0 UJ
p-isopropyltoluene		2.0 U	2.0 UJ
n-butylbenzene		5.0 U	5.0 UJ
1,2,4-trichlorobenzene		2.0 U	2.0 UJ

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
EW-HOUSE-GW-08062007	naphthalene	2.0 U	2.0 UJ
	methyl isothiocyanate	5.0 U	5.0 UJ
	ethyl acetate	2.0 U	2.0 UJ
	bromomethane	2.0 U	2.0 UJ
	2-hexanone	2.0 U	2.0 UJ
	styrene	2.0 U	2.0 UJ
	p-isopropyltoluene	2.0 U	2.0 UJ
	n-butylbenzene	5.0 U	5.0 UJ
	1,2,4-trichlorobenzene	2.0 U	2.0 UJ
	SANDILLO-GW-08062007	naphthalene	2.0 U
methyl isothiocyanate		5.0 U	5.0 UJ
ethyl acetate		2.0 U	2.0 UJ
bromomethane		2.0 U	2.0 UJ
2-hexanone		2.0 U	2.0 UJ
styrene		2.0 U	2.0 UJ
p-isopropyltoluene		2.0 U	2.0 UJ
n-butylbenzene		5.0 U	5.0 UJ
1,2,4-trichlorobenzene		2.0 U	2.0 UJ
PFWD-GW-08062007		naphthalene	2.0 U
	methyl isothiocyanate	5.0 U	5.0 UJ
	ethyl acetate	2.0 U	2.0 UJ
	bromomethane	2.0 U	2.0 UJ
	2-hexanone	2.0 U	2.0 UJ
	styrene	2.0 U	2.0 UJ
	p-isopropyltoluene	2.0 U	2.0 UJ
	n-butylbenzene	5.0 U	5.0 UJ
	1,2,4-trichlorobenzene	2.0 U	2.0 UJ
	LAFLAMME-GW-08062007	naphthalene	2.0 U
methyl isothiocyanate		5.0 U	5.0 UJ
ethyl acetate		2.0 U	2.0 UJ
bromomethane		2.0 U	2.0 UJ
2-hexanone		2.0 U	2.0 UJ
styrene		2.0 U	2.0 UJ
p-isopropyltoluene		2.0 U	2.0 UJ
n-butylbenzene		5.0 U	5.0 UJ
1,2,4-trichlorobenzene		2.0 U	2.0 UJ
TB-08062007		naphthalene	2.0 U
	methyl isothiocyanate	5.0 U	5.0 UJ
	ethyl acetate	2.0 U	2.0 UJ
	bromomethane	2.0 U	2.0 UJ
	2-hexanone	2.0 U	2.0 UJ
	styrene	2.0 U	2.0 UJ
	p-isopropyltoluene	2.0 U	2.0 UJ
	n-butylbenzene	5.0 U	5.0 UJ
	1,2,4-trichlorobenzene	2.0 U	2.0 UJ
	ethyl acetate	2.0 U	2.0 UJ

Instrument performance check qualifications

An instrument performance check sample was analyzed at the beginning of each 12-hour period during sample analysis. All ion abundance criteria were met for bromofluorobenzene (BFB). Two samples were analyzed outside the 12-hour tune period, the MS/MSD of sample FERRARO-GW-08062007. Therefore, the concentrations of the spike compounds in the MS/MSD are R qualified as rejected.

Method 8270C

Calibration qualifications

Stearic acid did not meet the %RSD criteria. EPA Method 8000 allows for the use a quadratic curve which requires an initial calibration consisting of six standards; the quadratic curve was used for sample quantification and consisted of only five standards. Evaluation of the quadratic curve used by the laboratory for stearic acid resulted in the elevation of the reporting limit for stearic acid from 0.5 µg/L to 5.0 µg/L, based on professional judgment.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
BROD-GW-08062007	stearic acid	0.50 U	5.0 U
FERRARO-GW-08062007	stearic acid	0.50 U	5.0 U
FERRARO-GW-08062007-DUP	stearic acid	0.50 U	5.0 U
EW-BARN-GW-08062007	stearic acid	0.50 U	5.0 U
EW-HOUSE-GW-08062007	stearic acid	0.50 U	5.0 U
SANDILLO-GW-08062007	stearic acid	0.50 U	5.0 U
PFWD-GW-08062007	stearic acid	0.50 U	5.0 U
LAFLAMME-GW-08062007	stearic acid	0.50 U	5.0 U

Blank qualifications

There were no detections of the compounds of concern in the laboratory method blank, except for butylbenzylphthalate, which was detected at a concentration greater than the RL (0.95 µg/L). The concentrations of butylbenzylphthalate in all samples were greater than the RL. Therefore, the concentrations of butylbenzylphthalate in the samples are U qualified as not detected at either the method blank concentration or the sample concentration (if greater than the method blank concentration).

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
BROD-GW-08062007	butylbenzylphthalate	1.7 B	1.7 U
FERRARO-GW-08062007	butylbenzylphthalate	0.97 B	0.97 U
FERRARO-GW-08062007-DUP	butylbenzylphthalate	0.78 B	0.95 U
EW-BARN-GW-08062007	butylbenzylphthalate	1.0 B	1.0 U
EW-HOUSE-GW-08062007	butylbenzylphthalate	0.76 B	0.95 U
SANDILLO-GW-08062007	butylbenzylphthalate	0.80 B	0.95 U
PFWD-GW-08062007	butylbenzylphthalate	1.8 B	1.8 U
LAFLAMME-GW-08062007	butylbenzylphthalate	0.83 B	0.95 U

B-Found in associated blank as well as sample.

Surrogate qualifications

All surrogate recoveries met laboratory acceptance limits, with the exception of two samples. There were low recoveries outside of laboratory control limits (3% and 10%) for two of the three phenolic surrogate compounds in sample FERRARO-GW-08062007-DUP; the third phenolic surrogate was just above the laboratory control limits. There were no recoveries of the three phenolic surrogates in sample BROD-GW-08062007. The samples were reextracted 22 days after collection with acceptable recoveries; however, these data were not evaluated due to the missed holding time. Therefore, the undetected concentration of the associated phenolic compounds in samples FERRARO-GW-08062007-DUP and BROD-GW-08062007 are R qualified as rejected.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
FERRARO-GW-08062007-DUP	phenol	0.53 U	0.53 R
	2-chlorophenol	0.53 U	0.53 R
	2-methylphenol	0.53 U	0.53 R
	4-methylphenol	0.53 U	0.53 R
	2-nitrophenol	0.53 U	0.53 R
	2, 4-dimethylphenol	0.53 U	0.53 R
	2, 4-dichlorophenol	0.53 U	0.53 R
	4-chloro-3-methylphenol	0.53 U	0.53 R
	2,4,6-trichlorophenol	0.53 U	0.53 R
	2,4,5-trichlorophenol	0.53 U	0.53 R
	2, 4-dinitrophenol	0.53 U	0.53 R
	4-nitrophenol	0.53 U	0.53 R
	4,6-dinitro-2-methylphenol	0.53 U	0.53 R
	pentachlorophenol	0.53 U	0.53 R
	BROD-GW-08062007	phenol	0.52 U
2-chlorophenol		0.52 U	0.52 R
2-methylphenol		0.52 U	0.52 R
4-methylphenol		0.52 U	0.52 R
2-nitrophenol		0.52 U	0.52 R
2, 4-dimethylphenol		0.52 U	0.52 R
2, 4-dichlorophenol		0.52 U	0.52 R
4-chloro-3-methylphenol		0.52 U	0.52 R
2,4,6-trichlorophenol		0.52 U	0.52 R
2,4,5-trichlorophenol		0.52 U	0.52 R
2, 4-dinitrophenol		0.52 U	0.52 R
4-nitrophenol		0.52 U	0.52 R
4,6-dinitro-2-methylphenol		0.52 U	0.52 R
pentachlorophenol		0.52 U	0.52 R

LCS qualifications

All LCS recoveries were within the laboratory control limits, with the exception of low or no recoveries for 2-methylphenol, 4-methylphenol, 2,4-dimethylphenol, 4-chloroaniline, hexachloropentadiene, n-nitrosodiphenylamine, 3,3'-dichlorobenzidine and aniline in the LCS and/or LCSD. All duplicate RPD results were acceptable, with the exception of high RPD results for 4-chloroaniline, hexachloropentadiene and n-nitrosodiphenylamine. No qualifications were

required due to the high RPD. However, based on the low (<10%) or no recoveries in the LCS and/or LCSD, the undetected concentrations of 2-methyphenol, 4-methyphenol, 2,4-dimethylphenol, 4-chloroaniline, n-nitrosodiphenylamine, 3,3'-dichlorobenzidine and aniline are R qualified as rejected and hexachloropentadiene is UJ qualified as estimated less than the reporting limit in all samples.

The samples were reextracted 22 days after collection; however, these data were not evaluated due to the missed holding times.

Stearic acid and orthophenylphenol were not spiked into the LCS/LCSD; therefore, the undetected concentrations of stearic acid and orthophenylphenol in the samples are UJ qualified as estimated below the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
BROD-GW-08062007	2-methyphenol	0.52 U	0.52 R
	4-methyphenol	0.52 U	0.52 R
	2,4-dimethylphenol	0.52 U	0.52 R
	4-chloroaniline	0.52 U	0.52 R
	hexachloropentadiene	0.52 U	0.52 UJ
	n-nitrosodiphenylamine	0.52 U	0.52 R
	3,3'-dichlorobenzidine	0.52 U	0.52 R
	aniline	0.52 U	0.52 R
	stearic acid	0.52 U	0.52 UJ
	orthophenylphenol	0.52 U	0.52 UJ
FERRARO-GW-08062007	2-methyphenol	0.53 U	0.53 R
	4-methyphenol	0.53 U	0.53 R
	2,4-dimethylphenol	0.53 U	0.53 R
	4-chloroaniline	0.53 U	0.53 R
	hexachloropentadiene	0.53 U	0.53 UJ
	n-nitrosodiphenylamine	0.53 U	0.53 R
	3,3'-dichlorobenzidine	0.53 U	0.53 R
	aniline	0.53 U	0.53 R
	stearic acid	0.53 U	0.53 R
	orthophenylphenol	0.53 U	0.53 UJ
FERRARO-GW-08062007-DUP	2-methyphenol	0.53 U	0.53 R
	4-methyphenol	0.53 U	0.53 R
	2,4-dimethylphenol	0.53 U	0.53 R
	4-chloroaniline	0.53 U	0.53 R
	hexachloropentadiene	0.53 U	0.53 UJ
	n-nitrosodiphenylamine	0.53 U	0.53 R
	3,3'-dichlorobenzidine	0.53 U	0.53 R
	aniline	0.53 U	0.53 R
	stearic acid	0.53 U	0.53 R
	orthophenylphenol	0.53 U	0.53 UJ
EW-BARN-GW-08062007	2-methyphenol	0.51 U	0.51 R
	4-methyphenol	0.51 U	0.51 R
	2,4-dimethylphenol	0.51 U	0.51 R
	4-chloroaniline	0.51 U	0.51 R
	hexachloropentadiene	0.51 U	0.51 UJ
	n-nitrosodiphenylamine	0.51 U	0.51 R
	3,3'-dichlorobenzidine	0.51 U	0.51 R
	aniline	0.51 U	0.51 R
	stearic acid	0.51 U	0.51 R
	orthophenylphenol	0.51 U	0.51 UJ
EW-HOUSE-GW-08062007	2-methyphenol	0.53 U	0.53 R

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
SANDILLO-GW-08062007	4-methyphenol	0.53 U	0.53 R
	2,4-dimethylphenol	0.53 U	0.53 R
	4-chloroaniline	0.53 U	0.53 R
	hexachloropentadiene	0.53 U	0.53 UJ
	n-nitrosodiphenylamine	0.53 U	0.53 R
	3,3'-dichlorobenzidine	0.53 U	0.53 R
	aniline	0.53 U	0.53 R
	stearic acid	0.53 U	0.53 R
	orthophenylphenol	0.53 U	0.53 UJ
	2-methyphenol	0.53 U	0.53 R
	4-methyphenol	0.53 U	0.53 R
	2,4-dimethylphenol	0.53 U	0.53 R
	4-chloroaniline	0.53 U	0.53 R
	hexachloropentadiene	0.53 U	0.53 UJ
	n-nitrosodiphenylamine	0.53 U	0.53 R
PFWD-GW-08062007	3,3'-dichlorobenzidine	0.53 U	0.53 R
	aniline	0.53 U	0.53 R
	stearic acid	0.53 U	0.53 R
	orthophenylphenol	0.53 U	0.53 UJ
	2-methyphenol	0.54 U	0.54 R
	4-methyphenol	0.54 U	0.54 R
	2,4-dimethylphenol	0.54 U	0.54 R
	4-chloroaniline	0.54 U	0.54 R
	hexachloropentadiene	0.54 U	0.54 UJ
	n-nitrosodiphenylamine	0.54 U	0.54 R
	3,3'-dichlorobenzidine	0.54 U	0.54 R
	aniline	0.54 U	0.54 R
	stearic acid	0.54 U	0.54 R
	orthophenylphenol	0.54 U	0.54 UJ
	LAFLAMME-GW-08062007	2-methyphenol	0.54 U
4-methyphenol		0.54 U	0.54 R
2,4-dimethylphenol		0.54 U	0.54 R
4-chloroaniline		0.54 U	0.54 R
hexachloropentadiene		0.54 U	0.54 UJ
n-nitrosodiphenylamine		0.54 U	0.54 R
3,3'-dichlorobenzidine		0.54 U	0.54 R
aniline		0.54 U	0.54 R
stearic acid		0.54 U	0.54 R
orthophenylphenol		0.54 U	0.54 UJ

Matrix spike qualifications

An MS/MSD pair was analyzed, using sample FERRARO-GW-08062007. Acceptable recovery and RPD results were within the laboratory QC acceptance limits for all compounds except low or no recoveries outside of laboratory limits for phenol, 2-methyphenol, 4-methyphenol, 2,4-dimethylphenol, 4-chloroaniline, hexachloropentadiene, 2,4-dinitrophenol, 4-nitrophenol, n-nitrosodiphenylamine, 3,3'-dichlorobenzidine and aniline. The RPDs were acceptable except for 4-chloroaniline, 2,4-dinitrophenol, 4-nitrophenol, 4,6-dinitro-2-methylphenol and n-nitrosodiphenylamine. No qualifications were required due to the RPD results. Therefore, based low or no recoveries outside of laboratory limits, the following qualifications were made for phenol, 2-methyphenol, 4-methyphenol, 2,4-dimethylphenol, 4-chloroaniline,

hexachloropentadiene, 2,4-dinitrophenol, 4-nitrophenol, 4,6-dinitro-2-methylphenol, n-nitrosodiphenylamine, 3,3'-dichlorobenzidine and aniline.

The MS/MSD samples were reextracted 22 days after collection; however, these data were not evaluated due to the missed holding times.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
FERRARO-GW-08062007	phenol	0.53 U	0.53 UJ
	2-methylphenol	0.53 U	0.53 R
	4-methylphenol	0.53 U	0.53 R
	2,4-dimethylphenol	0.53 U	0.53 R
	4-chloroaniline	0.53 U	0.53 R
	hexachloropentadiene	0.53 U	0.53 UJ
	2,4-dinitrophenol	0.53 U	0.53 R
	4-nitrophenol	0.53 U	0.53 UJ
	n-nitrosodiphenylamine	0.53 U	0.53 UJ
	3,3'-dichlorobenzidine	0.53 U	0.53 R
	aniline	0.53 U	0.53 R

Method EPH (laboratory specific method)

Matrix spike qualifications

Sample FERRARO-GW-08062007 was analyzed as the MS. All recoveries were within the laboratory control limits, with the exception of low recoveries for n-nonane (C9) and n-decane (C10). Therefore, the concentration of C9-C18 aliphatics in sample FERRARO-GW-08062007 is UJ qualified as estimated lower than the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
FERRARO-GW-08062007	C9-C18 aliphatics	32 U	32UJ

LCS qualifications

All LCS recoveries were within the laboratory control limits, with the exception of low recoveries for n-nonane (C9) and n-decane (C10). Therefore, the following qualifications were made to the samples.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
BROD-GW-08062007	c9-c18 aliphatics	30 U	30 UJ
FERRARO-GW-08062007	c9-c18 aliphatics	32 U	32 UJ
FERRARO-GW-08062007-DUP	c9-c18 aliphatics	32 U	32 UJ
EW-BARN-GW-08062007	c9-c18 aliphatics	30 U	30 UJ
EW-HOUSE-GW-08062007	c9-c18 aliphatics	32 U	32 UJ
SANDILLO-GW-08062007	c9-c18 aliphatics	32 U	32 UJ
PFWD-GW-08062007	c9-c18 aliphatics	32 U	32 UJ
LAFLAMME-GW-08062007	c9-c18 aliphatics	30 U	30 UJ

Method 6020

Calibration qualifications

The interference check standards (ICSA/ICSAB) met all acceptance criteria for the metals analyses with the exception of sodium in the ICSAB standard associated with the total metals analyses and sodium in both the ICSA and ICSAB standards associated with the dissolved metals analyses. The recoveries of sodium in the ICSA and/or ICSAB standards analyzed with the metals samples were listed as 0% on the QC summary forms. According to the report narrative, the recoveries of sodium from the interference check samples were given as a zero percent recovery due to the channel being saturated at the concentration being measured. Therefore, the total and dissolved sodium concentrations in the samples are J qualified as estimated.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
BROD-GW-08062007	total sodium	1700	1700 J
	dissolved sodium	2400	2400 J
FERRARO-GW-08062007	total sodium	1200	1200 J
	dissolved sodium	2200	2200 J
FERRARO-GW-08062007-DUP	total sodium	1300	1300 J
	dissolved sodium	2200	2200 J
EW-BARN-GW-08062007	total sodium	65000	65000 J
	dissolved sodium	61000	61000 J
EW-HOUSE-GW-08062007	total sodium	1200	1200 J
	dissolved sodium	1900	1900 J
SANDILLO-GW-08062007	total sodium	6600	6600 J
	dissolved sodium	7000	7000 J
PFWD-GW-08062007	total sodium	66000	66000 J
	dissolved sodium	61000	61000 J
LAFLAMME-GW-08062007	total sodium	2400	2400 J
	dissolved sodium	2600	2600 J

Blank qualifications

arsenic, barium, chromium, copper, lead, magnesium, manganese, nickel, sodium, thallium, vanadium and zinc were detected at low levels in the total method blank at concentrations less than the RL, but greater than the MDL. Antimony, calcium, chromium, iron, selenium and vanadium were detected at low levels in the total ICBs and/or CCBs at concentrations less than the RL, but greater than the MDL.

Antimony, arsenic, calcium, chromium, potassium, selenium, sodium, thallium and vanadium were detected at low levels in the dissolved method blank at concentrations less than the RL, but greater than the MDL. Antimony, cadmium, calcium, chromium, mercury, nickel, potassium, selenium, silver and vanadium were detected at low levels in the dissolved ICBs and CCBs at concentrations less than the RL, but greater than the MDL.

Based on these blank concentrations, the following sample qualifications were made.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
BROD-GW-08062007	total antimony	0.40 J	0.50 U
	total chromium	0.39 J	0.50 U
	total lead	0.33 J	0.50 U
	total vanadium	0.28 J	5.0 U
	total zinc	2.2 J	5.0 U
	dissolved selenium	0.39 J	1.0 U
FERRARO-GW-08062007	dissolved zinc	4.6 J	5.0 U
	total antimony	0.14 J	0.50 U
	total arsenic	0.26 J	0.50 U
	total lead	0.24 J	0.50 U
	dissolved antimony	0.20 J	0.50 U
	dissolved arsenic	0.31 J	0.50 U
FERRARO-GW-08062007-DUP	dissolved selenium	0.35 J	1.0 U
	dissolved vanadium	1.6 J	5.0 U
	total antimony	0.44 J	0.50 U
	total arsenic	0.19 J	0.50 U
	total zinc	4.6 J	5.0 U
	dissolved antimony	0.18 J	0.50 U
EW-BARN-GW-08062007	dissolved arsenic	0.20 J	0.50 U
	dissolved vanadium	0.48 J	5.0 U
	total antimony	0.22 J	0.50 U
	total arsenic	0.41 J	0.50 U
	total chromium	0.37 J	0.50 U
	total lead	0.14 J	0.50 U
EW-HOUSE-GW-08062007	total selenium	0.23 J	1.0 U
	total thallium	0.063 J	0.10 U
	total zinc	3.8 J	5.0 U
	dissolved antimony	0.16 J	0.50 U
	dissolved selenium	0.69 J	1.0 U
	dissolved vanadium	1.2 J	5.0 U
	total antimony	0.070 J	0.50 U
	total chromium	0.32 J	0.50 U
	total lead	0.092 J	0.50 U
	total manganese	0.38 J	5.0 U
SANDILLO-GW-08062007	total zinc	2.7 J	5.0 U
	dissolved antimony	0.078 J	0.50 U
	dissolved selenium	0.72 J	1.0 U
	dissolved vanadium	0.22 J	5.0 U
	total antimony	0.40 J	0.50 U
PFWD-GW-08062007	total chromium	0.26 J	0.50 U
	total zinc	3.9 J	5.0 U
	dissolved antimony	0.43 J	0.50 U
	dissolved selenium	0.67 J	1.0 U
	dissolved vanadium	1.4 J	5.0 U
LAFLAMME-GW-08062007	total selenium	0.28 J	1.0 U
	total thallium	0.051 J	0.10 U
	dissolved antimony	0.052 J	0.50 U
	dissolved selenium	0.74 J	1.0 U
	dissolved vanadium	1.4 J	5.0 U
LAFLAMME-GW-08062007	total antimony	0.21 J	0.50 U
	total arsenic	0.48 J	0.50 U
	total chromium	0.36 J	0.50 U
	total lead	0.35 J	0.50 U
	total selenium	0.35 J	1.0 U

dissolved antimony	0.25 J	0.50 U
dissolved selenium	0.42 J	1.0 U

Serial dilution qualifications

The serial dilution of sample FERRARO-GW-08062007 for total metals analysis did not meet the percent difference criteria for calcium, chromium, copper, iron, magnesium, potassium and zinc. The laboratory flagged the serial dilution results for calcium and magnesium as estimated due to interference. Additionally, the sample concentrations of chromium, copper, iron, potassium and zinc are <50 times the MDL; therefore no qualifications of these total metals results are required. Only the total calcium and magnesium concentrations for sample FERRARO-GW-08062007 are J qualified as estimated.

