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# SECTION A

## Test Methods Used to Analyze Groundwater Samples

| Analytes | Laboratory | Method |
|---|---|---|
| Anions | EPA - Ada[1] | SW-846 6500 |
| Nitrate, Nitrite, and Ammonia | EPA - Ada[1] | EPA 350.1 and 353.2 |
| Organic Carbon | EPA - Ada[1] | SW-846 9060A |
| Isotopes and Dissolved Gases | Isotech[2] | No EPA method |
| Metals (ICP, dissolved and total) | Shaw - Ada[3] | Method 200.7 |
| Metals (ICP-MS, dissolved and total) | CLP[4] | SOW ISM01.3 |
| Methylene Blue Active Substances | TestAmerica[5] | Method 425.1 |
| Methanol Scan | ALS[6] | SW-846 8015M |
| Organic Acids | Shaw - Ada[3] | RSKSOP112v6 |
| Dissolved Gases | Shaw - Ada[3] | RSKSOP175v5 and 194v4 |
| Water Isotopes | Shaw - Ada[3] | RSKSOP334v0 |
| Diesel Range Organics | EPA - Region 8[9] | SW-846 8015D |
| Gasoline Range Organics | EPA - Region 8[9] | SW-846 8015D |
| Semivolatile Organic Compounds (sVOC) | EPA - Region 8[9] | SW-846 8270D |
| Volatile Organic Compounds (VOC) | EPA - Region 8[9] | SW-846 5035 + 8260 |
| Volatile Organic Compounds (VOC) | Shaw - Ada[3] | SW-846 5021A + 8260 |
| Ethoxylates and Alkylphenols | EPA - Las Vegas[7] | Method in development[10] |
| Acrylamide | EPA - Las Vegas[7] | Method in development[11] |
| Glycols | EPA - Region 3[8] | Method in development[12] |

[1] General Parameters Laboratory, EPA, Ground Water and Ecosystems Restoration Division, Ada, OK. [2] Isotech Laboratories, Champaigne, IL. [3] Shaw Environmental, Ada, OK. [4] Contract Laboratory Program (Chemtech Consulting, Inc., Mountainside, NJ). [5] TestAmerica Laboratory, Savannah, GA. 6 ALS Environmental, Holland, MI. [7] Environmental Sciences Division, Las Vegas, NV. [8] Region 3 Laboratory, Fort Meade, MD. [9] Region 8 Laboratory, Golden, CO.

SW-846 "Test methods for evaluating solid waste, physical/chemical methods", 3rd Edition (1986).
Method 6500. Dissolved inorganic anions in aqueous matrices by capillary ion electrophoresis.
Method 350.1 Determination of ammonia nitrogen by semi-automated colorimetry.
Method 353.2. Determination of nitrate-nitrite nitrogen by automated colorimetry.
Method 9060A. Total organic carbon.
Method 200.7. Trace elements in water, solids, and biosolids by inductively coupled plasma-atomic emission spectrometry.
Inorganic SOW ISM01.3, Exhibit D - Part B, with method modifications.
Method 425.1. Methylene Blue Active Substances (MBAS).
Method 8015M. Nonhalogenated organics using GC/FID.
RSKSOP-112v6. Standard operating procedure for quantitative analysis of low molecular weight acids in aqueous samples by HPLC.
RSKSOP-175v5. Sample preparation and calculations for dissolved gas analysis in water samples using a GC headspace equilibration technique.
RSKSOP-194v4. Gas analysis by micro gas chromatograph (Agilent Micro 3000).
RSKSOP-334v0. Determination of stable hydrogen and oxygen isotope ratios in water samples using a Picarro L2120i cavity ring-down spectrometer (CRDS).
Method 8270D. Semivolatile organic compounds by gas chromatography/mass spectrometry (GC/MS).
Method 5035. Closed-system purge-and-trap and extraction for volatile organics in soil and waste samples.
Method 5021. Volatile organic compounds in soils and other matrices using equilibrium headspace analysis.
Method 8260. Volatile organic compounds by gas chromatography/mass spectrometry (GCMS).
[10] Methods modified from ASTM D7458-09 and USGS method O1433-01.
[11] Based on EPA Methods 8032A and 8316.
[12] Method based on ASTM D773-11.

# Analytes

| Field Parameters | |
|---|---|
| Temp | Temperature |
| SPC | Specific Conductivity |
| TDS | Total Dissolved Solids (calc. from SPC) |
| DO | Dissolved Oxygen |
| pH | Measurement of the hydrogen ion activity |
| ORP | Oxidation/Reduction Potential |
| $Fe^{2+}$ | Ferrous Iron |
| $H_2S$ | Hydrogen Sulfide |
| | |
| **Anions and Ammonia** | |
| $Br^-$ | Bromide |
| $Cl^-$ | Chloride |
| $SO_4^{2-}$ | Sulfate |
| $F^-$ | Fluoride |
| $NO_3^- + NO_2^-$ | Nitrate + Nitrite |
| $NH_3$ | Ammonia |
| | |
| **Carbon Group** | |
| DOC | Dissolved Organic Carbon |
| DIC | Dissolved Inorganic Carbon |
| | |
| **Isotopes and Dissolved Gases** | |
| He | Helium |
| $H_2$ | Hydrogen |
| Ar | Argon |
| $O_2$ | Oxygen |
| $CO_2$ | Carbon dioxide |
| $N_2$ | Nitrogen |
| CO | Carbon monoxide |
| $C_1$ | Methane |
| $C_2$ | Ethane |
| $C_2H_4$ | Ethene |
| $C_3$ | Propane |
| $C_3H_6$ | Propylene |
| $iC_4$ | Isobutane |
| $nC_4$ | Normal Butane |
| $iC_5$ | Isopentane |
| $nC_5$ | Normal Pentane |
| $C_6$+ | Hexane Plus |
| $\delta^{13}C_1$ | $[(^{13}C/^{12}C)$ Sample-Standard/( $^{13}C/^{12}C)$ Standard]*1000 |
| $\delta DC_1$ | $[(^{2}H/H)$ Sample-Standard/( $^{2}H/H)$ Standard]*1000 |
| $\delta^{13}C_2$ | $[(^{13}C/^{12}C)$ Sample-Standard/( $^{13}C/^{12}C)$ Standard]*1000 |
| $\delta^{13}C$ DIC | $[(^{13}C/^{12}C)$ Sample-Standard/( $^{13}C/^{12}C)$ Standard]*1000 |
| BTU | British Thermal Unit |
| Tritium | $^{3}H$ |

| Metals | |
|---|---|
| Ag | Silver |
| Al | Aluminum |
| As | Arsenic |
| B | Boron |
| Ba | Barium |
| Be | Beryllium |
| Ca | Calcuim |
| Cd | Cadmium |
| Co | Cobalt |
| Cr | Chromium |
| Cu | Copper |
| Fe | Iron |
| Hg | Mercury |
| K | Potassium |
| Li | Lithium |
| Mg | Magnesium |
| Mn | Manganese |
| Mo | Molybdenum |
| Na | Sodium |
| Ni | Nickel |
| P | Phosphorus |
| Pb | Lead |
| S | Sulfur |
| Sb | Antimony |
| Se | Selenium |
| Si | Silicon |
| Sr | Strontium |
| Th | Thorium |
| Ti | Titanium |
| Tl | Thallium |
| U | Uranium |
| V | Vanadium |
| Zn | Zinc |
| | |
| **MBAS** | |
| Methylene Blue Active Substances | |
| | |
| **Methanol Scan** | |
| Methanol | |
| Propylene Glycol | |
| Ethylene Glycol | |
| | |
| | |
| | |
| | |

## Analytes (cont.)

| Organic Acids | |
|---|---|
| | CAS Number |
| Lactate | 50-21-5 |
| Formate | 64-18-6 |
| Acetate | 64-19-7 |
| Propionate | 79-09-4 |
| Butyrate | 107-92-6 |
| | |
| **Dissolved Gases** | |
| | CAS Number |
| Methane | 74-82-8 |
| Ethane | 74-84-0 |
| Propane | 74-98-6 |
| Butane | 106-97-8 |
| | |
| **Ethoxylates and Alkylphenols** | |
| | CAS Numbers |
| Octylphenol ethoxylate | 9002-93-1 |
| Nonylphenol ethoxylate | 26027-38-3 |
| Ethoxylated alcohol C12 | |
| Ethoxylated alcohol C13 | |
| Ethoxylated alcohol C14 | |
| Nonylphenol | 25154-52-3 |
| Octylphenol | 27193-28-8 |
| | |
| **Acrylamide** | |
| | CAS Numbers |
| Acrylamide | 79-06-1 |
| | |
| **Glycols** | |
| | CAS Number |
| 2-butoxyethanol | 111-76-2 |
| Diethylene glycol | 111-46-6 |
| Triethylene glycol | 112-27-6 |
| Tetraethylene glycol | 112-60-7 |
| | |
| **Water Isotopes** | |
| $\delta^2H$ | [($^2H/H$) Sample-Standard/($^2H/H$) Standard]*1000 |
| $\delta^{18}O$ | [($^{18}O/^{16}O$) Sample-Standard/($^{18}O/^{16}O$) Standard]*1000 |
| | |
| **DRO GRO** | |
| DRO | Diesel Range Organics |
| GRO | Gasoline Range Organics |

| Volatile Organic Compounds (VOC) | |
|---|---|
| | CAS Number |
| ethanol | 64-17-5 |
| isopropanol | 67-63-0 |
| acrylonitrile | 107-13-1 |
| styrene | 100-42-5 |
| acetone | 67-64-1 |
| tert-butyl Alcohol | 75-65-0 |
| methyl tert-butyl ether | 1634-04-4 |
| diisopropyl ether | 108-20-3 |
| ethyl tert-butyl ether | 637-92-3 |
| tert-amyl methyl ether | 994-05-8 |
| vinyl chloride | 75-01-4 |
| 1,1-dichloroethene | 75-35-4 |
| carbon disulfide | 75-15-0 |
| methylene chloride | 75-09-2 |
| trans-1,2-dichloroethene | 156-60-5 |
| 1,1-dichloroethane | 75-34-3 |
| cis-1,2-dichoroethene | 156-59-2 |
| chloroform | 67-66-3 |
| 1,1,1-trichloroethane | 71-55-6 |
| carbon tetrachloride | 56-23-5 |
| benzene | 71-43-2 |
| 1,2-dichloroethane | 107-06-2 |
| trichloroethene | 79-01-6 |
| toluene | 108-88-3 |
| 1,1,2-trichloroethane | 79-00-5 |
| tetrachloroethene | 127-18-4 |
| chlorobenzene | 108-90-7 |
| ethylbenzene | 100-41-4 |
| m+p xylene | 108-38-3,106-42-3 |
| o-xylene | 95-47-6 |
| isopropylbenzene | 98-82-8 |
| 1,3,5-trimethylbenzene | 108-67-8 |
| 1,2,4-trimethylbenzene | 95-63-6 |
| 1,3-dichlorobenzene | 541-73-1 |
| 1,4-dichlorobenzene | 106-46-7 |
| 1,2,3-trimethylbenzene | 526-73-8 |
| 1,2-dichlorobenzene | 95-50-1 |
| naphthalene | 91-20-3 |
| *note: VOC list does not include full R8 profile | |

## Analytes (cont.)

| Semivolatile Organic Compounds (sVOC) | | | Semivolatile Organic Compounds (sVOC) | |
|---|---|---|---|---|
| | CAS Number | | | CAS Number |
| R-(+)-limonene | 5989-27-5 | | Benzo(a)anthracene | 56-55-3 |
| 1,2,4-trichlorobenzene | 120-82-1 | | Benzo(a)pyrene | 50-32-3 |
| 1,2-dichlorobenzene | 95-50-1 | | Benzo(b)fluoranthene | 205-99-2 |
| 1,2-dinitrobenzene | 528-29-0 | | Benzo(g,h,i)perylene | 191-24-2 |
| 1,3-dichlorobenzene | 541-73-1 | | Benzo(k)fluoranthene | 207-08-9 |
| 1,3-dimethyladamantane | 702-79-4 | | Benzoic Acid | 65-85-0 |
| 1,3-dinitrobenzene | 99-65-0 | | Benzyl alcohol | 100-51-6 |
| 1,4-dichlorobenzene | 106-46-7 | | Bis-(2-chloroethoxy)methane | 111-91-1 |
| 1,4-dinitrobenzene | 100-25-4 | | Bis-(2-chloroethyl)ether | 111-44-4 |
| 1-methylnaphthalene | 90-12-0 | | Bis-(2-chloroisopropyl)ether | 108-60-1 |
| 2,3,4,6-tetrachlorophenol | 58-90-2 | | Bis-(2-ethylhexyl) adipate | 103-23-1 |
| 2,3,5,6-tetrachlorophenol | 935-95-5 | | Bis-(2-ethylhexyl) phthalate | 117-81-7 |
| 2,4,5-trichlorophenol | 95-95-4 | | Butyl benzyl phthalate | 85-68-7 |
| 2,4,6-trichlorophenol | 88-06-2 | | Carbazole | 86-74-8 |
| 2,4-dichlorophenol | 120-83-2 | | Chrysene | 218-01-9 |
| 2,4-dimethylphenol | 105-67-9 | | Dibenz(a,h)anthracene | 53-70-3 |
| 2,4-dinitrophenol | 51-28-5 | | Dibenzofuran | 132-64-9 |
| 2,4dinitrotoluene | 121-14-2 | | Diethyl phthalate | 84-66-2 |
| 2,6-dinitrotoluene | 606-20-2 | | Dimethyl phthalate | 131-11-3 |
| 2-butoxyethanol | 111-76-2 | | Di-n-butyl phthalate | 84-74-2 |
| 2-chloronaphthalene | 91-58-7 | | Di-n-octyl phthalate | 117-84-0 |
| 2-chlorophenol | 95-57-8 | | Diphenylamine | 122-39-4 |
| 2-methylnaphthalene | 91-57-6 | | Fluoranthene | 206-44-0 |
| 2-methylphenol | 95-48-7 | | Fluorene | 86-73-7 |
| 2-nitroaniline | 88-74-4 | | Hexachlorobenzene | 118-74-1 |
| 2-nitrophenol | 88-75-5 | | Hexachlorobutadiene | 87-68-3 |
| 3&4-methylphenol | 108-39-4 & 106-44-5 | | Hexachlorocycl opentadiene | 77-47-4 |
| 3,3'-dichlorobenzidine | 91-94-1 | | Hexachloroethane | 67-72-1 |
| 3-nitroaniline | 99-09-2 | | Indeno(1,2,3-cd)pyrene | 193-39-5 |
| 4,6-dinitro-2-methylphenol | 534-52-1 | | Isophorone | 78-59-1 |
| 4-bromophenyl phenyl ether | 101-55-3 | | Naphthalene | 91-20-3 |
| 4-chloro-3-methylphenol | 59-50-7 | | Nitrobenzene | 98-95-3 |
| 4-chloroaniline | 106-47-8 | | N-nitrosodimethylamine | 62-75-9 |
| 4-chlorophenyl phenyl ether | 7005-72-3 | | N-nitrosodi-n-propylamine | 621-64-7 |
| 4-nitroaniline | 100-01-6 | | Pentachlorophenol | 87-86-5 |
| 4-nitrophenol | 100-02-7 | | Phenanthrene | 85-01-8 |
| Acenaphthene | 83-32-9 | | Phenol | 108-95-2 |
| Acenaphthylene | 208-96-8 | | Pyrene | 129-00-0 |
| Adamantane | 281-23-2 | | Pyridine | 110-86-1 |
| Aniline | 62-53-3 | | Squalene | 111-02-4 |
| Anthracene | 120-12-7 | | Terpiniol | 98-55-5 |
| Azobenzene | 103-33-3 | | tri-(2-butoxyethyl) phosphate | 78-51-3 |

## QC Flags

| Qualifier | Definition |
|---|---|
| U | The analyte was analyzed for, but was not detected above the reported quantitation limit (QL). |
| J | The analyte was positively identified. The associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the QL). |
| J+ | The result is an estimated quantity, but the result may be biased high. |
| J- | The result is an estimated quantity, but the result may be biased low. |
| B | The analyte is found in a blank sample above the QL and the concentration found in the sample is less than 10 times the concentration found in the blank. |
| H | The sample was prepared or analyzed beyond the specified holding time. Sample results may be biased low. |
| * | Relative percent difference of a field or lab blank is outside acceptance criteria. |
| R | The data are unusable. The sample results are rejected due to serious deficiencies in the ability to analyze the sample and/or meet quality control criteria. Sample results are not reported. |
| | |
| NA | Data not reported or collected. |

Note: For Phase V, the original ICP-MS results were rejected because proper procedures were not followed per the EPA method.

## Sample Locations

| Sample ID | Longitude | Latitude |
|---|---|---|
| PGDW05-0412 | -108.61264 | 43.25885 |
| PGDW20-0412 | -108.59128 | 43.25167 |
| PGDW20d-0412 | -108.59128 | 43.25167 |
| PGDW23-0412 | -108.62259 | 43.24866 |
| PGDW30-0412 | -108.62258 | 43.25753 |
| PGDW50-0412 | -108.60845 | 43.24526 |
| PGPW02-0412 | -108.68405 | 43.24697 |
| EPAMW02-0412-1 | -108.59468 | 43.25293 |
| EPAMW02-0412-2 | -108.59468 | 43.25293 |
| EPAMW01-0412 | -108.62185 | 43.25682 |
| EPAMW01d-0412 | -108.62185 | 43.25682 |
| EPAMW01-0412-2 | -108.62185 | 43.25682 |
| EPAMW01-0412-3 | -108.62185 | 43.25682 |
| EPAMW01-0412-4 | -108.62185 | 43.25682 |
| EPAMW01-0412-5 | -108.62185 | 43.25682 |
| EPAMW01-0412-6 | -108.62185 | 43.25682 |
| EPAMW01-0412-7 | -108.62185 | 43.25682 |
| EPAMW01-0412-8 | -108.62185 | 43.25682 |
| EPAMW01-0412-9 | -108.62185 | 43.25682 |
| EPAMW01-0412-10 | -108.62185 | 43.25682 |

## Key for Sample ID Numbers

| ID | Definition |
|---|---|
| P | Sample site - Pavillion |
| GDW | Groundwater sample |
| GPW | Municipal water well sample |
| EPAMW | Deep monitoring well sample |
| 01 | Sampling location |
| 0412 | Sample month and year |
| d | Field Duplicate |

| Example Sample ID<br>PGDW05-1412 | | | |
|---|---|---|---|
| **P**<br>Sample Site = Pavillion | **GDW**<br>Ground Water Sample | **05**<br>Sampling Location | **0412**<br>Sample month and year |

## Field Parameters

| Sample ID | Date | Purge Vol | Temp | SPC | TDS | DO | pH | ORP | Turbidity | Alkalinity | $Fe^{2+}$ | $Fe^{2+}$ QC | $\Sigma H_2S$ | $\Sigma H_2S$ QC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | gal | °C | mS/cm | g/L | mg/L | | mV | NTU | mg $CaCO_3$/L | mg $Fe^{2+}$/L | | mg S/L | |
| QL | | | | | | | | | | | 0.03 | | 0.01 | |
| PGDW05-0412 | 4/18/2012 | 60 | 11.3 | 0.837 | 0.544 | 0.11 | 9.30 | -102 | 1.6 | 91 | <0.03 | U | 0.01 | J |
| PGDW20-0412 | 4/16/2012 | 1420 | 9.8 | 2.429 | 1.579 | 0.00 | 8.89 | -249 | 1.8 | 66 | <0.03 | U | 0.09 | J |
| PGDW20d-0412 | 4/16/2012 | 1420 | 9.8 | 2.429 | 1.579 | 0.00 | 8.89 | -249 | 1.8 | 66 | <0.03 | U | 0.09 | J |
| PGDW23-0412 | 4/17/2012 | 2100 | 12.2 | 0.996 | 0.647 | 0.01 | 9.13 | -161 | 0.69 | 65 | <0.03 | U | <0.01 | U |
| PGDW30-0412 | 4/17/2012 | 315 | 10.9 | 0.954 | 0.620 | 0.44 | 8.98 | -54 | 0.87 | 91 | <0.03 | U | <0.01 | U |
| PGDW50-0412 | 4/19/2012 | 210 | 10.1 | 5.922 | 3.849 | 0.46 | 8.04 | 22 | 0.49 | 33 | <0.03 | U | <0.01 | U |
| PGPW02-0412 | 4/20/2012 | 240 | 11.7 | 1.856 | 1.206 | 0.03 | 8.46 | -235 | 0.38 | 77 | 0.11 | J | 0.02 | J |
| EPAMW02-0412-1 | 4/16/2012 | 50 | 12.3 | 3.313 | 2.153 | 0.02 | 11.96 | -154 | 4.5 | 390 | <0.03 | U | 0.01 | J |
| EPAMW02-0412-2 | 4/22/2012 | 535 | 15.3 | 2.888 (J) | 1.877 (J) | 0.01 | 11.81 | -148 | 15.7 | 254 | <0.03 | U | 0.01 | J |
| EPAMW01-0412 | 4/24/2012 | 670 | 16.8 | 1.489 | 0.968 | 0.00 | 11.34 | -388 | 2.0 | 213 | <0.03 | U | 1.53 | J |
| EPAMW01d-0412 | 4/24/2012 | 670 | 16.8 | 1.489 | 0.968 | 0.00 | 11.34 | -388 | 2.0 | 213 | <0.03 | U | 1.53 | J |
| EPAMW01-0412-2 | 4/24/2012 | 845 | 15.9 | 1.413 | 0.918 | 0.00 | 11.20 | -393 | NA | NA | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | 900 | 15.4 | 1.393 | 0.905 | 0.00 | 11.16 | -394 | NA | NA | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | 618 | 15.9 | 1.539 | 1.000 | 0.01 | 11.43 | -395 | NA | NA | NA | | NA | |
| EPAMW01-0412-5 | 4/24/2012 | 960 | 16.4 | 1.371 | 0.891 | 0.01 | 11.08 | -391 | NA | NA | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | 1080 | 16.6 | 1.336 | 0.868 | 0.01 | 10.94 | -395 | NA | NA | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | 1020 | 16.5 | 1.354 | 0.880 | 0.01 | 11.01 | -397 | NA | NA | NA | | NA | |
| EPAMW01-0412-8 | 4/24/2012 | 1140 | 16.3 | 1.335 | 0.868 | 0.00 | 10.89 | -385 | NA | NA | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | 1213 | 16.0 | 1.318 | 0.857 | 0.00 | 10.80 | -383 | NA | NA | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | 1300 | 14.8 | 1.307 | 0.850 | 0.01 | 10.71 | -379 | 2.6 | 181 | <0.03 | U | 2.51 | J |

Field-determined concentrations of $Fe^{2+}$ and $\Sigma H_2S$ are screening values.

## Anions, Ammonia, DIC and DOC

| Sample ID | Date | Water Type | DOC | DOC QC | DIC | DIC QC | Nitrate + Nitrite | Nitrate + Nitrite QC | Ammonia | Ammonia QC |
|---|---|---|---|---|---|---|---|---|---|---|
| **Units** | | | **mg/L** | | **mg/L** | | **mg N/L** | | **mg N/L** | |
| **MDL** | | | **0.07** | | **0.04** | | **0.008** | | **0.006** | |
| **QL** | | | **0.50** | | **1.00** | | **0.050** | | **0.100** | |
| PGDW05-0412 | 4/18/2012 | Na-SO4 | 0.57 | B | 17.7 | | <0.050 | U | 0.064 | J |
| PGDW20-0412 | 4/16/2012 | Na-SO4 | 0.63 | | 14.9 | | 0.073 | | 0.162 | |
| PGDW20d-0412 | 4/16/2012 | Na-SO4 | 0.63 | | 14.8 | | 0.045 | J | 0.165 | |
| PGDW23-0412 | 4/17/2012 | Na-SO4 | 0.65 | | 14.1 | | 0.024 | J | 0.067 | J |
| PGDW30-0412 | 4/17/2012 | Na-SO4 | 0.59 | | 19.8 | | 0.019 | J | 0.062 | J |
| PGDW50-0412 | 4/19/2012 | Na-SO4 | 5.33 | | 7.84 | | <0.050 | U | 0.171 | |
| PGPW02-0412 | 4/20/2012 | Na-SO4 | <0.50 | U | 18.0 | | 0.138 | | 0.104 | |
| EPAMW02-0412-1 | 4/16/2012 | Na-Cl | 19.4 | | 1.25 | | 0.056 | | 2.61 | |
| EPAMW02-0412-2 | 4/22/2012 | Na-Cl | 15.5 | | 2.26 | | 0.095 | | 1.23 | |
| EPAMW01-0412 | 4/24/2012 | Na-SO4 | 5.63 | | 15.2 | | 0.120 | | 1.81 | |
| EPAMW01d-0412 | 4/24/2012 | Na-SO4 | 5.75 | | 15.2 | | <0.050 | U | 1.60 | |
| EPAMW01-0412-2 | 4/24/2012 | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-5 | 4/24/2012 | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-8 | 4/24/2012 | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | Na-SO4 | 3.36 | | 19.1 | | <0.050 | U | 0.490 | |
| FieldBlk01 | 4/16/2012 | | <0.50 | U | <1.00 | U | <0.050 | U | <0.100 | U |
| FieldBlk02 | 4/18/2012 | | 0.08 | J | <1.00 | U | 0.009 | J | <0.100 | U |
| FieldBlk03 | 4/22/2012 | | <0.50 | U | <1.00 | U | <0.050 | U | <0.100 | U |
| FieldBlk04 | 4/24/2012 | | 0.07 | J | <1.00 | U | 0.028 | J | <0.100 | U |
| EquipBlk01 | 4/16/2012 | | <0.50 | U | <1.00 | U | <0.050 | U | <0.100 | U |
| EquipBlk02 | 4/18/2012 | | <0.50 | U | <1.00 | U | 0.008 | J | <0.100 | U |
| EquipBlk04 | 4/24/2012 | | 0.07 | J | <1.00 | U | <0.050 | U | <0.100 | U |

## Anions, Ammonia, DIC and DOC (cont.)

| Sample ID | Date | Br | Br QC | Cl | Cl QC | SO4 | SO4 QC | F | F QC |
|---|---|---|---|---|---|---|---|---|---|
| **Units** | | **mg/L** | | **mg/L** | | **mg/L** | | **mg/L** | |
| **MDL** | | **0.13** | | **0.11** | | **0.05** | | **0.03** | |
| **QL** | | **1.00** | | **1.00** | | **1.00** | | **0.20** | |
| PGDW05-0412 | 4/18/2012 | <1.00 | U | 16.8 | | 308 | | 0.90 | |
| PGDW20-0412 | 4/16/2012 | <1.00 | U | 32.3 | | 1130 | | 0.94 | |
| PGDW20d-0412 | 4/16/2012 | <1.00 | U | 32.3 | | 1240 | | 1.03 | |
| PGDW23-0412 | 4/17/2012 | <1.00 | U | 19.0 | | 397 | | 0.98 | |
| PGDW30-0412 | 4/17/2012 | <1.00 | U | 16.1 | | 337 | | 1.05 | |
| PGDW50-0412 | 4/19/2012 | <1.42 | U | 57.8 | | 3470 | | 0.38 | J |
| PGPW02-0412 | 4/20/2012 | <1.00 | U | 8.51 | | 886 | | 0.51 | J |
| EPAMW02-0412-1 | 4/16/2012 | <1.00 | U | 469 | | 81.8 | | 1.50 | |
| EPAMW02-0412-2 | 4/22/2012 | <1.00 | U | 495 | | 13.5 | | 1.16 | |
| EPAMW01-0412 | 4/24/2012 | <1.00 | U | 19.4 | | 390 | | 2.29 | |
| EPAMW01d-0412 | 4/24/2012 | <1.00 | U | 20.9 | | 388 | | 2.33 | |
| EPAMW01-0412-2 | 4/24/2012 | <1.00 | U | 22.0 | | 397 | | 2.37 | |
| EPAMW01-0412-3 | 4/24/2012 | <1.00 | U | 21.0 | | 394 | | 2.11 | |
| EPAMW01-0412-4 | 4/24/2012 | <1.00 | U | 21.0 | | 391 | | 2.24 | |
| EPAMW01-0412-5 | 4/24/2012 | <1.00 | U | 21.2 | | 406 | | 2.29 | |
| EPAMW01-0412-6 | 4/24/2012 | <1.00 | U | 21.5 | | 401 | | 2.33 | |
| EPAMW01-0412-7 | 4/24/2012 | <1.00 | U | 21.0 | | 407 | | 2.01 | |
| EPAMW01-0412-8 | 4/24/2012 | <1.00 | U | 21.6 | | 411 | | 2.13 | |
| EPAMW01-0412-9 | 4/24/2012 | <1.00 | U | 20.8 | | 413 | | 2.06 | |
| EPAMW01-0412-10 | 4/24/2012 | <1.00 | U | 21.2 | | 428 | | 2.01 | |
| FieldBlk01 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <0.20 | U |
| FieldBlk02 | 4/18/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <0.20 | U |
| FieldBlk03 | 4/22/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <0.20 | U |
| FieldBlk04 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <0.20 | U |
| EquipBlk01 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <0.20 | U |
| EquipBlk02 | 4/18/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <0.20 | U |
| EquipBlk04 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <0.20 | U |

## Metals

| Sample ID | Date Collected | ICP-OES Dissolved Ag[A] | ICP-OES Dissolved Ag QC | ICP-OES Total Ag[B] | ICP-OES Total Ag QC | ICP-OES Dissolved Al[A] | ICP-OES Dissolved Al QC | ICP-OES Total Al[B] | ICP-OES Total Al QC | ICP-MS Dissolved As[C] | ICP-MS Dissolved As QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| MDL | | 4 | | 4 | | 148 | | 164 | | 0.18 | |
| QL | | 14 | | 16 | | 494 | | 548 | | 1.00 | |
| PGDW05-0412 | 4/18/2012 | <14 | U | <16 | J-, U | <494 | U | <548 | U | <1.00 | U |
| PGDW20-0412 | 4/16/2012 | <14 | U | <16 | J-, U | <494 | U | <548 | U | R | R |
| PGDW20d-0412 | 4/16/2012 | <14 | U | <16 | J-, U | <494 | U | <548 | U | 0.31 | J |
| PGDW23-0412 | 4/17/2012 | <14 | U | <16 | J-, U | <494 | U | <548 | U | 0.24 | J |
| PGDW30-0412 | 4/17/2012 | <14 | U | <16 | J-, U | <494 | U | <548 | U | 0.34 | J |
| PGDW50-0412 | 4/19/2012 | <14 | U | <16 | J-, U | <494 | U | <548 | U | 1.4 | |
| PGPW02-0412 | 4/20/2012 | <14 | U | <16 | J-, U | <494 | U | <548 | U | <1.00 | U |
| EPAMW02-0412-1 | 4/16/2012 | <14 | U | <16 | J-, U | 660 | J | 661 | J | 3.1 | |
| EPAMW02-0412-2 | 4/22/2012 | <14 | U | <16 | J-, U | 816 | J | 1110 | J | 3.4 | |
| EPAMW01-0412 | 4/24/2012 | <14 | U | <16 | J-, U | 234 | J | 278 | J | 0.49 | J |
| EPAMW01d-0412 | 4/24/2012 | <14 | U | <16 | J-, U | 245 | J | 198 | J | 0.71 | J |
| EPAMW01-0412-2 | 4/24/2012 | <14 | U | NA | | 211 | J | NA | | <1.00 | U |
| EPAMW01-0412-3 | 4/24/2012 | <14 | U | NA | | <494 | U | NA | | 0.53 | J |
| EPAMW01-0412-4 | 4/24/2012 | <14 | U | NA | | 205 | J | NA | | 0.40 | J |
| EPAMW01-0412-5 | 4/24/2012 | <14 | U | NA | | <494 | U | NA | | 0.28 | J |
| EPAMW01-0412-6 | 4/24/2012 | <14 | U | NA | | <494 | U | NA | | 0.47 | J |
| EPAMW01-0412-7 | 4/24/2012 | <14 | U | NA | | <494 | U | NA | | 0.82 | J |
| EPAMW01-0412-8 | 4/24/2012 | <14 | U | NA | | <494 | U | NA | | 0.43 | J |
| EPAMW01-0412-9 | 4/24/2012 | <14 | U | NA | | <494 | U | NA | | 0.59 | J |
| EPAMW01-0412-10 | 4/24/2012 | <14 | U | <16 | J-, U | <494 | U | <548 | U | <1.00 | U |
| FieldBlk01 | 4/16/2012 | <14 | U | 5 | J- | <494 | U | <548 | U | <1.00 | U |
| FieldBlk02 | 4/18/2012 | <14 | U | <16 | J-, U | <494 | U | <548 | U | 0.24 | J |
| FieldBlk03 | 4/22/2012 | <14 | U | <16 | J-, U | <494 | U | <548 | U | <1.00 | U |
| FieldBlk04 | 4/24/2012 | <14 | U | <16 | J-, U | <494 | U | <548 | U | <1.00 | U |
| EquipBlk01 | 4/16/2012 | <14 | U | <16 | J-, U | <494 | U | <548 | U | <1.00 | U |
| EquipBlk02 | 4/18/2012 | <14 | U | <16 | J-, U | <494 | U | <548 | U | <1.00 | U |
| EquipBlk04 | 4/24/2012 | <14 | U | <16 | J-, U | <494 | U | <548 | U | <1.00 | U |

A. EPA Method 200.7
B. EPA Methods 3015A and 200.7
C. EPA CLP Inorganic Statement of Work ISMO1.3, Exhibit D - Part B.
R flags: trace metal data rejected for sample PGDW20-0412 due to sample contamination.

## Metals (cont.)

| Sample ID | Date Collected | ICP-MS Total As[C] | ICP-MS Total As QC | ICP-OES Dissolved B[A] | ICP-OES Dissolved B QC | ICP-OES Total B[B] | ICP-OES Total B QC | ICP-OES Dissolved Ba[A] | ICP-OES Dissolved Ba QC | ICP-OES Total Ba[B] | ICP-OES Total Ba QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| MDL | | 0.18 | | 100 | | 111 | | 1 | | 1 | |
| QL | | 1.00 | | 333 | | 370 | | 4 | | 4 | |
| PGDW05-0412 | 4/18/2012 | <1.00 | U | 131 | J | 115 | J | 10 | J | 10 | J |
| PGDW20-0412 | 4/16/2012 | <1.00 | U | 285 | J | 196 | J | 8 | J | 9 | J |
| PGDW20d-0412 | 4/16/2012 | <1.00 | U | 190 | J | 176 | J | 9 | J | 8 | J |
| PGDW23-0412 | 4/17/2012 | <1.00 | U | 144 | J | 133 | J | 10 | J | 11 | J |
| PGDW30-0412 | 4/17/2012 | <1.00 | U | 123 | J | 112 | J | 7 | J | 8 | J |
| PGDW50-0412 | 4/19/2012 | 1.2 | | 215 | J | 215 | J | 5 | J | 5 | J |
| PGPW02-0412 | 4/20/2012 | <1.00 | U | <333 | U | <370 | U | 7 | J | 7 | J |
| EPAMW02-0412-1 | 4/16/2012 | 2.6 | | 114 | J | <370 | U | 95 | J | 91 | J |
| EPAMW02-0412-2 | 4/22/2012 | 3.4 | | 108 | J | 115 | J | 147 | J | 158 | J |
| EPAMW01-0412 | 4/24/2012 | 0.46 | J | 136 | J | 141 | J | 21 | J | 22 | J |
| EPAMW01d-0412 | 4/24/2012 | 0.50 | J | 136 | J | 141 | J | 21 | J | 22 | J |
| EPAMW01-0412-2 | 4/24/2012 | NA | | 131 | J | NA | | 20 | J | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | 130 | J | NA | | 20 | J | NA | |
| EPAMW01-0412-4 | 4/24/2012 | NA | | 142 | J | NA | | 21 | J | NA | |
| EPAMW01-0412-5 | 4/24/2012 | NA | | 128 | J | NA | | 20 | J | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | 125 | J | NA | | 20 | J | NA | |
| EPAMW01-0412-7 | 4/24/2012 | NA | | 126 | J | NA | | 20 | J | NA | |
| EPAMW01-0412-8 | 4/24/2012 | NA | | 123 | J | NA | | 20 | J | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | 121 | J | NA | | 20 | J | NA | |
| EPAMW01-0412-10 | 4/24/2012 | 0.37 | J | 119 | J | 121 | J | 19 | J | 20 | J |
| FieldBlk01 | 4/16/2012 | <1.00 | U | <333 | U | <370 | U | <4 | U | <4 | U |
| FieldBlk02 | 4/18/2012 | <1.00 | U | <333 | U | <370 | U | <4 | U | <4 | U |
| FieldBlk03 | 4/22/2012 | <1.00 | U | <333 | U | <370 | U | <4 | U | <4 | U |
| FieldBlk04 | 4/24/2012 | <1.00 | U | <333 | U | <370 | U | <4 | U | <4 | U |
| EquipBlk01 | 4/16/2012 | <1.00 | U | <333 | U | <370 | U | <4 | U | <4 | U |
| EquipBlk02 | 4/18/2012 | <1.00 | U | <333 | U | <370 | U | <4 | U | <4 | U |
| EquipBlk04 | 4/24/2012 | <1.00 | U | <333 | U | <370 | U | <4 | U | <4 | U |

A. EPA Method 200.7
B. EPA Methods 3015A and 200.7
C. EPA CLP Inorganic Statement of Work ISMO1.3, Exhibit D - Part B.
R flags: trace metal data rejected for sample PGDW20-0412 due to sample contamination.

## Metals (cont.)

| Sample ID | Date Collected | ICP-OES Dissolved Be[A] | ICP-OES Dissolved Be QC | ICP-OES Total Be[B] | ICP-OES Total Be QC | ICP-OES Dissolved Ca[A] | ICP-OES Dissolved Ca QC | ICP-OES Total Ca[B] | ICP-OES Total Ca QC | ICP-MS Dissolved Cd[C] | ICP-MS Dissolved Cd QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | mg/L | | mg/L | | µg/L | |
| MDL | | 3 | | 3 | | 0.09 | | 0.10 | | 0.06 | |
| QL | | 10 | | 11 | | 0.29 | | 0.32 | | 1.00 | |
| PGDW05-0412 | 4/18/2012 | <10 | U | <11 | U | 3.17 | | 3.34 | J | <1.00 | U |
| PGDW20-0412 | 4/16/2012 | <10 | U | <11 | U | 57.9 | | 59.8 | J | R | R |
| PGDW20d-0412 | 4/16/2012 | <10 | U | <11 | U | 58.3 | | 59.5 | J | <1.00 | U |
| PGDW23-0412 | 4/17/2012 | <10 | U | <11 | U | 7.19 | | 7.30 | J | <1.00 | U |
| PGDW30-0412 | 4/17/2012 | <10 | U | <11 | U | 4.42 | | 4.48 | J | <1.00 | U |
| PGDW50-0412 | 4/19/2012 | <10 | U | <11 | U | 314 | | 315 | J | <1.00 | U |
| PGPW02-0412 | 4/20/2012 | <10 | U | <11 | U | 34.7 | | 35.2 | J | <1.00 | U |
| EPAMW02-0412-1 | 4/16/2012 | <10 | U | <11 | U | 50.8 | | 51.7 | J | <1.00 | U |
| EPAMW02-0412-2 | 4/22/2012 | <10 | U | <11 | U | 36.1 | | 37.3 | J | <1.00 | U |
| EPAMW01-0412 | 4/24/2012 | <10 | U | <11 | U | 9.87 | | 10.1 | J | <1.00 | U |
| EPAMW01d-0412 | 4/24/2012 | <10 | U | <11 | U | 9.91 | | 9.99 | J | <1.00 | U |
| EPAMW01-0412-2 | 4/24/2012 | <10 | U | NA | | 9.75 | | NA | | <1.00 | U |
| EPAMW01-0412-3 | 4/24/2012 | <10 | U | NA | | 9.67 | | NA | | <1.00 | U |
| EPAMW01-0412-4 | 4/24/2012 | <10 | U | NA | | 9.80 | | NA | | <1.00 | U |
| EPAMW01-0412-5 | 4/24/2012 | <10 | U | NA | | 9.69 | | NA | | <1.00 | U |
| EPAMW01-0412-6 | 4/24/2012 | <10 | U | NA | | 9.66 | | NA | | <1.00 | U |
| EPAMW01-0412-7 | 4/24/2012 | <10 | U | NA | | 9.67 | | NA | | <1.00 | U |
| EPAMW01-0412-8 | 4/24/2012 | <10 | U | NA | | 9.61 | | NA | | <1.00 | U |
| EPAMW01-0412-9 | 4/24/2012 | <10 | U | NA | | 9.65 | | NA | | <1.00 | U |
| EPAMW01-0412-10 | 4/24/2012 | <10 | U | <11 | U | 9.47 | | 9.82 | J | <1.00 | U |
| FieldBlk01 | 4/16/2012 | <10 | U | <11 | U | <0.29 | U | <0.32 | U | <1.00 | U |
| FieldBlk02 | 4/18/2012 | <10 | U | <11 | U | <0.29 | U | <0.32 | U | <1.00 | U |
| FieldBlk03 | 4/22/2012 | <10 | U | <11 | U | <0.29 | U | <0.32 | U | 0.14 | J |
| FieldBlk04 | 4/24/2012 | <10 | U | <11 | U | <0.29 | U | <0.32 | U | 0.45 | J |
| EquipBlk01 | 4/16/2012 | <10 | U | <11 | U | <0.29 | U | <0.32 | U | 0.23 | J |
| EquipBlk02 | 4/18/2012 | <10 | U | <11 | U | <0.29 | U | <0.32 | U | 0.10 | J |
| EquipBlk04 | 4/24/2012 | <10 | U | <11 | U | <0.29 | U | <0.32 | U | 0.12 | J |

A. EPA Method 200.7
B. EPA Methods 3015A and 200.7
C. EPA CLP Inorganic Statement of Work ISMO1.3, Exhibit D - Part B.
R flags: trace metal data rejected for sample PGDW20-0412 due to sample contamination.