The serial dilution of sample FERRARO-GW-08062007 for dissolved metals analysis did not meet the percent difference criteria for antimony, arsenic, calcium, chromium, nickel, thallium and vanadium. The laboratory flagged the serial dilution results for calcium as estimated due to interference. Additionally, the sample concentrations of antimony, arsenic, chromium, nickel, thallium and vanadium are <50 times the MDL; no qualifications of these total metals results are required. Therefore, the dissolved calcium concentration for sample FERRARO-GW-08062007 is J qualified as estimated.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
FERRARO-GW-08062007	total calcium	39000 E	39000 J
	total magnesium	22000E	22000 J
	dissolved calcium	41000 E	41000 J

E- Estimated due to interference

Sulfide (EPA Method 376.2)

Holding time qualifications

Sulfide should be analyzed within 7 days of collection. The samples were analyzed eleven days after collection. Therefore, the sulfide concentrations in the samples are UJ qualified as estimated below the reporting limit.

Sample ID	Compound	Laboratory Result (mg/L)	Validation Result (mg/L)
FERRARO-GW-08062007	sulfide	0.20 U	0.20 UJ
FERRARO-GW-08062007-DUP	sulfide	0.20 U	0.20 UJ

C.9.3.2.4. *Laboratory Report: 0708051*

This report includes the following analyses and samples:

Analyses

alkalinity, 2320b
bromide, 300.0
chloride, 300.0
fluoride, 300.0
nitrate, 300.0
nitrite, 300.0
sulfate, 300.0
tds, 160.1
6020/7470a

Client Sample ID

Trib2A SW08022007
Trib2B SW08022007
OC-1 SW08022007
OC-2 SW08022007
SP-C

The data from this sample set were validated to Tier II; additionally, full Tier III validation was performed for arsenic data.

The sample qualifications are summarized below, by laboratory method.

Sample	Analysis	Qualifications	Comments
Trib2A SW08022007	nitrate, 300.0	0.10 UJ	The sample was analyzed 2 days past the holding time. Additionally, the LCS recovery was low and outside the laboratory control limits.
	nitrite, 300.0	0.050 UJ	The sample was analyzed 2 days past the holding time.
Trib2B SW08022007	nitrate, 300.0	0.10 UJ	The sample was analyzed 2 days past the holding time. Additionally, the LCS recovery was low and outside the laboratory control limits.
	nitrite, 300.0	0.050 UJ	The sample was analyzed 2 days past the holding time.
OC-1 SW08022007	nitrate, 300.0	0.25 J	The sample was analyzed 2 days past the holding time. Additionally, the LCS recovery was low and outside the laboratory control limits.
	nitrite, 300.0	0.050 UJ	The sample was analyzed 2 days past the holding time.
OC-2 SW08022007	nitrate, 300.0	0.35 J	The sample was analyzed 2 days past the holding time. Additionally, the LCS recovery was low and outside the laboratory control limits.
	nitrite, 300.0	0.050 UJ	The sample was analyzed 2 days past the holding time.
SP-C SW08022007	nitrate, 300.0	0.10 UJ	The sample was analyzed 2 days past the holding time. Additionally, the LCS recovery was low and outside the laboratory control limits.
	nitrite, 300.0	0.050 UJ	The sample was analyzed 2 days past the holding time.

Methods 6020 and 74740A

Calibration qualifications

The recoveries of sodium in the ICSA/ICSAB standards analyzed with the total metals samples were listed as 0% on the QC summary form. According to the report narrative, "The recovery of sodium from the ICS analyzed on 8/23/07 at 10:41 is shown as a 0% on form IV because of channel saturation." Therefore, the total sodium concentrations in all samples are J qualified as estimated.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Trib2A SW08022007	sodium	28000	28000 J
Trib2B SW08022007	sodium	6700	6700 J
OC-1 SW08022007	sodium	380000	380000 J
OC-2 SW08022007	sodium	370000	370000 J
SP-C SW08022007	sodium	35000	35000 J

Blank qualifications

arsenic, sodium, thallium, vanadium and zinc were detected at low levels in the total metals method blank at concentrations less than the reporting limit (RL), but greater than the method detection limit (MDL). Antimony, calcium and vanadium were detected at low levels in the total metals initial calibration blank (ICB) and antimony, arsenic, calcium, chromium, mercury, sodium, thallium and vanadium were detected at low levels in the total metals CCBs at concentrations less than the RL, but greater than the MDL. The following qualifications were made.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Trib2A SW08022007	antimony	0.45 J	0.50 U
	chromium	0.41 J	0.50 U
	mercury	0.0094 J	0.020 U
	thallium	0.049 J	0.10 U
	vanadium	1.6 J	5.0 U
	zinc	4.8 J	5.0 U
Trib2B SW08022007	antimony	0.15 J	0.50 U
	chromium	0.42 J	0.50 U
	mercury	0.014 J	0.020 U
	thallium	0.051 J	0.10 U
	zinc	3.4 J	5.0 U
OC-1 SW08022007	antimony	0.13 J	0.50 U
	chromium	0.41 J	0.50 U
	mercury	0.014 J	0.020 U
	vanadium	3.7 J	5.0 U
OC-2 SW08022007	antimony	0.092 J	0.50 U
	mercury	0.012 J	0.020 U
	thallium	0.029 J	0.10 U
SP-C SW08022007	antimony	0.074 J	0.50 U
	mercury	0.011 J	0.020 U
	thallium	0.045 J	0.10 U
	vanadium	2.4 J	5.0 U

Serial dilution qualifications

The serial dilution of sample Trib2A SW08022007 for total metals analysis did not meet the percent difference criteria for antimony, arsenic, chromium, cobalt, iron, potassium, thallium, vanadium and zinc. The laboratory flagged the serial dilution result for iron as estimated due to interference. Additionally, the sample concentrations of antimony, arsenic, chromium, cobalt, potassium, thallium, vanadium and zinc are <50 times the MDL; no qualifications of these total metals results are required. Therefore, the total iron concentration for sample Trib2A SW08022007 is J qualified as estimated.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Trib2A SW08022007	iron	900 E	900 J

E-Estimated due to interference

C.9.3.2.5. *Laboratory Report: 0707104*

This report includes the following analyses and samples:

Analyses

8260B
8270C
EPH
6020/7470A
wet chemistry analyses
methylamine and 2-propanol (EPA Method 1671)
acrylamide (modified EPA Method 8032A)

Client Sample ID

WELL-J-GW-(154)-07182007
WELL-J-GW-(154)-07182007DUP
WELL-J-GW-(85)-07182007
CDP WELL#5-GW-07182007
WELL-I-GW-07182007
WELL-G-GW-07182007
TB01-07182007
RB01-07182007
TB02-07182007
WELL-N-GW-07182007
WELL-D-GW-07182007
WELL-E-GW-07182007
TB03-07182007
RB02-07182007

The data from this sample set were validated to Tier II; additionally, full Tier III validation was performed for arsenic data.

The sample qualifications are summarized below, by laboratory method.

Method 8260B

Calibration qualifications

Appropriate initial calibrations were performed for each analyte. Based on the method of calibration, the laboratory calculated the percent relative standard deviation (%RSD). For all target analytes, the RRFs met the method criteria; the RSDs met the method criteria for all compounds except bromomethane, chloroethane, methyl chloride and bromoform. The %RSDs were within the validation acceptance criteria for all compounds except bromomethane. Therefore, the undetected concentrations of bromomethane in all samples are UJ qualified as estimated below the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-J-GW-(154)-07182007	bromomethane	2.0 U	2.0 UJ
WELL-J-GW-(154)-07182007DUP	bromomethane	2.0 U	2.0 UJ
WELL-J-GW-(85)-07182007	bromomethane	2.0 U	2.0 UJ
CDP WELL#5-GW-07182007	bromomethane	2.0 U	2.0 UJ
WELL-I-GW-07182007	bromomethane	2.0 U	2.0 UJ
WELL-G-GW-07182007	bromomethane	2.0 U	2.0 UJ
TB01-07182007	bromomethane	2.0 U	2.0 UJ
RB01-07182007	bromomethane	2.0 U	2.0 UJ
TB02-07182007	bromomethane	2.0 U	2.0 UJ
WELL-N-GW-07182007	bromomethane	2.0 U	2.0 UJ
WELL-D-GW-07182007	bromomethane	2.0 U	2.0 UJ
WELL-E-GW-07182007	bromomethane	2.0 U	2.0 UJ
TB03-07182007	bromomethane	2.0 U	2.0 UJ
RB02-07182007	bromomethane	2.0 U	2.0 UJ

Method 8270C

Calibration qualifications

Appropriate initial calibrations were performed for each analyte. Based on the method of calibration, the laboratory calculated the percent relative standard deviation (%RSD) of the RRFs. For all target analytes, the RRFs met the method criteria; the RSDs met the method criteria for all compounds except 2,4-dinitrophenol, 4,6-dinitro-2-methylphenol and pentachlorophenol. The %RSDs were within validation acceptance criteria for all compounds except pentachlorophenol. Therefore, the undetected sample concentrations for pentachlorophenol are UJ qualified as estimated below the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-J-GW-(154)-07182007	pentachlorophenol	2.0 U	2.0 UJ
WELL-J-GW-(154)-07182007DUP	pentachlorophenol	2.0 U	2.0 UJ
WELL-J-GW-(85)-07182007	pentachlorophenol	2.0 U	2.0 UJ
CDP WELL#5-GW-07182007	pentachlorophenol	2.0 U	2.0 UJ
WELL-I-GW-07182007	pentachlorophenol	2.0 U	2.0 UJ
WELL-G-GW-07182007	pentachlorophenol	2.0 U	2.0 UJ
WELL-N-GW-07182007	pentachlorophenol	2.0 U	2.0 UJ
WELL-D-GW-07182007	pentachlorophenol	2.0 U	2.0 UJ
WELL-E-GW-07182007	pentachlorophenol	2.0 U	2.0 UJ

Blank qualifications

There were no detections of the compounds of concern in the laboratory method blank, except for butylbenzylphthalate, which was detected at a concentration greater than the RL (0.66 µg/L). The concentrations of butylbenzylphthalate in all samples were greater than the RL, but less than two times the RL. Therefore, the concentrations of butylbenzylphthalate in the samples are U qualified as not detected at either the method blank concentration or at the sample concentration (if greater than the method blank concentration).

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-J-GW-(154)-07182007	butylbenzylphthalate	0.39 JB	0.66 U
WELL-J-GW-(154)-07182007DUP	butylbenzylphthalate	0.42 JB	0.66 U
WELL-J-GW-(85)-07182007	butylbenzylphthalate	0.91	0.91 U
CDP WELL#5-GW-07182007	butylbenzylphthalate	0.41 JB	1.0 U
WELL-I-GW-07182007	butylbenzylphthalate	0.38 JB	0.66 U
WELL-G-GW-07182007	butylbenzylphthalate	0.42 JB	0.66 U
WELL-N-GW-07182007	butylbenzylphthalate	0.39 JB	0.66 U
WELL-D-GW-07182007	butylbenzylphthalate	0.49 JB	0.66 U
WELL-E-GW-07182007	butylbenzylphthalate	0.47 JB	0.66 U

B-Found in associated blank as well as sample.

Surrogate qualifications

All surrogate recoveries met laboratory acceptance limits, with the exception of two of the three phenolic surrogate compounds in sample WELL-E-GW-07182007 (5% and 3% recoveries); the third phenolic surrogate was just above the laboratory control limits (15-110%). Therefore, the undetected concentration of the associated phenolic compounds in sample WELL-E-GW-07182007 are R qualified as rejected.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-E-GW-07182007	phenol	0.50 U	0.50 R
	2-chlorophenol	0.50 U	0.50 R
	2-methylphenol	0.50 U	0.50 R
	4-methylphenol	0.50 U	0.50 R
	2-nitrophenol	0.50 U	0.50 R
	2, 4-dimethylphenol	0.50 U	0.50 R
	2, 4-dichlorophenol	0.50 U	0.50 R
	4-chloro-3-methylphenol	0.50 U	0.50 R
	2,4,6-trichlorophenol	0.50 U	0.50 R
	2,4,5-trichlorophenol	0.50 U	0.50 R
	2, 4-dinitrophenol	2.0 U	2.0 R
	4-nitrophenol	0.50 U	0.50 R
	4,6-dinitro-2-methylphenol	0.50 U	0.50 R
	pentachlorophenol	2.0 U	2.0 R

LCS qualifications

All LCS recoveries were within the laboratory control limits, with the exception of low recoveries for phenol, 2,4-dimethylphenol, hexachloropentadiene, 2,4-dinitrophenol and aniline in the LCS and/or LCSD. All duplicate RPD results were acceptable, with the exception of high RPD results for phenol, hexachloropentadiene 2,4-dinitrophenol and pentachlorophenol. No qualifications were required due to the high RPD. However, based on the low recoveries in the LCS and/or LCSD, the undetected concentrations of phenol, hexachloropentadiene 2,4-dinitrophenol and aniline are UJ qualified as estimated below the reporting limit in all samples. The LCS recoveries for 2,4-dimethylphenol were below 10% in the LCS and/or LCSD. Therefore, the undetected concentrations of 2,4-dimethylphenol in all samples are R qualified as rejected.

Stearic acid and orthophenylphenol were not spiked into the LCS/LCSD; therefore, the undetected concentrations of stearic acid and orthophenylphenol in the samples are UJ qualified as estimated below the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-J-GW-(154)-07182007	phenol	0.50 U	0.50 UJ
	2,4-dimethylphenol	0.50 U	0.50 UJ
	hexachloropentadiene	0.50 U	0.50 UJ
	2,4-dinitrophenol	0.50 U	0.50 R
	aniline	0.50 U	0.50 UJ
	stearic acid	0.50 U	0.50 UJ
	orthophenylphenol	0.50 U	0.50 UJ
	WELL-J-GW-(154)-07182007DUP	phenol	0.50 U
2,4-dimethylphenol		0.50 U	0.50 UJ
hexachloropentadiene		0.50 U	0.50 UJ
2,4-dinitrophenol		0.50 U	0.50 R
aniline		0.50 U	0.50 UJ
stearic acid		0.50 U	0.50 UJ
orthophenylphenol		0.50 U	0.50 UJ
WELL-J-GW-(85)-07182007		phenol	0.50 U
	2,4-dimethylphenol	0.50 U	0.50 UJ
	hexachloropentadiene	0.50 U	0.50 UJ
	2,4-dinitrophenol	0.50 U	0.50 R
	aniline	0.50 U	0.50 UJ
	stearic acid	0.50 U	0.50 UJ
	orthophenylphenol	0.50 U	0.50 UJ
	CDP WELL#5-GW-07182007	phenol	0.50 U
2,4-dimethylphenol		0.50 U	0.50 UJ
hexachloropentadiene		0.50 U	0.50 UJ
2,4-dinitrophenol		0.50 U	0.50 R
aniline		0.50 U	0.50 UJ
stearic acid		0.50 U	0.50 UJ
orthophenylphenol		0.50 U	0.50 UJ
WELL-I-GW-07182007		phenol	0.50 U
	2,4-dimethylphenol	0.50 U	0.50 UJ
	hexachloropentadiene	0.50 U	0.50 UJ
	2,4-dinitrophenol	0.50 U	0.50 R
	aniline	0.50 U	0.50 UJ
	stearic acid	0.50 U	0.50 UJ
	orthophenylphenol	0.50 U	0.50 UJ
	WELL-G-GW-07182007	phenol	0.50 U
2,4-dimethylphenol		0.50 U	0.50 UJ
hexachloropentadiene		0.50 U	0.50 UJ
2,4-dinitrophenol		0.50 U	0.50 R
aniline		0.50 U	0.50 UJ
stearic acid		0.50 U	0.50 UJ
orthophenylphenol		0.50 U	0.50 UJ
WELL-N-GW-07182007		phenol	0.50 U
	2,4-dimethylphenol	0.50 U	0.50 UJ
	hexachloropentadiene	0.50 U	0.50 UJ
	2,4-dinitrophenol	0.50 U	0.50 R
	aniline	0.50 U	0.50 UJ
	stearic acid	0.50 U	0.50 UJ
	orthophenylphenol	0.50 U	0.50 UJ

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-D-GW-07182007	phenol	0.50 U	0.50 UJ
	2,4-dimethylphenol	0.50 U	0.50 UJ
	hexachloropentadiene	0.50 U	0.50 UJ
	2,4-dinitrophenol	0.50 U	0.50 R
	aniline	0.50 U	0.50 UJ
	stearic acid	0.50 U	0.50 UJ
	orthophenylphenol	0.50 U	0.50 UJ
WELL-E-GW-07182007	phenol	0.50 U	0.50 UJ
	2,4-dimethylphenol	0.50 U	0.50 UJ
	hexachloropentadiene	0.50 U	0.50 UJ
	2,4-dinitrophenol	0.50 U	0.50 R
	aniline	0.50 U	0.50 UJ
	stearic acid	0.50 U	0.50 UJ
	orthophenylphenol	0.50 U	0.50 UJ

Method EPH (laboratory specific method)

Surrogate qualifications

All surrogate recoveries met laboratory acceptance limits, with the exception of low 5-alpha androstane and ortho-terphenyl recoveries in sample WELL-J-GW-(154)-07182007DUP. Therefore, the undetected concentrations of all compounds are UJ qualified as estimated below the reporting limits.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-J-GW-(154)-07182007DUP	C9-C18 aliphatics	30 U	30UJ
	C19-C36 aliphatics	40 U	40 UJ
	C11-C22 aromatics	85 U	85 UJ
	unadjusted C11-C22 aromatics	85 U	85 UJ
	indeno(1,2,3-cd)pyrene and dibenzo(a,h)anthracene	10 U	10 UJ
	all other PAHs	5.0 U	5.0 UJ

LCS qualifications

All LCS recoveries were within the laboratory control limits, with the exception of low recoveries for n-nonane (c9), n-decane (c10), n-dodecane (c12), naphthalene and 2-methylnaphthalene. Therefore, the following qualifications were made to the samples. The samples were reextracted past the holding time, but the reextracted data were not evaluated.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-J-GW-(154)-07182007	C9-C18 aliphatics	30 U	30UJ
	naphthalene	5.0 U	5.0 UJ
	2-methylnaphthalene	5.0 U	5.0 UJ
WELL-J-GW-(154)-07182007DUP	C9-C18 aliphatics	30 U	30 UJ
	naphthalene	5.0 U	5.0 UJ
	2-methylnaphthalene	5.0 U	5.0 UJ
CDP WELL#5-GW-07182007	C9-C18 aliphatics	30 U	30 UJ
	naphthalene	5.0 U	5.0 UJ
	2-methylnaphthalene	5.0 U	5.0 UJ

Method 6020

Calibration qualifications

The recoveries of sodium in the ICSA/ICSAB standards analyzed with the dissolved metals samples were listed as 0% on the QC summary form. According to the report narrative, the recoveries of sodium from the interference check samples were given as a zero percent recovery due to the channel being saturated at the concentration being measured. Therefore, the dissolved sodium concentrations in the samples are J qualified as estimated.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-J-GW-(154)-07182007	dissolved sodium	7600	7600 J
WELL-J-GW-(154)-07182007DUP	dissolved sodium	7700	7700 J
WELL-J-GW-(85)-07182007	dissolved sodium	9100	9100 J
CDP WELL#5-GW-07182007	dissolved sodium	4100	4100 J
WELL-I-GW-07182007	dissolved sodium	1700	1700 J
WELL-G-GW-07182007	dissolved sodium	2400	2400 J
WELL-N-GW-07182007	dissolved sodium	150000	150000 J
WELL-D-GW-07182007	dissolved sodium	2000	2000 J
WELL-E-GW-07182007	dissolved sodium	140000	140000 J

Blank qualifications

arsenic, chromium, magnesium, potassium, sodium, thallium and vanadium were detected at low levels in the total method blank at concentrations less than the RL, but greater than the MDL. Antimony, arsenic, calcium, chromium, iron, mercury, potassium, selenium, sodium, vanadium, and zinc were detected at low levels in the total ICBs and/or CCBs at concentrations less than the RL, but greater than the MDL.

Arsenic, calcium and vanadium were detected at low levels in the dissolved method blank at concentrations less than the RL, but greater than the MDL. Antimony, calcium, chromium, iron, magnesium, potassium, silver, thallium and vanadium were detected at low levels in the dissolved ICBs and CCBs at concentrations less than the RL, but greater than the MDL. Based on these blank concentrations, the following sample qualifications were made.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-J-GW-(154)-07182007	total antimony	0.36 J	0.50 U
	total selenium	0.27 J	1.0 U
	total vanadium	2.8 J	5.0 U
	dissolved vanadium	1.5 J	5.0 U
WELL-J-GW-(154)-07182007DUP	total antimony	0.088 J	0.50 U
	total selenium	0.27 J	1.0 U
	total vanadium	1.4 J	5.0 U
	dissolved vanadium	0.36 J	5.0 U
WELL-J-GW-(85)-07182007 CDP WELL#5-GW-07182007	dissolved antimony	0.23 J	0.50 U
	total thallium	0.069 J	0.10 U
	dissolved antimony	0.085 J	0.50 U
WELL-I-GW-07182007	dissolved thallium	0.051 J	0.10 U
	total thallium	0.064 J	0.10 U
	total zinc	2.8 J	5.0 U
WELL-G-GW-07182007	dissolved arsenic	0.13 J	0.50 U
	dissolved thallium	0.052 J	0.10 U
	total antimony	0.062 J	0.50 U
	total arsenic	0.34 J	0.50 U
RB01-07182007	total thallium	0.037 J	0.10 U
	dissolved antimony	0.047 J	0.50 U
	dissolved thallium	0.036 J	0.10 U
	total iron	23 J	50 U
WELL-N-GW-07182007	total potassium	96 JE	100 U
	total zinc	1.4 J	5.0 U
	total antimony	0.071 J	0.50 U
WELL-D-GW-07182007	total selenium	0.84 J	1.0 U
	total zinc	1.8 J	5.0 U
	total arsenic	0.23 J	0.50 U
	total zinc	1.0 J	5.0 U
WELL-E-GW-07182007	dissolved arsenic	0.29 J	0.50 U
	dissolved vanadium	0.24 J	5.0 U
	total vanadium	2.9 J	5.0 U
RB02-07182007	dissolved thallium	0.043 J	0.10 U
	dissolved vanadium	2.4 J	5.0 U
	total calcium	110 J	200 U
RB02-07182007	total vanadium	0.19 J	0.50 U
	total zinc	2.8 J	5.0 U

There were detections for several total metals in the rinse blanks (samples RB01-07182007 and RB02-07182007) that resulted in additional sample qualifications: chromium (0.56 µg/L, RB01-07182007 and RB02-07182007), cobalt (0.54 µg/L, RB02-07182007), copper (0.92 µg/L, RB02-07182007), lead (0.098 µg/L, RB02-07182007), and thallium (0.23 µg/L, RB02-07182007). Based on professional judgment, these detections in the rinse blank samples resulted in the following additional sample qualifications.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
CDP WELL#5-GW-07182007	total chromium	0.56 E	0.56 U
	total cobalt	0.21	0.21 U
	total copper	0.78	0.78 U
WELL-N-GW-07182007	total cobalt	0.48	0.48 U
	total lead	0.11	0.11 U
WELL-D-GW-07182007	total thallium	0.091 J	0.091 U

E- Estimated due to interference

Matrix spike qualifications

Sample WELL-J-GW-(154)-07182007 was analyzed as the MS. All MS recoveries were within laboratory acceptance limits, with the exception of dissolved calcium and total and dissolved magnesium. The concentrations of total and dissolved magnesium in sample WELL-J-GW-(154)-07182007 are greater than four times the spike amount; therefore, no sample qualifications are required. The low recovery of calcium in the dissolved metals analysis resulted in the calcium concentration in sample WELL-J-GW-(154)-07182007 to be J- qualified as estimated with low bias.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-J-GW-(154)-07182007	dissolved calcium	88000 E	88000 J-

E- Estimated due to interference

Duplicate qualifications

Sample WELL-J-GW-(154)-07182007 was analyzed as the laboratory duplicate for both the total and dissolved metals analyses. The RPD results were within laboratory acceptance limits, with the exception of total aluminum, total antimony, total arsenic, total vanadium, total iron, dissolved antimony and dissolved vanadium. However, since the sample results for total aluminum, total antimony, total arsenic, total vanadium, dissolved antimony and dissolved vanadium in the original and duplicate are < five times the RL and the absolute differences between the sample and duplicate are < the RL, no qualifications are required. The concentration of total iron in sample WELL-J-GW-(154)-07182007 is J qualified as estimated due to the duplicate result outside of the RPD criteria.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-J-GW-(154)-07182007	total iron	1600	1600 J

Serial dilution qualifications

The serial dilution of sample WELL-J-GW-(154)-07182007 for total metals analysis did not meet the percent difference criteria for aluminum, arsenic, cadmium, chromium, potassium and vanadium. The laboratory flagged the serial dilution results for chromium and potassium as estimated due to interference. Additionally, the sample concentrations of aluminum, arsenic, cadmium and vanadium are <50 times the MDL; no qualifications of these total metals results

are required. Therefore, the total chromium and potassium concentrations for sample WELL-J-GW-(154)-071820071 are J qualified as estimated.

The serial dilution of sample WELL-J-GW-(154)-07182007 for dissolved metals analysis did not meet the percent difference criteria for antimony, arsenic, chromium, thallium and vanadium. The laboratory flagged the serial dilution results for thallium as estimated due to interference. Additionally, the sample concentrations of antimony, arsenic, chromium and vanadium are <50 times the MDL; no qualifications of these total metals results are required. Therefore, the dissolved thallium concentration for sample WELL-J-GW-(154)-07182007 is J qualified as estimated.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-J-GW-(154)-07182007	total calcium	8.4 E	8.4 J
	total potassium	2200 E	2200 J
	dissolved thallium	2.0 E	2.0 J

E- Estimated due to interference

Free Chlorine (Standard Methods 4500-Cl)

Holding time qualifications

Free chlorine should be immediately after sample collection; the samples were analyzed three days after collection. Therefore, the free chlorine concentrations in the samples are UJ qualified as estimated below the reporting limit.

Sample ID	Compound	Laboratory Result (mg/L)	Validation Result (mg/L)
CDP WELL#5-GW-07182007	free chlorine	0.05 U	0.05 UJ
WELL-J-GW-(154)-07182007	free chlorine	0.05 U	0.05 UJ
WELL-I-GW-07182007	free chlorine	0.05 U	0.05 UJ
WELL-N-GW-07182007	free chlorine	0.05 U	0.05 UJ
WELL-D-GW-07182007	free chlorine	0.05 U	0.05 UJ
WELL-E-GW-07182007	free chlorine	0.05 U	0.05 UJ
WELL-G-GW-07182007	free chlorine	0.05 U	0.05 UJ

C.9.3.2.6. Laboratory Report: 0707093

This report includes the following analyses and samples:

Analyses
8260B
8270C
EPH
6020/7470A
wet chemistry analyses
methylamine and 2-propanol (EPA Method 1671)
acrylamide (modified EPA Method 8032A)

Client Sample ID

WELL-F-GW-07172007
WELL-M-GW-07172007
WELL-C-GW-07172007
RB01-07172007
TB01-07172007
WELL-H-GW-07172007
EB01-07172007
WELL-96-1-GW-07172007
TB02-07172007
OGS 1+2-GW-07172007
WELL-A-GW-07172007
TB03-07172007
WELL-96-2-GW-07172007

The data from this sample set were validated to Tier II; additionally, full Tier III validation was performed for arsenic data.

The sample qualifications are summarized below, by laboratory method.

Method 8260B

Calibration qualifications

Appropriate initial calibrations were performed for each analyte. Based on the method of calibration, the laboratory calculated the percent relative standard deviation (%RSD). For all target analytes, the RRFs met the method criteria. The RSDs met the method criteria for all compounds except bromomethane, chloroethane, methyl chloride and bromoform. The %RSDs were within the validation acceptance criteria for all compounds except bromomethane. Therefore, the undetected concentrations of bromomethane in all samples are UJ qualified as estimated below the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-F-GW-07172007	bromomethane	2.0 U	2.0 UJ
WELL-M-GW-07172007	bromomethane	2.0 U	2.0 UJ
WELL-C-GW-07172007	bromomethane	2.0 U	2.0 UJ
RB01-07172007	bromomethane	2.0 U	2.0 UJ
TB01-07172007	bromomethane	2.0 U	2.0 UJ
WELL-H-GW-07172007	bromomethane	2.0 U	2.0 UJ
EB01-07172007	bromomethane	2.0 U	2.0 UJ
WELL-96-1-GW-07172007	bromomethane	2.0 U	2.0 UJ
TB02-07172007	bromomethane	2.0 U	2.0 UJ
OGS 1+2-GW-07172007	bromomethane	2.0 U	2.0 UJ
WELL-A-GW-07172007	bromomethane	2.0 U	2.0 UJ
TB03-07172007	bromomethane	2.0 U	2.0 UJ
WELL-96-2-GW-07172007	bromomethane	2.0 U	2.0 UJ

For all target analytes, the RRFs met the method criteria; the percent differences (%D) between the RRFs in the initial and continuing calibration standards for all target analytes were within the method acceptance criteria, with the exception of bromomethane and chloroethane. Therefore,

the undetected concentrations of bromomethane and chloroethane in all samples are UJ qualified as estimated below the reporting limits.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-F-GW-07172007	bromomethane	2.0 U	2.0 UJ
	chloroethane	2.0 U	2.0 UJ
WELL-M-GW-07172007	bromomethane	2.0 U	2.0 UJ
	chloroethane	2.0 U	2.0 UJ
WELL-C-GW-07172007	bromomethane	2.0 U	2.0 UJ
	chloroethane	2.0 U	2.0 UJ
RB01-07172007	bromomethane	2.0 U	2.0 UJ
	chloroethane	2.0 U	2.0 UJ
TB01-07172007	bromomethane	2.0 U	2.0 UJ
	chloroethane	2.0 U	2.0 UJ
WELL-H-GW-07172007	bromomethane	2.0 U	2.0 UJ
	chloroethane	2.0 U	2.0 UJ
EB01-07172007	bromomethane	2.0 U	2.0 UJ
	chloroethane	2.0 U	2.0 UJ
WELL-96-1-GW-07172007	bromomethane	2.0 U	2.0 UJ
	chloroethane	2.0 U	2.0 UJ
TB02-07172007	bromomethane	2.0 U	2.0 UJ
	chloroethane	2.0 U	2.0 UJ
OGS 1+2-GW-07172007	bromomethane	2.0 U	2.0 UJ
	chloroethane	2.0 U	2.0 UJ
WELL-A-GW-07172007	bromomethane	2.0 U	2.0 UJ
	chloroethane	2.0 U	2.0 UJ
TB03-07172007	bromomethane	2.0 U	2.0 UJ
	chloroethane	2.0 U	2.0 UJ
WELL-96-2-GW-07172007	bromomethane	2.0 U	2.0 UJ
	chloroethane	2.0 U	2.0 UJ

LCS qualifications

All LCS recoveries and RPDs were within laboratory acceptance limits, with the exception of low recoveries for vinyl chloride and chloroethane. Therefore, the undetected concentrations of vinyl chloride and chloroethane in all samples are UJ qualified as estimated below the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-F-GW-07172007	vinyl chloride	2.0 U	2.0 UJ
	chloroethane	2.0 U	2.0 UJ
WELL-M-GW-07172007	vinyl chloride	2.0 U	2.0 UJ
	chloroethane	2.0 U	2.0 UJ
WELL-C-GW-07172007	vinyl chloride	2.0 U	2.0 UJ
	chloroethane	2.0 U	2.0 UJ
RB01-07172007	vinyl chloride	2.0 U	2.0 UJ
	chloroethane	2.0 U	2.0 UJ
TB01-07172007	vinyl chloride	2.0 U	2.0 UJ
	chloroethane	2.0 U	2.0 UJ
WELL-H-GW-07172007	vinyl chloride	2.0 U	2.0 UJ
	chloroethane	2.0 U	2.0 UJ
EB01-07172007	vinyl chloride	2.0 U	2.0 UJ
	chloroethane	2.0 U	2.0 UJ
WELL-96-1-GW-07172007	vinyl chloride	2.0 U	2.0 UJ
	chloroethane	2.0 U	2.0 UJ
TB02-07172007	vinyl chloride	2.0 U	2.0 UJ
	chloroethane	2.0 U	2.0 UJ
OGS 1+2-GW-07172007	vinyl chloride	2.0 U	2.0 UJ
	chloroethane	2.0 U	2.0 UJ
WELL-A-GW-07172007	vinyl chloride	2.0 U	2.0 UJ
	chloroethane	2.0 U	2.0 UJ
TB03-07172007	vinyl chloride	2.0 U	2.0 UJ
	chloroethane	2.0 U	2.0 UJ
WELL-96-2-GW-07172007	vinyl chloride	2.0 U	2.0 UJ
	chloroethane	2.0 U	2.0 UJ

Matrix spike qualifications

Sample WELL-H-GW-07172007 was analyzed as the MS/MSD. All MS/MSD recoveries and RPDs were within laboratory acceptance limits, with the exception of low recoveries for bromomethane and 2,2-dichloropropane. Therefore, the undetected concentrations of bromomethane and 2,2-dichloropropane in sample WELL-H-GW-07172007 are UJ qualified as estimated below the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-H-GW-07172007	bromomethane	2.0 U	2.0 UJ
	2,2-dichloropropane	2.0 U	2.0 UJ

Method 8270C

Calibration qualifications

Appropriate initial calibrations were performed for each analyte. Based on the method of calibration, the laboratory calculated the percent relative standard deviation (%RSD) of the RRFs. For all target analytes, the RRFs met the method criteria; the RSDs met the method criteria for all compounds except 2,4-dinitrophenol, 4,6-dinitro-2-methylphenol and pentachlorophenol. The %RSDs were within validation acceptance criteria for all compounds except pentachlorophenol. Therefore, the undetected sample concentrations for pentachlorophenol are UJ qualified as estimated below the reporting limit.

Stearic acid did not meet the %RSD criteria. EPA Method 8000 allows for the use a quadratic curve which requires an initial calibration consisting of six standards; the quadratic curve was used for sample quantification and consisted of only five standards. Evaluation of the quadratic curve used by the laboratory for stearic acid resulted in the elevation of the reporting limit for stearic acid from 0.5 µg/L to 2.0 µg/L, based on professional judgment.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-F-GW-07172007	pentachlorophenol	2.0 U	2.0 UJ
	stearic acid	0.50 U	2.0 U
WELL-M-GW-07172007	pentachlorophenol	2.0 U	2.0 UJ
	stearic acid	0.50 U	2.0 U
WELL-C-GW-07172007	pentachlorophenol	2.0 U	2.0 UJ
	stearic acid	0.50 U	2.0 U
WELL-H-GW-07172007	pentachlorophenol	2.0 U	2.0 UJ
	stearic acid	0.50 U	2.0 U
WELL-96-1-GW-07172007	pentachlorophenol	2.0 U	2.0 UJ
	stearic acid	1.0 U	4.0 U
OGS 1+2-GW-07172007	pentachlorophenol	2.0 U	2.0 UJ
	stearic acid	0.50 U	2.0 U
WELL-A-GW-07172007	pentachlorophenol	2.0 U	2.0 UJ
	stearic acid	0.50 U	2.0 U
WELL-96-2-GW-07172007	pentachlorophenol	2.0 U	2.0 UJ
	stearic acid	0.50 U	2.0 U

Blank qualifications

There were no detections of the compounds of concern in the laboratory method blank, except for butylbenzylphthalate, which was detected at a concentration greater than the RL (0.51 µg/L). The concentrations of butylbenzylphthalate in the samples were greater than the RL, but less than two times the RL. Therefore, based on professional judgment, the concentrations of butylbenzylphthalate in the samples are U qualified as not detected at the RL or at the sample concentration.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-F-GW-07172007	butylbenzylphthalate	0.82 B	0.82 U
WELL-M-GW-07172007	butylbenzylphthalate	0.41 JB	0.50 U
WELL-C-GW-07172007	butylbenzylphthalate	0.33 JB	0.50 U
WELL-H-GW-07172007	butylbenzylphthalate	0.44 JB	0.50 U
WELL-96-1-GW-07172007	butylbenzylphthalate	1.4 B	1.4 U
OGS 1+2-GW-07172007	butylbenzylphthalate	0.47 B	0.50 U
WELL-A-GW-07172007	butylbenzylphthalate	0.43 JB	0.50 U
WELL-96-2-GW-07172007	butylbenzylphthalate	0.42 JB	0.50 U

B-Found in associated blank as well as sample.

LCS qualifications

All LCS recoveries were within the laboratory control limits, with the exception of low recoveries for 2-methylphenol, 4-methylphenol, 2,4-dimethylphenol, 4-chloroaniline, hexachloropentadiene, 3,3'-dichlorobenzidine and aniline in the LCS and/or LCSD. All duplicate RPD results were acceptable, with the exception of high RPD results for 2,4-dinitrophenol. No qualifications were required due to the high RPD. However, based on the low recoveries in the LCS and/or LCSD, the undetected concentrations of 2-methylphenol, 4-methylphenol, 4-chloroaniline, hexachloropentadiene and 3,3'-dichlorobenzidine are UJ qualified as estimated below the reporting limit in all samples.

The LCS recoveries for 2,4-dimethylphenol and aniline were below 10% in the LCS and/or LCSD. Therefore, the undetected concentrations of 2,4-dimethylphenol and aniline in all samples are R qualified as rejected.

Stearic acid and orthophenylphenol were not spiked into the LCS/LCSD; therefore, the undetected concentrations of stearic acid and orthophenylphenol in the samples are UJ qualified as estimated below the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-F-GW-07172007	2-methylphenol	0.50 U	0.50 UJ
	4-methylphenol	0.50 U	0.50 UJ
	4-chloroaniline	0.50 U	0.50 UJ
	hexachloropentadiene	0.50 U	0.50 UJ
	3,3'-dichlorobenzidine	0.50 U	0.50 UJ
	2,4-dimethylphenol	0.50 U	0.50 R
	aniline	0.50 U	0.50 R
	stearic acid	0.50 U	0.50 UJ
	orthophenylphenol	0.50 U	0.50 UJ
	WELL-M-GW-07172007	2-methylphenol	0.50 U
4-methylphenol		0.50 U	0.50 UJ
4-chloroaniline		0.50 U	0.50 UJ
hexachloropentadiene		0.50 U	0.50 UJ
3,3'-dichlorobenzidine		0.50 U	0.50 UJ
2,4-dimethylphenol		0.50 U	0.50 R
aniline		0.50 U	0.50 R
stearic acid		0.50 U	0.50 UJ
orthophenylphenol		0.50 U	0.50 UJ
WELL-C-GW-07172007		2-methylphenol	0.50 U
	4-methylphenol	0.50 U	0.50 UJ
	4-chloroaniline	0.50 U	0.50 UJ
	hexachloropentadiene	0.50 U	0.50 UJ
	3,3'-dichlorobenzidine	0.50 U	0.50 UJ
	2,4-dimethylphenol	0.50 U	0.50 R
	aniline	0.50 U	0.50 R
	stearic acid	0.50 U	0.50 UJ
	orthophenylphenol	0.50 U	0.50 UJ
	WELL-H-GW-07172007	2-methylphenol	0.50 U
4-methylphenol		0.50 U	0.50 UJ
4-chloroaniline		0.50 U	0.50 UJ
hexachloropentadiene		0.50 U	0.50 UJ
3,3'-dichlorobenzidine		0.50 U	0.50 UJ
2,4-dimethylphenol		0.50 U	0.50 R
aniline		0.50 U	0.50 R

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-96-1-GW-07172007	stearic acid	0.50 U	0.50 UJ
	orthophenylphenol	0.50 U	0.50 UJ
	2-methylphenol	0.50 U	0.50 UJ
	4-methylphenol	0.50 U	0.50 UJ
	4-chloroaniline	0.50 U	0.50 UJ
	hexachloropentadiene	0.50 U	0.50 UJ
	3,3'-dichlorobenzidine	0.50 U	0.50 UJ
	2,4-dimethylphenol	0.50 U	0.50 R
OGS 1+2-GW-07172007	aniline	0.50 U	0.50 R
	stearic acid	0.50 U	0.50 UJ
	orthophenylphenol	0.50 U	0.50 UJ
	2-methylphenol	0.50 U	0.50 UJ
	4-methylphenol	0.50 U	0.50 UJ
	4-chloroaniline	0.50 U	0.50 UJ
	hexachloropentadiene	0.50 U	0.50 UJ
	3,3'-dichlorobenzidine	0.50 U	0.50 UJ
WELL-A-GW-07172007	2,4-dimethylphenol	0.50 U	0.50 R
	aniline	0.50 U	0.50 R
	stearic acid	0.50 U	0.50 UJ
	orthophenylphenol	0.50 U	0.50 UJ
	2-methylphenol	0.50 U	0.50 UJ
	4-methylphenol	0.50 U	0.50 UJ
	4-chloroaniline	0.50 U	0.50 UJ
	hexachloropentadiene	0.50 U	0.50 UJ
WELL-96-2-GW-07172007	3,3'-dichlorobenzidine	0.50 U	0.50 UJ
	2,4-dimethylphenol	0.50 U	0.50 R
	aniline	0.50 U	0.50 R
	stearic acid	0.50 U	0.50 UJ
	orthophenylphenol	0.50 U	0.50 UJ
	2-methylphenol	0.50 U	0.50 UJ
	4-methylphenol	0.50 U	0.50 UJ
	4-chloroaniline	0.50 U	0.50 UJ

Matrix spike qualifications

Sample WELL-H-GW-07172007 was analyzed as the MS/MSD. All MS/MSD recoveries and RPDs were within laboratory acceptance limits, with the exception of low recoveries for phenol, 2-methylphenol, 4-methylphenol, 2,4-dimethylphenol, 4-chloroaniline, hexachlorobutadiene, 2,4-dinitrophenol, 4-nitrophenol, 3,3'-dichlorobenzidine and aniline. All duplicate RPD results were acceptable, with the exception of high RPD results for 4-chloroaniline, hexachlorobutadiene, 2,4-dinitrophenol, 4-nitrophenol, 4,6-dinitro-2-methylphenol and aniline. No qualifications were required due to the high RPD. However, based on the low recoveries in the MS and/or MSD, the undetected concentrations of phenol, 2-methylphenol, 4-methylphenol, 4-chloroaniline, 4-nitrophenol and 3,3'-dichlorobenzidine in sample WELL-H-GW-07172007 are UJ qualified as estimated below the reporting limits.