## Metals (cont.)

| Sample ID | Date Collected | ICP-MS Total Cd[C] | ICP-MS Total Cd QC | ICP-OES Dissolved Co[A] | ICP-OES Dissolved Co QC | ICP-OES Total Co[B] | ICP-OES Total Co QC | ICP-MS Dissolved Cr[C] | ICP-MS Dissolved Cr QC | ICP-MS Total Cr[C] | ICP-MS Total Cr QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| MDL | | 0.06 | | 1 | | 1 | | 0.06 | | 0.06 | |
| QL | | 1.00 | | 4 | | 4 | | 2.00 | | 2.00 | |
| PGDW05-0412 | 4/18/2012 | <1.00 | U | <4 | U | <4 | U | <2.00 | U | <2.00 | U |
| PGDW20-0412 | 4/16/2012 | <1.00 | U | <4 | U | <4 | U | R | R | <2.00 | U |
| PGDW20d-0412 | 4/16/2012 | <1.00 | U | <4 | U | <4 | U | <2.00 | J | <2.00 | U |
| PGDW23-0412 | 4/17/2012 | <1.00 | U | <4 | U | <4 | U | <2.00 | J | <2.00 | U |
| PGDW30-0412 | 4/17/2012 | <1.00 | U | <4 | U | <4 | U | 13.4 | | <2.00 | U |
| PGDW50-0412 | 4/19/2012 | <1.00 | U | <4 | U | <4 | U | <2.00 | U | <2.00 | U |
| PGPW02-0412 | 4/20/2012 | <1.00 | U | <4 | U | <4 | U | <2.00 | U | <2.00 | U |
| EPAMW02-0412-1 | 4/16/2012 | <1.00 | U | <4 | U | <4 | U | <2.00 | U | <2.00 | U |
| EPAMW02-0412-2 | 4/22/2012 | <1.00 | U | <4 | U | <4 | U | <2.00 | U | 5.1 | *, J |
| EPAMW01-0412 | 4/24/2012 | <1.00 | U | <4 | U | <4 | U | <2.00 | U | <2.00 | U |
| EPAMW01d-0412 | 4/24/2012 | <1.00 | U | <4 | U | <4 | U | 2.2 | | <2.00 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | <4 | U | NA | | <2.00 | U | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | <4 | U | NA | | <2.00 | U | NA | |
| EPAMW01-0412-4 | 4/24/2012 | NA | | <4 | U | NA | | <2.00 | U | NA | |
| EPAMW01-0412-5 | 4/24/2012 | NA | | <4 | U | NA | | <2.00 | U | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | <4 | U | NA | | <2.00 | U | NA | |
| EPAMW01-0412-7 | 4/24/2012 | NA | | <4 | U | NA | | <2.00 | U | NA | |
| EPAMW01-0412-8 | 4/24/2012 | NA | | <4 | U | NA | | <2.00 | U | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | <4 | U | NA | | <2.00 | U | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <1.00 | U | <4 | U | <4 | U | <2.00 | U | <2.00 | U |
| FieldBlk01 | 4/16/2012 | <1.00 | U | <4 | U | <4 | U | 0.96 | J | 0.35 | *, J |
| FieldBlk02 | 4/18/2012 | 0.09 | J | <4 | U | <4 | U | 13.4 | | 0.45 | *, J |
| FieldBlk03 | 4/22/2012 | <1.00 | U | <4 | U | <4 | U | 1.4 | J | 0.30 | *, J |
| FieldBlk04 | 4/24/2012 | <1.00 | U | <4 | U | <4 | U | 1.5 | J | 1.4 | *, J |
| EquipBlk01 | 4/16/2012 | 0.10 | J | <4 | U | <4 | U | 0.29 | J | 0.37 | *, J |
| EquipBlk02 | 4/18/2012 | <1.00 | U | <4 | U | <4 | U | 0.40 | J | 1.1 | *, J |
| EquipBlk04 | 4/24/2012 | <1.00 | U | <4 | U | <4 | U | 0.78 | J | 0.50 | *, J |

A. EPA Method 200.7
B. EPA Methods 3015A and 200.7
C. EPA CLP Inorganic Statement of Work ISMO1.3, Exhibit D - Part B.
R flags: trace metal data rejected for sample PGDW20-0412 due to sample contamination.

## Metals (cont.)

| Sample ID | Date Collected | ICP-MS Dissolved Cu[C] | ICP-MS Dissolved Cu QC | ICP-MS Total Cu[C] | ICP-MS Total Cu QC | ICP-OES Dissolved Fe[A] | ICP-OES Dissolved Fe QC | ICP-OES Total Fe[B] | ICP-OES Total Fe QC | ICP-OES Dissolved K[A] | ICP-OES Dissolved K QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | | mg/L | |
| MDL | | 0.11 | | 0.11 | | 20 | | 22 | | 0.11 | |
| QL | | 2.00 | | 2.00 | | 67 | | 74 | | 0.35 | |
| PGDW05-0412 | 4/18/2012 | <2.00 | U | 79.5 | | <67 | U | 78 | J | 0.47 | J |
| PGDW20-0412 | 4/16/2012 | R | R | <2.00 | U | 55 | J | 137 | J | 1.64 | J |
| PGDW20d-0412 | 4/16/2012 | <2.00 | U | <2.00 | U | 55 | J | 136 | J | 1.27 | J |
| PGDW23-0412 | 4/17/2012 | <2.00 | U | <2.00 | U | <67 | U | 25 | J | 0.61 | J |
| PGDW30-0412 | 4/17/2012 | <2.00 | U | <2.00 | U | <67 | U | 74 | J | 0.55 | J |
| PGDW50-0412 | 4/19/2012 | 3.2 | | 5.6 | | <67 | U | <74 | U | 3.04 | J |
| PGPW02-0412 | 4/20/2012 | <2.00 | U | <2.00 | U | 201 | | 211 | J | 0.92 | J |
| EPAMW02-0412-1 | 4/16/2012 | <2.00 | U | 4.6 | | <67 | U | 466 | J | 31.4 | J |
| EPAMW02-0412-2 | 4/22/2012 | 4.4 | | 10.1 | | 151 | | 2330 | J | 16.6 | J |
| EPAMW01-0412 | 4/24/2012 | <2.00 | U | <2.00 | U | <67 | U | 56 | J | 17.3 | J |
| EPAMW01d-0412 | 4/24/2012 | <2.00 | U | <2.00 | U | <67 | U | <74 | U | 17.2 | J |
| EPAMW01-0412-2 | 4/24/2012 | <2.00 | U | NA | | <67 | U | NA | | 16.2 | J |
| EPAMW01-0412-3 | 4/24/2012 | <2.00 | U | NA | | <67 | U | NA | | 16.0 | J |
| EPAMW01-0412-4 | 4/24/2012 | <2.00 | U | NA | | <67 | U | NA | | 17.8 | J |
| EPAMW01-0412-5 | 4/24/2012 | <2.00 | U | NA | | <67 | U | NA | | 15.7 | J |
| EPAMW01-0412-6 | 4/24/2012 | <2.00 | U | NA | | <67 | U | NA | | 15.0 | J |
| EPAMW01-0412-7 | 4/24/2012 | <2.00 | U | NA | | <67 | U | NA | | 15.3 | J |
| EPAMW01-0412-8 | 4/24/2012 | <2.00 | U | NA | | <67 | U | NA | | 14.5 | J |
| EPAMW01-0412-9 | 4/24/2012 | <2.00 | U | NA | | <67 | U | NA | | 14.4 | J |
| EPAMW01-0412-10 | 4/24/2012 | <2.00 | U | <2.00 | U | <67 | U | <74 | U | 13.6 | J |
| FieldBlk01 | 4/16/2012 | 1.1 | J | 0.52 | J | <67 | U | <74 | U | <0.35 | U |
| FieldBlk02 | 4/18/2012 | 1.7 | J | 0.45 | J | <67 | U | <74 | U | <0.35 | U |
| FieldBlk03 | 4/22/2012 | 1.3 | J | 0.32 | J | <67 | U | <74 | U | <0.35 | U |
| FieldBlk04 | 4/24/2012 | 1.3 | J | 3.4 | | <67 | U | <74 | U | <0.35 | U |
| EquipBlk01 | 4/16/2012 | 0.87 | J | 0.37 | J | <67 | U | <74 | U | <0.35 | U |
| EquipBlk02 | 4/18/2012 | 0.90 | J | 0.63 | J | <67 | U | <74 | U | <0.35 | U |
| EquipBlk04 | 4/24/2012 | 1.1 | J | 0.31 | J | <67 | U | <74 | U | <0.35 | U |

A. EPA Method 200.7
B. EPA Methods 3015A and 200.7
C. EPA CLP Inorganic Statement of Work ISMO1.3, Exhibit D - Part B.
R flags: trace metal data rejected for sample PGDW20-0412 due to sample contamination.

## Metals (cont.)

| Sample ID | Date Collected | ICP-OES Total K[B] | ICP-OES Total K QC | ICP-OES Dissolved Mg[A] | ICP-OES Dissolved Mg QC | ICP-OES Total Mg[B] | ICP-OES Total Mg QC | ICP-OES Dissolved Mn[A] | ICP-OES Dissolved Mn QC | ICP-OES Total Mn[B] | ICP-OES Total Mn QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | mg/L | | mg/L | | mg/L | | µg/L | | µg/L | |
| MDL | | 0.12 | | 0.03 | | 0.03 | | 4 | | 4 | |
| QL | | 0.39 | | 0.10 | | 0.11 | | 14 | | 16 | |
| PGDW05-0412 | 4/18/2012 | 0.43 | J | 0.07 | J | 0.08 | J | <14 | U | <16 | U |
| PGDW20-0412 | 4/16/2012 | 1.49 | J | 5.93 | | 6.11 | J | 22 | | 23 | J |
| PGDW20d-0412 | 4/16/2012 | 1.52 | J | 5.95 | | 6.15 | J | 21 | | 23 | J |
| PGDW23-0412 | 4/17/2012 | 0.69 | J | 0.09 | J | 0.10 | J | <14 | U | <16 | U |
| PGDW30-0412 | 4/17/2012 | 0.64 | J | 0.10 | J | 0.11 | J | <14 | U | <16 | U |
| PGDW50-0412 | 4/19/2012 | 3.89 | J | 12.8 | | 12.8 | J | 90 | | 92 | J |
| PGPW02-0412 | 4/20/2012 | 0.99 | J | 0.24 | | 0.25 | J | 8 | J | 9 | J |
| EPAMW02-0412-1 | 4/16/2012 | 31.7 | J | <0.10 | U | <0.11 | U | <14 | U | 5 | J |
| EPAMW02-0412-2 | 4/22/2012 | 16.0 | J | <0.10 | U | 0.17 | J | <14 | U | 21 | J |
| EPAMW01-0412 | 4/24/2012 | 17.8 | J | 0.14 | | 0.18 | J | <14 | U | <16 | U |
| EPAMW01d-0412 | 4/24/2012 | 17.9 | J | 0.15 | | 0.14 | J | <14 | U | <16 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | J | 0.14 | | NA | | <14 | U | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | J | 0.15 | | NA | | <14 | U | NA | |
| EPAMW01-0412-4 | 4/24/2012 | NA | J | 0.13 | | NA | | <14 | U | NA | |
| EPAMW01-0412-5 | 4/24/2012 | NA | J | 0.15 | | NA | | <14 | U | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | J | 0.16 | | NA | | <14 | U | NA | |
| EPAMW01-0412-7 | 4/24/2012 | NA | J | 0.16 | | NA | | <14 | U | NA | |
| EPAMW01-0412-8 | 4/24/2012 | NA | J | 0.16 | | NA | | <14 | U | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | J | 0.17 | | NA | | <14 | U | NA | |
| EPAMW01-0412-10 | 4/24/2012 | 14.1 | J | 0.17 | | 0.18 | J | <14 | U | <16 | U |
| FieldBlk01 | 4/16/2012 | <0.39 | U | <0.10 | U | <0.11 | U | <14 | U | <16 | U |
| FieldBlk02 | 4/18/2012 | <0.39 | U | <0.10 | U | <0.11 | U | <14 | U | <16 | U |
| FieldBlk03 | 4/22/2012 | <0.39 | U | <0.10 | U | <0.11 | U | <14 | U | <16 | U |
| FieldBlk04 | 4/24/2012 | <0.39 | U | <0.10 | U | <0.11 | U | <14 | U | <16 | U |
| EquipBlk01 | 4/16/2012 | <0.39 | U | <0.10 | U | <0.11 | U | <14 | U | <16 | U |
| EquipBlk02 | 4/18/2012 | <0.39 | U | <0.10 | U | <0.11 | U | <14 | U | <16 | U |
| EquipBlk04 | 4/24/2012 | <0.39 | U | <0.10 | U | <0.11 | U | <14 | U | <16 | U |

A. EPA Method 200.7
B. EPA Methods 3015A and 200.7
C. EPA CLP Inorganic Statement of Work ISMO1.3, Exhibit D - Part B.
R flags: trace metal data rejected for sample PGDW20-0412 due to sample contamination.

## Metals (cont.)

| Sample ID | Date Collected | ICP-OES Dissolved Mo[A] | ICP-OES Dissolved Mo QC | ICP-OES Total Mo[B] | ICP-OES Total Mo QC | ICP-OES Dissolved Na[A] | ICP-OES Dissolved Na QC | ICP-OES Total Na[B] | ICP-OES Total Na QC | ICP-MS Dissolved Ni[C] | ICP-MS Dissolved Ni QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | mg/L | | mg/L | | µg/L | |
| MDL | | 5 | | 6 | | 0.51 | | 0.57 | | 0.11 | |
| QL | | 17 | | 19 | | 1.71 | | 1.90 | | 1.00 | |
| PGDW05-0412 | 4/18/2012 | <17 | U | <19 | U | 190 | J | 189 | J | <1.00 | U |
| PGDW20-0412 | 4/16/2012 | <17 | U | <19 | U | 491 | J | 502 | J | R | R |
| PGDW20d-0412 | 4/16/2012 | <17 | U | <19 | U | 493 | J | 498 | J | <1.00 | U |
| PGDW23-0412 | 4/17/2012 | <17 | U | <19 | U | 223 | J | 221 | J | <1.00 | U |
| PGDW30-0412 | 4/17/2012 | <17 | U | <19 | U | 213 | J | 212 | J | 14.9 | |
| PGDW50-0412 | 4/19/2012 | <17 | U | <19 | U | 1290 | J | 1290 | J | <1.00 | U |
| PGPW02-0412 | 4/20/2012 | <17 | U | 7 | J | 414 | J | 413 | J | <1.00 | U |
| EPAMW02-0412-1 | 4/16/2012 | 6 | J | 10 | J | 419 | J | 429 | J | 4.3 | |
| EPAMW02-0412-2 | 4/22/2012 | <17 | U | <19 | U | 381 | J | 379 | J | 2.6 | |
| EPAMW01-0412 | 4/24/2012 | 7 | J | 10 | J | 276 | J | 274 | J | <1.00 | U |
| EPAMW01d-0412 | 4/24/2012 | 8 | J | 10 | J | 277 | J | 276 | J | 0.39 | J |
| EPAMW01-0412-2 | 4/24/2012 | 5 | J | NA | | 271 | J | NA | | <1.00 | U |
| EPAMW01-0412-3 | 4/24/2012 | <17 | U | NA | | 264 | J | NA | | 0.23 | J |
| EPAMW01-0412-4 | 4/24/2012 | 7 | J | NA | | 273 | J | NA | | <1.00 | U |
| EPAMW01-0412-5 | 4/24/2012 | <17 | U | NA | | 265 | J | NA | | <1.00 | U |
| EPAMW01-0412-6 | 4/24/2012 | <17 | U | NA | | 264 | J | NA | | <1.00 | U |
| EPAMW01-0412-7 | 4/24/2012 | <17 | U | NA | | 265 | J | NA | | <1.00 | U |
| EPAMW01-0412-8 | 4/24/2012 | <17 | U | NA | | 264 | J | NA | | <1.00 | U |
| EPAMW01-0412-9 | 4/24/2012 | <17 | U | NA | | 268 | J | NA | | <1.00 | U |
| EPAMW01-0412-10 | 4/24/2012 | <17 | U | 7 | J | 264 | J | 273 | J | <1.00 | U |
| FieldBlk01 | 4/16/2012 | <17 | U | <19 | U | <1.71 | U | <1.90 | U | <1.00 | U |
| FieldBlk02 | 4/18/2012 | <17 | U | <19 | U | <1.71 | U | <1.90 | U | 13.5 | |
| FieldBlk03 | 4/22/2012 | <17 | U | <19 | U | <1.71 | U | <1.90 | U | <1.00 | U |
| FieldBlk04 | 4/24/2012 | <17 | U | <19 | U | <1.71 | U | <1.90 | U | <1.00 | U |
| EquipBlk01 | 4/16/2012 | <17 | U | <19 | U | <1.71 | U | <1.90 | U | <1.00 | U |
| EquipBlk02 | 4/18/2012 | <17 | U | <19 | U | <1.71 | U | <1.90 | U | <1.00 | U |
| EquipBlk04 | 4/24/2012 | <17 | U | <19 | U | <1.71 | U | <1.90 | U | <1.00 | U |

A. EPA Method 200.7
B. EPA Methods 3015A and 200.7
C. EPA CLP Inorganic Statement of Work ISMO1.3, Exhibit D - Part B.
R flags: trace metal data rejected for sample PGDW20-0412 due to sample contamination.

## Metals (cont.)

| Sample ID | Date Collected | ICP-MS Total Ni[C] | ICP-MS Total Ni QC | ICP-OES Dissolved P[A] | ICP-OES Dissolved P QC | ICP-OES Total P[B] | ICP-OES Total P QC | ICP-MS Dissolved Pb[C] | ICP-MS Dissolved Pb QC | ICP-MS Total Pb[C] | ICP-MS Total Pb QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | mg/L | | mg/L | | µg/L | | µg/L | |
| MDL | | 0.11 | | 0.02 | | 0.02 | | 0.03 | | 0.03 | |
| QL | | 1.00 | | 0.06 | | 0.07 | | 1.00 | | 1.00 | |
| PGDW05-0412 | 4/18/2012 | <1.00 | U | <0.06 | U | 0.02 | J | <1.00 | U | 1.3 | * |
| PGDW20-0412 | 4/16/2012 | <1.00 | U | <0.06 | U | <0.07 | U | R | R | <1.00 | U |
| PGDW20d-0412 | 4/16/2012 | <1.00 | U | <0.06 | U | <0.07 | U | <1.00 | U | <1.00 | U |
| PGDW23-0412 | 4/17/2012 | <1.00 | U | <0.06 | U | <0.07 | U | <1.00 | U | <1.00 | U |
| PGDW30-0412 | 4/17/2012 | <1.00 | U | <0.06 | U | <0.07 | U | <1.00 | U | <1.00 | U |
| PGDW50-0412 | 4/19/2012 | 2.0 | *, J | <0.06 | U | <0.07 | U | <1.00 | U | <1.00 | U |
| PGPW02-0412 | 4/20/2012 | <1.00 | U | <0.06 | U | <0.07 | U | <1.00 | U | <1.00 | U |
| EPAMW02-0412-1 | 4/16/2012 | 5.8 | *, J | <0.06 | U | <0.07 | U | <1.00 | U | <1.00 | U |
| EPAMW02-0412-2 | 4/22/2012 | 4.5 | *, J | <0.06 | U | <0.07 | U | <1.00 | U | 0.61 | *, J |
| EPAMW01-0412 | 4/24/2012 | <1.00 | U | <0.06 | U | <0.07 | U | <1.00 | U | <1.00 | U |
| EPAMW01d-0412 | 4/24/2012 | <1.00 | U | <0.06 | U | <0.07 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | <0.06 | U | NA | | <1.00 | U | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | <0.06 | U | NA | | <1.00 | U | NA | |
| EPAMW01-0412-4 | 4/24/2012 | NA | | <0.06 | U | NA | | <1.00 | U | NA | |
| EPAMW01-0412-5 | 4/24/2012 | NA | | <0.06 | U | NA | | <1.00 | U | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | <0.06 | U | NA | | <1.00 | U | NA | |
| EPAMW01-0412-7 | 4/24/2012 | NA | | <0.06 | U | NA | | <1.00 | U | NA | |
| EPAMW01-0412-8 | 4/24/2012 | NA | | <0.06 | U | NA | | <1.00 | U | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | <0.06 | U | NA | | <1.00 | U | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <1.00 | U | <0.06 | U | <0.07 | U | <1.00 | U | <1.00 | U |
| FieldBlk01 | 4/16/2012 | <1.00 | U | <0.06 | U | <0.07 | U | 0.23 | J | 0.17 | *, J |
| FieldBlk02 | 4/18/2012 | <1.00 | U | <0.06 | U | <0.07 | U | 0.94 | J | 0.16 | *, J |
| FieldBlk03 | 4/22/2012 | <1.00 | U | <0.06 | U | <0.07 | U | 0.59 | J | <1.00 | U |
| FieldBlk04 | 4/24/2012 | 1.4 | *, J | <0.06 | U | <0.07 | U | 0.55 | J | 0.40 | *, J |
| EquipBlk01 | 4/16/2012 | <1.00 | U | <0.06 | U | <0.07 | U | 0.13 | J | <1.00 | U |
| EquipBlk02 | 4/18/2012 | <1.00 | U | <0.06 | U | <0.07 | U | 0.13 | J | 0.28 | *, J |
| EquipBlk04 | 4/24/2012 | <1.00 | U | <0.06 | U | <0.07 | U | 0.39 | J | <1.00 | U |

A. EPA Method 200.7
B. EPA Methods 3015A and 200.7
C. EPA CLP Inorganic Statement of Work ISMO1.3, Exhibit D - Part B.
R flags: trace metal data rejected for sample PGDW20-0412 due to sample contamination.