The recoveries for 2,4-dimethylphenol, hexachlorobutadiene, 2,4-dinitrophenol and aniline were below 10% in the MS and/or MSD. Therefore, the undetected concentrations of 2,4-dimethylphenol, hexachlorobutadiene, 2,4-dinitrophenol and aniline in sample WELL-H-GW-07172007 are R qualified as rejected.

Stearic acid and orthophenylphenol were not spiked into the MS/MSD; therefore, the undetected concentrations of stearic acid and orthophenylphenol in sample WELL-H-GW-07172007 are UJ qualified as estimated below the reporting limits.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-H-GW-07172007	phenol	0.50 U	0.50 UJ
	2-methylphenol	0.50 U	0.50 UJ
	4-methylphenol	0.50 U	0.50 UJ
	4-chloroaniline	0.50 U	0.50 UJ
	hexachlorobutadiene	0.50 U	0.50 UJ
	2,4-dinitrophenol	2.0 U	2.0 UJ
	4-nitrophenol	0.50 U	0.50 UJ
	3,3'-dichlorobenzidine	0.50 U	0.50 UJ
	2,4-dimethylphenol	0.50 U	0.50 R
	aniline	0.50 U	0.50 R
	stearic acid	0.50 U	0.50 UJ
	orthophenylphenol	0.50 U	0.50 UJ

Method EPH (laboratory specific method)

Surrogate qualifications

All surrogate recoveries met laboratory acceptance limits, with the exception of low 5-alpha androstane recovery in sample WELL-96-2-GW-07172007. Therefore, the undetected concentrations of C9-C18 aliphatics, C19-C36 aliphatics, C11-C22 aromatics and unadjusted C11-C22 aromatics are UJ qualified as estimated below the reporting limits.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-96-2-GW-07172007	C9-C18 aliphatics	30 U	30 UJ
	C19-C36 aliphatics	40 U	40 UJ
	C11-C22 aromatics	85 U	85 UJ
	unadjusted C11-C22 aromatics	85 U	85 UJ

Matrix spike qualifications

Sample WELL-H-GW-07172007 was analyzed as the MS/MSD. All MS/MSD recoveries and RPDs were within laboratory acceptance limits, with the exception of low recoveries for naphthalene, 2-methylnaphthalene, n-nonane (C9) and n-decane (C10). Therefore, the concentrations of naphthalene, 2-methylnaphthalene and C9-C18 aliphatics in sample WELL-H-GW-07172007 are UJ qualified as estimated below the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-H-GW-07172007	C9-C18 Aliphatics	30 U	30 UJ
	naphthalene	5.0 U	5.0 UJ
	2-methylnaphthalene	5.0 U	5.0 UJ

LCS qualifications

All LCS recoveries were within the laboratory control limits, with the exception of n-nonane (C9) and n-decane (C10). Therefore, the following qualifications were made to the samples.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-M-GW-07172007	C9-C18 aliphatics	30 U	30 UJ
WELL-H-GW-07172007	C9-C18 aliphatics	30 U	30 UJ
WELL-96-1-GW-07172007	C9-C18 aliphatics	30 U	30 UJ
WELL-96-2-GW-07172007	C9-C18 aliphatics	30 U	30 UJ

Methods 6020 and 7470A

Calibration qualifications

The percent recoveries in all associated initial and continuing calibration verification standards (ICVs and CCVs) were within the QC acceptance limits, with the exception of the closing total mercury CCV associated with sample WELL-96-2-GW-07172007, which had high recovery outside the method limits. Therefore, the concentration of total mercury in sample 013 is J+ qualified as estimated with a high bias.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-96-2-GW-07172007	total mercury	0.015 J	0.015 J+

Calibration qualifications

The recoveries of sodium in the ICSA/ICSAB standards analyzed with the total and dissolved metals samples were listed as 0% on the QC summary form. According to the report narrative, the recoveries of sodium from the interference check samples were given as a zero percent recovery due to the channel being saturated at the concentration being measured. Therefore, the total and dissolved sodium concentrations in the samples are J qualified as estimated.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-F-GW-07172007	total sodium	2300000 E	2300000 J
	dissolved sodium	2200000 E	2200000 J
WELL-M-GW-07172007	total sodium	430000 E	430000 J
	dissolved sodium	420000 E	420000 J
WELL-C-GW-07172007	total sodium	7000 E	7000 J
	dissolved sodium	6200 E	6200 J
RB01-07172007	total sodium	460 E	460 J
WELL-H-GW-07172007	total sodium	2700 E	2700 J
	dissolved sodium	2800 E	2800 J
EB01-07172007	total sodium	280 E	280 J
WELL-96-1-GW-07172007	total sodium	170000 E	170000 J
	dissolved sodium	170000 E	170000 J
OGS 1+2-GW-07172007	total sodium	19000 E	19000 J
	dissolved sodium	18000 E	18000 J
WELL-A-GW-07172007	total sodium	2200 E	2200 J
	dissolved sodium	2200 E	2200 J
WELL-96-2-GW-07172007	total sodium	350000 E	350000 J
	dissolved sodium	340000 E	340000 J

E-Estimated due to interference

Blank qualifications

Arsenic, chromium, sodium, thallium and zinc were detected at low levels in the total method blank at concentrations less than the RL, but greater than the MDL. Antimony, arsenic, calcium, chromium, mercury, potassium, sodium and vanadium were detected at low levels in the total ICBs and CCBs at concentrations less than the RL, but greater than the MDL.

Antimony, arsenic, calcium, potassium, sodium and vanadium were detected at low levels in the dissolved method blank at concentrations less than the RL, but greater than the MDL. Antimony, arsenic, calcium, chromium, mercury, potassium, sodium, thallium and vanadium were detected at low levels in the dissolved ICBs and CCBs at concentrations less than the RL, but greater than the MDL.

Based on these blank concentrations, the following sample qualifications were made.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-F-GW-07172007	total mercury	0.018 J	0.020 U
WELL-M-GW-07172007	dissolved thallium	0.071 J	0.10 U
WELL-C-GW-07172007	total antimony	0.15 J	0.50 U
	total vanadium	4.4 J	5.0 U
	dissolved antimony	0.28 J	0.50 U
	dissolved thallium	0.096 J	0.10 U
RB01-07172007	total thallium	0.052 J	0.10 U
	total vanadium	3.2 J	5.0 U
WELL-H-GW-07172007	total vanadium	1.9 J	5.0 U
	dissolved antimony	0.12 J	0.50 U
EB01-07172007	total antimony	0.23 J	0.50 U
	total arsenic	0.44 J	0.50 U
	total vanadium	0.95 J	5.0 U
WELL-96-1-GW-07172007	total antimony	0.32 J	0.50 U
	total thallium	0.048 J	0.10 U
	total vanadium	3.5 J	5.0 U
	dissolved vanadium	4.7 J	5.0 U
OGS 1+2-GW-07172007	total thallium	0.065 J	0.10 U
	total vanadium	1.3 J	5.0 U
	dissolved antimony	0.28 J	0.50 U
	dissolved vanadium	2.5 J	5.0 U
WELL-A-GW-07172007	total arsenic	0.54	0.54 U
	total thallium	0.051 J	0.10 U
	total vanadium	0.75 J	5.0 U
	total zinc	2.0 J	5.0 U
	dissolved antimony	0.17 J	0.50 U
	dissolved arsenic	0.35 J	0.50 U
	dissolved vanadium	1.9 JE	5.0 U
WELL-96-2-GW-07172007	total antimony	0.081 J	0.50 U
	total mercury	0.015 J	0.030 U
	total thallium	0.052 J	0.10 U
	dissolved antimony	0.18 J	0.50 U

There were detections for several total metals in the rinse blank (sample RB01-07172007) and equipment blank (sample EB01-07172007) that resulted in sample qualifications: arsenic (0.95 µg/L), chromium (0.90 µg/L) and zinc (6.9 µg/L) in RB01-07172007 and chromium (0.99 µg/L) and zinc (7.4 µg/L) in EB01-07172007. Based on professional judgment, these detections in the field blank samples resulted in the following sample qualifications.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-F-GW-07172007	total zinc	7.7	7.7 U
WELL-M-GW-07172007	total chromium	1.2	1.2 U
	total zinc	7.8	7.8 U
WELL-H-GW-07172007	total arsenic	1.4	1.4 U
	total zinc	5.1 U	5.1 U
WELL-96-1-GW-07172007	total zinc	6.3	6.3 U
OGS 1+2-GW-07172007	total chromium	0.60	0.60 U
WELL-A-GW-07172007	total arsenic	0.54	0.54 U
	total chromium	0.89	0.89 U
	total zinc	2.0 J	5.0 U

Matrix spike qualifications

Sample WELL-H-GW-07172007 was analyzed as the MS. All MS recoveries were within laboratory acceptance limits, with the exception of total and dissolved calcium. The concentration of total calcium in sample WELL-H-GW-07172007 is greater than four times the spike amount; therefore, no sample qualifications are required. The low recovery of calcium in the dissolved metals analysis resulted in the calcium concentration in sample WELL-H-GW-07172007 J- qualified as estimated with low bias.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-H-GW-07172007	dissolved calcium	95000 EN	95000 J-

E- Estimated due to interference

N- Spike recovery outside control limits

Serial dilution qualifications

The serial dilution of sample WELL-H-GW-07172007 for total metals analysis did not meet the percent difference criteria for arsenic, calcium, chromium, potassium, sodium, thallium and vanadium. The laboratory flagged the serial dilution results for calcium, potassium and sodium as estimated due to interference. Additionally, the sample concentrations of arsenic, chromium, thallium and vanadium are <50 times the MDL; no qualifications of these total metals results are required. Therefore, the total calcium, potassium and sodium concentrations for sample WELL-H-GW-07172007 are J qualified as estimated.

The serial dilution of sample WELL-H-GW-07172007 for dissolved metals analysis did not meet the percent difference criteria for antimony, arsenic, calcium, chromium, copper, potassium, sodium, thallium, vanadium and zinc. The laboratory flagged the serial dilution results for calcium, potassium, sodium and vanadium as estimated due to interference. Additionally, the sample concentrations of antimony, arsenic, chromium, copper, thallium and zinc are <50 times the MDL; no qualifications of these total metals results are required. Therefore, the dissolved calcium, potassium, sodium and vanadium concentrations for sample WELL-H-GW-07172007 are J qualified as estimated.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-H-GW-07172007	total calcium	95000 E	95000 J
	total potassium	1500 E	1500 J
	total sodium	2700 E	2700 J
	dissolved calcium	95000 E	95000 J
	dissolved potassium	1400 E	1400 J
	dissolved sodium	2800 E	2800 J
	dissolved vanadium	6.2 E	6.2 J

E- Estimated due to interference

Standard Methods 4500-Cl, Free chlorine

Holding time qualifications

Free chlorine should be immediately after sample collection; the samples were analyzed six days after collection. Therefore, the free chlorine concentrations in the samples are UJ qualified as estimated below the reporting limit and J qualified as estimated.

Sample ID	Compound	Laboratory Result (mg/L)	Validation Result (mg/L)
WELL-A-GW-07172007	free chlorine	0.05 U	0.05 UJ
WELL-C-GW-07172007	free chlorine	0.20	0.20 J
WELL-F-GW-07172007	free chlorine	0.08	0.08 J
WELL-M-GW-07172007	free chlorine	0.06	0.06 J
WELL-H-GW-07172007	free chlorine	0.05 U	0.05 UJ
WELL-96-1-GW-07172007	free chlorine	0.05 U	0.05 UJ
WELL-96-2-GW-07172007	free chlorine	0.07	0.07 J
OGS 1+2-GW-07172007	free chlorine	0.05 U	0.05 UJ

Sulfide (EPA Method 376.2)

Holding time qualifications

Sample WELL-H-GW-07172007 was analyzed for sulfide one day past the seven day holding time. Additionally, the sample was collected with headspace in the sample container. The method recommends that samples are collected with a minimum of aeration, as sulfide may be volatilized by aeration and any oxygen inadvertently added to the sample may convert the sulfide to an unmeasurable form. Therefore, the undetected concentration of sulfide in sample WELL-H-GW-07172007 is UJ qualified as estimated less than the reporting limit.

Sample ID	Compound	Laboratory Result (mg/L)	Validation Result (mg/L)
WELL-H-GW-07172007	sulfide	0.20 U	0.20 UJ

Matrix spike qualifications

Sample WELL-H-GW-07172007 was analyzed as the MS for alkalinity, sulfide, nitrate and sulfate. All MS recoveries were within laboratory acceptance limits, with the exception of low sulfide recovery (75%, limits of 80-120% recovery). Therefore, the undetected sulfide

concentration in sample WELL-H-GW-07172007 is UJ qualified as estimated less than the reporting limit.

Sample ID	Compound	Laboratory Result (mg/L)	Validation Result (mg/L)
WELL-H-GW-07172007	sulfide	0.20 U	0.20 UJ

C.9.3.2.7. Laboratory Reports: 0707077, 0707078

These reports include the following analyses and samples:

Analyses

8260B
8270C
EPH
6020/7470A
wet chemistry analyses
methylamine and 2-propanol (EPA Method 1671)
acrylamide (modified EPA Method 8032A)

Client Sample ID

EB01-07162007
RB01-07162007
TB01-07162007
WELL-C-2-GW-07162007
TB02-07162007

The data from this sample set were validated to Tier II; additionally, full Tier III validation was performed for arsenic data.

The sample qualifications are summarized below, by laboratory method.

Method 8260B

Calibration qualifications

Appropriate initial calibrations were performed for each analyte. Based on the method of calibration, the laboratory calculated the percent relative standard deviation (%RSD). For all target analytes, the RRFs met the method criteria; the RSDs met the method criteria for all compounds except n-butylbenzene, 1,2,4-trichlorobenzene, 1,2,3-trichlorobenzene and methyl isothiocyanate. The %RSDs were within the validation acceptance criteria for all compounds except methyl isothiocyanate. Therefore, the undetected concentrations of methyl isothiocyanate in all samples are UJ qualified as estimated below the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
EB01-07162007	methyl isothiocyanate	2.0 U	2.0 UJ
RB01-07162007	methyl isothiocyanate	2.0 U	2.0 UJ
TB01-07162007	methyl isothiocyanate	2.0 U	2.0 UJ
WELL-C-2-GW-07162007	methyl isothiocyanate	2.0 U	2.0 UJ
TB02-07162007	methyl isothiocyanate	2.0 U	2.0 UJ

Blank qualifications

Acetone was detected in the equipment blank (sample EB01-07162007) at a concentration greater than the MDL, but less than two times the reporting limit (RL). Therefore, the concentration of acetone in sample WELL-C-2-GW-07162007 is UJ qualified as estimated undetected at two times the reporting limit.

Sample	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-C-2-GW-07162007	acetone	4.8 J	10 UJ

Method 8270C

Calibration qualifications

Stearic acid did not meet the %RSD criteria. EPA Method 8000 allows for the use a quadratic curve which requires an initial calibration consisting of six standards; the quadratic curve was used for sample quantification and consisted of only five standards. Evaluation of the quadratic curve used by the laboratory for stearic acid resulted in the elevation of the reporting limit for stearic acid from 0.5 µg/L to 2.0 µg/L, based on professional judgment.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-C-2-GW-07162007	stearic acid	0.50 U	2.0 U
EB01-07162007	stearic acid	0.50 U	2.0 U

Blank qualifications

There were no detections of the compounds of concern in the laboratory method blank, except for butylbenzylphthalate, which was detected at a concentration greater than the MDL, but less than the RL (0.42 µg/L). The concentrations of butylbenzylphthalate in the samples were greater than the RL, but less than two times the RL. Therefore, based on professional judgment, the concentrations of butylbenzylphthalate in the samples are U qualified as not detected at the sample concentration.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-C-2-GW-07162007	butylbenzylphthalate	0.64 B	0.64 U
EB01-07162007	butylbenzylphthalate	0.51 B	0.51 U

B-Found in associated blank as well as sample.

LCS qualifications

All LCS recoveries were within the laboratory control limits, with the exception of low recoveries for 1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichlorobenzene hexachloroethane, 2,4-dimethylphenol, hexachlorobutadiene and hexachloropentadiene in the LCS and/or LCSD. All duplicate RPD results were acceptable, with the exception of high RPD results for 1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichlorobenzene hexachloroethane, 2,4-dimethylphenol, hexachlorobutadiene and hexachloropentadiene. No qualifications were required due to the high RPD, as the compounds were not detected in any sample. However, based on the low recoveries in the LCS and/or LCSD, the undetected concentrations of 1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichlorobenzene hexachloroethane, 2,4-dimethylphenol, hexachlorobutadiene and hexachloropentadiene are UJ qualified as estimated below the reporting limit in all samples.