## Metals (cont.)

| Sample ID | Date Collected | ICP-OES Dissolved S[A] | ICP-OES Dissolved S QC | ICP-OES Total S[B] | ICP-OES Total S QC | ICP-MS Dissolved Sb[C] | ICP-MS Dissolved Sb QC | ICP-MS Total Sb[C] | ICP-MS Total Sb QC | ICP-MS Dissolved Se[C] | ICP-MS Dissolved Se QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | mg/L | | mg/L | | µg/L | | µg/L | | µg/L | |
| MDL | | 0.14 | | 0.15 | | 0.08 | | 0.08 | | 1.20 | |
| QL | | 0.46 | | 0.51 | | 2.00 | | 2.00 | | 5.00 | |
| PGDW05-0412 | 4/18/2012 | 101 | J | 96.6 | J | <2.00 | U | <2.00 | U | <5.00 | U |
| PGDW20-0412 | 4/16/2012 | 375 | J | 354 | J | R | R | <2.00 | U | R | R |
| PGDW20d-0412 | 4/16/2012 | 375 | J | 353 | J | <2.00 | U | <2.00 | U | <5.00 | U |
| PGDW23-0412 | 4/17/2012 | 135 | J | 125 | J | <2.00 | U | <2.00 | U | <5.00 | U |
| PGDW30-0412 | 4/17/2012 | 118 | J | 109 | J | <2.00 | U | <2.00 | U | <5.00 | U |
| PGDW50-0412 | 4/19/2012 | 1120 | J | 1130 | J | <2.00 | U | <2.00 | U | 1.30 | J |
| PGPW02-0412 | 4/20/2012 | 284 | J | 275 | J | <2.00 | U | <2.00 | U | <5.00 | U |
| EPAMW02-0412-1 | 4/16/2012 | 32.1 | J | 30.7 | J | <2.00 | U | <2.00 | U | 4.7 | J |
| EPAMW02-0412-2 | 4/22/2012 | 7.38 | J | 5.35 | J | <2.00 | U | <2.00 | U | 4.9 | J |
| EPAMW01-0412 | 4/24/2012 | 177 | J | 120 | J | <2.00 | U | <2.00 | U | <5.00 | U |
| EPAMW01d-0412 | 4/24/2012 | 171 | J | 120 | J | <2.00 | U | <2.00 | U | <5.00 | U |
| EPAMW01-0412-2 | 4/24/2012 | 202 | J | NA | | <2.00 | U | NA | | <5.00 | U |
| EPAMW01-0412-3 | 4/24/2012 | 198 | J | NA | | <2.00 | U | NA | | <5.00 | U |
| EPAMW01-0412-4 | 4/24/2012 | 187 | J | NA | | <2.00 | U | NA | | <5.00 | U |
| EPAMW01-0412-5 | 4/24/2012 | 210 | J | NA | | <2.00 | U | NA | | <5.00 | U |
| EPAMW01-0412-6 | 4/24/2012 | 208 | J | NA | | <2.00 | U | NA | | <5.00 | U |
| EPAMW01-0412-7 | 4/24/2012 | 210 | J | NA | | <2.00 | U | NA | | <5.00 | U |
| EPAMW01-0412-8 | 4/24/2012 | 210 | J | NA | | <2.00 | U | NA | | <5.00 | U |
| EPAMW01-0412-9 | 4/24/2012 | 214 | J | NA | | <2.00 | U | NA | | <5.00 | U |
| EPAMW01-0412-10 | 4/24/2012 | 200 | J | 129 | J | <2.00 | U | <2.00 | U | <5.00 | U |
| FieldBlk01 | 4/16/2012 | <0.46 | U | <0.51 | U | <2.00 | U | <2.00 | U | <5.00 | U |
| FieldBlk02 | 4/18/2012 | <0.46 | U | <0.51 | U | <2.00 | U | <2.00 | U | <5.00 | U |
| FieldBlk03 | 4/22/2012 | <0.46 | U | <0.51 | U | 0.30 | J | <2.00 | U | <5.00 | U |
| FieldBlk04 | 4/24/2012 | <0.46 | U | <0.51 | U | 0.20 | J | <2.00 | U | <5.00 | U |
| EquipBlk01 | 4/16/2012 | <0.46 | U | <0.51 | U | 0.13 | J | 0.30 | J | <5.00 | U |
| EquipBlk02 | 4/18/2012 | <0.46 | U | <0.51 | U | 0.11 | J | 0.18 | J | <5.00 | U |
| EquipBlk04 | 4/24/2012 | <0.46 | U | <0.51 | U | 0.09 | J | 0.12 | J | <5.00 | U |

A. EPA Method 200.7
B. EPA Methods 3015A and 200.7
C. EPA CLP Inorganic Statement of Work ISMO1.3, Exhibit D - Part B.
R flags: trace metal data rejected for sample PGDW20-0412 due to sample contamination.

## Metals (cont.)

| Sample ID | Date Collected | ICP-MS Total Se[C] | ICP-MS Total Se QC | ICP-OES Dissolved Si[A] | ICP-OES Dissolved Si QC | ICP-OES Total Si[B] | ICP-OES Total Si QC | ICP-OES Dissolved Sr[A] | ICP-OES Dissolved Sr QC | ICP-OES Total Sr[B] | ICP-OES Total Sr QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | mg/L | | mg/L | | µg/L | | µg/L | |
| MDL | | 1.20 | | 0.13 | | 0.14 | | 1 | | 1 | |
| QL | | 5.00 | | 0.43 | | 0.48 | | 4 | | 4 | |
| PGDW05-0412 | 4/18/2012 | <5.00 | U | 5.21 | J+ | 5.56 | J+ | 53 | | 56 | J |
| PGDW20-0412 | 4/16/2012 | <5.00 | U | 5.69 | J+ | 5.91 | J+ | 864 | | 879 | J |
| PGDW20d-0412 | 4/16/2012 | <5.00 | U | 5.68 | J+ | 5.91 | J+ | 873 | | 872 | J |
| PGDW23-0412 | 4/17/2012 | <5.00 | U | 5.15 | J+ | 5.52 | J+ | 92 | | 92 | J |
| PGDW30-0412 | 4/17/2012 | <5.00 | U | 4.71 | J+ | 4.97 | J+ | 69 | | 69 | J |
| PGDW50-0412 | 4/19/2012 | <5.00 | U | 4.74 | J+ | 4.80 | J+ | 3000 | | 2940 | J |
| PGPW02-0412 | 4/20/2012 | <5.00 | U | 5.05 | J+ | 5.24 | J+ | 330 | | 333 | J |
| EPAMW02-0412-1 | 4/16/2012 | 4.5 | J | 4.89 | J+ | 5.03 | J+ | 1260 | | 1240 | J |
| EPAMW02-0412-2 | 4/22/2012 | 4.3 | J | 5.00 | J+ | 6.03 | J+ | 806 | | 786 | J |
| EPAMW01-0412 | 4/24/2012 | <5.00 | U | 10.50 | J+ | 11.90 | J+ | 315 | | 318 | J |
| EPAMW01d-0412 | 4/24/2012 | <5.00 | U | 10.50 | J+ | 11.70 | J+ | 314 | | 320 | J |
| EPAMW01-0412-2 | 4/24/2012 | NA | | 10.10 | J+ | NA | | 312 | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | 9.95 | J+ | NA | | 309 | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | NA | | 12.00 | J+ | NA | | 328 | | NA | |
| EPAMW01-0412-5 | 4/24/2012 | NA | | 9.54 | J+ | NA | | 307 | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | 8.81 | J+ | NA | | 301 | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | NA | | 9.09 | J+ | NA | | 304 | | NA | |
| EPAMW01-0412-8 | 4/24/2012 | NA | | 8.43 | J+ | NA | | 298 | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | 8.18 | J+ | NA | | 301 | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <5.00 | U | 7.69 | J+ | 7.66 | J+ | 291 | | 292 | J |
| FieldBlk01 | 4/16/2012 | <5.00 | U | <0.43 | U | <0.48 | U | <4 | U | <4 | U |
| FieldBlk02 | 4/18/2012 | <5.00 | U | <0.43 | U | <0.48 | U | <4 | U | <4 | U |
| FieldBlk03 | 4/22/2012 | <5.00 | U | <0.43 | U | <0.48 | U | <4 | U | <4 | U |
| FieldBlk04 | 4/24/2012 | <5.00 | U | <0.43 | U | <0.48 | U | <4 | U | <4 | U |
| EquipBlk01 | 4/16/2012 | <5.00 | U | <0.43 | U | <0.48 | U | <4 | U | <4 | U |
| EquipBlk02 | 4/18/2012 | <5.00 | U | <0.43 | U | <0.48 | U | <4 | U | <4 | U |
| EquipBlk04 | 4/24/2012 | <5.00 | U | <0.43 | U | <0.48 | U | <4 | U | <4 | U |

A. EPA Method 200.7
B. EPA Methods 3015A and 200.7
C. EPA CLP Inorganic Statement of Work ISMO1.3, Exhibit D - Part B.
R flags: trace metal data rejected for sample PGDW20-0412 due to sample contamination.

## Metals (cont.)

| Sample ID | Date Collected | ICP-OES Dissolved Ti[A] | ICP-OES Dissolved Ti QC | ICP-OES Total Ti[B] | ICP-OES Total Ti QC | ICP-MS Dissolved Ti[C] | ICP-MS Dissolved Ti QC | ICP-MS Total Ti[C] | ICP-MS Total Ti QC | ICP-OES Dissolved V[A] | ICP-OES Dissolved V QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| MDL | | 2 | | 2 | | 0.04 | | 0.04 | | 3 | |
| QL | | 7 | | 8 | | 1.00 | | 1.00 | | 10 | |
| PGDW05-0412 | 4/18/2012 | <7 | U | <8 | U | <1.00 | U | <1.00 | U | <10 | U |
| PGDW20-0412 | 4/16/2012 | <7 | U | <8 | U | R | R | <1.00 | U | <10 | U |
| PGDW20d-0412 | 4/16/2012 | <7 | U | <8 | U | <1.00 | U | <1.00 | U | <10 | U |
| PGDW23-0412 | 4/17/2012 | <7 | U | <8 | U | <1.00 | U | <1.00 | U | <10 | U |
| PGDW30-0412 | 4/17/2012 | <7 | U | <8 | U | <1.00 | U | <1.00 | U | <10 | U |
| PGDW50-0412 | 4/19/2012 | 3 | J | 3 | J | 0.32 | J | <1.00 | U | <10 | U |
| PGPW02-0412 | 4/20/2012 | <7 | U | <8 | U | <1.00 | U | <1.00 | U | <10 | U |
| EPAMW02-0412-1 | 4/16/2012 | <7 | U | <8 | U | <1.00 | U | <1.00 | U | <10 | U |
| EPAMW02-0412-2 | 4/22/2012 | <7 | U | 11 | J | <1.00 | U | <1.00 | U | <10 | U |
| EPAMW01-0412 | 4/24/2012 | <7 | U | 3 | J | <1.00 | U | <1.00 | U | <10 | U |
| EPAMW01d-0412 | 4/24/2012 | <7 | U | <8 | U | <1.00 | U | <1.00 | U | <10 | U |
| EPAMW01-0412-2 | 4/24/2012 | <7 | U | NA | | <1.00 | U | NA | | <10 | U |
| EPAMW01-0412-3 | 4/24/2012 | <7 | U | NA | | <1.00 | U | NA | | <10 | U |
| EPAMW01-0412-4 | 4/24/2012 | <7 | U | NA | | <1.00 | U | NA | | <10 | U |
| EPAMW01-0412-5 | 4/24/2012 | <7 | U | NA | | <1.00 | U | NA | | <10 | U |
| EPAMW01-0412-6 | 4/24/2012 | <7 | U | NA | | <1.00 | U | NA | | <10 | U |
| EPAMW01-0412-7 | 4/24/2012 | <7 | U | NA | | <1.00 | U | NA | | <10 | U |
| EPAMW01-0412-8 | 4/24/2012 | <7 | U | NA | | <1.00 | U | NA | | <10 | U |
| EPAMW01-0412-9 | 4/24/2012 | <7 | U | NA | | <1.00 | U | NA | | <10 | U |
| EPAMW01-0412-10 | 4/24/2012 | <7 | U | <8 | U | <1.00 | U | <1.00 | U | <10 | U |
| FieldBlk01 | 4/16/2012 | <7 | U | <8 | U | <1.00 | U | 0.31 | J | <10 | U |
| FieldBlk02 | 4/18/2012 | <7 | U | <8 | U | <1.00 | U | 0.12 | J | <10 | U |
| FieldBlk03 | 4/22/2012 | <7 | U | <8 | U | 0.35 | J | 0.07 | J | <10 | U |
| FieldBlk04 | 4/24/2012 | <7 | U | <8 | U | 0.10 | J | 0.05 | J | <10 | U |
| EquipBlk01 | 4/16/2012 | <7 | U | <8 | U | <1.00 | U | 0.41 | J | <10 | U |
| EquipBlk02 | 4/18/2012 | <7 | U | <8 | U | <1.00 | U | 0.13 | J | <10 | U |
| EquipBlk04 | 4/24/2012 | <7 | U | <8 | U | <1.00 | U | 0.07 | J | <10 | U |

A. EPA Method 200.7
B. EPA Methods 3015A and 200.7
C. EPA CLP Inorganic Statement of Work ISMO1.3, Exhibit D - Part B.
R flags: trace metal data rejected for sample PGDW20-0412 due to sample contamination.

## Metals (cont.)

| Sample ID | Date Collected | ICP-OES Total V[B] | ICP-OES Total V QC | ICP-OES Dissolved Zn[A] | ICP-OES Dissolved Zn QC | ICP-OES Total Zn[B] | ICP-OES Total Zn QC |
|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | |
| MDL | | 3 | | 15 | | 17 | |
| QL | | 11 | | 50 | | 56 | |
| PGDW05-0412 | 4/18/2012 | <11 | U | <50 | U | <56 | U |
| PGDW20-0412 | 4/16/2012 | <11 | U | <50 | U | <56 | U |
| PGDW20d-0412 | 4/16/2012 | <11 | U | <50 | U | <56 | U |
| PGDW23-0412 | 4/17/2012 | <11 | U | <50 | U | <56 | U |
| PGDW30-0412 | 4/17/2012 | <11 | U | <50 | U | <56 | U |
| PGDW50-0412 | 4/19/2012 | <11 | U | <50 | U | <56 | U |
| PGPW02-0412 | 4/20/2012 | <11 | U | <50 | U | <56 | U |
| EPAMW02-0412-1 | 4/16/2012 | 4 | J | <50 | U | <56 | U |
| EPAMW02-0412-2 | 4/22/2012 | 4 | J | <50 | U | 168 | J |
| EPAMW01-0412 | 4/24/2012 | <11 | U | <50 | U | <56 | U |
| EPAMW01d-0412 | 4/24/2012 | <11 | U | <50 | U | <56 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | <50 | U | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | <50 | U | NA | |
| EPAMW01-0412-4 | 4/24/2012 | NA | | <50 | U | NA | |
| EPAMW01-0412-5 | 4/24/2012 | NA | | <50 | U | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | <50 | U | NA | |
| EPAMW01-0412-7 | 4/24/2012 | NA | | <50 | U | NA | |
| EPAMW01-0412-8 | 4/24/2012 | NA | | <50 | U | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | <50 | U | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <11 | U | <50 | U | <56 | U |
| FieldBlk01 | 4/16/2012 | <11 | U | <50 | U | <56 | U |
| FieldBlk02 | 4/18/2012 | <11 | U | <50 | U | <56 | U |
| FieldBlk03 | 4/22/2012 | <11 | U | <50 | U | <56 | U |
| FieldBlk04 | 4/24/2012 | <11 | U | <50 | U | <56 | U |
| EquipBlk01 | 4/16/2012 | <11 | U | <50 | U | <56 | U |
| EquipBlk02 | 4/18/2012 | <11 | U | <50 | U | <56 | U |
| EquipBlk04 | 4/24/2012 | <11 | U | <50 | U | <56 | U |

A. EPA Method 200.7
B. EPA Methods 3015A and 200.7
C. EPA CLP Inorganic Statement of Work ISMO1.3, Exhibit D - Part B.
R flags: trace metal data rejected for sample PGDW20-0412 due to sample contamination.

# Organic Acids

| Sample ID | Date | Lactate (50-21-5) | Lactate QC | Formate (141-53-7) | Formate QC | Acetate (127-09-3) | Acetate QC | Propionate (137-40-6) | Propionate QC | Butyrate (156-54-7) | Butyrate QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Units** | | **mg/L** | | **mg/L** | | **mg/L** | | **mg/L** | | **mg/L** | |
| **MDL** | | **0.009** | | **0.012** | | **0.009** | | **0.016** | | **0.009** | |
| **QL** | | **0.100** | | **0.100** | | **0.100** | | **0.100** | | **0.100** | |
| PGDW05-0412 | 4/18/2012 | <0.100 | U | R | R | <0.100 | U | <0.100 | U | <0.100 | U |
| PGDW20-0412 | 4/16/2012 | <0.100 | U | R | R | <0.100 | U | <0.100 | U | <0.100 | U |
| PGDW20d-0412 | 4/16/2012 | <0.100 | U | R | R | <0.100 | U | <0.100 | U | <0.100 | U |
| PGDW23-0412 | 4/17/2012 | <0.100 | U | R | R | <0.100 | U | <0.100 | U | <0.100 | U |
| PGDW30-0412 | 4/17/2012 | <0.100 | U | R | R | <0.100 | U | <0.100 | U | <0.100 | U |
| PGDW50-0412 | 4/19/2012 | <0.100 | U | R | R | <0.100 | U | <0.100 | U | <0.100 | U |
| PGPW02-0412 | 4/20/2012 | <0.100 | U | R | R | <0.100 | U | <0.100 | U | <0.100 | U |
| EPAMW02-0412-1 | 4/16/2012 | 0.25 | | R | R | 4.80 | | 0.844 | | <0.100 | U |
| EPAMW02-0412-2 | 4/22/2012 | <0.100 | U | R | R | 2.84 | J | 0.687 | J | <0.100 | U |
| EPAMW01-0412 | 4/24/2012 | <0.100 | U | R | R | 3.42 | * | 0.075 | J | <0.100 | U |
| EPAMW01d-0412 | 4/24/2012 | <0.100 | U | R | R | 5.96 | * | 0.095 | J | <0.100 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <0.100 | U | R | R | 6.08 | | 0.084 | J | <0.100 | U |
| FieldBlk01 | 4/16/2012 | <0.100 | U | R | R | <0.100 | U | <0.100 | U | <0.100 | U |
| FieldBlk02 | 4/18/2012 | <0.100 | U | R | R | <0.100 | U | <0.100 | U | <0.100 | U |
| FieldBlk03 | 4/22/2012 | <0.100 | U | R | R | <0.100 | U | <0.100 | U | <0.100 | U |
| FieldBlk04 | 4/24/2012 | <0.100 | U | R | R | <0.100 | U | <0.100 | U | <0.100 | U |
| EquipBlk01 | 4/16/2012 | <0.100 | U | R | R | <0.100 | U | <0.100 | U | <0.100 | U |
| EquipBlk02 | 4/18/2012 | <0.100 | U | R | R | <0.100 | U | <0.100 | U | <0.100 | U |
| EquipBlk04 | 4/24/2012 | <0.100 | U | R | R | <0.100 | U | <0.100 | U | <0.100 | U |

R flags: data rejected due to field and equipment blank contamination.

## Dissolved Gases

| Sample ID | Date | Methane (74-82-8) | Methane QC | Ethane (74-84-0) | Ethane QC | Propane (74-98-6) | Propane QC | Butane (106-97-8) | Butane QC |
|---|---|---|---|---|---|---|---|---|---|
| **Units** | | **mg/L** | | **mg/L** | | **mg/L** | | **mg/L** | |
| **MDL** | | **0.0003** | | **0.0005** | | **0.0007** | | **0.0007** | |
| **QL** | | **0.0013** | | **0.0027** | | **0.0038** | | **0.0047** | |
| PGDW05-0412 | 4/18/2012 | 0.053 | B | <0.0027 | U | <0.0038 | U | <0.0047 | U |
| PGDW20-0412 | 4/16/2012 | 0.111 | | 0.008 | | <0.0038 | U | <0.0047 | U |
| PGDW20d-0412 | 4/16/2012 | 0.108 | | 0.007 | | <0.0038 | U | <0.0047 | U |
| PGDW23-0412 | 4/17/2012 | 0.226 | | 0.019 | | 0.0114 | | 0.0009 | J |
| PGDW30-0412 | 4/17/2012 | 0.384 | | 0.003 | | <0.0038 | U | <0.0047 | U |
| PGDW50-0412 | 4/19/2012 | <0.0013 | U | <0.0027 | U | <0.0038 | U | <0.0047 | U |
| PGPW02-0412 | 4/20/2012 | 0.008 | B | <0.0027 | U | <0.0038 | U | <0.0047 | U |
| EPAMW02-0412-1 | 4/16/2012 | 19.1 | | 3.06 | | 1.58 | | 0.380 | |
| EPAMW02-0412-2 | 4/22/2012 | 22.0 | | 3.07 | | 1.78 | | 0.517 | |
| EPAMW01-0412 | 4/24/2012 | 17.3 | | 2.38 | | 0.763 | | 0.199 | |
| EPAMW01d-0412 | 4/24/2012 | 17.3 | | 2.21 | | 0.663 | | 0.169 | |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | NA | | NA | | NA | | NA | |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | NA | | NA | | NA | | NA | |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | 18.8 | | 2.27 | | 0.715 | | 0.184 | |
| FieldBlk01 | 4/16/2012 | <0.0013 | U | <0.0027 | U | <0.0038 | U | <0.0047 | U |
| FieldBlk02 | 4/18/2012 | 0.012 | | <0.0027 | U | 0.0011 | J | <0.0047 | U |
| FieldBlk03 | 4/22/2012 | <0.0013 | U | <0.0027 | U | <0.0038 | U | <0.0047 | U |
| FieldBlk04 | 4/24/2012 | <0.0013 | U | <0.0027 | U | <0.0038 | U | <0.0047 | U |
| EquipBlk01 | 4/16/2012 | <0.0013 | U | <0.0027 | U | <0.0038 | U | <0.0047 | U |
| EquipBlk02 | 4/18/2012 | 0.012 | | 0.002 | J | 0.0008 | J | <0.0047 | U |
| EquipBlk04 | 4/24/2012 | <0.0013 | U | <0.0027 | U | <0.0038 | U | <0.0047 | U |
| TripBlk01 | 4/16/2012 | <0.0013 | U | <0.0027 | U | <0.0038 | U | <0.0047 | U |
| TripBlk02 | 4/18/2012 | <0.0013 | U | <0.0027 | U | <0.0038 | U | <0.0047 | U |
| TripBlk03 | 4/22/2012 | <0.0013 | U | <0.0027 | U | <0.0038 | U | <0.0047 | U |
| TripBlk04 | 4/24/2012 | <0.0013 | U | <0.0027 | U | <0.0038 | U | <0.0047 | U |

## Volatile Organic Compounds (Shaw Environmental)

| Sample ID | Date | vinyl chloride | vinyl chloride QC | 1,1-dichloroethene | 1,1-dichloroethene QC | methylene chloride | methylene chloride QC | trans-1,2-dichloroethene | trans-1,2-dichloroethene QC | 1,1-dichloroethane | 1,1-dichloroethane QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| MDL | | 0.14 | | 0.07 | | 0.19 | | 0.05 | | 0.15 | |
| QL | | 1.00 | | 0.50 | | 0.50 | | 0.50 | | 0.50 | |
| PGDW05-0412 | 4/18/2012 | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| PGDW20-0412 | 4/16/2012 | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| PGDW20d-0412 | 4/16/2012 | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| PGDW23-0412 | 4/17/2012 | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| PGDW30-0412 | 4/17/2012 | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| PGDW50-0412 | 4/19/2012 | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| PGPW02-0412 | 4/20/2012 | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW02-0412-1 | 4/16/2012 | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW02-0412-2 | 4/22/2012 | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412 | 4/24/2012 | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01d-0412 | 4/24/2012 | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-2 | 4/24/2012 | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-3 | 4/24/2012 | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-4 | 4/24/2012 | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-5 | 4/24/2012 | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-6 | 4/24/2012 | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-7 | 4/24/2012 | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-8 | 4/24/2012 | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-9 | 4/24/2012 | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-10 | 4/24/2012 | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| FieldBlk01 | 4/16/2012 | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| FieldBlk02 | 4/18/2012 | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| FieldBlk03 | 4/22/2012 | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| FieldBlk04 | 4/24/2012 | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EquipBlk01 | 4/16/2012 | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EquipBlk02 | 4/18/2012 | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EquipBlk03 | 4/22/2012 | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EquipBlk04 | 4/24/2012 | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| TripBlk01 | 4/16/2012 | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| TripBlk02 | 4/18/2012 | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| TripBlk03 | 4/22/2012 | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| TripBlk04 | 4/24/2012 | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |

## Volatile Organic Compounds (Shaw Environmental, cont.)

| Sample ID | Date | cis-1,2-dichloroethene | cis-1,2-dichloroetheneQC | chloroform | chloroform QC | 1,1,1-trichloroethane | 1,1,1-trichloroethane QC | carbon tetrachloride | carbon tetrachloride QC | 1,2-dichloroethane | 1,2-dichloroethane QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| MDL | | 0.07 | | 0.03 | | 0.04 | | 0.03 | | 0.07 | |
| QL | | 0.50 | | 0.50 | | 0.50 | | 0.50 | | 0.50 | |
| PGDW05-0412 | 4/18/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| PGDW20-0412 | 4/16/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| PGDW20d-0412 | 4/16/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| PGDW23-0412 | 4/17/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| PGDW30-0412 | 4/17/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| PGDW50-0412 | 4/19/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| PGPW02-0412 | 4/20/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW02-0412-1 | 4/16/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW02-0412-2 | 4/22/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01d-0412 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-2 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-3 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-4 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-5 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-6 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-7 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-8 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-9 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-10 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| FieldBlk01 | 4/16/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| FieldBlk02 | 4/18/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| FieldBlk03 | 4/22/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| FieldBlk04 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EquipBlk01 | 4/16/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EquipBlk02 | 4/18/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EquipBlk03 | 4/22/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EquipBlk04 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| TripBlk01 | 4/16/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| TripBlk02 | 4/18/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| TripBlk03 | 4/22/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| TripBlk04 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |

## Volatile Organic Compounds (Shaw Environmental, cont.)

| Sample ID | Date | trichloroethene | trichloroethene QC | 1,1,2-trichloroethane | 1,1,2-trichloroethane QC | tetrachloroethene | tetrachloroethene QC | chlorobenzene | chlorobenzene QC | 1,3-dichlorobenzene | 1,3-dichlorobenzene QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| MDL | | 0.03 | | 0.09 | | 0.04 | | 0.06 | | 0.04 | |
| QL | | 0.50 | | 0.50 | | 0.50 | | 0.50 | | 0.50 | |
| PGDW05-0412 | 4/18/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| PGDW20-0412 | 4/16/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| PGDW20d-0412 | 4/16/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| PGDW23-0412 | 4/17/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| PGDW30-0412 | 4/17/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| PGDW50-0412 | 4/19/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| PGPW02-0412 | 4/20/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW02-0412-1 | 4/16/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW02-0412-2 | 4/22/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01d-0412 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-2 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-3 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-4 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-5 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-6 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-7 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-8 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-9 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-10 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| FieldBlk01 | 4/16/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| FieldBlk02 | 4/18/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| FieldBlk03 | 4/22/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| FieldBlk04 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EquipBlk01 | 4/16/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EquipBlk02 | 4/18/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EquipBlk03 | 4/22/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EquipBlk04 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| TripBlk01 | 4/16/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| TripBlk02 | 4/18/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| TripBlk03 | 4/22/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| TripBlk04 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |

## Volatile Organic Compounds (Shaw Environmental, cont.)

| Sample ID | Date | 1,4-dichlorobenzene | 1,4-dichlorobenzene QC | 1,2-dichlorobenzene | 1,2-dichlorobenzene QC | ethanol | ethanol QC | isopropanol | isopropanol QC | n-propanol | n-propanol QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| MDL | | 0.03 | | 0.11 | | 24.7 | | 11.4 | | 13.5 | |
| QL | | 0.50 | | 1.00 | | 100 | | 100 | | 100 | |
| PGDW05-0412 | 4/18/2012 | <0.50 | U | <1.00 | U | <100 | U | <100 | U | <100 | J-, U |
| PGDW20-0412 | 4/16/2012 | <0.50 | U | <1.00 | U | <100 | U | <100 | U | <100 | J-, U |
| PGDW20d-0412 | 4/16/2012 | <0.50 | U | <1.00 | U | <100 | U | <100 | U | <100 | J-, U |
| PGDW23-0412 | 4/17/2012 | <0.50 | U | <1.00 | U | <100 | U | <100 | U | <100 | J-, U |
| PGDW30-0412 | 4/17/2012 | <0.50 | U | <1.00 | U | <100 | U | <100 | U | <100 | J-, U |
| PGDW50-0412 | 4/19/2012 | <0.50 | U | <1.00 | U | <100 | U | <100 | U | <100 | J-, U |
| PGPW02-0412 | 4/20/2012 | <0.50 | U | <1.00 | U | <100 | U | <100 | U | <100 | J-, U |
| EPAMW02-0412-1 | 4/16/2012 | <0.50 | U | <1.00 | U | <100 | U | 862 | | 62 | J- |
| EPAMW02-0412-2 | 4/22/2012 | <0.50 | U | <1.00 | U | <100 | U | 802 | | <100 | J-, U |
| EPAMW01-0412 | 4/24/2012 | <0.50 | U | <1.00 | U | <100 | U | 69.8 | J | <100 | J-, U |
| EPAMW01d-0412 | 4/24/2012 | <0.50 | U | <1.00 | U | <100 | U | 69.2 | J | <100 | J-, U |
| EPAMW01-0412-2 | 4/24/2012 | <0.50 | U | <1.00 | U | <100 | U | 74.8 | J | <100 | J-, U |
| EPAMW01-0412-3 | 4/24/2012 | <0.50 | U | <1.00 | U | <100 | U | 76.8 | J | <100 | J-, U |
| EPAMW01-0412-4 | 4/24/2012 | <0.50 | U | <1.00 | U | <100 | U | 65.0 | J | <100 | J-, U |
| EPAMW01-0412-5 | 4/24/2012 | <0.50 | U | <1.00 | U | <100 | U | 82.2 | J | <100 | J-, U |
| EPAMW01-0412-6 | 4/24/2012 | <0.50 | U | <1.00 | U | <100 | U | 77.4 | J | <100 | J-, U |
| EPAMW01-0412-7 | 4/24/2012 | <0.50 | U | <1.00 | U | <100 | U | 62.6 | J | <100 | J-, U |
| EPAMW01-0412-8 | 4/24/2012 | <0.50 | U | <1.00 | U | <100 | U | 80.0 | J | <100 | J-, U |
| EPAMW01-0412-9 | 4/24/2012 | <0.50 | U | <1.00 | U | <100 | U | 68.5 | J | <100 | J-, U |
| EPAMW01-0412-10 | 4/24/2012 | <0.50 | U | <1.00 | U | <100 | U | 69.3 | J | <100 | J-, U |
| FieldBlk01 | 4/16/2012 | <0.50 | U | <1.00 | U | <100 | U | <100 | U | <100 | J-, U |
| FieldBlk02 | 4/18/2012 | <0.50 | U | <1.00 | U | <100 | U | <100 | U | <100 | J-, U |
| FieldBlk03 | 4/22/2012 | <0.50 | U | <1.00 | U | <100 | U | <100 | U | <100 | J-, U |
| FieldBlk04 | 4/24/2012 | <0.50 | U | <1.00 | U | <100 | U | <100 | U | <100 | J-, U |
| EquipBlk01 | 4/16/2012 | <0.50 | U | <1.00 | U | <100 | U | <100 | U | <100 | J-, U |
| EquipBlk02 | 4/18/2012 | <0.50 | U | <1.00 | U | <100 | U | <100 | U | <100 | J-, U |
| EquipBlk03 | 4/22/2012 | <0.50 | U | <1.00 | U | <100 | U | <100 | U | <100 | J-, U |
| EquipBlk04 | 4/24/2012 | <0.50 | U | <1.00 | U | <100 | U | <100 | U | <100 | J-, U |
| TripBlk01 | 4/16/2012 | <0.50 | U | <1.00 | U | <100 | U | <100 | U | <100 | J-, U |
| TripBlk02 | 4/18/2012 | <0.50 | U | <1.00 | U | <100 | U | <100 | U | <100 | J-, U |
| TripBlk03 | 4/22/2012 | <0.50 | U | <1.00 | U | <100 | U | <100 | U | <100 | J-, U |
| TripBlk04 | 4/24/2012 | <0.50 | U | <1.00 | U | <100 | U | <100 | U | <100 | J-, U |

## Volatile Organic Compounds (Shaw Environmental, cont.)

| Sample ID | Date | isobutanol | isobutanol QC | n-butanol | n-butanol QC | acetone | acetone QC | tert-butyl alcohol | tert-butyl alcohol QC | methyl tert-butyl ether | methyl tert-butyl ether QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| MDL | | 15.6 | | 15.5 | | 3.97 | | 1.72 | | 0.11 | |
| QL | | 100 | | 100 | | 5.00 | | 5.00 | | 0.50 | |
| PGDW05-0412 | 4/18/2012 | <100 | U | <100 | U | <5.00 | U | <5.00 | U | <0.50 | U |
| PGDW20-0412 | 4/16/2012 | <100 | U | <100 | U | <5.00 | U | <5.00 | U | <0.50 | U |
| PGDW20d-0412 | 4/16/2012 | <100 | U | <100 | U | <5.00 | U | <5.00 | U | <0.50 | U |
| PGDW23-0412 | 4/17/2012 | <100 | U | <100 | U | <5.00 | U | <5.00 | U | <0.50 | U |
| PGDW30-0412 | 4/17/2012 | <100 | U | <100 | U | <5.00 | U | <5.00 | U | <0.50 | U |
| PGDW50-0412 | 4/19/2012 | <100 | U | <100 | U | <5.00 | U | <5.00 | U | <0.50 | U |
| PGPW02-0412 | 4/20/2012 | <100 | U | <100 | U | <5.00 | U | <5.00 | U | <0.50 | U |
| EPAMW02-0412-1 | 4/16/2012 | <100 | U | <100 | U | 1460 | | 5910 | | <0.50 | U |
| EPAMW02-0412-2 | 4/22/2012 | <100 | U | <100 | U | 231 | | 6120 | | <0.50 | U |
| EPAMW01-0412 | 4/24/2012 | <100 | U | <100 | U | <5.00 | U | <5.00 | U | <0.50 | U |
| EPAMW01d-0412 | 4/24/2012 | <100 | U | <100 | U | <5.00 | U | <5.00 | U | <0.50 | U |
| EPAMW01-0412-2 | 4/24/2012 | <100 | U | <100 | U | <5.00 | U | <5.00 | U | <0.50 | U |
| EPAMW01-0412-3 | 4/24/2012 | <100 | U | <100 | U | <5.00 | U | <5.00 | U | <0.50 | U |
| EPAMW01-0412-4 | 4/24/2012 | <100 | U | <100 | U | <5.00 | U | <5.00 | U | <0.50 | U |
| EPAMW01-0412-5 | 4/24/2012 | <100 | U | <100 | U | <5.00 | U | <5.00 | U | <0.50 | U |
| EPAMW01-0412-6 | 4/24/2012 | <100 | U | <100 | U | <5.00 | U | <5.00 | U | <0.50 | U |
| EPAMW01-0412-7 | 4/24/2012 | <100 | U | <100 | U | <5.00 | U | <5.00 | U | <0.50 | U |
| EPAMW01-0412-8 | 4/24/2012 | <100 | U | <100 | U | <5.00 | U | <5.00 | U | <0.50 | U |
| EPAMW01-0412-9 | 4/24/2012 | <100 | U | <100 | U | <5.00 | U | <5.00 | U | <0.50 | U |
| EPAMW01-0412-10 | 4/24/2012 | <100 | U | <100 | U | <5.00 | U | <5.00 | U | <0.50 | U |
| FieldBlk01 | 4/16/2012 | <100 | U | <100 | U | <5.00 | U | <5.00 | U | <0.50 | U |
| FieldBlk02 | 4/18/2012 | <100 | U | <100 | U | <5.00 | U | <5.00 | U | <0.50 | U |
| FieldBlk03 | 4/22/2012 | <100 | U | <100 | U | <5.00 | U | <5.00 | U | <0.50 | U |
| FieldBlk04 | 4/24/2012 | <100 | U | <100 | U | <5.00 | U | <5.00 | U | <0.50 | U |
| EquipBlk01 | 4/16/2012 | <100 | U | <100 | U | <5.00 | U | <5.00 | U | <0.50 | U |
| EquipBlk02 | 4/18/2012 | <100 | U | <100 | U | <5.00 | U | <5.00 | U | <0.50 | U |
| EquipBlk03 | 4/22/2012 | <100 | U | <100 | U | <5.00 | U | <5.00 | U | <0.50 | U |
| EquipBlk04 | 4/24/2012 | <100 | U | <100 | U | <5.00 | U | <5.00 | U | <0.50 | U |
| TripBlk01 | 4/16/2012 | <100 | U | <100 | U | <5.00 | U | <5.00 | U | <0.50 | U |
| TripBlk02 | 4/18/2012 | <100 | U | <100 | U | <5.00 | U | <5.00 | U | <0.50 | U |
| TripBlk03 | 4/22/2012 | <100 | U | <100 | U | <5.00 | U | <5.00 | U | <0.50 | U |
| TripBlk04 | 4/24/2012 | <100 | U | <100 | U | <5.00 | U | <5.00 | U | <0.50 | U |

## Volatile Organic Compounds (Shaw Environmental, cont.)

| Sample ID | Date | di-isopropyl ether | di-isopropyl ether QC | ethyl tert-butyl ether | ethyl tert-butyl ether QC | benzene | benzene QC | tert-amyl methyl ether | tert-amyl methyl ether QC | 2,5-dimethylfuran | 2,5-dimethylfuran QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Units** | | **µg/L** | | **µg/L** | | **µg/L** | | **µg/L** | | **µg/L** | |
| **MDL** | | **0.11** | | **0.03** | | **0.06** | | **0.06** | | **0.03** | |
| **QL** | | **0.50** | | **0.50** | | **0.50** | | **0.50** | | **0.50** | |
| PGDW05-0412 | 4/18/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| PGDW20-0412 | 4/16/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| PGDW20d-0412 | 4/16/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| PGDW23-0412 | 4/17/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| PGDW30-0412 | 4/17/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| PGDW50-0412 | 4/19/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| PGPW02-0412 | 4/20/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW02-0412-1 | 4/16/2012 | <0.50 | U | <0.50 | U | 166 | | <0.50 | U | <0.50 | U |
| EPAMW02-0412-2 | 4/22/2012 | <0.50 | U | <0.50 | U | 232 | | <0.50 | U | <0.50 | U |
| EPAMW01-0412 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01d-0412 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-2 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-3 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-4 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-5 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-6 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-7 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-8 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-9 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-10 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| FieldBlk01 | 4/16/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| FieldBlk02 | 4/18/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| FieldBlk03 | 4/22/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| FieldBlk04 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EquipBlk01 | 4/16/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EquipBlk02 | 4/18/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EquipBlk03 | 4/22/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EquipBlk04 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| TripBlk01 | 4/16/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| TripBlk02 | 4/18/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| TripBlk03 | 4/22/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| TripBlk04 | 4/24/2012 | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U | <0.50 | U |

## Volatile Organic Compounds (Shaw Environmental, cont.)

| Sample ID | Date | toluene | toluene QC | 1,2-dibromoethane | 1,2-dibromoethane QC | ethyl benzene | ethyl benzene QC | m+p xylene | m+p xylene QC | o-xylene | o-xylene QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Units** | | **µg/L** | | **µg/L** | | **µg/L** | | **µg/L** | | **µg/L** | |
| **MDL** | | **0.03** | | **0.09** | | **0.03** | | **0.08** | | **0.03** | |
| **QL** | | **0.50** | | **1.00** | | **0.50** | | **0.50** | | **0.50** | |
| PGDW05-0412 | 4/18/2012 | <0.50 | U | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| PGDW20-0412 | 4/16/2012 | <0.50 | U | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| PGDW20d-0412 | 4/16/2012 | <0.50 | U | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| PGDW23-0412 | 4/17/2012 | <0.50 | U | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| PGDW30-0412 | 4/17/2012 | <0.50 | U | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| PGDW50-0412 | 4/19/2012 | <0.50 | U | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| PGPW02-0412 | 4/20/2012 | <0.50 | U | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW02-0412-1 | 4/16/2012 | 402 | | <1.00 | U | 61.1 | | 549 | | 161 | |
| EPAMW02-0412-2 | 4/22/2012 | 607 | | <1.00 | U | 101 | | 894 | | 245 | |
| EPAMW01-0412 | 4/24/2012 | <0.50 | U | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01d-0412 | 4/24/2012 | <0.50 | U | <1.00 | U | <0.50 | U | <0.50 | U | 0.06 | J |
| EPAMW01-0412-2 | 4/24/2012 | <0.50 | U | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-3 | 4/24/2012 | <0.50 | U | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-4 | 4/24/2012 | <0.50 | U | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-5 | 4/24/2012 | <0.50 | U | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-6 | 4/24/2012 | <0.50 | U | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-7 | 4/24/2012 | <0.50 | U | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-8 | 4/24/2012 | <0.50 | U | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-9 | 4/24/2012 | <0.50 | U | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EPAMW01-0412-10 | 4/24/2012 | <0.50 | U | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| FieldBlk01 | 4/16/2012 | <0.50 | U | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| FieldBlk02 | 4/18/2012 | <0.50 | U | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| FieldBlk03 | 4/22/2012 | <0.50 | U | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| FieldBlk04 | 4/24/2012 | <0.50 | U | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EquipBlk01 | 4/16/2012 | <0.50 | U | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EquipBlk02 | 4/18/2012 | <0.50 | U | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EquipBlk03 | 4/22/2012 | <0.50 | U | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| EquipBlk04 | 4/24/2012 | 0.297 | J | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| TripBlk01 | 4/16/2012 | <0.50 | U | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| TripBlk02 | 4/18/2012 | <0.50 | U | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| TripBlk03 | 4/22/2012 | <0.50 | U | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U |
| TripBlk04 | 4/24/2012 | <0.50 | U | <1.00 | U | <0.50 | U | <0.50 | U | <0.50 | U |

## Volatile Organic Compounds (Shaw Environmental, cont.)

| Sample ID | Date | 1,3,5-Trimethylbenzene | 1,3,5-Trimethylbenzene QC | 1,2,4-Trimethylbenzene | 1,2,4-Trimethylbenzene QC | 1,2,3-Trimethylbenzene | 1,2,3-Trimethylbenzene QC | naphthalene | naphthalene QC |
|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | |
| MDL | | 0.04 | | 0.02 | | 0.04 | | 0.03 | |
| QL | | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| PGDW05-0412 | 4/18/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW20-0412 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW20d-0412 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW23-0412 | 4/17/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW30-0412 | 4/17/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW50-0412 | 4/19/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGPW02-0412 | 4/20/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW02-0412-1 | 4/16/2012 | 39.5 | | 74.9 | | 27.6 | | 4.89 | |
| EPAMW02-0412-2 | 4/22/2012 | 71.4 | | 137 | | 45.5 | | 7.49 | |
| EPAMW01-0412 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01d-0412 | 4/24/2012 | 0.15 | J | 0.27 | J | 0.26 | J | 3.78 | |
| EPAMW01-0412-2 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412-3 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412-4 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412-5 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412-6 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412-7 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412-8 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412-9 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412-10 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk01 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk02 | 4/18/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk03 | 4/22/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk04 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk01 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk02 | 4/18/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk03 | 4/22/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk04 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| TripBlk01 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| TripBlk02 | 4/18/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| TripBlk03 | 4/22/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| TripBlk04 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |

## Volatile Organic Compounds (Region 8)

| Sample ID | Date | 1,1,1,2-tetrachloroethane | 1,1,1,2-tetrachloroethane QC | 1,1,1-trichloroethane | 1,1,1-trichloroethane QC | 1,1,2,2-tetrachloroethane | 1,1,2,2-tetrachloroethane QC | 1,1,2-trichloroethane | 1,1,2-trichloroethane QC | 1,1-dichloroethane | 1,1-dichloroethane QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| QL | | 0.25 | | 0.25 | | 0.25 | | 0.25 | | 0.25 | |
| PGDW05-0412 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW20-0412 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW20d-0412 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW23-0412 | 4/17/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW30-0412 | 4/17/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW50-0412 | 4/19/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGPW02-0412 | 4/20/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW02-0412-1 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW02-0412-2 | 4/22/2012 | <5.0 | U | <5.0 | U | <5.0 | U | <5.0 | U | <5.0 | U |
| EPAMW01-0412 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW01d-0412 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |

All values flagged as screening values by lab; second source verification standard was not used.

## Volatile Organic Compounds (Region 8, cont.)

| Sample ID | Date | 1,1-dichloroethene | 1,1-dichloroethene QC | 1,1-dichloropropene | 1,1-dichloropropene QC | 1,2,3-trichlorobenzene | 1,2,3-trichlorobenzene QC | 1,2,3-trichloropropane | 1,2,3-trichloropropane QC | 1,2,4-trichlorobenzene | 1,2,4-trichlorobenzene QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| QL | | 0.25 | | 0.25 | | 0.25 | | 0.25 | | 0.25 | |
| PGDW05-0412 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW20-0412 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW20d-0412 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW23-0412 | 4/17/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW30-0412 | 4/17/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW50-0412 | 4/19/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGPW02-0412 | 4/20/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW02-0412-1 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW02-0412-2 | 4/22/2012 | <5.0 | U | <5.0 | U | <5.0 | U | <5.0 | U | <5.0 | U |
| EPAMW01-0412 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW01d-0412 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |

All values flagged as screening values by lab; second source verification standard was not used.