Stearic acid and orthophenylphenol were not spiked into the LCS/LCSD; therefore, the undetected concentrations of stearic acid and orthophenylphenol in the samples are UJ qualified as estimated below the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-C-2-GW-07162007	1,3-dichlorobenzene	0.50 U	0.50 UJ
	1,4-dichlorobenzene	0.50 U	0.50 UJ
	1,2-dichlorobenzene	0.50 U	0.50 UJ
	hexachloroethane	0.50 U	0.50 UJ
	2,4-dimethylphenol	0.50 U	0.50 UJ
	hexachlorobutadiene	0.50 U	0.50 UJ
	hexachloropentadiene	0.50 U	0.50 UJ
	stearic acid	0.50 U	0.50 UJ
	orthophenylphenol	0.50 U	0.50 UJ
	EB01-07162007	1,3-dichlorobenzene	0.50 U
1,4-dichlorobenzene		0.50 U	0.50 UJ
1,2-dichlorobenzene		0.50 U	0.50 UJ
hexachloroethane		0.50 U	0.50 UJ
2,4-dimethylphenol		0.50 U	0.50 UJ
hexachlorobutadiene		0.50 U	0.50 UJ
hexachloropentadiene		0.50 U	0.50 UJ
stearic acid		0.50 U	0.50 UJ
orthophenylphenol		0.50 U	0.50 UJ

Method EPH (laboratory specific method)

LCS qualifications

All LCS recoveries were within the laboratory control limits, with the exception of low recoveries for n-nonane (C9) and n-decane (C10). Therefore, the following qualification was made to the sample.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
WELL-C-2-GW-07162007	C9-C18 aliphatics	30 U	30 UJ
EB01-07162007	C9-C18 aliphatics	30 U	30 UJ

Method 6020

Calibration qualifications

The recoveries of sodium in the ICSA/ICSAB standards analyzed with the total and dissolved metals samples were listed as 0% on the QC summary form. According to the report narratives, the recoveries of sodium from the interference check samples were given as a zero percent recovery due to the channel being saturated at the concentration being measured. Therefore, the total and dissolved sodium concentrations in the samples are J qualified as estimated.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
EB01-07162007	total sodium	32 J	32 J
RB01-07162007	total sodium	770	770 J
WELL-C-2-GW-07162007	total sodium	640	640 J
WELL-C-2-GW-07162007	dissolved sodium	690	690 J

Blank qualifications

Antimony, arsenic, copper, mercury, vanadium and zinc were detected at low levels in the total and dissolved metals method blanks at concentrations less than the RL, but greater than the MDL. Antimony, chromium, iron, mercury, selenium, thallium and vanadium were detected at low levels in the total and dissolved metals ICBs and CCBs at concentrations less than the RL, but greater than the MDL. Based on these blank concentrations, the following sample qualifications were made.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
EB01-07162007	total antimony	0.32 J	0.50 U
	total arsenic	0.25 J	0.50 U
	total iron	18 J	50 U
	total mercury	0.012 J	0.020 U
	total selenium	0.46 J	1.0 U
	total thallium	0.037 J	0.10 U
	total vanadium	1.5 J	5.0 U
	total zinc	1.8 J	5.0 U
RB01-07162007	total antimony	0.13 J	0.50 U
	total arsenic	0.19 J	0.50 U
	total chromium	0.18 J	0.50 U
	total copper	0.37 J	1.0 U
	total iron	39 J	50 U
	total mercury	0.014 J	0.020 U
	total thallium	0.029 J	0.10 U
	total vanadium	1.0 J	5.0 U
WELL-C-2-GW-07162007	total antimony	0.18 J	0.50 U
	total mercury	0.012 J	0.020 U
	total selenium	0.41 J	1.0 U
	total thallium	0.052 J	0.10 U
	total vanadium	0.31 J	5.0 U
	total zinc	3.9 J	5.0 U
	dissolved arsenic	0.34 J	0.50 U
	dissolved mercury	0.007 J	0.020 U
	dissolved vanadium	1.1 J	5.0 U

C.9.3.2.8. Laboratory Report: 0707022

This report includes the following analyses and samples:

Analyses

TKN 351.2
total ammonia 350.1
nitrate 300.0
nitrite 300.0
total P 365.4
o-PO4 356.2
TSS
perchlorate 332.0

Client Sample ID

SP-C SW07052007
SP-OC SW07052007
OC-1 SW07052007
SN-001 SW07052007
Trib-2 SW07052007
Trib-3 SW07052007
Trib-4 SW07052007
HB-1 SW07052007
HB-2 SW07052007
HB-3 SW07052007
RB01 SW07052007
HB-4 SW07052007
Trip blank

The data from this sample set were validated to Tier II; additionally, full Tier III validation was performed for perchlorate data. There were no sample qualifications.

C.9.3.2.9. Laboratory Report 0706027

This report includes the following analyses and samples:

Analyses

8260B
8270C
EPH
6020/7470A
wet chemistry analyses
methylamine and 2-propanol (EPA Method 1671)
acrylamide (modified EPA Method 8032A)

Client Sample ID

Well B-GW-86-96-06072007

Well B-GW-46-56-06072007

RBLANK-06072007

EQBLANK-06072007

TBLANK-1-06072007

TBLANK-2-06072007

The data from this sample set were validated at the Tier III level. The sample qualifications are summarized below, by laboratory method.

Method 8260B**Calibration qualifications**

Appropriate initial calibrations were performed for each analyte, with the exceptions of 2-pentanone and ethyl acetate, as noted above. Based on the method of calibration, the laboratory calculated the percent relative standard deviation (%RSD). For all target analytes, the RRFs met the method criteria; the RSDs met the method criteria for all compounds except bromomethane, 2-hexanone, sec-butylbenzene, p-isopropyltoluene, n-butylbenzene, 1,2,4-trichlorobenzene, hexachlorobutadiene, naphthalene, 1,2,3-trichlorobenzene and methyl isothiocyanate. The %RSDs were within the validation acceptance criteria for all compounds except bromomethane, n-butylbenzene, 1,2,4-trichlorobenzene, hexachlorobutadiene, 1,2,3-trichlorobenzene and methyl isothiocyanate. Therefore, the undetected concentrations of bromomethane, n-butylbenzene, 1,2,4-trichlorobenzene, hexachlorobutadiene, 1,2,3-trichlorobenzene and methyl isothiocyanate in all samples are UJ qualified as estimated below the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well B-GW-86-96-06072007	bromomethane	2.0 U	2.0 UJ
	n-butylbenzene	2.0 U	2.0 UJ
	1,2,4-trichlorobenzene	2.0 U	2.0 UJ
	hexachlorobutadiene	2.0 U	2.0 UJ
	1,2,3-trichlorobenzene	2.0 U	2.0 UJ
	methyl isothiocyanate	2.0 U	2.0 UJ
Well B-GW-46-56-06072007	bromomethane	2.0 U	2.0 UJ
	n-butylbenzene	2.0 U	2.0 UJ
	1,2,4-trichlorobenzene	2.0 U	2.0 UJ
	hexachlorobutadiene	2.0 U	2.0 UJ
	1,2,3-trichlorobenzene	2.0 U	2.0 UJ
	methyl isothiocyanate	2.0 U	2.0 UJ
RBLANK-06072007	bromomethane	2.0 U	2.0 UJ
	n-butylbenzene	2.0 U	2.0 UJ
	1,2,4-trichlorobenzene	2.0 U	2.0 UJ
	hexachlorobutadiene	2.0 U	2.0 UJ
	1,2,3-trichlorobenzene	2.0 U	2.0 UJ
	methyl isothiocyanate	2.0 U	2.0 UJ
EQBLANK-06072007	bromomethane	2.0 U	2.0 UJ
	n-butylbenzene	2.0 U	2.0 UJ
	1,2,4-trichlorobenzene	2.0 U	2.0 UJ
	hexachlorobutadiene	2.0 U	2.0 UJ
	1,2,3-trichlorobenzene	2.0 U	2.0 UJ
	methyl isothiocyanate	2.0 U	2.0 UJ
TBLANK-1-06072007	bromomethane	2.0 U	2.0 UJ
	n-butylbenzene	2.0 U	2.0 UJ
	1,2,4-trichlorobenzene	2.0 U	2.0 UJ
	hexachlorobutadiene	2.0 U	2.0 UJ
	1,2,3-trichlorobenzene	2.0 U	2.0 UJ
	methyl isothiocyanate	2.0 U	2.0 UJ
TBLANK-2-06072007	bromomethane	2.0 U	2.0 UJ
	n-butylbenzene	2.0 U	2.0 UJ
	1,2,4-trichlorobenzene	2.0 U	2.0 UJ
	hexachlorobutadiene	2.0 U	2.0 UJ
	1,2,3-trichlorobenzene	2.0 U	2.0 UJ
	methyl isothiocyanate	2.0 U	2.0 UJ

Blank qualifications

Acetone was detected in the rinse blank (sample RBLANK-06072007) at a concentration greater than the MDL, but less than two times the reporting limit (RL). 2-butanone was detected in the rinse blank at a concentration greater than the reporting limit (RL); however, 2-butanone was not detected in any samples. Therefore, the concentrations of acetone in samples Well B-GW-86-96-06072007 and Well B-GW-46-56-06072007 are UJ qualified as estimated undetected at two times the reporting limit.

Sample	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well B-GW-86-96-06072007	acetone	6.5	10 UJ
Well B-GW-46-56-06072007	acetone	4.2 J	10 UJ

LCS qualifications

The report narrative noted that methyl isothiocyanate was not evaluated as a spike compound in the LCS. Therefore, the undetected concentrations of methyl isothiocyanate in the samples are UJ qualified as estimated below the reporting limit. 2-Pentanone and ethyl acetate were not evaluated as spike compounds in the LCS, either. However, since 2-pentanone and ethyl acetate were evaluated as tentatively identified compounds (TICs), no sample qualifications were made.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well B-GW-86-96-06072007	methyl isothiocyanate	2.0 U	2.0 UJ
Well B-GW-46-56-06072007	methyl isothiocyanate	2.0 U	2.0 UJ
RBLANK-06072007	methyl isothiocyanate	2.0 U	2.0 UJ
EQBLANK-06072007	methyl isothiocyanate	2.0 U	2.0 UJ
TBLANK-1-06072007	methyl isothiocyanate	2.0 U	2.0 UJ
TBLANK-2-06072007	methyl isothiocyanate	2.0 U	2.0 UJ

Method 8270C

Calibration qualifications

Appropriate initial calibrations were performed for each analyte. Based on the method of calibration, the laboratory calculated the percent relative standard deviation (%RSD) of the RRFs. For all target analytes, the RRFs met the method criteria; the RSDs met the method criteria for all compounds except 2,4-dinitrophenol, 2,4-dinitrotoluene, 4,6-dinitro-2-methylphenol, aniline and stearic acid. The %RSDs were within validation acceptance criteria for all compounds except 2,4-dinitrophenol and stearic acid. Therefore, the undetected concentrations of 2,4-dinitrophenol in all samples are UJ qualified as estimated below the reporting limit.

Stearic acid did not meet the %RSD criteria for the initial calibration. EPA Method 8000 allows for the use a quadratic curve which requires an initial calibration consisting of six standards; the quadratic curve was used for sample quantification and consisted of only five standards. Therefore, based on professional judgment, the concentrations of stearic acid in the samples are J qualified as estimated.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well B-GW-86-96-06072007	2,4-dinitrophenol	0.50 U	0.50 UJ
	stearic acid	4.1	4.1 J
Well B-GW-46-56-06072007	2,4-dinitrophenol	0.50 U	0.50 UJ
	stearic acid	3.4	3.4 J

For all target analytes, the RRFs met the method criteria; the percent differences (%D) between the RRFs in the initial calibration standards of all target analytes were within method acceptance

criteria for all compounds except 2-nitroaniline, 2,4-dinitrophenol, 4-nitrophenol, 4-nitroaniline and 4,6-dinitro-2-methylphenol; the %D validation criteria was not met for 2,4-dinitrophenol and 4,6-dinitro-2-methylphenol. Therefore, the undetected concentrations of 2,4-dinitrophenol and 4,6-dinitro-2-methylphenol in the samples are UJ qualified as estimated below the reporting limits.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well B-GW-86-96-06072007	2,4-dinitrophenol	0.50 U	0.50 UJ
	4,6-dinitro-2-methylphenol	0.50 U	0.50 UJ
Well B-GW-46-56-06072007	2,4-dinitrophenol	0.50 U	0.50 UJ
	4,6-dinitro-2-methylphenol	0.50 U	0.50 UJ

LCS qualifications

All LCS recoveries were within statistically derived limits established by the laboratory, with the exception of low recoveries for phenol, 1,4-dichlorobenzene, 2-methylphenol, 4-methylphenol, 2,4-dimethylphenol, 4-chloroaniline, n-nitrosodiphenylamine, 3,3'-dichlorobenzidine and aniline in the LCS and/or LCSD. All duplicate RPD results were acceptable, with the exception of high RPD results for 3,3'-dichlorobenzidine. No qualifications were required due to the high RPD, as 3,3'-dichlorobenzidine was not detected in any sample. However, based on the low recoveries in the LCS and/or LCSD, the undetected concentrations of phenol, 1,4-dichlorobenzene, 2-methylphenol, 4-methylphenol, 4-chloroaniline, n-nitrosodiphenylamine, 3,3'-dichlorobenzidine and aniline in samples Well B-GW-86-96-06072007 and Well B-GW-46-56-0607200 are UJ qualified as estimated below the reporting limit. The concentrations of n-nitrosodiphenylamine in samples Well B-GW-86-96-06072007 and Well B-GW-46-56-0607200 are J qualified as estimated.

The concentrations 2,4-dimethylphenol in samples Well B-GW-86-96-06072007 and Well B-GW-46-56-06072007 are R qualified as rejected due to low recoveries of 2,4-dimethylphenol in the LCS/LCSD; recoveries were 6% and 5%, respectively and the laboratory control limits were 30-130% recovery.

Stearic acid and orthophenylphenol were not spiked into the LCS/LCSD; therefore, the undetected concentrations of stearic acid and orthophenylphenol in the samples are UJ qualified as estimated below the reporting limit and J qualified as estimated.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)	
Well B-GW-86-96-06072007	phenol	0.50 U	0.50 UJ	
	1,4-dichlorobenzene	0.50 U	0.50 UJ	
	2-methylphenol	0.50 U	0.50 UJ	
	4-methylphenol	0.50 U	0.50 UJ	
	4-chloroaniline	0.50 U	0.50 UJ	
	n-nitrosodiphenylamine	0.42 J	0.42 J	
	3,3'-dichlorobenzidine	0.50 U	0.50 UJ	
	aniline	0.50 U	0.50 UJ	
	2,4-dimethylphenol	0.50 U	0.50 R	
	stearic acid	4.1	4.1 J	
	orthophenylphenol	0.50 U	0.50 UJ	
	Well B-GW-46-56-0607200	phenol	0.50 U	0.50 UJ
		1,4-dichlorobenzene	0.50 U	0.50 UJ
		2-methylphenol	0.50 U	0.50 UJ
4-methylphenol		0.50 U	0.50 UJ	
4-chloroaniline		0.50 U	0.50 UJ	
n-nitrosodiphenylamine		1.7	1.7 J	
3,3'-dichlorobenzidine		0.50 U	0.50 UJ	
aniline		0.50 U	0.50 UJ	
2,4-dimethylphenol		0.50 U	0.50 R	
stearic acid		3.4	3.4 J	
orthophenylphenol		0.50 U	0.50 UJ	

Method 6020

Calibration qualifications

The percent recoveries in all associated ICVs and CCVs were within the QC acceptance limits, with the exception of vanadium. The recoveries of vanadium for the total metals analysis in both the ICV and one of the bracketing CCVs was 114%, outside the 90-110% acceptance limits. Therefore, the concentrations of total vanadium for samples Well B-GW-86-96-06072007 and Well B-GW-46-56-0607200 are J+ qualified as estimated high.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well B-GW-86-96-06072007	vanadium	1.4 J	1.4 J+
Well B-GW-46-56-0607200	vanadium	0.47 J	0.47 J+

The recovery of vanadium for the dissolved metals analysis in the ICV was 112%, outside the 90-110% acceptance limits. Therefore, the dissolved vanadium concentrations for samples Well B-GW-86-96-06072007 and Well B-GW-46-56-0607200 are J+ qualified as estimated high.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well B-GW-86-96-06072007	dissolved vanadium	1.8 J	1.8 J+
Well B-GW-46-56-0607200	dissolved vanadium	1.2 J	1.2 J+

The recoveries of sodium in the ICSA/ICSAB standards analyzed with the total metals samples were listed as 0% on the QC summary form. According to the report narrative, "The recovery of sodium from the interference check sample is given as a zero percent recovery due to the channel being saturated at the concentration being measured." Therefore, the total sodium concentrations

in samples Well B-GW-86-96-06072007 and Well B-GW-46-56-0607200 are J qualified as estimated.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well B-GW-86-96-06072007	sodium	39000	39000 J
Well B-GW-46-56-0607200	sodium	34000	34000 J

Blank qualifications

arsenic, calcium, copper, mercury, potassium and vanadium were detected at low levels in the dissolved metals method blanks at concentrations less than the RL, but greater than the MDL. dissolved mercury was not detected in the samples; dissolved arsenic, calcium and potassium were detected above the RLs. Therefore, due to the dissolved metals concentrations in the samples, the dissolved metals concentrations of copper and vanadium in sample Well B-GW-86-96-06072007 and vanadium in sample Well B-GW-46-56-06072007 are U qualified as not detected at the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well B-GW-86-96-06072007	dissolved copper	2.0 J	2.0 U
	dissolved vanadium	1.8 J	5.0 U
Well B-GW-46-56-06072007	dissolved vanadium	1.2 U	5.0 U

Antimony and vanadium were detected at low levels in the total metals ICB and antimony, calcium, copper, iron, lead, potassium and magnesium were detected at low levels in the total metals continuing CCBs at concentrations less than the RL, but greater than the MDL. The following qualifications were made to the total antimony and vanadium sample results, due to the concentrations detected in the sample at greater than the MDL and less than the RL. The other metals detected in the ICB and CCBs were detected in the samples at concentrations greater than the RL, so no qualifications to the sample results were required.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well B-GW-86-96-06072007	antimony	0.42 J	0.50 U
	vanadium	1.4 J	5.0 U
Well B-GW-46-56-0607200	antimony	0.11 J	0.50 U
	vanadium	0.47 J	5.0 U

Antimony and beryllium were detected at low levels in the dissolved metals ICB and antimony, beryllium, calcium, chromium, mercury, potassium, silver and vanadium were detected at low levels in the dissolved metals continuing CCBs at concentrations less than the RL, but greater than the MDL. No qualifications are required for dissolved beryllium, mercury and silver in sample Well B-GW-86-96-06072007 and dissolved antimony, beryllium, mercury and silver in sample Well B-GW-46-56-06072007 as these were not detected in these samples. The dissolved sample concentrations of calcium, chromium and potassium were above the RL in all samples. Therefore, due to the dissolved concentrations detected in the samples that were less than the RL, but greater than the MDL, the following concentrations were U qualified as undetected at the reporting limits.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well B-GW-86-96-06072007	dissolved vanadium	1.8 J	5.0 U
Well B-GW-46-56-06072007	dissolved vanadium	1.2 J	5.0 U

Matrix spike qualifications

Sample Well B-GW-86-96-06072007 was utilized for MS analysis for total metals. The MS recoveries were within the laboratory QC acceptance limits, except for calcium (no recovery), magnesium and sodium (low recoveries). The concentrations of calcium and sodium in sample Well B-GW-86-96-06072007 were greater than four times the spike level; therefore, the spike limits do not apply and no qualifications are required. However, the concentration of magnesium in sample Well B-GW-86-96-06072007 is J- qualified as estimated low due to the low MS recovery.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well B-GW-86-96-06072007	magnesium	19000	19000 J-

Sample Well B-GW-86-96-06072007 was utilized for MS analysis for dissolved metals. The MS recoveries were within the laboratory QC acceptance limits, except for magnesium, potassium and sodium (low recoveries). The concentration of dissolved sodium in sample Well B-GW-86-96-06072007 is greater than four times the spike level; therefore, the spike limits do not apply and no qualifications are required. However, due to the low magnesium and potassium recoveries, the concentrations of magnesium and potassium in sample Well B-GW-86-96-06072007 are J- qualified as estimated low.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well B-GW-86-96-06072007	dissolved magnesium	20000	20000 J-
	dissolved potassium	12000	12000 J-

Serial dilution qualifications

The serial dilution of sample Well B-GW-86-96-06072007 for total metals analysis did not meet the percent difference criteria for arsenic, chromium, copper, manganese, nickel and selenium. The laboratory flagged the serial dilution results for arsenic, manganese and nickel as estimated due to interference. Additionally, the sample concentrations of chromium, copper and selenium are <50 times the MDL; no qualifications of these total metals results are required. Therefore, the total arsenic, manganese and nickel concentrations for sample Well-2-GW-105-150-06062007 are J qualified as estimated.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well B-GW-86-96-06072007	arsenic	9.9 E	9.9 J
	manganese	2500 E	2500 J
	nickel	17 E	17 J

E-Estimated due to interference

The serial dilution of sample Well B-GW-86-96-06072007 for dissolved metals analysis did not meet the percent difference criteria for arsenic, calcium, chromium, copper and vanadium. The laboratory flagged the serial dilution results for arsenic, calcium and chromium as estimated due to interference. Additionally, the sample concentrations of copper and vanadium are <50 times the MDL; no qualifications of these dissolved metals results are required. Therefore, the dissolved arsenic, calcium and chromium concentrations for sample Well B-GW-86-96-06072007 are J qualified as estimated.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well B-GW-86-96-06072007	dissolved arsenic	11 E	11 J
	dissolved calcium	220000 E	22000 J
	dissolved chromium	21 E	21 J

E-Estimated due to interference

Free Chlorine (Standard Methods 4500-Cl)

Holding time qualifications:

All samples were analyzed within the method-specified holding time, with the exception of free chlorine. Free chlorine should be immediately after sample collection; the samples were analyzed two days after collection. Therefore, the free chlorine concentrations of samples Well B-GW-86-96-06072007 and Well B-GW-46-56-06072007 are UJ qualified as estimated below the reporting limit.

Sample ID	Compound	Laboratory Result (mg/L)	Validation Result (mg/L)
Well B-GW-86-96-06072007	free chlorine	0.10 U	0.10 UJ
Well B-GW-46-56-06072007	free chlorine	0.10 U	0.10 UJ

methylamine and 2-propanol (EPA Method 1671)

Matrix spike qualifications

No laboratory acceptance criteria were reported for the MS/MSD. The MS/MSD recoveries, using sample Well B-GW-86-96-06072007, were 42% and 54% for methylamine and 98% and 97% for 2-propanol and the RSD results were 24% and 1% respectively. Based on professional judgment, the concentration of methylamine in sample Well B-GW-86-96-06072007 is UJ qualified as estimated less than the reporting limit due to the MS/MSD recoveries.