## Volatile Organic Compounds (Region 8, cont.)

| Sample ID | Date | 1,2,4-trimethylbenzene | 1,2,4-trimethylbenzene QC | 1,2-dibromo-3-chloropropane | 1,2-dibromo-3-chloropropane QC | 1,2-dibromomethane (EDB) | 1,2-dibromomethane (EDB) QC | 1,2-dichlorobenzene | 1,2-dichlorobenzene QC | 1,2-dichloroethane | 1,2-dichloroethane QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| QL | | 0.25 | | 0.25 | | 0.25 | | 0.25 | | 0.25 | |
| PGDW05-0412 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW20-0412 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW20d-0412 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW23-0412 | 4/17/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW30-0412 | 4/17/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW50-0412 | 4/19/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGPW02-0412 | 4/20/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW02-0412-1 | 4/16/2012 | 77.0 | J | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW02-0412-2 | 4/22/2012 | 148 | J | <5.0 | U | <5.0 | U | <5.0 | U | <5.0 | U |
| EPAMW01-0412 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW01d-0412 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |

All values flagged as screening values by lab; second source verification standard was not used.

## Volatile Organic Compounds (Region 8, cont.)

| Sample ID | Date | 1,2-dichloropropane | 1,2-dichloropropane QC | 1,3,5-trimethylbenzene | 1,3,5-trimethylbenzene QC | 1,3-dichlorobenzene | 1,3-dichlorobenzene QC | 1,3-dichloropropane | 1,3-dichloropropane QC | 1,3-dimethyl adamantane | 1,3-dimethyl adamantane QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| QL | | 0.25 | | 0.25 | | 0.25 | | 0.25 | | 0.25 | |
| PGDW05-0412 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | 2.82 | J |
| PGDW20-0412 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW20d-0412 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW23-0412 | 4/17/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW30-0412 | 4/17/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | 2.50 | J |
| PGDW50-0412 | 4/19/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGPW02-0412 | 4/20/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW02-0412-1 | 4/16/2012 | <0.25 | U | 39.5 | J | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW02-0412-2 | 4/22/2012 | <5.0 | U | 74.0 | J | <5.0 | U | <5.0 | U | <5.0 | U |
| EPAMW01-0412 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW01d-0412 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |

All values flagged as screening values by lab; second source verification standard was not used.

## Volatile Organic Compounds (Region 8, cont.)

| Sample ID | Date | 1,4-dichlorobenzene | 1,4-dichlorobenzene QC | 2,2-dichloropropane | 2,2-dichloropropane QC | 2-butanone | 2-butanone QC | 2-chlorotoluene | 2-chlorotoluene QC | 2-hexanone | 2-hexanone QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| QL | | 0.25 | | 0.25 | | 0.25 | | 0.25 | | 0.25 | |
| PGDW05-0412 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW20-0412 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW20d-0412 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW23-0412 | 4/17/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW30-0412 | 4/17/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW50-0412 | 4/19/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGPW02-0412 | 4/20/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW02-0412-1 | 4/16/2012 | <0.25 | U | <0.25 | U | 208 | J | <0.25 | U | <0.25 | U |
| EPAMW02-0412-2 | 4/22/2012 | <5.0 | U | <5.0 | U | 86.2 | J | <5.0 | U | <5.0 | U |
| EPAMW01-0412 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | 0.26 | J |
| EPAMW01d-0412 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |

All values flagged as screening values by lab; second source verification standard was not used.

## Volatile Organic Compounds (Region 8, cont.)

| Sample ID | Date | 4-chlorotoluene | 4-chlorotoluene QC | 4-methyl-2-pentanone | 4-methyl-2-pentanone QC | acetone | acetone QC | acrylonitrile | acrylonitrile QC | adamantane | adamantane QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| QL | | 0.25 | | 0.25 | | 1.00 | | 0.25 | | 0.25 | |
| PGDW05-0412 | 4/18/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| PGDW20-0412 | 4/16/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| PGDW20d-0412 | 4/16/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| PGDW23-0412 | 4/17/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| PGDW30-0412 | 4/17/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| PGDW50-0412 | 4/19/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| PGPW02-0412 | 4/20/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| EPAMW02-0412-1 | 4/16/2012 | <0.25 | U | <0.25 | U | 982 | J | <0.25 | U | <0.25 | U |
| EPAMW02-0412-2 | 4/22/2012 | <5.0 | U | <5.0 | U | 157 | J | <5.0 | U | <5.0 | U |
| EPAMW01-0412 | 4/24/2012 | <0.25 | U | 1.39 | J | 155 | J | <0.25 | U | <0.25 | U |
| EPAMW01d-0412 | 4/24/2012 | <0.25 | U | 1.07 | J | 133 | J | <0.25 | U | <0.25 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <0.25 | U | 0.59 | J | 114 | J | <0.25 | U | <0.25 | U |
| FieldBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| FieldBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| FieldBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| FieldBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| EquipBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| EquipBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| EquipBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| EquipBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| TripBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| TripBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| TripBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| TripBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |

All values flagged as screening values by lab; second source verification standard was not used.

## Volatile Organic Compounds (Region 8, cont.)

| Sample ID | Date | allyl chloride | allyl chloride QC | benzene | benzene QC | bromobenzene | bromobenzene QC | bromochloromethane | bromochloromethane QC | bromodichloromethane | bromodichloromethane QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| QL | | 0.25 | | 0.25 | | 0.25 | | 0.25 | | 0.25 | |
| PGDW05-0412 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW20-0412 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW20d-0412 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW23-0412 | 4/17/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW30-0412 | 4/17/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW50-0412 | 4/19/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGPW02-0412 | 4/20/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW02-0412-1 | 4/16/2012 | <0.25 | U | 175 | J | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW02-0412-2 | 4/22/2012 | <5.0 | U | 247 | J | <5.0 | U | <5.0 | U | <5.0 | U |
| EPAMW01-0412 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW01d-0412 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |

All values flagged as screening values by lab; second source verification standard was not used.

## Volatile Organic Compounds (Region 8, cont.)

| Sample ID | Date | bromoform | bromoform QC | bromomethane | bromomethane QC | carbon disulfide | carbon disulfide QC | carbon tetrachloride | carbon tetrachloride QC | chlorobenzene | chlorobenzene QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| QL | | 0.25 | | 0.25 | | 0.25 | | 0.25 | | 0.25 | |
| PGDW05-0412 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW20-0412 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW20d-0412 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW23-0412 | 4/17/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW30-0412 | 4/17/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW50-0412 | 4/19/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGPW02-0412 | 4/20/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW02-0412-1 | 4/16/2012 | <0.25 | U | <0.25 | U | 5.40 | J | <0.25 | U | <0.25 | U |
| EPAMW02-0412-2 | 4/22/2012 | <5.0 | U | <5.0 | U | <5.0 | U | <5.0 | U | <5.0 | U |
| EPAMW01-0412 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW01d-0412 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |

All values flagged as screening values by lab; second source verification standard was not used.

## Volatile Organic Compounds (Region 8, cont.)

| Sample ID | Date | chlorodibromomethane | chlorodibromomethane QC | chloroethane | chloroethane QC | chloroform | chloroform QC | chloromethane | chloromethane QC | cis-1,2-dichloroethane | cis-1,2-dichloroethane QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| QL | | 0.25 | | 0.25 | | 0.25 | | 0.25 | | 0.25 | |
| PGDW05-0412 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW20-0412 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW20d-0412 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW23-0412 | 4/17/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW30-0412 | 4/17/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW50-0412 | 4/19/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGPW02-0412 | 4/20/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW02-0412-1 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW02-0412-2 | 4/22/2012 | <5.0 | U | <5.0 | U | <5.0 | U | <5.0 | U | <5.0 | U |
| EPAMW01-0412 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW01d-0412 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |

All values flagged as screening values by lab; second source verification standard was not used.

## Volatile Organic Compounds (Region 8, cont.)

| Sample ID | Date | cis-1,3-dichloropropene | cis-1,3-dichloropropene QC | dibromomethane | dibromomethane QC | dichlorodifluoromethane | dichlorodifluoromethane QC | ethyl ether | ethyl ether QA | ethylbenzene | ethylbenzene QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| QL | | 0.25 | | 0.25 | | 1.00 | | 0.25 | | 0.25 | |
| PGDW05-0412 | 4/18/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| PGDW20-0412 | 4/16/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| PGDW20d-0412 | 4/16/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| PGDW23-0412 | 4/17/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| PGDW30-0412 | 4/17/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| PGDW50-0412 | 4/19/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| PGPW02-0412 | 4/20/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| EPAMW02-0412-1 | 4/16/2012 | <0.25 | U | <0.25 | U | <1.00 | U | 1.94 | J | 57.0 | J |
| EPAMW02-0412-2 | 4/22/2012 | <5.0 | U | <5.0 | U | <20.0 | U | <5.0 | U | 89.6 | J |
| EPAMW01-0412 | 4/24/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| EPAMW01d-0412 | 4/24/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| FieldBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| FieldBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| FieldBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| FieldBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| EquipBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| EquipBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| EquipBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| EquipBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| TripBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| TripBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| TripBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |
| TripBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <1.00 | U | <0.25 | U | <0.25 | U |

All values flagged as screening values by lab; second source verification standard was not used.

## Volatile Organic Compounds (Region 8, cont.)

| Sample ID | Date | hexachlorobutadiene | hexachlorobutadiene QC | hexachloroethane | hexachloroethane QC | iodomethane | iodomethane QC | isopropylbenzene | isopropylbenzene QC | m,p-xylene | m,p-xylene QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| QL | | 0.25 | | 0.25 | | 0.25 | | 0.25 | | 0.25 | |
| PGDW05-0412 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW20-0412 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW20d-0412 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW23-0412 | 4/17/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW30-0412 | 4/17/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW50-0412 | 4/19/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGPW02-0412 | 4/20/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW02-0412-1 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | 9.03 | J | 578 | J |
| EPAMW02-0412-2 | 4/22/2012 | <5.0 | U | <5.0 | U | <5.0 | U | 9.40 | J | 973 | J |
| EPAMW01-0412 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW01d-0412 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |

All values flagged as screening values by lab; second source verification standard was not used.

## Volatile Organic Compounds (Region 8, cont.)

| Sample ID | Date | methacrylonitrile | methacrylonitrile QC | methyl acrylate | methyl acrylate QC | methyl tert-butyl ether | methyl tert-butyl ether QC | methylene chloride | methylene chloride QC | naphthalene | naphthalene QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| QL | | 0.25 | | 0.25 | | 0.25 | | 0.25 | | 0.25 | |
| PGDW05-0412 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW20-0412 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW20d-0412 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW23-0412 | 4/17/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW30-0412 | 4/17/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW50-0412 | 4/19/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGPW02-0412 | 4/20/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW02-0412-1 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | 7.19 | J |
| EPAMW02-0412-2 | 4/22/2012 | <5.0 | U | <5.0 | U | <5.0 | U | <5.0 | U | 7.20 | J |
| EPAMW01-0412 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW01d-0412 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |

All values flagged as screening values by lab; second source verification standard was not used.

## Volatile Organic Compounds (Region 8, cont.)

| Sample ID | Date | n-butyl benzene | n-butyl benzene QC | n-propyl benzene | n-propyl benzene QC | o-xylene | o-xylene QC | p-isopropyltoluene | p-isopropyltoluene QC | sec-butylbenzene | sec-butylbenzene QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| QL | | 0.25 | | 0.25 | | 0.25 | | 0.25 | | 0.25 | |
| PGDW05-0412 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW20-0412 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW20d-0412 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW23-0412 | 4/17/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW30-0412 | 4/17/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW50-0412 | 4/19/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGPW02-0412 | 4/20/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW02-0412-1 | 4/16/2012 | 0.38 | J | 9.94 | J | 164 | J | 1.36 | J | 1.05 | J |
| EPAMW02-0412-2 | 4/22/2012 | <5.0 | U | 11.8 | J | 253 | J | <5.0 | U | <5.0 | U |
| EPAMW01-0412 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW01d-0412 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |

All values flagged as screening values by lab; second source verification standard was not used.

## Volatile Organic Compounds (Region 8, cont.)

| Sample ID | Date | styrene | styrene QC | tert-butylbenzene | tert-butylbenzene QC | tetrachloroethene | tetrachloroethene QC | toluene | toluene QC | trans-1,2-dichloroethene | trans-1,2-dichloroethene QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| QL | | 0.25 | | 0.25 | | 0.25 | | 0.25 | | 0.25 | |
| PGDW05-0412 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW20-0412 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW20d-0412 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW23-0412 | 4/17/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW30-0412 | 4/17/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGDW50-0412 | 4/19/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| PGPW02-0412 | 4/20/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW02-0412-1 | 4/16/2012 | 0.43 | J | 0.83 | J | <0.25 | U | 437 | J | <0.25 | U |
| EPAMW02-0412-2 | 4/22/2012 | <5.0 | U | <5.0 | U | <5.0 | U | 677 | J | <5.0 | U |
| EPAMW01-0412 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW01d-0412 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| FieldBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| EquipBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | 0.31 | J | <0.25 | U |
| TripBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |
| TripBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U |

All values flagged as screening values by lab; second source verification standard was not used.

## Volatile Organic Compounds (Region 8, cont.)

| Sample ID | Date | trans-1,3-dichloropropene | trans-1,3-dichloropropene QC | trichloroethene | trichloroethene QC | trichlorofluoromethane | trichlorofluoromethane QC | vinyl chloride | vinyl chloride QC | xylenes (total) | xylenes (total) QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| QL | | 0.25 | | 0.25 | | 0.25 | | 0.25 | | 1.00 | |
| PGDW05-0412 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <1.00 | U |
| PGDW20-0412 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <1.00 | U |
| PGDW20d-0412 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <1.00 | U |
| PGDW23-0412 | 4/17/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <1.00 | U |
| PGDW30-0412 | 4/17/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <1.00 | U |
| PGDW50-0412 | 4/19/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <1.00 | U |
| PGPW02-0412 | 4/20/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <1.00 | U |
| EPAMW02-0412-1 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | 742 | J |
| EPAMW02-0412-2 | 4/22/2012 | <5.0 | U | <5.0 | U | <5.0 | U | <5.0 | U | 1230 | J |
| EPAMW01-0412 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <1.00 | U |
| EPAMW01d-0412 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <1.00 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <1.00 | U |
| FieldBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <1.00 | U |
| FieldBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <1.00 | U |
| FieldBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <1.00 | U |
| FieldBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <1.00 | U |
| EquipBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <1.00 | U |
| EquipBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <1.00 | U |
| EquipBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <1.00 | U |
| EquipBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <1.00 | U |
| TripBlk01 | 4/16/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <1.00 | U |
| TripBlk02 | 4/18/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <1.00 | U |
| TripBlk03 | 4/22/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <1.00 | U |
| TripBlk04 | 4/24/2012 | <0.25 | U | <0.25 | U | <0.25 | U | <0.25 | U | <1.00 | U |

All values flagged as screening values by lab; second source verification standard was not used.

## Semivolatile Organic Compounds

| Sample ID | Date | R-(+)-limonene (5989-27-5) | R-(+)-limonene QC | 1,2,4-trichlorobenzene (120-82-1) | 1,2,4-trichlorobenzene QC | 1,2-dichlorobenzene (95-50-1) | 1,2-dichlorobenzene QC | 1,2-dinitrobenzene (528-29-0) | 1,2-dinitrobenzene QC | 1,3-dichlorobenzene (541-73-1) | 1,3-dichlorobenzene QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Units** | | **µg/L** | | **µg/L** | | **µg/L** | | **µg/L** | | **µg/L** | |
| **QL** | | **1.00** | | **1.00** | | **1.00** | | **1.00** | | **1.00** | |
| PGDW05-0412 | 4/18/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW20-0412 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW20d-0412 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW23-0412 | 4/17/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW30-0412 | 4/17/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW50-0412 | 4/19/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGPW02-0412 | 4/20/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW02-0412-1 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW02-0412-2 | 4/22/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01d-0412 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | 1.98 | | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk01 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk02 | 4/18/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk03 | 4/22/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk04 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk01 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk02 | 4/18/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk03 | 4/22/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk04 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |

## Semivolatile Organic Compounds (cont.)

| Sample ID | Date | 1,3-dimethyladamantane (702-79-4) | 1,3-dimethyladamantane QC | 1,3-dinitrobenzene (99-65-0) | 1,3-dinitrobenzene QC | 1,4-dichlorobenzene (106-46-7) | 1,4-dichlorobenzene QC | 1,4-dinitrobenzene (100-25-4) | 1,4-dinitrobenzene QC | 1-methylnaphthalene (90-12-0) | 1-methylnaphthalene QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| QL | | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| PGDW05-0412 | 4/18/2012 | 1.36 | | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW20-0412 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW20d-0412 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW23-0412 | 4/17/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW30-0412 | 4/17/2012 | 1.08 | | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW50-0412 | 4/19/2012 | <1.00 | J-, U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGPW02-0412 | 4/20/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW02-0412-1 | 4/16/2012 | <1.00 | J-, U | <1.00 | U | <1.00 | U | <1.00 | U | 2.23 | |
| EPAMW02-0412-2 | 4/22/2012 | <1.00 | J-, U | <1.00 | U | <1.00 | U | <1.00 | U | 2.85 | |
| EPAMW01-0412 | 4/24/2012 | <1.00 | J-, U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01d-0412 | 4/24/2012 | <1.00 | J-, U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | <1.00 | J-, U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | <1.00 | J-, U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <1.00 | J-, U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk01 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk02 | 4/18/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk03 | 4/22/2012 | <1.00 | J-, U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk04 | 4/24/2012 | <1.00 | J-, U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk01 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk02 | 4/18/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk03 | 4/22/2012 | <1.00 | J-, U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk04 | 4/24/2012 | <1.00 | J-, U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |

## Semivolatile Organic Compounds (cont.)

| Sample ID | Date | 2,3,4,6-tetrachlorophenol (58-90-2) | 2,3,4,6-tetrachlorophenol QC | 2,3,5,6-tetrachlorophenol (935-95-5) | 2,3,5,6-tetrachlorophenol QC | 2,4,5-trichlorophenol (95-95-4) | 2,4,5-trichlorophenol QC | 2,4,6-trichlorophenol (88-06-2) | 2,4,6-trichlorophenol QC | 2,4-dichlorophenol (120-83-2) | 2,4-dichlorophenol QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| QL | | 2.00 | | 2.00 | | 2.00 | | 2.00 | | 2.00 | |
| PGDW05-0412 | 4/18/2012 | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U |
| PGDW20-0412 | 4/16/2012 | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U |
| PGDW20d-0412 | 4/16/2012 | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U |
| PGDW23-0412 | 4/17/2012 | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U |
| PGDW30-0412 | 4/17/2012 | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U |
| PGDW50-0412 | 4/19/2012 | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U |
| PGPW02-0412 | 4/20/2012 | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U |
| EPAMW02-0412-1 | 4/16/2012 | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U |
| EPAMW02-0412-2 | 4/22/2012 | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U |
| EPAMW01-0412 | 4/24/2012 | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U |
| EPAMW01d-0412 | 4/24/2012 | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U |
| FieldBlk01 | 4/16/2012 | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U |
| FieldBlk02 | 4/18/2012 | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U |
| FieldBlk03 | 4/22/2012 | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U |
| FieldBlk04 | 4/24/2012 | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U |
| EquipBlk01 | 4/16/2012 | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U |
| EquipBlk02 | 4/18/2012 | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U |
| EquipBlk03 | 4/22/2012 | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U |
| EquipBlk04 | 4/24/2012 | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U | <2.00 | U |

## Semivolatile Organic Compounds (cont.)

| Sample ID | Date | 2,4-dimethylphenol (105-67-9) | 2,4-dimethylphenol QC | 2,4-dinitrophenol (51-28-5) | 2,4-dinitrophenol QC | 2,4-dinitrotoluene (121-14-2) | 2,4-dinitrotoluene QC | 2,6-dinitrotoluene (606-20-2) | 2,6-dinitrotoluene QC | 2-butoxyethanol (111-76-2) | 2-butoxyethanol QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| QL | | 2.00 | | 3.00 | | 1.00 | | 1.00 | | 1.00 | |
| PGDW05-0412 | 4/18/2012 | <2.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW20-0412 | 4/16/2012 | <2.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW20d-0412 | 4/16/2012 | <2.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW23-0412 | 4/17/2012 | <2.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW30-0412 | 4/17/2012 | <2.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW50-0412 | 4/19/2012 | <2.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGPW02-0412 | 4/20/2012 | <2.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW02-0412-1 | 4/16/2012 | 36.6 | J+ | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW02-0412-2 | 4/22/2012 | 32.0 | | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412 | 4/24/2012 | <2.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01d-0412 | 4/24/2012 | <2.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | 5.78 | |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | <2.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | <2.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | 3.49 | |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <2.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk01 | 4/16/2012 | <2.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk02 | 4/18/2012 | <2.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk03 | 4/22/2012 | <2.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk04 | 4/24/2012 | <2.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk01 | 4/16/2012 | <2.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk02 | 4/18/2012 | <2.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk03 | 4/22/2012 | <2.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk04 | 4/24/2012 | <2.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |

## Semivolatile Organic Compounds (cont.)

| Sample ID | Date | tri-(2-butoxyethyl) phosphate (78-51-3) | tri-(2-butoxyethyl) phosphate QC | 2-chloronaphthalene (91-58-7) | 2-chloronaphthalene QC | 2-chlorophenol (95-57-8) | 2-chlorophenol QC | 2-methylnaphthalene (91-57-6) | 2-methylnaphthalene QC | 2-methylphenol (95-48-7) | 2-methylphenol QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Units** | | **µg/L** | | **µg/L** | | **µg/L** | | **µg/L** | | **µg/L** | |
| **QL** | | **1.00** | | **1.00** | | **2.00** | | **1.00** | | **2.00** | |
| PGDW05-0412 | 4/18/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |
| PGDW20-0412 | 4/16/2012 | 1.13 | | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |
| PGDW20d-0412 | 4/16/2012 | 1.66 | | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |
| PGDW23-0412 | 4/17/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |
| PGDW30-0412 | 4/17/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |
| PGDW50-0412 | 4/19/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |
| PGPW02-0412 | 4/20/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |
| EPAMW02-0412-1 | 4/16/2012 | <1.00 | U | <1.00 | U | <2.00 | U | 4.08 | | 22.2 | |
| EPAMW02-0412-2 | 4/22/2012 | <1.00 | U | <1.00 | U | <2.00 | U | 5.52 | | 20.8 | J |
| EPAMW01-0412 | 4/24/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |
| EPAMW01d-0412 | 4/24/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |
| FieldBlk01 | 4/16/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |
| FieldBlk02 | 4/18/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |
| FieldBlk03 | 4/22/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |
| FieldBlk04 | 4/24/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |
| EquipBlk01 | 4/16/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |
| EquipBlk02 | 4/18/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |
| EquipBlk03 | 4/22/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |
| EquipBlk04 | 4/24/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |

## Semivolatile Organic Compounds (cont.)

| Sample ID | Date | 2-nitroaniline (88-74-4) | 2-nitroaniline QC | 2-nitrophenol (88-75-5) | 2-nitrophenol QC | 3&4-methylphenol (108-39-4 & 106-44-5) | 3&4-methylphenol QC | 3,3'-dichlorobenzidine (91-94-1) | 3,3'-dichlorobenzidine QC | 3-nitroaniline (99-09-2) | 3-nitroaniline QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Units** | | **µg/L** | | **µg/L** | | **µg/L** | | **µg/L** | | **µg/L** | |
| **QL** | | **1.00** | | **2.00** | | **5.00** | | **1.00** | | **3.00** | |
| PGDW05-0412 | 4/18/2012 | <1.00 | U | <2.00 | U | <5.00 | U | <1.00 | U | <3.00 | U |
| PGDW20-0412 | 4/16/2012 | <1.00 | U | <2.00 | U | <5.00 | U | <1.00 | U | <3.00 | U |
| PGDW20d-0412 | 4/16/2012 | <1.00 | U | <2.00 | U | <5.00 | U | <1.00 | U | <3.00 | U |
| PGDW23-0412 | 4/17/2012 | <1.00 | U | <2.00 | U | <5.00 | U | <1.00 | U | <3.00 | U |
| PGDW30-0412 | 4/17/2012 | <1.00 | U | <2.00 | U | <5.00 | U | <1.00 | U | <3.00 | U |
| PGDW50-0412 | 4/19/2012 | <1.00 | U | <2.00 | U | <5.00 | U | <1.00 | U | <3.00 | U |
| PGPW02-0412 | 4/20/2012 | <1.00 | U | <2.00 | U | <5.00 | U | <1.00 | U | <3.00 | U |
| EPAMW02-0412-1 | 4/16/2012 | <1.00 | U | <2.00 | U | 39.8 | | <1.00 | U | <3.00 | J-, U |
| EPAMW02-0412-2 | 4/22/2012 | <1.00 | U | <2.00 | U | 33.5 | | <1.00 | U | <3.00 | U |
| EPAMW01-0412 | 4/24/2012 | <1.00 | U | <2.00 | U | <5.00 | U | <1.00 | U | <3.00 | U |
| EPAMW01d-0412 | 4/24/2012 | <1.00 | U | <2.00 | U | <5.00 | U | <1.00 | U | <3.00 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | <1.00 | U | <2.00 | U | <5.00 | U | <1.00 | U | <3.00 | U |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | <1.00 | U | <2.00 | U | <5.00 | U | <1.00 | U | <3.00 | U |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <1.00 | U | <2.00 | U | <5.00 | U | <1.00 | U | <3.00 | U |
| FieldBlk01 | 4/16/2012 | <1.00 | U | <2.00 | U | <5.00 | U | <1.00 | U | <3.00 | U |
| FieldBlk02 | 4/18/2012 | <1.00 | U | <2.00 | U | <5.00 | U | <1.00 | U | <3.00 | U |
| FieldBlk03 | 4/22/2012 | <1.00 | U | <2.00 | U | <5.00 | U | <1.00 | U | <3.00 | U |
| FieldBlk04 | 4/24/2012 | <1.00 | U | <2.00 | U | <5.00 | U | <1.00 | U | <3.00 | U |
| EquipBlk01 | 4/16/2012 | <1.00 | U | <2.00 | U | <5.00 | U | <1.00 | U | <3.00 | U |
| EquipBlk02 | 4/18/2012 | <1.00 | U | <2.00 | U | <5.00 | U | <1.00 | U | <3.00 | U |
| EquipBlk03 | 4/22/2012 | <1.00 | U | <2.00 | U | <5.00 | U | <1.00 | U | <3.00 | U |
| EquipBlk04 | 4/24/2012 | <1.00 | U | <2.00 | U | <5.00 | U | <1.00 | U | <3.00 | U |

## Semivolatile Organic Compounds (cont.)

| Sample ID | Date | 4,6-dinitro-2-methylphenol (534-52-1) | 4,6-dinitro-2-methylphenol QC | 4-bromophenyl phenyl ether (101-55-3) | 4-bromophenyl phenyl ether QC | 4-chloro-3-methylphenol (59-50-7) | 4-chloro-3-methylphenol QC | 4-chloroaniline (106-47-8) | 4-chloroaniline QC | 4-chlorophenyl phenyl ether (7005-72-3) | 4-chlorophenyl phenyl ether QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Units** | | **µg/L** | | **µg/L** | | **µg/L** | | **µg/L** | | **µg/L** | |
| **QL** | | **2.00** | | **1.00** | | **2.00** | | **3.00** | | **1.00** | |
| PGDW05-0412 | 4/18/2012 | <2.00 | U | <1.00 | U | <2.00 | U | <3.00 | U | <1.00 | U |
| PGDW20-0412 | 4/16/2012 | <2.00 | U | <1.00 | U | <2.00 | U | <3.00 | U | <1.00 | U |
| PGDW20d-0412 | 4/16/2012 | <2.00 | U | <1.00 | U | <2.00 | U | <3.00 | U | <1.00 | U |
| PGDW23-0412 | 4/17/2012 | <2.00 | U | <1.00 | U | <2.00 | U | <3.00 | U | <1.00 | U |
| PGDW30-0412 | 4/17/2012 | <2.00 | U | <1.00 | U | <2.00 | U | <3.00 | U | <1.00 | U |
| PGDW50-0412 | 4/19/2012 | <2.00 | U | <1.00 | U | <2.00 | U | <3.00 | U | <1.00 | U |
| PGPW02-0412 | 4/20/2012 | <2.00 | U | <1.00 | U | <2.00 | U | <3.00 | U | <1.00 | U |
| EPAMW02-0412-1 | 4/16/2012 | <2.00 | U | <1.00 | U | <2.00 | U | <3.00 | J-, U | <1.00 | U |
| EPAMW02-0412-2 | 4/22/2012 | <2.00 | U | <1.00 | U | <2.00 | U | <3.00 | U | <1.00 | U |
| EPAMW01-0412 | 4/24/2012 | <2.00 | U | <1.00 | U | <2.00 | U | <3.00 | U | <1.00 | U |
| EPAMW01d-0412 | 4/24/2012 | <2.00 | U | <1.00 | U | <2.00 | U | <3.00 | U | <1.00 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | <2.00 | U | <1.00 | U | <2.00 | U | <3.00 | U | <1.00 | U |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | <2.00 | U | <1.00 | U | <2.00 | U | <3.00 | U | <1.00 | U |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <2.00 | U | <1.00 | U | <2.00 | U | <3.00 | U | <1.00 | U |
| FieldBlk01 | 4/16/2012 | <2.00 | U | <1.00 | U | <2.00 | U | <3.00 | U | <1.00 | U |
| FieldBlk02 | 4/18/2012 | <2.00 | U | <1.00 | U | <2.00 | U | <3.00 | U | <1.00 | U |
| FieldBlk03 | 4/22/2012 | <2.00 | U | <1.00 | U | <2.00 | U | <3.00 | U | <1.00 | U |
| FieldBlk04 | 4/24/2012 | <2.00 | U | <1.00 | U | <2.00 | U | <3.00 | U | <1.00 | U |
| EquipBlk01 | 4/16/2012 | <2.00 | U | <1.00 | U | <2.00 | U | <3.00 | U | <1.00 | U |
| EquipBlk02 | 4/18/2012 | <2.00 | U | <1.00 | U | <2.00 | U | <3.00 | U | <1.00 | U |
| EquipBlk03 | 4/22/2012 | <2.00 | U | <1.00 | U | <2.00 | U | <3.00 | U | <1.00 | U |
| EquipBlk04 | 4/24/2012 | <2.00 | U | <1.00 | U | <2.00 | U | <3.00 | U | <1.00 | U |

## Semivolatile Organic Compounds (cont.)

| Sample ID | Date | 4-nitroaniline (100-01-6) | 4-nitroaniline QC | 4-nitrophenol (100-02-7) | 4-nitrophenol QC | Acenaphthene (83-32-9) | Acenaphthene QC | Acenaphthylene (208-96-8) | Acenaphthylene QC | Adamantane (281-23-2) | Adamantane QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Units** | | **µg/L** | | **µg/L** | | **µg/L** | | **µg/L** | | **µg/L** | |
| **QL** | | **3.00** | | **3.00** | | **1.00** | | **1.00** | | **1.00** | |
| PGDW05-0412 | 4/18/2012 | <3.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW20-0412 | 4/16/2012 | <3.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW20d-0412 | 4/16/2012 | <3.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW23-0412 | 4/17/2012 | <3.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW30-0412 | 4/17/2012 | <3.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW50-0412 | 4/19/2012 | <3.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGPW02-0412 | 4/20/2012 | <3.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW02-0412-1 | 4/16/2012 | <3.00 | J-, U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW02-0412-2 | 4/22/2012 | <3.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412 | 4/24/2012 | <3.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01d-0412 | 4/24/2012 | <3.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | <3.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | <3.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <3.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk01 | 4/16/2012 | <3.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk02 | 4/18/2012 | <3.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk03 | 4/22/2012 | <3.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk04 | 4/24/2012 | <3.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk01 | 4/16/2012 | <3.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk02 | 4/18/2012 | <3.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk03 | 4/22/2012 | <3.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk04 | 4/24/2012 | <3.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |

## Semivolatile Organic Compounds (cont.)

| Sample ID | Date | Aniline (62-53-3) | Aniline QC | Anthracene (120-12-7) | Anthracene QC | Azobenzene (103-33-3) | Azobenzene QC | Benzo(a)anthracene (56-55-3) | Benzo(a)anthracene QC | Benzo(a)pyrene (50-32-3) | Benzo(a)pyrene QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Units** | | **µg/L** | | **µg/L** | | **µg/L** | | **µg/L** | | **µg/L** | |
| **QL** | | **1.00** | | **1.00** | | **1.00** | | **1.00** | | **1.00** | |
| PGDW05-0412 | 4/18/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW20-0412 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW20d-0412 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW23-0412 | 4/17/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW30-0412 | 4/17/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW50-0412 | 4/19/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGPW02-0412 | 4/20/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW02-0412-1 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW02-0412-2 | 4/22/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01d-0412 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk01 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk02 | 4/18/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk03 | 4/22/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk04 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk01 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk02 | 4/18/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk03 | 4/22/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk04 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |

## Semivolatile Organic Compounds (cont.)

| Sample ID | Date | Benzo(b)fluoranthene (205-99-2) | Benzo(b)fluoranthene QC | Benzo(g,h,i)perylene (191-24-2) | Benzo(g,h,i)perylene QC | Benzo(k)fluoranthene (207-08-9) | Benzo(k)fluoranthene QC | Benzoic Acid (65-85-0) | Benzoic Acid QC | Benzyl alcohol (100-51-6) | Benzyl alcohol QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| QL | | 1.00 | | 1.00 | | 1.00 | | 3.00 | | 1.00 | |
| PGDW05-0412 | 4/18/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <3.00 | U | <1.00 | U |
| PGDW20-0412 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <3.00 | U | <1.00 | U |
| PGDW20d-0412 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <3.00 | U | <1.00 | U |
| PGDW23-0412 | 4/17/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <3.00 | U | <1.00 | U |
| PGDW30-0412 | 4/17/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <3.00 | U | <1.00 | U |
| PGDW50-0412 | 4/19/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <3.00 | U | <1.00 | U |
| PGPW02-0412 | 4/20/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <3.00 | U | <1.00 | U |
| EPAMW02-0412-1 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | 513 | | <1.00 | J-, U |
| EPAMW02-0412-2 | 4/22/2012 | <1.00 | U | <1.00 | U | <1.00 | U | 110 | * | <1.00 | U |
| EPAMW01-0412 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | 221 | * | <1.00 | U |
| EPAMW01d-0412 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | 309 | * | <1.00 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | 735 | *, J | <1.00 | U |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | 310 | * | <1.00 | U |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | 237 | * | <1.00 | U |
| FieldBlk01 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <3.00 | U | <1.00 | U |
| FieldBlk02 | 4/18/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <3.00 | U | <1.00 | U |
| FieldBlk03 | 4/22/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <3.00 | U | <1.00 | U |
| FieldBlk04 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <3.00 | U | <1.00 | U |
| EquipBlk01 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <3.00 | U | <1.00 | U |
| EquipBlk02 | 4/18/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <3.00 | U | <1.00 | U |
| EquipBlk03 | 4/22/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <3.00 | U | <1.00 | U |
| EquipBlk04 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <3.00 | U | <1.00 | U |

## Semivolatile Organic Compounds (cont.)

| Sample ID | Date | Bis (2-chloroethoxy)methane (111-91-1) | Bis (2-chloroethoxy)methane QC | Bis (2-chloroethyl)ether (111-44-4) | Bis (2-chloroethyl)ether QC | Bis (2-chloroisopropyl)ether (108-60-1) | Bis (2-chloroisopropyl)ether QC | Bis (2-ethylhexyl) adipate (103-23-1) | Bis (2-ethylhexyl) adipate QC | Bis (2-ethylhexyl) phthalate (117-81-7) | Bis (2-ethylhexyl) phthalate QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| QL | | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 2.00 | |
| PGDW05-0412 | 4/18/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | 5.17 | |
| PGDW20-0412 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <2.00 | U |
| PGDW20d-0412 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <2.00 | U |
| PGDW23-0412 | 4/17/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <2.00 | U |
| PGDW30-0412 | 4/17/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <2.00 | U |
| PGDW50-0412 | 4/19/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <2.00 | U |
| PGPW02-0412 | 4/20/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <2.00 | U |
| EPAMW02-0412-1 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | 3.52 | J- |
| EPAMW02-0412-2 | 4/22/2012 | <1.00 | U | <1.00 | U | <1.00 | U | 1.03 | | 2.10 | |
| EPAMW01-0412 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <2.00 | U |
| EPAMW01d-0412 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <2.00 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <2.00 | U |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <2.00 | U |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <2.00 | U |
| FieldBlk01 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <2.00 | U |
| FieldBlk02 | 4/18/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <2.00 | U |
| FieldBlk03 | 4/22/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <2.00 | U |
| FieldBlk04 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <2.00 | U |
| EquipBlk01 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <2.00 | U |
| EquipBlk02 | 4/18/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <2.00 | U |
| EquipBlk03 | 4/22/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <2.00 | U |
| EquipBlk04 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <2.00 | U |

## Semivolatile Organic Compounds (cont.)

| Sample ID | Date | Butyl benzyl phthalate (85-68-7) | Butyl benzyl phthalate QC | Carbazole (86-74-8) | Carbazole QC | Chrysene (218-01-9) | Chrysene QC | Dibenz(a,h)anthracene (53-70-3) | Dibenz(a,h)anthracene QC | Dibenzofuran (132-64-9) | Dibenzofuran QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Units** | | **µg/L** | | **µg/L** | | **µg/L** | | **µg/L** | | **µg/L** | |
| **QL** | | **1.00** | | **3.00** | | **1.00** | | **1.00** | | **1.00** | |
| PGDW05-0412 | 4/18/2012 | <1.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW20-0412 | 4/16/2012 | <1.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW20d-0412 | 4/16/2012 | <1.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW23-0412 | 4/17/2012 | <1.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW30-0412 | 4/17/2012 | <1.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW50-0412 | 4/19/2012 | <1.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGPW02-0412 | 4/20/2012 | <1.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW02-0412-1 | 4/16/2012 | <1.00 | U | <3.00 | U | <1.00 | J-, U | <1.00 | U | <1.00 | U |
| EPAMW02-0412-2 | 4/22/2012 | <1.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412 | 4/24/2012 | <1.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01d-0412 | 4/24/2012 | <1.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | <1.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | <1.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <1.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk01 | 4/16/2012 | <1.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk02 | 4/18/2012 | <1.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk03 | 4/22/2012 | <1.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk04 | 4/24/2012 | <1.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk01 | 4/16/2012 | <1.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk02 | 4/18/2012 | <1.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk03 | 4/22/2012 | <1.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk04 | 4/24/2012 | <1.00 | U | <3.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |

## Semivolatile Organic Compounds (cont.)

| Sample ID | Date | Diethyl phthalate (84-66-2) | Diethyl phthalate QC | Dimethyl phthalate (131-11-3) | Dimethyl phthalate QC | Di-n-butyl phthalate (84-74-2) | Di-n-butyl phthalate QC | Di-n-octyl phthalate (117-84-0) | Di-n-octyl phthalate QC | Diphenylamine (122-39-4) | Diphenylamine QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Units** | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| **QL** | | **1.00** | | **1.00** | | **1.00** | | **1.00** | | **1.00** | |
| PGDW05-0412 | 4/18/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW20-0412 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW20d-0412 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW23-0412 | 4/17/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW30-0412 | 4/17/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW50-0412 | 4/19/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGPW02-0412 | 4/20/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW02-0412-1 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW02-0412-2 | 4/22/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01d-0412 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk01 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk02 | 4/18/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk03 | 4/22/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk04 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk01 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk02 | 4/18/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk03 | 4/22/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk04 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |

## Semivolatile Organic Compounds (cont.)

| Sample ID | Date | Fluoranthene (206-44-0) | Fluoranthene QC | Fluorene (86-73-7) | Fluorene QC | Hexachlorobenzene (118-74-1) | Hexachlorobenzene QC | Hexachlorobutadiene (87-68-3) | Hexachlorobutadiene QC | Hexachlorocyclopentadiene (77-47-4) | Hexachlorocyclopentadiene QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| QL | | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| PGDW05-0412 | 4/18/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW20-0412 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW20d-0412 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW23-0412 | 4/17/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW30-0412 | 4/17/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW50-0412 | 4/19/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGPW02-0412 | 4/20/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW02-0412-1 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW02-0412-2 | 4/22/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01d-0412 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk01 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk02 | 4/18/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk03 | 4/22/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk04 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk01 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk02 | 4/18/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk03 | 4/22/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk04 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |

## Semivolatile Organic Compounds (cont.)

| Sample ID | Date | Hexachloroethane (67-72-1) | Hexachloroethane QC | Indeno(1,2,3-cd)pyrene (193-39-5) | Indeno(1,2,3-cd)pyrene QC | Isophorone (78-59-1) | Isophorone QC | Naphthalene (91-20-3) | Naphthalene QC | Nitrobenzene (98-95-3) | Nitrobenzene QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Units** | | **µg/L** | | **µg/L** | | **µg/L** | | **µg/L** | | **µg/L** | |
| **QL** | | **1.00** | | **1.00** | | **1.00** | | **1.00** | | **1.00** | |
| PGDW05-0412 | 4/18/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW20-0412 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW20d-0412 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW23-0412 | 4/17/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW30-0412 | 4/17/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGDW50-0412 | 4/19/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| PGPW02-0412 | 4/20/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW02-0412-1 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | 4.29 | | <1.00 | U |
| EPAMW02-0412-2 | 4/22/2012 | <1.00 | U | <1.00 | U | <1.00 | U | 4.78 | | <1.00 | U |
| EPAMW01-0412 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01d-0412 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk01 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk02 | 4/18/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk03 | 4/22/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| FieldBlk04 | 4/24/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk01 | 4/16/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk02 | 4/18/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk03 | 4/22/2012 | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U | <1.00 | U |
| EquipBlk04 | 4/24/2012 | <1.00 | U | <1.00 | U | 1.17 | | <1.00 | U | <1.00 | U |

## Semivolatile Organic Compounds (cont.)

| Sample ID | Date | N-nitrosodimethylamine (62-75-9) | N-nitrosodimethylamine QC | N-nitrosodi-n-propylamine (621-64-7) | N-nitrosodi-n-propylamine QC | Pentachlorophenol (87-86-5) | Pentachlorophenol QC | Phenanthrene (85-01-8) | Phenanthrene QC | Phenol (108-95-2) | Phenol QC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Units** | | **µg/L** | | **µg/L** | | **µg/L** | | **µg/L** | | **µg/L** | |
| **QL** | | **1.00** | | **1.00** | | **2.00** | | **1.00** | | **2.00** | |
| PGDW05-0412 | 4/18/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |
| PGDW20-0412 | 4/16/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |
| PGDW20d-0412 | 4/16/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |
| PGDW23-0412 | 4/17/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |
| PGDW30-0412 | 4/17/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |
| PGDW50-0412 | 4/19/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |
| PGPW02-0412 | 4/20/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |
| EPAMW02-0412-1 | 4/16/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | 32.7 | J- |
| EPAMW02-0412-2 | 4/22/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | 16.0 | |
| EPAMW01-0412 | 4/24/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | 8.09 | J+ |
| EPAMW01d-0412 | 4/24/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | 8.42 | |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | 9.65 | |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | 6.68 | |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | 5.42 | |
| FieldBlk01 | 4/16/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |
| FieldBlk02 | 4/18/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |
| FieldBlk03 | 4/22/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |
| FieldBlk04 | 4/24/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |
| EquipBlk01 | 4/16/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |
| EquipBlk02 | 4/18/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |
| EquipBlk03 | 4/22/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |
| EquipBlk04 | 4/24/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U | <2.00 | U |