Sample ID	Compound	Laboratory Result (mg/L)	Validation Result (mg/L)
Well B-GW-86-96-06072007	methylamine	ND (2.0 U)	2.0 UJ

C.9.3.2.10. Laboratory Report: 0706025

This report includes the following analyses and samples:

Analyses

8260B
8270C
EPH
6020/7470A
wet chemistry analyses
methylamine and 2-propanol (EPA Method 1671)
acrylamide (modified EPA Method 8032A)

Client Sample ID

Well-2-GW-105-150-06062007
Well-2-GW-61.5-81.5-06062007
Well-2-GW-27-47-06062007
TB-06062007
RB-06062007
EQBLANK-06062007
Well-2-GW-105-150-06062007 DUP

The data from this sample set were validated at the Tier III level. The sample qualifications are summarized below, by laboratory method.

Method 8260B

Calibration qualifications

Appropriate initial calibrations were performed for each analyte, with the exceptions of 2-pentanone and ethyl acetate. 2-Pentanone and ethyl acetate were not included in the calibration standards. All samples had a library search of TICs performed to confirm the absence of 2-pentanone and ethyl acetate. Based on the method of calibration, the laboratory calculated the percent relative standard deviation (%RSD) of the RRFs. For all target analytes, the RRFs met the method criteria; the RSDs met the method criteria for all compounds except bromomethane, hexachlorobutadiene and methyl isothiocyanate; the %RSDs were within the validation acceptance criteria for all compounds except bromomethane. Therefore, the undetected

concentrations of bromomethane in all samples are UJ qualified as estimated below the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-2-GW-105-150-06062007	bromomethane	2.0 U	2.0 UJ
Well-2-GW-61.5-81.5-06062007	bromomethane	2.0 U	2.0 UJ
Well-2-GW-27-47-06062007	bromomethane	2.0 U	2.0 UJ
TB-06062007	bromomethane	2.0 U	2.0 UJ
RB-06062007	bromomethane	2.0 U	2.0 UJ
EQBLANK-06062007	bromomethane	2.0 U	2.0 UJ
Well-2-GW-105-150-06062007 DUP	bromomethane	2.0 U	2.0 UJ

Blank qualifications

Acetone was detected in the trip blank and rinse blank (samples TB-06062007 and RB-06062007, respectively), at concentrations greater than the MDL, but less than two times the reporting limit (RL). Therefore, the concentrations of acetone in samples Well-2-GW-105-150-06062007, Well-2-GW-61.5-81.5-06062007, Well-2-GW-27-47-06062007 and Well-2-GW-105-150-06062007 DUP are U qualified as estimated below the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-2-GW-105-150-06062007	acetone	2.8 J	5.0 U
Well-2-GW-61.5-81.5-06062007	acetone	5.0 J	5.0 U
Well-2-GW-27-47-06062007	acetone	4.2 J	5.0 U
Well-2-GW-105-150-06062007 DUP	acetone	2.8 J	5.0 U

LCS qualifications

The report narrative noted that methyl isothiocyanate was not evaluated as a spike compound in the LCS. Therefore, the undetected concentrations of methyl isothiocyanate in the samples are UJ qualified as estimated below the reporting limit. 2-Pentanone and ethyl acetate were not evaluated as spike compounds in the LCS, either. However, since 2-pentanone and ethyl acetate were evaluated as TICs, no sample qualifications were made.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-2-GW-105-150-06062007	methyl isothiocyanate	2.0 U	2.0 UJ
Well-2-GW-61.5-81.5-06062007	methyl isothiocyanate	2.0 U	2.0 UJ
Well-2-GW-27-47-06062007	methyl isothiocyanate	2.0 U	2.0 UJ
TB-06062007	methyl isothiocyanate	2.0 U	2.0 UJ
RB-06062007	methyl isothiocyanate	2.0 U	2.0 UJ
EQBLANK-06062007	methyl isothiocyanate	2.0 U	2.0 UJ
Well-2-GW-105-150-06062007 DUP	methyl isothiocyanate	2.0 U	2.0 UJ

Matrix spike qualifications

Sample Well-2-GW-105-150-06062007 was utilized for MS/MSD analysis. The MS recoveries were within the laboratory QC acceptance limits, except for low recoveries for styrene in the MS/MSD and bromoform in the MSD. Bromoform recovery in the MSD was 69%, with recovery limits of 70-130%; based on professional judgment, no qualifications were made to the bromoform concentration. However, based on the low styrene MS/MSD recoveries, the undetected concentration of styrene in sample Well-2-GW-105-150-06062007 is UJ qualified as estimated below the reporting limits.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-2-GW-105-150-06062007	stryene	2.0 U	2.0 UJ

Method 8270C

Calibration qualifications

Stearic acid did not meet the %RSD criteria for the initial calibration. EPA Method 8000 allows for the use a quadratic curve which requires an initial calibration consisting of six standards; the quadratic curve was used for sample quantification and consisted of only five standards. Therefore, based on professional judgment, the concentrations of stearic acid in the samples are J qualified as estimated.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-2-GW-105-150-06062007	2,4-dinitrophenol	0.50 U	0.50 UJ
	stearic acid	2.0 U	2.0 UJ
Well-2-GW-61.5-81.5-06062007	2,4-dinitrophenol	0.50 U	0.50 UJ
	stearic acid	4.5	4.5J
Well-2-GW-27-47-06062007	2,4-dinitrophenol	0.50 U	0.50 UJ
	stearic acid	4.5	4.5J
Well-2-GW-105-150-06062007 DUP	2,4-dinitrophenol	0.50 U	0.50 UJ
	stearic acid	2.0 U	2.0 UJ

For all target analytes, the %D between the RRFs in the initial and continuing calibration standards were within the method acceptance criteria for all compounds except 2-nitroaniline, 2,4-dinitrophenol, 4-nitrophenol, 4-nitroaniline and 4,6-dinitro-2-methylphenol; the %D validation criteria was not met for 2,4-dinitrophenol and 4,6-dinitro-2-methylphenol. Therefore, the undetected concentrations of 2,4-dinitrophenol and 4,6-dinitro-2-methylphenol in the samples are UJ qualified as estimated below the reporting limits.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-2-GW-105-150-06062007	2,4-dinitrophenol	0.50 U	0.50 UJ
	4,6-dinitro-2-methylphenol	0.50 U	0.50 UJ
Well-2-GW-61.5-81.5-06062007	2,4-dinitrophenol	0.50 U	0.50 UJ
	4,6-dinitro-2-methylphenol	0.50 U	0.50 UJ
Well-2-GW-27-47-06062007	2,4-dinitrophenol	0.50 U	0.50 UJ
	4,6-dinitro-2-methylphenol	0.50 U	0.50 UJ
Well-2-GW-105-150-06062007 DUP	2,4-dinitrophenol	0.50 U	0.50 UJ
	4,6-dinitro-2-methylphenol	0.50 U	0.50 UJ

LCS qualifications

All LCS recoveries were within the laboratory control limits, with the exception of low recoveries for phenol, 1,4-dichlorobenzene, 2-methylphenol, 4-methylphenol, 2,4-dimethylphenol, 4-chloroaniline, n-nitrosodiphenylamine, 3,3'-dichlorobenzidine and aniline in the LCS and/or LCSD. All duplicate RPD results were acceptable, with the exception of high RPD results for 3,3'-dichlorobenzidine. No qualifications were required due to the high RPD, as this compound was not detected in any sample. However, based on the low recoveries in the LCS and/or LCSD, the undetected concentrations of phenol, 1,4-dichlorobenzene, 2-methylphenol, 4-methylphenol, 4-chloroaniline, n-nitrosodiphenylamine, 3,3'-dichlorobenzidine and aniline in the samples are UJ qualified as estimated below the reporting limit. Additionally, the concentrations 2,4-dimethylphenol in samples Well B-GW-86-96-06072007, Well B-GW-46-56-06072007, Well-2-GW-105-150-06062007, Well-2-GW-61.5-81.5-06062007, Well-2-GW-27-47-06062007 and Well-2-GW-105-150-06062007 DUP are R qualified as rejected due to low recoveries of 2,4-dimethylphenol in the LCS/LCSD; recoveries were 6% and 5%, respectively and the laboratory control limits were 30-130% recovery.

Stearic acid and orthophenylphenol were not spiked into the LCS/LCSD; therefore, the undetected concentrations of stearic acid and orthophenylphenol in the samples are UJ qualified as estimated below the reporting limit and J qualified as estimated.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)	
Well-2-GW-105-150-06062007	phenol	0.50 U	0.50 UJ	
	1,4-dichlorobenzene	0.50 U	0.50 UJ	
	2-methylphenol	0.50 U	0.50 UJ	
	4-methylphenol	0.50 U	0.50 UJ	
	4-chloroaniline	0.50 U	0.50 UJ	
	n-nitrosodiphenylamine	0.50 U	0.50 UJ	
	3,3'-dichlorobenzidine	0.50 U	0.50 UJ	
	aniline	0.50 U	0.50 UJ	
	2,4-dimethylphenol	0.50 U	0.50 R	
	stearic acid	2.0 U	2.0 UJ	
	orthophenylphenol	0.50 U	0.50 UJ	
	Well-2-GW-61.5-81.5-06062007	phenol	0.50 U	0.50 UJ
		1,4-dichlorobenzene	0.50 U	0.50 UJ
		2-methylphenol	0.50 U	0.50 UJ
4-methylphenol		0.50 U	0.50 UJ	
4-chloroaniline		0.50 U	0.50 UJ	
n-nitrosodiphenylamine		0.50 U	0.50 UJ	
3,3'-dichlorobenzidine		0.50 U	0.50 UJ	
aniline		0.50 U	0.50 UJ	
2,4-dimethylphenol		0.50 U	0.50 R	
stearic acid		4.5	4.5 J	
orthophenylphenol		0.50 U	0.50 UJ	
Well-2-GW-27-47-06062007		phenol	0.50 U	0.50 UJ
		1,4-dichlorobenzene	0.50 U	0.50 UJ
		2-methylphenol	0.50 U	0.50 UJ
	4-methylphenol	0.50 U	0.50 UJ	
	4-chloroaniline	0.50 U	0.50 UJ	
	n-nitrosodiphenylamine	0.50 U	0.50 UJ	
	3,3'-dichlorobenzidine	0.50 U	0.50 UJ	
	aniline	0.50 U	0.50 UJ	
	2,4-dimethylphenol	0.50 U	0.50 R	
	stearic acid	4.5	4.5 J	
	orthophenylphenol	0.50 U	0.50 UJ	
	Well-2-GW-105-150-06062007 DUP	phenol	0.50 U	0.50 UJ
		1,4-dichlorobenzene	0.50 U	0.50 UJ
		2-methylphenol	0.50 U	0.50 UJ
4-methylphenol		0.50 U	0.50 UJ	
4-chloroaniline		0.50 U	0.50 UJ	
n-nitrosodiphenylamine		0.50 U	0.50 UJ	
3,3'-dichlorobenzidine		0.50 U	0.50 UJ	
aniline		0.50 U	0.50 UJ	
2,4-dimethylphenol		0.50 U	0.50 R	
stearic acid		2.0 U	2.0 UJ	
orthophenylphenol		0.50 U	0.50 UJ	

Matrix spike qualifications

Sample Well-2-GW-105-150-06062007 was utilized for MS/MSD analysis. The MS recoveries were within the laboratory QC acceptance limits, except for low recoveries for 2-methylphenol, 4-methylphenol, 2,4-dimethylphenol and 3,3'-dichlorobenzidine and high recoveries for 2-nitroaniline. Additionally, the RPD results for 3,3'-dichlorobenzidine were high and outside the laboratory control limits; no qualifications were required for the high RPD result. No

qualifications were required for the high MS/MSD recoveries, since 2-nitroaniline was not detected in the samples. However, the concentrations of 2-methylphenol, 4-methylphenol, 2,4-dimethylphenol and 3,3'-dichlorobenzidine in sample Well-2-GW-105-150-06062007 are UJ qualified as estimated below the reporting limits.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-2-GW-105-150-06062007	2-methylphenol	0.50 U	0.50 UJ
	4-methylphenol	0.50 U	0.50 UJ
	2,4-dimethylphenol	0.50 U	0.50 UJ
	3,3'-dichlorobenzidine	0.50 U	0.50 UJ

Method 6020

Calibration qualifications

The recoveries of sodium in the ICSA/ICSAB standards analyzed with the dissolved metals samples were listed as 0% on the QC summary form. According to the report narrative, "The recovery of sodium from the interference check sample is given as a zero percent recovery due to the channel being saturated at the concentration being measured." Therefore, the dissolved sodium concentrations in samples Well-2-GW-105-150-06062007, Well-2-GW-61.5-81.5-06062007, Well-2-GW-27-47-06062007 and Well-2-GW-105-150-06062007 DUP are J qualified as estimated.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-2-GW-105-150-06062007	dissolved sodium	24000	24000 J
Well-2-GW-61.5-81.5-06062007	dissolved sodium	110000	110000 J
Well-2-GW-27-47-06062007	dissolved sodium	140000	140000 J
Well-2-GW-105-150-06062007 DUP	dissolved sodium	24000	24000 J

Blank qualifications

Barium, chromium, lead, magnesium, manganese, potassium, sodium and zinc were detected at low levels in the total metals method blank at concentrations less than the reporting limit (RL), but greater than the MDL. The concentrations of all elements in the samples but lead were above the RL. The concentrations of lead in samples Well-2-GW-105-150-06062007 and Well-2-GW-105-150-06062007 DUP were less than the RL, but greater than the MDL; the concentrations of lead in samples Well-2-GW-61.5-81.5-06062007 and Well-2-GW-27-47-06062007 were greater than the RL. Therefore, the total metals concentration of lead in samples Well-2-GW-105-150-06062007 and Well-2-GW-105-150-06062007 DUP are U qualified as not detected at the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-2-GW-105-150-06062007	lead	0.43 J	0.50 U
Well-2-GW-105-150-06062007 DUP	lead	0.43 J	0.50 U

Antimony, chromium and vanadium were detected at low levels in the dissolved metals method blank at concentrations less than the RL, but greater than the MDL. The dissolved vanadium concentrations in samples Well-2-GW-105-150-06062007, Well-2-GW-61.5-81.5-06062007, Well-2-GW-27-47-06062007 and Well-2-GW-105-150-06062007 DUP were above the MDL but < RL, as were the dissolved antimony concentrations in samples Well-2-GW-27-47-06062007 and Well-2-GW-105-150-06062007 DUP. Therefore, the dissolved vanadium concentrations in samples Well-2-GW-105-150-06062007, Well-2-GW-61.5-81.5-06062007, Well-2-GW-27-47-06062007 and Well-2-GW-105-150-06062007 DUP and the dissolved antimony concentrations in samples Well-2-GW-27-47-06062007 and Well-2-GW-105-150-06062007 DUP are U qualified as not detected at the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-2-GW-105-150-06062007	dissolved vanadium	0.99 J	5.0 U
Well-2-GW-61.5-81.5-06062007	dissolved vanadium	2.0 J	5.0 U
Well-2-GW-27-47-06062007	dissolved antimony	0.31 J	0.50 U
	dissolved vanadium	2.6 J	5.0 U
Well-2-GW-105-150-06062007 DUP	dissolved antimony	0.25 J	0.50 U
	dissolved vanadium	1.6 J	5.0 U

Antimony, calcium and vanadium were detected at low levels in the total metals ICB and antimony, arsenic, calcium, chromium, potassium, selenium, sodium and vanadium were detected at low levels in the total metals CCBs at concentrations less than the RL, but greater than the MDL. The following qualifications were made to the total metals sample results, due to the concentrations detected in the sample greater than the MDLs and less than the RLs.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-2-GW-105-150-06062007	antimony	0.38 J	0.50 U
	selenium	0.58 J	1.0 U
Well-2-GW-61.5-81.5-06062007	antimony	0.28 J	0.50 U
	selenium	0.54 J	1.0 U
	vanadium	1.2 J	5.0 U
Well-2-GW-27-47-06062007	antimony	0.11 J	0.50 U
	selenium	0.45 J	1.0 U
	vanadium	1.8 J	5.0 U
Well-2-GW-105-150-06062007 DUP	selenium	0.34 J	1.0 U
	vanadium	0.49 J	5.0 U

Antimony, lead and thallium were detected at low levels in the dissolved metals ICB and antimony, arsenic, beryllium, calcium, chromium, copper, lead, silver, sodium, thallium and vanadium were detected at low levels in the dissolved metals CCBs at concentrations less than the RL, but greater than the MDL. Dissolved silver was detected in a CCB at a concentration greater than the RL. No qualifications are required for dissolved beryllium in samples Well-2-GW-105-150-06062007 and Well-2-GW-105-150-06062007 DUP and dissolved silver and thallium in any sample as dissolved beryllium, silver and thallium were not detected in these samples. The dissolved sample concentrations of arsenic, calcium, chromium and sodium were above the RL in all samples. Therefore, due the dissolved concentrations detected in the samples that were less than the RL, but greater than the MDL, the following concentrations were U qualified as undetected at the reporting limits.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-2-GW-105-150-06062007	dissolved copper	0.33 J	1.0 U
	dissolved lead	0.15 J	0.50 U
	dissolved vanadium	0.99 J	5.0 U
Well-2-GW-61.5-81.5-06062007	dissolved beryllium	0.059 J	0.20 U
	dissolved lead	0.20 J	0.50 U
	dissolved vanadium	2.0 J	5.0 U
Well-2-GW-27-47-06062007	dissolved antimony	0.31 J	0.50 U
	dissolved beryllium	0.047 J	0.20 U
	dissolved lead	0.15 J	0.50 U
Well-2-GW-105-150-06062007 DUP	dissolved vanadium	2.6 J	5.0 U
	dissolved antimony	0.25 J	0.50 U
	dissolved copper	0.67 J	1.0 U
	dissolved lead	0.085 J	0.50 U
	dissolved vanadium	1.6 J	5.0 U

Matrix spike qualifications

Sample Well-2-GW-105-150-06062007 was utilized for MS analysis for dissolved metals. The MS recoveries were within the laboratory QC acceptance limits, except for barium, calcium, magnesium and sodium (low recoveries); there was no recovery of manganese in the MS. The concentrations of dissolved magnesium, manganese and sodium in sample Well-2-GW-105-150-06062007 are greater than four times the spike level; therefore, the spike limits do not apply and no qualifications are required. However, due to the low barium and calcium recoveries, the concentrations of barium and calcium in sample Well-2-GW-105-150-06062007 are J- qualified as estimated low.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-2-GW-105-150-06062007	dissolved barium	120	120 J-
	dissolved calcium	99000	99000 J-

Serial dilution qualifications

The serial dilution of sample Well-2-GW-105-150-06062007 for total metals analysis did not meet the percent difference criteria for aluminum, antimony, arsenic, barium, chromium, copper, lead, magnesium and potassium. The laboratory flagged the serial dilution results for barium, magnesium and potassium as estimated due to interference. Additionally, the sample concentrations of aluminum, antimony, arsenic, chromium, copper and lead are <50 times the MDL; no qualifications of these total metals results are required. Therefore, the total barium, magnesium and potassium concentrations for sample Well-2-GW-105-150-06062007 are J qualified as estimated.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-2-GW-105-150-06062007	barium	120 E	120 J
	magnesium	23000 E	23000 J
	potassium	1300 E	1300 J

E-Estimated due to interference

The serial dilution of sample Well-2-GW-105-150-06062007 for dissolved metals analysis did not meet the percent difference criteria for antimony, arsenic, nickel, selenium and vanadium. The laboratory flagged the serial dilution results for nickel as estimated due to interference. Additionally, the sample concentrations of antimony, arsenic, selenium and vanadium are <50 times the MDL; no qualifications of these dissolved metals results are required. Therefore, the dissolved nickel concentration for sample Well-2-GW-105-150-06062007 is J qualified as estimated.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-L-GW-112-128-06052007	dissolved nickel	11 E	11 J

E-Estimated due to interference

Standard Methods 4500-Cl, Free chlorine

Holding time qualifications

All samples were analyzed within the method-specified holding time, with the exception of free chlorine. Free chlorine should be immediately after sample collection; the samples were analyzed two days after collection. Therefore, the free chlorine concentrations of samples Well-2-GW-105-150-06062007, Well-2-GW-61.5-81.5-06062007, Well-2-GW-27-47-06062007 and Well-2-GW-105-150-06062007 DUP are UJ qualified as estimated below the reporting limit.

Sample ID	Compound	Laboratory Result (mg/L)	Validation Result (mg/L)
Well-2-GW-105-150-06062007	free chlorine	0.10 U	0.10 UJ
Well-2-GW-61.5-81.5-06062007	free chlorine	0.10 U	0.10 UJ
Well-2-GW-27-47-06062007	free chlorine	0.10 U	0.10 UJ
Well-2-GW-105-150-06062007 DUP	free chlorine	0.10 U	0.10 UJ

C.9.3.2.11. Laboratory Report: 0706021

This report includes the following analyses and samples:

Analyses
8260B
8270C
EPH
6020/7470A
wet chemistry analyses
methylamine and 2-propanol (EPA Method 1671)
acrylamide (modified EPA Method 8032A)

Client Sample ID

Well-L-GW-112-128-06052007
EQBLANK-06052007
TB-06052007
Well-L-GW-48-64-06052007
RB-06052007
TB-06052007

The data from this sample set were validated at the Tier III level. The sample qualifications are summarized below by laboratory method.

Method 8260B**Calibration qualifications**

Appropriate initial calibrations were performed for each analyte, with the exceptions of 2-pentanone and ethyl acetate. 2-Pentanone and ethyl acetate were not included in the calibration standards. All samples had a library search of TICs performed to confirm the absence of 2-pentanone and ethyl acetate. Based on the method of calibration, the laboratory calculated the percent relative standard deviation (%RSD) of the RRFs. For all target analytes, the RRFs met the method criteria; the RSDs met the method criteria for all compounds except bromomethane, chloroethane, trichlorofluoromethane, bromoform, 1,3,5- trimethylbenzene, tert-butylbenzene, 1,2,4-trimethylbenzene p-isopropyltoluene, n-butylbenzene, 1,2,4-trichlorobenzene, hexachlorobutadiene, naphthalene, 1,2,3-trichlorobenzene and methyl isothiocyanate; the %RSDs were within the validation acceptance criteria for all compounds except bromomethane, 1,2,4-trichlorobenzene, hexachlorobutadiene and naphthalene. Therefore, the undetected concentrations of bromomethane, 1,2,4-trichlorobenzene, hexachlorobutadiene and naphthalene in all samples are UJ qualified as estimated below the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-L-GW-112-128-06052007	bromomethane	2.0 U	2.0 UJ
	1,2,4-trichlorobenzene	2.0 U	2.0 UJ
	hexachlorobutadiene	2.0 U	2.0 UJ
	naphthalene	2.0 U	2.0 UJ
EQBLANK-06052007	bromomethane	2.0 U	2.0 UJ
	1,2,4-trichlorobenzene	2.0 U	2.0 UJ
	hexachlorobutadiene	2.0 U	2.0 UJ
	naphthalene	2.0 U	2.0 UJ
TB-06052007	bromomethane	2.0 U	2.0 UJ
	1,2,4-trichlorobenzene	2.0 U	2.0 UJ
	hexachlorobutadiene	2.0 U	2.0 UJ
	naphthalene	2.0 U	2.0 UJ
Well-L-GW-48-64-06052007	bromomethane	2.0 U	2.0 UJ
	1,2,4-trichlorobenzene	2.0 U	2.0 UJ
	hexachlorobutadiene	2.0 U	2.0 UJ
	naphthalene	2.0 U	2.0 UJ
RB-06052007	bromomethane	2.0 U	2.0 UJ
	1,2,4-trichlorobenzene	2.0 U	2.0 UJ
	hexachlorobutadiene	2.0 U	2.0 UJ
	naphthalene	2.0 U	2.0 UJ
TB-06052007	bromomethane	2.0 U	2.0 UJ
	1,2,4-trichlorobenzene	2.0 U	2.0 UJ
	hexachlorobutadiene	2.0 U	2.0 UJ
	naphthalene	2.0 U	2.0 UJ

LCS qualifications

All LCS recoveries were within the laboratory control limits, with the exception of high recoveries of acetone (LCS/LCS Duplicate-LCSD) and 2-butanone (LCS) and low recovery for bromomethane (LCSD). All duplicate RPD results were acceptable. No qualifications were required due to the high acetone and 2-butanone recoveries, as no acetone and 2-butanone were detected in any sample. However, based on the low bromomethane recovery in the LCSD, the undetected concentrations of bromomethane in the samples are UJ qualified as estimated below the reporting limit.

The report narrative noted that methyl isothiocyanate was not evaluated as a spike compound in the LCS. Therefore, the undetected concentrations of methyl isothiocyanate in the samples are UJ qualified as estimated below the reporting limit. 2-Pentanone and ethyl acetate were not evaluated as spike compounds in the LCS, either. However, since 2-pentanone and ethyl acetate were evaluated as TICs, no sample qualifications were made.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-L-GW-112-128-06052007	bromomethane	2.0 U	2.0 UJ
	methyl isothiocyanate	2.0 U	2.0 UJ
EQBLANK-06052007	bromomethane	2.0 U	2.0 UJ
	methyl isothiocyanate	2.0 U	2.0 UJ
TB-06052007	bromomethane	2.0 U	2.0 UJ
	methyl isothiocyanate	2.0 U	2.0 UJ
Well-L-GW-48-64-06052007	bromomethane	2.0 U	2.0 UJ
	methyl isothiocyanate	2.0 U	2.0 UJ
RB-06052007	bromomethane	2.0 U	2.0 UJ
	methyl isothiocyanate	2.0 U	2.0 UJ
TB-06052007	bromomethane	2.0 U	2.0 UJ
	methyl isothiocyanate	2.0 U	2.0 UJ

Method 8270C

Calibration qualifications

Stearic acid did not meet the %RSD criteria for the initial calibration. EPA Method 8000 allows for the use a quadratic curve which requires an initial calibration consisting of six standards; the quadratic curve was used for sample quantification and consisted of only five standards. Therefore, based on professional judgment, the concentrations of stearic acid in the samples are J qualified as estimated.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-L-GW-112-128-06052007	2,4-dinitrophenol	0.50 U	0.50 UJ
	stearic acid	4.3	4.3 J
Well-L-GW-48-64-06052007	2,4-dinitrophenol	0.50 U	0.50 UJ
	stearic acid	6.0	6.0 J

For all target analytes, the %D between the RRFs in the initial and continuing calibration standards were within the method acceptance criteria for all compounds except 2-nitroaniline, 2,4-dinitrophenol, 4-nitrophenol and 4,6-dinitro-2-methylphenol; the %D validation criteria was not met for 2-nitroaniline, 2,4-dinitrophenol, 4-nitrophenol, and 4,6-dinitro-2-methylphenol. Therefore, the undetected concentrations of 2-nitroaniline, 2,4-dinitrophenol, 4-nitrophenol and 4,6-dinitro-2-methylphenol in the samples are UJ qualified as estimated below the reporting limits.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-L-GW-112-128-06052007	2-nitroaniline	0.50 U	0.50 UJ
	2,4-dinitrophenol	0.50 U	0.50 UJ
	4-nitrophenol	0.50 U	0.50 UJ
	4,6-dinitro-2-methylphenol	0.50 U	0.50 UJ
Well-L-GW-48-64-06052007	2-nitroaniline	0.50 U	0.50 UJ
	2,4-dinitrophenol	0.50 U	0.50 UJ
	4-nitrophenol	0.50 U	0.50 UJ
	4,6-dinitro-2-methylphenol	0.50 U	0.50 UJ

LCS qualifications

All LCS recoveries were within the laboratory control limits, with the exception of high recoveries of 2-nitroaniline, 2,4-dinitrophenol and 4-nitroaniline and low recoveries for 2,4-dimethylphenol in the LCS and/or LCSD. All duplicate RPD results were acceptable, with the exception of high RPD results for 2,4-dimethylphenol, 2,4-dinitrophenol and pentachlorophenol. No qualifications were required due to the high recoveries or RPDs, as these compounds were not detected in any sample. However, based on the low recoveries in the LCS and LCSD, the undetected concentrations of 2,4-dimethylphenol in the samples are UJ qualified as estimated below the reporting limit.

Stearic acid and orthophenylphenol were not spiked into the LCS/LCSD; therefore, the undetected concentrations of stearic acid and orthophenylphenol in the samples are UJ qualified as estimated below the reporting limit and J qualified as estimated.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-L-GW-112-128-06052007	2,4-dimethylphenol	0.50 U	0.50 UJ
	stearic acid	4.3	4.3 J
	orthophenylphenol	0.50 U	0.50 UJ
Well-L-GW-48-64-06052007	2,4-dimethylphenol	0.50 U	0.50 UJ
	stearic acid	6.0	6.0 J
	orthophenylphenol	0.50 U	0.50 UJ

Method 6020

Calibration qualifications

The recoveries of sodium in the ICSA/ICSAB standards analyzed with the dissolved metals samples were listed as 0% on the QC summary form. According to the report narrative, "The recovery of sodium from the interference check sample is given as a zero percent recovery due to the channel being saturated at the concentration being measured." Therefore, the dissolved sodium concentrations in samples Well-L-GW-112-128-06052007 and Well-L-GW-48-64-06052007 are J qualified as estimated.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-L-GW-112-128-06052007	dissolved sodium	5800	5800 J
Well-L-GW-48-64-06052007	dissolved sodium	5100	5100 J

Blank qualifications

arsenic, barium, calcium, chromium, magnesium, potassium, sodium, vanadium and zinc were detected at low levels in the total metals method blank at concentrations less than the reporting limit (RL), but greater than the MDL. The sample concentrations of all elements but vanadium were above the RL. The concentration of vanadium in sample Well-L-GW-48-64-06052007 was not detected; therefore, no qualification was required. The concentration of vanadium in sample Well-L-GW-112-128-06052007 was less than the reporting limit (RL), but greater than the

MDL; therefore, the total metals concentration of vanadium in sample Well-L-GW-112-128-06052007 is U qualified as not detected at the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-L-GW-112-128-06052007	vanadium	0.21 J	5.0 U

Antimony, arsenic, silver, sodium and vanadium were detected at low levels in the dissolved metals method blank at concentrations less than the RL, but greater than the MDL. The concentrations in samples Well-L-GW-112-128-06052007 and Well-L-GW-48-64-06052007 of all these elements but silver and vanadium were above the RL. Silver was not detected in the samples, so no qualifications were required. The dissolved vanadium concentrations in samples Well-L-GW-112-128-06052007 and Well-L-GW-48-64-06052007 were less than the RL, but greater than the MDL. Therefore, the dissolved vanadium concentrations in samples Well-L-GW-112-128-06052007 and Well-L-GW-48-64-06052007 are U qualified as not detected at the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-L-GW-112-128-06052007	dissolved vanadium	1.1 J	5.0 U
Well-L-GW-48-64-06052007	dissolved vanadium	0.64 J	5.0 U

Antimony, calcium, lead and thallium were detected at low levels in the dissolved metals ICB and antimony, arsenic, beryllium, calcium, chromium, copper, lead, silver, sodium, thallium and vanadium were detected at low levels in the dissolved metals CCBs at concentrations less than the RL, but greater than the MDL. Additionally, dissolved silver was detected in two CCBs above the RL. No qualifications are required for dissolved beryllium, silver and thallium in either sample and for dissolved lead in sample Well-L-GW-48-64-06052007 since dissolved beryllium, silver and thallium were not detected in either sample and dissolved lead was not detected in sample Well-L-GW-48-64-06052007. The dissolved concentrations of antimony, arsenic, calcium, copper, chromium and sodium in both samples were above the RL; therefore, no qualifications were required. However, dissolved lead in sample Well-L-GW-112-128-06052007 and dissolved vanadium in samples Well-L-GW-112-128-06052007 and Well-L-GW-48-64-06052007 are U qualified as undetected at the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-L-GW-112-128-06052007	dissolved lead	0.45 J	0.50 U
	dissolved vanadium	1.1 J	5.0 U
Well-L-GW-48-64-06052007	dissolved vanadium	0.64 J	5.0 U

Matrix spike qualifications

Sample Well-L-GW-112-128-06052007 was utilized for MS analysis for dissolved metals. The MS recoveries were within the laboratory QC acceptance limits, except for calcium (low recovery). Therefore, the concentration of dissolved calcium in sample Well-L-GW-112-128-06052007 is J- qualified as estimated low.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-L-GW-112-128-06052007	dissolved calcium	120000	120000 J-

Serial dilution qualifications

The serial dilution of sample Well-L-GW-112-128-06052007 for dissolved metals analysis did not meet the percent difference criteria for antimony, arsenic, chromium and vanadium. The laboratory flagged the serial dilution results for chromium as estimated due to interference. Additionally, the sample concentrations of antimony, arsenic and vanadium are <50 times the MDL; no qualifications of these dissolved metals results are required. Therefore, the dissolved chromium concentration for sample Well-L-GW-112-128-06052007 is J qualified as estimated.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-L-GW-112-128-06052007	dissolved chromium	8.0 E	8.0 J

E-Estimated due to interference

Standard Methods 4500-Cl, Free chlorine

Holding time qualifications

Free chlorine should be immediately after sample collection; the samples were analyzed two days after collection. Therefore, the free chlorine concentrations of samples Well-L-GW-112-128-06052007 and Well-L-GW-48-64-06052007 are UJ qualified as estimated below the reporting limit.

Sample ID	Compound	Laboratory Result (mg/L)	Validation Result (mg/L)
Well-L-GW-112-128-06052007	free chlorine	0.10 U	0.10 UJ
Well-L-GW-48-64-06052007	free chlorine	0.10 U	0.10 UJ

C.9.3.2.12. Laboratory Report: 0706002

This report includes the following analyses and samples:

Analyses

8260B
8270C
EPH
6020/7470A
wet chemistry analyses
methylamine and 2-propanol (EPA Method 1671)
acrylamide (modified EPA Method 8032A)

Client Sample ID

Well-K-GW-(204-214)-05302007
EQBLANK-05302007
RB-05302007
TB-05302007
Well-K-GW-(49-64)-05312007
RB-05312007
EQBLANK-05312007
TB-05312007

The data from this sample set were validated at the Tier III level. The sample qualifications are summarized below, by laboratory method.

Method 8260B**Calibration qualifications**

Appropriate initial calibrations were performed for each analyte, with the exceptions of 2-pentanone and ethyl acetate. 2-Pentanone and ethyl acetate were not included in the calibration standards. All samples had a library search of TICs performed to confirm the absence of 2-pentanone and ethyl acetate. Based on the method of calibration, the laboratory calculated the percent relative standard deviation (%RSD) of the RRFs. For all target analytes, the RRFs met the method criteria; the RSDs met the method criteria for all compounds except bromomethane, chloroethane, trichlorofluoromethane, bromoform, 1,3,5-trimethylbenzene, tert-butylbenzene, 1,2,4-trimethylbenzene p-isopropyltoluene, n-butylbenzene, 1,2,4-trichlorobenzene, hexachlorobutadiene, naphthalene, 1,2,3-trichlorobenzene and methyl isothiocyanate; the %RSDs were within the validation acceptance criteria for all compounds except bromomethane, 1,2,4-trichlorobenzene, hexachlorobutadiene and naphthalene. Therefore, the undetected concentrations of bromomethane, 1,2,4-trichlorobenzene, hexachlorobutadiene and naphthalene in all samples are UJ qualified as estimated below the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-K-GW-(204-214)-05302007	bromomethane	2.0 U	2.0 UJ
	1,2,4-trichlorobenzene	2.0 U	2.0 UJ
	hexachlorobutadiene	2.0 U	2.0 UJ
	naphthalene	2.0 U	2.0 UJ
EQBLANK-05302007	bromomethane	2.0 U	2.0 UJ
	1,2,4-trichlorobenzene	2.0 U	2.0 UJ
	hexachlorobutadiene	2.0 U	2.0 UJ
	naphthalene	2.0 U	2.0 UJ
RB-05302007	bromomethane	2.0 U	2.0 UJ
	1,2,4-trichlorobenzene	2.0 U	2.0 UJ
	hexachlorobutadiene	2.0 U	2.0 UJ
	naphthalene	2.0 U	2.0 UJ
TB-05302007	bromomethane	2.0 U	2.0 UJ
	1,2,4-trichlorobenzene	2.0 U	2.0 UJ
	hexachlorobutadiene	2.0 U	2.0 UJ
	naphthalene	2.0 U	2.0 UJ
Well-K-GW-(49-64)-05312007	bromomethane	2.0 U	2.0 UJ
	1,2,4-trichlorobenzene	2.0 U	2.0 UJ
	hexachlorobutadiene	2.0 U	2.0 UJ
	naphthalene	2.0 U	2.0 UJ
RB-05312007	bromomethane	2.0 U	2.0 UJ
	1,2,4-trichlorobenzene	2.0 U	2.0 UJ
	hexachlorobutadiene	2.0 U	2.0 UJ
	naphthalene	2.0 U	2.0 UJ
EQBLANK-05312007	bromomethane	2.0 U	2.0 UJ
	1,2,4-trichlorobenzene	2.0 U	2.0 UJ
	hexachlorobutadiene	2.0 U	2.0 UJ
	naphthalene	2.0 U	2.0 UJ
TB-05312007	bromomethane	2.0 U	2.0 UJ
	1,2,4-trichlorobenzene	2.0 U	2.0 UJ
	hexachlorobutadiene	2.0 U	2.0 UJ
	naphthalene	2.0 U	2.0 UJ

LCS qualifications

All LCS recoveries were within the laboratory control limits, with the exception of high recovery of 1,1-dichloroethene in the LCS and low recoveries for bromomethane (in the LCS Duplicate-LCSD) and carbon disulfide (in the LCS and LCSD). All duplicate RPD results were acceptable. No qualifications were required due to the high 1,1-dichloroethene recovery, as 1,1-dichloroethene was not detected in any sample. However, based on the low recoveries in the LCS and/or LCSD, the undetected concentrations of bromomethane and carbon disulfide in the samples are UJ qualified as estimated below the reporting limit.

The report narrative noted that methyl isothiocyanate was not evaluated as a spike compound in the LCS. Therefore, the undetected concentrations of methyl isothiocyanate in the samples are UJ qualified as estimated below the reporting limit. 2-Pentanone and ethyl acetate were not evaluated as spike compounds in the LCS, either. However, since 2-pentanone and ethyl acetate were evaluated as TICs, no sample qualifications were made.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-K-GW-(204-214)-05302007	bromomethane	2.0 U	2.0 UJ
	carbon disulfide	2.0 U	2.0 UJ
	methyl isothiocyanate	2.0 U	2.0 UJ
EQBLANK-05302007	bromomethane	2.0 U	2.0 UJ
	carbon disulfide	2.0 U	2.0 UJ
	methyl isothiocyanate	2.0 U	2.0 UJ
RB-05302007	bromomethane	2.0 U	2.0 UJ
	carbon disulfide	2.0 U	2.0 UJ
	methyl isothiocyanate	2.0 U	2.0 UJ
TB-05302007	bromomethane	2.0 U	2.0 UJ
	carbon disulfide	2.0 U	2.0 UJ
	methyl isothiocyanate	2.0 U	2.0 UJ
Well-K-GW-(49-64)-05312007	bromomethane	2.0 U	2.0 UJ
	carbon disulfide	2.0 U	2.0 UJ
	methyl isothiocyanate	2.0 U	2.0 UJ
RB-05312007	bromomethane	2.0 U	2.0 UJ
	carbon disulfide	2.0 U	2.0 UJ
	methyl isothiocyanate	2.0 U	2.0 UJ
EQBLANK-05312007	bromomethane	2.0 U	2.0 UJ
	carbon disulfide	2.0 U	2.0 UJ
	methyl isothiocyanate	2.0 U	2.0 UJ
TB-05312007	bromomethane	2.0 U	2.0 UJ
	carbon disulfide	2.0 U	2.0 UJ
	methyl isothiocyanate	2.0 U	2.0 UJ

Method 8270C

Calibration qualifications

Appropriate initial calibrations were performed for each analyte. Based on the method of calibration, the laboratory calculated the %RSD of the RRFs. For all target analytes, the RRFs met the method criteria; the %RSDs met the method criteria for all compounds except 2,4-dinitrophenol, 2,4-dinitrotoluene, 4,6-dinitro-2-methylphenol and aniline; the %RSDs were within validation acceptance criteria for all compounds except 2,4-dinitrophenol and stearic acid. Therefore, the undetected concentrations of 2,4-dinitrophenol in all samples are UJ qualified as estimated below the reporting limit.

Stearic acid did not meet the %RSD criteria for the initial calibration. EPA Method 8000 allows for the use a quadratic curve which requires an initial calibration consisting of six standards; the quadratic curve was used for sample quantification and consisted of only five standards. Therefore, based on professional judgment, the concentrations of stearic acid in the samples are J qualified as estimated.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-K-GW-(204-214)-05302007	2,4-dinitrophenol	0.50 U	0.50 UJ
	stearic acid	11	11 J
Well-K-GW-(49-64)-05312007	2,4-dinitrophenol	0.50 U	0.50 UJ
	stearic acid	7.6	7.6 J

Two CCVs were analyzed with the samples. The CCV associated with the undiluted analyses of both samples had the %D between the RRFs in the initial and continuing calibration standards within the method acceptance criteria for all compounds except 2-nitroaniline, 2,4-dinitrophenol, 4-nitrophenol and 4,6-dinitro-2-methylphenol; the %D validation criteria was not met for these compounds. Therefore, the undetected concentrations of 2-nitroaniline, 2,4-dinitrophenol, 4-nitrophenol and 4,6-dinitro-2-methylphenol in the samples are UJ qualified as estimated below the reporting limits.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-K-GW-(204-214)-05302007	2-nitroaniline	0.50 U	0.50 UJ
	2,4-dinitrophenol	0.50 U	0.50 UJ
	4-nitrophenol	0.50 U	0.50 UJ
	4,6-dinitro-2-methylphenol	0.50 U	0.50 UJ
Well-K-GW-(49-64)-05312007	2-nitroaniline	0.50 U	0.50 UJ
	2,4-dinitrophenol	0.50 U	0.50 UJ
	4-nitrophenol	0.50 U	0.50 UJ
	4,6-dinitro-2-methylphenol	0.50 U	0.50 UJ

LCS qualifications

All LCS recoveries were within the laboratory control limits, with the exception of high recoveries of 2-nitroaniline, 2,4-dinitrophenol and 4-nitroaniline and low recoveries for 2,4-dimethylphenol in the LCS and/or LCSD. All duplicate RPD results were acceptable, with the exception of high RPD results for 2,4-dinitrophenol and pentachlorophenol. No qualifications were required due to the high recoveries or RPDs, as these compounds were not detected in any sample. However, based on the low recoveries in the LCS and LCSD, the undetected concentrations of 2,4-dimethylphenol in the samples are UJ qualified as estimated below the reporting limit.

Stearic acid and orthophenylphenol were not spiked into the LCS/LCSD; therefore, the undetected concentrations of stearic acid and orthophenylphenol in the samples are UJ qualified as estimated below the reporting limit and J qualified as estimated.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-K-GW-(204-214)-05302007	2,4-dimethylphenol	0.50 U	0.50 UJ
	stearic acid	11	11 J
	orthophenylphenol	0.50 U	0.50 UJ
Well-K-GW-(49-64)-05312007	2,4-dimethylphenol	0.50 U	0.50 UJ
	stearic acid	7.6	7.6 J
	orthophenylphenol	0.50 U	0.50 UJ

Method 6020

Calibration qualifications

The recoveries of sodium in the ICSA/ICSAB standards analyzed with the dissolved metals samples were listed as 0% on the QC summary form. According to the report narrative, "The recovery of sodium from the interference check sample is given as a zero percent recovery due to the channel being saturated at the concentration being measured." Therefore, the dissolved

sodium concentrations in samples Well-K-GW-(204-214)-05302007 and Well-K-GW-(49-64)-05312007 are J qualified as estimated.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-K-GW-(204-214)-05302007	dissolved sodium	68000	68000 J
Well-K-GW-(49-64)-05312007	dissolved sodium	76000	76000 J

Blank qualifications

arsenic, calcium, chromium, magnesium, potassium, sodium, vanadium and zinc were detected at low levels in the total metals method blank at concentrations less than the reporting limit (RL), but greater than the MDL. The sample concentrations of all these elements but vanadium were above the RL; therefore, the total vanadium concentration in sample Well-K-GW-(49-64)-05312007 is U qualified as not detected at the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-K-GW-(49-64)-05312007	vanadium	2.4 J	5.0 U

Antimony, arsenic, calcium and vanadium were detected at low levels in the dissolved metals method blank at concentrations less than the RL, but greater than the MDL. The samples' concentrations of all elements but vanadium were above the RL; therefore, the dissolved vanadium concentrations in samples Well-K-GW-(204-214)-05302007 and Well-K-GW-(49-64)-05312007 are U qualified as not detected at the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-K-GW-(204-214)-05302007	dissolved vanadium	3.3 J	5.0 U
Well-K-GW-(49-64)-05312007	dissolved vanadium	3.4 J	5.0 U

Antimony, lead and thallium were detected at low levels in the dissolved metals ICB and antimony, arsenic, beryllium, calcium, chromium, copper, lead, sodium, thallium and vanadium were detected at low levels in the dissolved metals CCB at concentrations less than the RL, but greater than the MDL. No qualifications are required for dissolved beryllium in sample Well-K-GW-(49-64)-05312007 and dissolved thallium in samples Well-K-GW-(204-214)-05302007 and Well-K-GW-(49-64)-0531200 since dissolved beryllium and thallium were not detected. The dissolved concentrations in both samples of antimony, arsenic, calcium, copper, chromium and sodium were above the RL; therefore, no qualifications were required. However, dissolved beryllium in sample Well-K-GW-(204-214)-05302007 is U qualified as undetected at the reporting limit. Additionally, dissolved lead and vanadium in samples Well-K-GW-(204-214)-05302007 and Well-K-GW-(49-64)-05312007 are U qualified as undetected at the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-K-GW-(204-214)-05302007	dissolved beryllium	0.063 J	2.0 U
	dissolved lead	0.32 J	0.50 U
	dissolved vanadium	3.3 J	5.0 U
Well-K-GW-(49-64)-05312007	dissolved lead	0.30 J	0.50 U

Matrix spike qualifications

Sample Well-K-GW-(49-64)-05312007 was utilized for MS analysis for total metals. The MS recoveries were within the laboratory QC acceptance limits, except for calcium (high recovery), magnesium and potassium (low recoveries). The concentration of calcium in sample Well-K-GW-(49-64)-05312007 is greater than four times the spike level; therefore, the spike limits do not apply and no qualifications are required. Due to the low magnesium and potassium recoveries, the total concentrations of magnesium and potassium in sample Well-K-GW-(49-64)-05312007 are J- qualified as estimated low.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-K-GW-(49-64)-05312007	magnesium	12000	12000 J-
	potassium	11000	11000 J-

Sample Well-K-GW-(49-64)-05312007 was utilized for MS analysis for dissolved metals. The MS recoveries were within the laboratory QC acceptance limits, except for calcium and silver, both with low recoveries. Therefore, the concentration of dissolved calcium in sample Well-K-GW-(49-64)-05312007 is J qualified as estimated low; the concentration of dissolved silver in sample Well-K-GW-(49-64)-05312007 is UJ qualified as estimated below the reporting limit.

Sample ID	Compound	Laboratory Result (µg/L)	Validation Result (µg/L)
Well-K-GW-(49-64)-05312007	dissolved calcium	79000	79000 J-
	dissolved silver	0.035 U	0.035 UJ

Serial dilution qualifications

The serial dilution of sample Well-K-GW-(49-64)-05312007 for total metals analysis did not meet the percent difference criteria for aluminum, antimony, arsenic, chromium, copper, thallium and vanadium. The laboratory flagged the serial dilution results for arsenic and chromium as estimated due to interference. Additionally, the sample concentrations of aluminum, antimony, copper, thallium and vanadium are <50 times the MDL; no qualifications of these total metals results are required. However, based on the serial dilution results, the total arsenic and chromium concentrations for sample Well-K-GW-(49-64)-05312007 are J qualified as estimated.

Sample ID	Compound	Laboratory Result ($\mu\text{g/L}$)	Validation Result ($\mu\text{g/L}$)
Well-K-GW-(49-64)-05312007	arsenic	6.8 E	6.8 J
	chromium	8.8 E	8.8 J

E-Estimated due to interference

The serial dilution of sample Well-K-GW-(49-64)-05312007 for dissolved metals analysis did not meet the percent difference criteria for antimony, arsenic, chromium, copper, mercury, selenium and vanadium. The laboratory flagged the serial dilution results for arsenic and chromium as estimated due to interference. Additionally, the sample concentrations of antimony, copper, mercury, selenium and vanadium are <50 times the MDL; no qualifications of these dissolved metals results are required. Therefore, the dissolved arsenic and chromium concentrations for sample Well-K-GW-(49-64)-05312007 are J qualified as estimated.

Sample ID	Compound	Laboratory Result ($\mu\text{g/L}$)	Validation Result ($\mu\text{g/L}$)
Well-K-GW-(49-64)-05312007	dissolved arsenic	5.2 E	5.2 J
	dissolved chromium	8.2 E	8.2 J

E-Estimated due to interference

Standard Methods 4500-Cl, Free chlorine

Holding time qualifications

All samples were analyzed within the method-specified holding times, with the exception of free chlorine. Free chlorine should be immediately after sample collection; the samples were analyzed two days after collection. Therefore, the free chlorine concentrations in samples Well-K-GW-(204-214)-05302007 and Well-K-GW-(49-64)-05312007 are UJ qualified as estimated below the reporting limit.

Sample ID	Compound	Laboratory Result (mg/L)	Validation Result (mg/L)
Well-K-GW-(204-214)-05302007	free chlorine	0.10 U	0.10 UJ
Well-K-GW-(49-64)-05312007	free chlorine	0.10 U	0.10 UJ

C.9.3.2.13. Laboratory Report: L0711562

This report includes the following analyses and samples:

Analyses

perchlorate 332.0

Client Sample ID

WELL-C2-GW-07162007
WELL-F-GW-07172007
WELL-M-GW-07172007
WELL-C-GW-07172007
WELL-H-GW-07172007
WELL-96-1-GW-07172007
OGS 1&2-GW-07172007
WELL-A-GW-07172007
WELL-96-2-GW-07172007
WELL-J-GW-(154)-07172007
CDP WELL #5-GW-07182007
WELL-I-GW-07182007
WELL-N-GW-07182007
WELL-D-GW-07182007
WELL-E-GW-07182007

The data from this sample set were validated at the Tier III level. There were no sample qualifications.

C.9.3.2.14. Laboratory Report: L0709644, 070702

This report includes the following analyses and samples:

Analyses

TKN 351.2
total ammonia 350.1
nitrate 300.0
nitrite 300.0
total P 365.4
o-PO4 356.2
TSS
perchlorate 332.0

Client Sample ID

SP-C-SW07052007
SP-O-SW07052007
OC-1-SW07052007
SN-001-SW07052007
Trib-2 SW07052007
Trib-3 SW07052007
Trib-4 SW07052007
HB-1 SW07052007
HB-2 SW07052007
HB-3 SW07052007
RB01 SW07052007
HB-4 SW07052007
Trip blank

The data from this sample set were validated to Tier II; additionally, full Tier III validation was performed for perchlorate data. The sample qualifications are summarized below, by laboratory method.

Sample	Analysis	Qualifications	Comments
SP-C-SW07052007	total suspended solids	2.3 J	The sample was analyzed 5 days past the holding time.
SP-O-SW07052007	total suspended solids	4.7 J	The sample was analyzed 5 days past the holding time.
OC-1-SW07052007	total suspended solids	2.0 UJ	The sample was analyzed 5 days past the holding time.
SN-001-SW07052007	total suspended solids	2.0 UJ	The sample was analyzed 5 days past the holding time.
Trib-2 SW07052007	total suspended solids	2.0 UJ	The sample was analyzed 5 days past the holding time.
Trib-3 SW07052007	total suspended solids	2.0 UJ	The sample was analyzed 5 days past the holding time.
Trib-4 SW07052007	total suspended solids	2.0 UJ	The sample was analyzed 5 days past the holding time.

Laboratory Report L0712002

This report includes the following analyses and samples:

Analyses
Perchlorate 332.0

Client Sample ID
755 Firehill_GW_08172007
1143 Firehill_GW (Shallow)
1143 Firehill_GW_08172007 DEEP
142 Block Rd_GW_8172007
2192 West Creek Rd_GW_8172007
2247 West Creek Rd_GW_8172007
2847 West Creek Rd_GW_8172007
PFWD-GW-POST-8/17/2007
PFWD-GW-PRE-8/17/2007
219 Hollister Quarry_GW
219 Hollister Quarry_GW DUP
411 Hollister Quarry_GW
670 Hollister Quarry_GW
764 Hollister Quarry_GW (BARN)
764 Hollister Quarry_GW (HOUSE)
469 Hollister Quarry_GW

The data from this sample set were validated to full Tier III validation.

There were no sample qualifications.

C.9.4. Results of field sampling audit

A field sampling audit was performed during low flow groundwater sampling of site monitoring wells from June 4th through June 6th, 2007. During the audit, field activities were observed and compared against the requirements stated in the QAPP and FSP. Field log books, field forms, monitoring well sampling procedures, analytical method specifications, chain of custody forms, shipping and decontamination procedures were observed and assessed.

Prior to field mobilization, each member of the field sampling team was provided with all of the pertinent information and forms needed to perform the field sampling in compliance with the systematic planning documents. Each member was also provided a copy of the FSP and QAPP prior to the sampling activities and each confirmed that they had reviewed and were familiar with these documents. A field supervisor was present and in charge of the field sampling activities at all times. The sampling event lasted four days and the audit lasted for three of the four days. A safety meeting was held each day prior to the beginning of sampling activities. In addition to the safety topic, quality assurance topics were also discussed during the meeting. The

daily field form was used to record the meeting and was signed by all of the personnel present at the meeting. Any person not present at the time of the meeting was given the information upon their arrival at the site and then signed the field form indicating their understanding of the material.

Field instruments were calibrated each day prior to deployment for groundwater sampling. The appropriate field forms were completed for each instrument calibration parameter. Relevant field forms and notes are presented in Appendix 10. Sampling equipment was deployed to the site after successful calibration. During the audit, well sampling activities were observed and it was concluded that the sampling was generally performed as specified by the low flow purging and sampling SOP contained in the FSP.

A dedicated equipment decontamination area was located central to the areas of field activities. Adequate secondary containment was provided as well as adequate storage for decontamination fluids. Decontamination was performed on field equipment as specified by the SOP contained in the FSP.

A general field log book was maintained in accordance with the specifications of the FSP and QAPP. In addition to the field log book, a monitoring well development purging and sampling record was completed for each monitoring well as it was sampled. These records were reviewed by the QAO at the end of each sampling day for completeness, accuracy, and proper documentation practices. Although some discrepancies were observed in regard to documentation correction practices, overall, the documentation was completed as specified by the FSP and QAPP.

Field quality control samples were collected as specified by the FSP with the exception of field blank samples. Field blank samples are used to verify that blank water is free of contaminants. Equipment blanks, trip blanks, matrix spikes and matrix spike duplicates and field duplicates were collected at the appropriate frequency as specified by the QAPP.

Sample bottles for each analysis were provided by the laboratories. Alpha Woods Hole Laboratory provided sample bottles containing the proper preservation chemicals per analysis as specified by the QAPP. Sample bottles for flotation agent analysis by Test America (formerly STL) had the preservation reagent (100 microliters of trifluoroacetic acid [TFA]) added to each sample container at the Omya laboratory in Florence, VT prior to sample collection. During the audit it was observed that all samples were preserved per analysis as specified in the QAPP.

Preserved samples were packed on ice in coolers. COC forms were completed each day for the samples being shipped or transported to the laboratory. A chain of custody was included in each cooler prior to the cooler being sealed with packing tape. Custody seals were attached to each cooler prior to shipment or transportation. These procedures were completed in accordance with the FSP and QAPP.

Samples were shipped to the lab on a daily basis and immediate receipt verification was received from each laboratory. Some discrepancies were noted by the laboratories upon receipt of the samples. These discrepancies included minor differences in the COC information versus sample identification and in one case sample bottle breakage during sample shipment. Because each

sample was collected in duplicate per analysis as specified by the QAPP, even with the broken bottles, adequate sample volumes were received by the lab in order to complete the required analyses. The COC documentation discrepancies were noted and corrected by the laboratory. The quality of the data was unaffected by the COC and shipping discrepancies; however, upon notification of these occurrences, corrective measures were implemented by the field team in order to eliminate reoccurrence. These corrective measures included direct transportation of the samples to the lab by a field team member, increased sample packing materials around samples to protect against breakage, and more careful documentation on the COCs. Overall, during the sampling event, sample quality was not compromised during packaging, shipping and handling of the samples and proper COC implementation was observed during the field audit.

The results from the field audit indicated that the general requirements of the FSP and QAPP were followed during sample collection. Any deviations from these documents were communicated to the project manager and approved prior to being made and recorded on field forms or in the general field log book. Samples were collected in a manner that meets the DQOs for the project.

C.9.5. Deviations from the FSP and QAPP

We identified several discrepancies between field procedures and specifications in the FSP and QAPP. None of these discrepancies affect the usability of the collected data.

FSP Deviations

- Section 4.8.1.2 – Sampling Procedures and Equipment: Open Bedrock Boreholes. This section specifies that filtered samples be collected for flotation agent analysis when groundwater turbidity exceeds 5 nephelometric turbidity units (NTUs) after stabilization of field parameters. While several samples exceeded 5 NTUs, only unfiltered samples were collected for flotation agent analysis. Any bias is introduced by this deviation would be a high bias.
- Section 5.2.1 – Sample Numbering System. The section specifies the collection of field blanks and rinsate blanks. Neither field blanks nor rinsate blanks were collected; however, equipment blanks, which are equivalent to rinsate blanks, were collected. Additionally, the FSP specifies collection of blind field duplicate samples. Field duplicate samples were collected but not submitted as blind samples.
- Section 5.3 – Sample Packaging and Shipping Requirements. This section specifies that multiple copies of the COC will be completed (carbon copies). Only an original copy that was sent to the lab was completed during the sampling events. A photocopy of the COC was then returned to us by the lab after the samples had been verified and logged in. Additionally, custody seals on the coolers were not covered with strapping tape prior to shipment, as specified by the FSP.
- Table 1 – Organization and Responsibilities. Members of the field team deviated from those specifically listed on this table. The Project Manager at Alpha Woods Hole Lab changed after project activities began.
- Table 8 – Sampling Locations, Methodologies, and QC Requirements. This table specifies what analysis will be requested for each sample location as well which sample

will have QC assigned to it. These specifications changed during sampling events at the direction of the project manager. These changes have been documented, as appropriate, in other appendices of this report.

- Appendix B Standard Operating Procedures – Standard Operating Procedure No. 007 – Groundwater Sampling Using The Low Flow Protocol
 - The specific calibration protocol for ORP was not 231 mV as listed. Instead the actual calibration solution was 100 mV.
 - The turbidity meter was calibrated prior to well sampling, but this procedure is not documented in the SOP.
 - A Hach spectrophotometer was used for ferrous iron analysis in the field but is not included in the SOP.
 - Sampling for VOC and Biodegradation Parameters
 1. Step 1 for VOC samples was not followed as described in the FSP. pH paper was not used and sample bottles were received pre-preserved from the lab. No “dummy” sample was collected.
 2. Step 2b: ferrous iron was measured in the field and not submitted for laboratory analysis.
 3. Step 2f : sulfide was not collected in glass bottles and were not preserved in the field. The lab provided pre-preserved plastic bottles for sulfide collection.
 4. Step 4d: “dummy” samples were not collected for metals or phenols and no pH paper was inserted into the sample containers.
 - The deviations listed under Sampling for VOC and Biodegradation Parameters did not affect the usability of the data for the following reasons:
 1. Step 1: the laboratory provided pre-preserved VOA vials for VOC sample collection. The pH of the VOC samples was verified by the lab upon receipt and no pH discrepancies were reported. Although no “dummy” samples were prepared in the field, trip blanks were utilized to ensure that contamination was not introduced during sample handling and shipping.
 2. Step 2b: the immediate analysis of ferrous iron in the field is more representative of groundwater conditions due to the tendency of ferrous iron to oxidize to ferric iron upon contact with air. Therefore, the field analysis that occurred is preferred over the method specified in the SOP.
 3. Step 2f: the pre-preserved plastic bottles provided by the lab for sulfide sampling are acceptable under the specific preservation requirements stated by the Method for this analysis and therefore equitable to the criteria stated in the SOP.
 4. Step 4d – The laboratory provided pre-preserved bottles for these analyses and verified the pH upon receipt. No pH discrepancies were noted by the lab upon sample receipt.

QAPP Deviations

- Section 2.1 – Project Organization Chart. The field team members varied over the course of the project and the project manager for the Alpha Wood Hole Laboratory changed after the project began.

- Section 2.4 – Laboratory Responsibilities. In addition to the project management change, STL became Test America Laboratories.
- Section 5.4.3 – Sample Numbering System. The section specifies the collection of field blanks and rinsate blanks. Neither field blanks nor rinsate blanks were collected; however, equipment blanks, which are equivalent to rinsate blanks, were collected. Additionally, this section specifies the submission of blind field duplicate samples. Field duplicate samples were collected but not submitted as blind samples.
- Section 6.1 – Analytical Methods. The laboratories substituted equitable or improved methods for some of the listed analytical methods. The quality of the data was not impacted by these changes.
- Section 7.1.3 – Field Blanks. Field blanks were not collected during sampling events for the project.
- Section 10.1.1 – Field Assessments. The text in this section refers to a “SAP.” An SAP was not prepared for this project; instead, an FSP and QAPP were prepared.
- Table 1 – Sampling Locations, Methodologies, and QC Requirements. This table specifies what analyses will be requested for each sample location as well which sample will have QC assigned to it. These specifications changed during sampling events as directed by the project manager. These changes do not affect data quality, and are documented in other appendices to this report.

C.9.6. References

Metcalf, L.D., 1984. The Analysis of Cationic Surfactants. *JAOCS*, 61:2; 363-366.

USEPA, 2006. *Guidance on Systematic Planning Using the Data Quality Objectives Process*, EPA QA/G-4, EPA/240/B-06/001 February 2006

USEPA, 2005. *Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review*, USEPA-540-R-04-009, January 2005.

USEPA, 2004. *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, EPA 540-R-04-004, October 2004.