## Semivolatile Organic Compounds (cont.)

| Sample ID | Date | Pyrene (129-00-0) | Pyrene QC | Pyridine (110-86-1) | Pyridine QC | Squalene (111-02-4) | Squalene QC | Terpinol (98-55-5) | Terpinol QC |
|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | |
| QL | | 1.00 | | 1.00 | | 2.00 | | 1.00 | |
| PGDW05-0412 | 4/18/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U |
| PGDW20-0412 | 4/16/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U |
| PGDW20d-0412 | 4/16/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U |
| PGDW23-0412 | 4/17/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U |
| PGDW30-0412 | 4/17/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U |
| PGDW50-0412 | 4/19/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | J-, U |
| PGPW02-0412 | 4/20/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U |
| EPAMW02-0412-1 | 4/16/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U |
| EPAMW02-0412-2 | 4/22/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U |
| EPAMW01-0412 | 4/24/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U |
| EPAMW01d-0412 | 4/24/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U |
| FieldBlk01 | 4/16/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U |
| FieldBlk02 | 4/18/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U |
| FieldBlk03 | 4/22/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U |
| FieldBlk04 | 4/24/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U |
| EquipBlk01 | 4/16/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U |
| EquipBlk02 | 4/18/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U |
| EquipBlk03 | 4/22/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U |
| EquipBlk04 | 4/24/2012 | <1.00 | U | <1.00 | U | <2.00 | U | <1.00 | U |

## Diesel Range Organics and Gasoline Range Organics

| Sample ID | Date | GRO/TPH | GRO/TPH QC | DRO | DRO QC |
|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | |
| QL | | 20 | | 20 | |
| PGDW05-0412 | 4/18/2012 | 48 | | 63.5 | |
| PGDW20-0412 | 4/16/2012 | <20 | U | <20 | U |
| PGDW20d-0412 | 4/16/2012 | <20 | U | <20 | U |
| PGDW23-0412 | 4/17/2012 | <20 | U | <20 | U |
| PGDW30-0412 | 4/17/2012 | 27.3 | | 43.8 | |
| PGDW50-0412 | 4/19/2012 | <20 | H, U | <20 | U |
| PGPW02-0412 | 4/20/2012 | <20 | U | <20 | U |
| EPAMW02-0412-1 | 4/16/2012 | 4500 | | 4150 | |
| EPAMW02-0412-2 | 4/22/2012 | 5290 | | 2100 | |
| EPAMW01-0412 | 4/24/2012 | 528 | | 484 | |
| EPAMW01d-0412 | 4/24/2012 | 539 | | 476 | |
| EPAMW01-0412-2 | 4/24/2012 | 531 | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | 493 | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | 584 | | 555 | |
| EPAMW01-0412-5 | 4/24/2012 | 461 | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | 444 | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | 418 | | 379 | |
| EPAMW01-0412-8 | 4/24/2012 | 402 | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | 410 | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | 328 | | 267 | |
| FieldBlk01 | 4/16/2012 | <20 | U | <20 | U |
| FieldBlk02 | 4/18/2012 | <20 | U | <20 | U |
| FieldBlk03 | 4/22/2012 | <20 | U | <20 | U |
| FieldBlk04 | 4/24/2012 | <20 | U | <20 | U |
| EquipBlk01 | 4/16/2012 | <20 | U | <20 | U |
| EquipBlk02 | 4/18/2012 | <20 | U | <20 | U |
| EquipBlk03 | 4/22/2012 | <20 | U | <20 | U |
| EquipBlk04 | 4/24/2012 | 22.4 | J | <20 | U |

## Glycols

| Sample ID | Date | 2-butoxyethanol (111-76-2) | 2-butoxyethanol QC | Diethylene glycol (111-46-6) | Diethylene glycol QC | Triethylene glycol (112-27-6) | Triethylene glycol QC | Tetraethylene glycol (112-60-7) | Tetraethylene glycol QC |
|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | |
| QL | | 5.0 | | 5.0 | | 10.0 | | 10.0 | |
| PGDW05-0412 | 4/18/2012 | <5.0 | J-, U | <5.0 | J-, U | <10.0 | J-, U | <10.0 | J-, U |
| PGDW20-0412 | 4/16/2012 | <5.0 | J-, U | <5.0 | J-, U | <10.0 | J-, U | <10.0 | J-, U |
| PGDW20d-0412 | 4/16/2012 | <5.0 | J-, U | <5.0 | J-, U | <10.0 | J-, U | <10.0 | J-, U |
| PGDW23-0412 | 4/17/2012 | <5.0 | J-, U | <5.0 | J-, U | <10.0 | J-, U | <10.0 | J-, U |
| PGDW30-0412 | 4/17/2012 | <5.0 | J-, U | <5.0 | J-, U | <10.0 | J-, U | <10.0 | J-, U |
| PGDW50-0412 | 4/19/2012 | <5.0 | U | <5.0 | U | <10.0 | U | <10.0 | U |
| PGPW02-0412 | 4/20/2012 | <5.0 | U | <5.0 | U | <10.0 | U | <10.0 | U |
| EPAMW02-0412-1 | 4/16/2012 | 6.8 | J- | 1260 | J- | 262 | J- | 22.6 | J- |
| EPAMW02-0412-2 | 4/22/2012 | <5.0 | U | 378 | J | 72.3 | J | 3.6 | J |
| EPAMW01-0412 | 4/24/2012 | 3.5 | J- | 53.9 | J | 11.5 | J- | <10.0 | J-, U |
| EPAMW01d-0412 | 4/24/2012 | 3.0 | J- | 53.9 | J | 11.6 | J- | <10.0 | J-, U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | 5.1 | J- | 60 | J | 12.7 | J- | <10.0 | J-, U |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | 1.5 | J- | 34.1 | J | 4.9 | J- | <10.0 | J-, U |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <5.0 | J-, U | 26.4 | J | 2.9 | J- | <10.0 | J-, U |
| FieldBlk01 | 4/16/2012 | <5.0 | J-, U | <5.0 | J-, U | <10.0 | J-, U | <10.0 | J-, U |
| FieldBlk02 | 4/18/2012 | <5.0 | J-, U | <5.0 | J-, U | <10.0 | J-, U | <10.0 | J-, U |
| FieldBlk03 | 4/22/2012 | <5.0 | U | <5.0 | U | <10.0 | U | <10.0 | U |
| FieldBlk04 | 4/24/2012 | <5.0 | U | <5.0 | U | <10.0 | U | <10.0 | U |
| EquipBlk01 | 4/16/2012 | <5.0 | U | <5.0 | U | <10.0 | U | <10.0 | U |
| EquipBlk02 | 4/18/2012 | <5.0 | J-, U | <5.0 | J-, U | <10.0 | J-, U | <10.0 | J-, U |
| EquipBlk04 | 4/24/2012 | <5.0 | U | <5.0 | U | <10.0 | U | <10.0 | U |

Method used for analysis of glycols is in development.

## Methanol, Ethylene Glycol, and Propylene Glycol

| Sample ID | Date | Methanol | Methanol QC | Ethylene Glycol | Ethylene Glycol QC | Propylene Glycol | Propylene Glycol QC |
|---|---|---|---|---|---|---|---|
| **Units** | | **µg/L** | | **µg/L** | | **µg/L** | |
| **QL** | | **5000** | | **5000** | | **5000** | |
| PGDW05-0412 | 4/18/2012 | <5000 | U | <5000 | U | <5000 | U |
| PGDW20-0412 | 4/16/2012 | <5000 | U | <5000 | U | <5000 | U |
| PGDW20d-0412 | 4/16/2012 | <5000 | U | <5000 | U | <5000 | U |
| PGDW23-0412 | 4/17/2012 | <5000 | U | <5000 | U | <5000 | U |
| PGDW30-0412 | 4/17/2012 | <5000 | U | <5000 | U | <5000 | U |
| PGDW50-0412 | 4/19/2012 | <5000 | U | <5000 | U | <5000 | U |
| PGPW02-0412 | 4/20/2012 | <5000 | U | <5000 | U | <5000 | U |
| EPAMW02-0412-1 | 4/16/2012 | <5000 | U | <5000 | U | <5000 | U |
| EPAMW02-0412-2 | 4/22/2012 | <5000 | U | <5000 | U | <5000 | U |
| EPAMW01-0412 | 4/24/2012 | <5000 | U | <5000 | U | <5000 | U |
| EPAMW01d-0412 | 4/24/2012 | <5000 | U | <5000 | U | <5000 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | NA | | NA | | NA | |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | NA | | NA | | NA | |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <5000 | U | <5000 | U | <5000 | U |
| FieldBlk01 | 4/16/2012 | <5000 | U | <5000 | U | <5000 | U |
| FieldBlk02 | 4/18/2012 | <5000 | U | <5000 | U | <5000 | U |
| FieldBlk03 | 4/22/2012 | <5000 | U | <5000 | U | <5000 | U |
| FieldBlk04 | 4/24/2012 | <5000 | U | <5000 | U | <5000 | U |
| EquipBlk01 | 4/16/2012 | <5000 | U | <5000 | U | <5000 | U |
| EquipBlk02 | 4/18/2012 | <5000 | U | <5000 | U | <5000 | U |
| EquipBlk04 | 4/24/2012 | <5000 | U | <5000 | U | <5000 | U |

# Ethoxylates, Alkylphenols, and Acrylamide

| Sample ID | Date | Nonylphenol ethoxylate | Nonylphenol ethoxylate QC | Ethoxylated alcohol C12 | Ethoxylated alcohol C12 QC | Ethoxylated alcohol C13 | Ethoxylated alcohol C13 QC | Ethoxylated alcohol C14 | Ethoxylated alcohol C14 QC | Ethoxylated alcohol C15 | Ethoxylated alcohol C15 QC | Nonylphenol | Nonylphenol QC | Octylphenol | Octylphenol QC | Acrylamide | Acrylamide QC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Units | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| QL | | 0.2 | | 0.05 | | 0.05 | | 0.05 | | 0.05 | | 0.05 | | 0.05 | | 0.2 | |
| PGDW05-0412 | 4/18/2012 | R | R | R | R | R | R | R | R | R | R | 0.11 | J-, B | <0.05 | U | <0.20 | U |
| PGDW20-0412 | 4/16/2012 | R | R | R | R | R | R | R | R | R | R | <0.05 | U | <0.05 | H, U | <0.20 | U |
| PGDW20d-0412 | 4/16/2012 | R | R | R | R | R | R | R | R | R | R | <0.05 | U | <0.05 | H, U | <0.20 | U |
| PGDW23-0412 | 4/17/2012 | R | R | R | R | R | R | R | R | R | R | <0.05 | U | <0.05 | U | <0.20 | U |
| PGDW30-0412 | 4/17/2012 | R | R | R | R | R | R | R | R | R | R | <0.05 | U | <0.05 | U | <0.20 | U |
| PGDW50-0412 | 4/19/2012 | R | R | R | R | R | R | R | R | R | R | 0.10 | J-, B | <0.05 | U | <0.20 | U |
| PGPW02-0412 | 4/20/2012 | R | R | R | R | R | R | R | R | R | R | 0.06 | J-, B | <0.05 | U | <0.20 | U |
| EPAMW02-0412-1 | 4/16/2012 | R | R | R | R | R | R | R | R | R | R | 28 | H, J- | 2.9 | H, J | <0.20 | U |
| EPAMW02-0412-2 | 4/22/2012 | R | R | R | R | R | R | R | R | R | R | 7.4-7.9 | J- | 0.5-0.7 | J | <0.20 | U |
| EPAMW01-0412 | 4/24/2012 | R | R | R | R | R | R | R | R | R | R | 0.60 | J-, B | 0.14 | J | <0.20 | U |
| EPAMW01d-0412 | 4/24/2012 | R | R | R | R | R | R | R | R | R | R | 0.57 | J-, B | 0.13 | J | <0.20 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-4 | 4/24/2012 | R | R | R | R | R | R | R | R | R | R | 0.65 | J-, B | 0.16 | J | <0.20 | U |
| EPAMW01-0412-5 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-7 | 4/24/2012 | R | R | R | R | R | R | R | R | R | R | 0.65 | J, B | 0.10 | J | <0.20 | U |
| EPAMW01-0412-8 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | | NA | | NA | | NA | | NA | | NA | | NA | | NA | |
| EPAMW01-0412-10 | 4/24/2012 | R | R | R | R | R | R | R | R | R | R | 0.24 | J-, B | 0.051 | J | <0.20 | U |
| FieldBlk01 | 4/16/2012 | R | R | R | R | R | R | R | R | R | R | 0.42 | J- | <0.05 | U | <0.20 | U |
| FieldBlk02 | 4/18/2012 | R | R | R | R | R | R | R | R | R | R | 0.06 | J- | <0.05 | U | <0.20 | U |
| FieldBlk03 | 4/22/2012 | R | R | R | R | R | R | R | R | R | R | <0.05 | U | <0.05 | U | <0.20 | U |
| FieldBlk04 | 4/24/2012 | R | R | R | R | R | R | R | R | R | R | 0.07 | J- | <0.05 | U | <0.20 | U |
| EquipBlk01 | 4/16/2012 | R | R | R | R | R | R | R | R | R | R | 0.05 | J-, H | <0.05 | H, U | <0.20 | U |
| EquipBlk02 | 4/18/2012 | R | R | R | R | R | R | R | R | R | R | 0.06 | J | <0.05 | U | <0.20 | U |
| EquipBlk04 | 4/22/2012 | R | R | R | R | R | R | R | R | R | R | 0.07 | J | <0.05 | U | <0.20 | U |

R flags: data rejected due to significant lab, field, and equipment blank contamination, and laboratory QA/QC deficiencies.
Methods used for analysis are in development.

## Methylene Blue Active Substances

| Sample ID | Date | MBAS | MBAS QA |
|---|---|---|---|
| Units | | mg/L | |
| QL | | 0.2 LAS † | |
| PGDW05-0412 | 4/18/2012 | <0.2 | U |
| PGDW20-0412 | 4/18/2012 | <0.2 | U |
| PGDW20d-0412 | 4/18/2012 | <0.2 | U |
| PGDW23-0412 | 4/17/2012 | <0.2 | U |
| PGDW30-0412 | 4/17/2012 | <0.2 | U |
| PGDW50-0412 | 4/19/2012 | <0.2 | U |
| PGPW02-0412 | 4/20/2012 | <0.2 | U |
| EPAMW02-0412-1 | 4/16/2012 | <0.2 | U |
| EPAMW02-0412-2 | 4/22/2012 | <0.2 | U |
| EPAMW01-0412 | 4/24/2012 | <0.2 | U |
| EPAMW01d-0412 | 4/24/2012 | <0.2 | U |
| EPAMW01-0412-2 | 4/24/2012 | NA | |
| EPAMW01-0412-3 | 4/24/2012 | NA | |
| EPAMW01-0412-4 | 4/24/2012 | <0.2 | U |
| EPAMW01-0412-5 | 4/24/2012 | NA | |
| EPAMW01-0412-6 | 4/24/2012 | NA | |
| EPAMW01-0412-7 | 4/24/2012 | <0.2 | U |
| EPAMW01-0412-8 | 4/24/2012 | NA | |
| EPAMW01-0412-9 | 4/24/2012 | NA | |
| EPAMW01-0412-10 | 4/24/2012 | <0.2 | U |
| FieldBlk01 | 4/16/2012 | ** | |
| FieldBlk02 | 4/18/2012 | <0.2 | U |
| FieldBlk03 | 4/22/2012 | <0.2 | U |
| FieldBlk04 | 4/24/2012 | <0.2 | U |
| EquipBlk01 | 4/16/2012 | ** | |
| EquipBlk02 | 4/18/2012 | <0.2 | U |
| EquipBlk04 | 4/24/2012 | <0.2 | U |

** Samples lost in shipment.
† Linear Alkylate Sulfonate

## Water Isotopes

| Sample ID | Date | $\delta^2H$ | QC Flags | $\delta^{18}O$ | QC Flags |
|---|---|---|---|---|---|
| Units | | ‰ | | ‰ | |
| PGDW05-0412 | 4/18/2012 | -111.0 | | -12.9 | |
| PGDW20-0412 | 4/16/2012 | -108.0 | | -12.8 | |
| PGDW20d-0412 | 4/16/2012 | -108.5 | J | -12.9 | |
| PGDW23-0412 | 4/17/2012 | -111.0 | | -13.0 | |
| PGDW30-0412 | 4/17/2012 | -111.0 | | -13.0 | |
| PGDW50-0412 | 4/19/2012 | -100.5 | | -12.7 | |
| PGPW02-0412 | 4/20/2012 | -113.2 | | -13.5 | |
| EPAMW02-0412-1 | 4/16/2012 | -116.3 | | -14.2 | |
| EPAMW02-0412-2 | 4/22/2012 | -116.8 | | -14.2 | |
| EPAMW01-0412 | 4/24/2012 | -113.1 | | -13.2 | |
| EPAMW01d-0412 | 4/24/2012 | -113.0 | | -13.3 | |
| EPAMW01-0412-2 | 4/24/2012 | -113.0 | | -13.3 | |
| EPAMW01-0412-3 | 4/24/2012 | -113.0 | | -13.3 | |
| EPAMW01-0412-4 | 4/24/2012 | -112.9 | | -13.3 | |
| EPAMW01-0412-5 | 4/24/2012 | -113.1 | | -13.3 | |
| EPAMW01-0412-6 | 4/24/2012 | -113.2 | | -13.4 | |
| EPAMW01-0412-7 | 4/24/2012 | -113.2 | | -13.3 | |
| EPAMW01-0412-8 | 4/24/2012 | -113.3 | | -13.4 | |
| EPAMW01-0412-9 | 4/24/2012 | -113.4 | | -13.3 | |
| EPAMW01-0412-10 | 4/24/2012 | -113.6 | | -13.3 | |

## Isotech Gas Isotopes

| Sample ID | Date | He | $H_2$ | Ar | $O_2$ | $CO_2$ | $N_2$ | CO | $C_1$ | $C_2$ | $C_2H_4$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Units** | | % | % | % | % | % | % | % | % | % | % |
| PGDW05-0412 | 4/18/2012 | NA | NA | 1.67 | 7.36 | 0.02 | 90.67 | 0.05 | 0.24 | ND | ND |
| PGDW20-0412 | 4/16/2012 | NA | NA | 1.63 | 9.27 | 0.14 | 88.31 | 0.07 | 0.56 | 0.017 | ND |
| PGDW20d-0412 | 4/16/2012 | NA | NA | 1.59 | 8.46 | 0.13 | 89.20 | 0.05 | 0.55 | 0.016 | ND |
| PGDW23-0412 | 4/17/2012 | NA | NA | 1.68 | 10.81 | 0.04 | 86.43 | 0.13 | 0.91 | ND | ND |
| PGDW30-0412 | 4/17/2012 | NA | NA | 1.64 | 4.85 | 0.03 | 88.20 | 0.03 | 5.25 | 0.001 | ND |
| PGDW50-0412 | 4/19/2012 | NA | NA | 1.21 | 7.51 | 0.10 | 91.17 | ND | 0.01 | ND | ND |
| PGPW02-0412 | 4/20/2012 | NA | NA | 1.47 | 8.50 | 0.09 | 89.92 | ND | 0.03 | ND | ND |
| EPAMW02-0412-1 | 4/16/2012 | 0.02 | NA | 0.16 | 1.68 | ND | 7.14 | 0.01 | 82.65 | 5.13 | 0.001 |
| EPAMW02-0412-2 | 4/22/2012 | NA | NA | 0.13 | 2.15 | ND | 5.55 | ND | 81.89 | 6.36 | 0.001 |
| EPAMW01-0412 | 4/24/2012 | NA | NA | 0.26 | 0.38 | ND | 12.41 | ND | 80.38 | 4.87 | 0.002 |
| EPAMW01d-0412 | 4/24/2012 | NA | NA | 0.24 | 0.11 | ND | 10.93 | ND | 82.07 | 4.96 | 0.002 |
| EPAMW01-0412-2 | 4/24/2012 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| EPAMW01-0412-3 | 4/24/2012 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| EPAMW01-0412-4 | 4/24/2012 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| EPAMW01-0412-5 | 4/24/2012 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| EPAMW01-0412-6 | 4/24/2012 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| EPAMW01-0412-7 | 4/24/2012 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| EPAMW01-0412-8 | 4/24/2012 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| EPAMW01-0412-9 | 4/24/2012 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| EPAMW01-0412-10 | 4/24/2012 | 0.02 | NA | 0.404 | 0.02 | ND | 20.97 | ND | 73.34 | 3.89 | 0.001 |

## Isotech Gas Isotopes (cont.)

| Sample ID | Date | $C_3$ | $C_3H_6$ | $iC_4$ | $nC_4$ | $iC_5$ | $nC_5$ | $C_6$+ | $\delta^{13}C_1$ | $\delta DC_1$ | $\delta^{13}C_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Units** | | % | % | % | % | % | % | % | ‰ | ‰ | ‰ |
| PGDW05-0412 | 4/18/2012 | ND | ND | ND | ND | ND | ND | ND | 0.70 | NA | NA |
| PGDW20-0412 | 4/16/2012 | 0.0015 | ND | 0.0007 | ND | ND | ND | ND | -32.0 | NA | NA |
| PGDW20d-0412 | 4/16/2012 | 0.0013 | ND | 0.0007 | ND | ND | ND | ND | -32.0 | NA | NA |
| PGDW23-0412 | 4/17/2012 | ND | ND | 0.0011 | ND | ND | ND | ND | 12.7 | 205 | NA |
| PGDW30-0412 | 4/17/2012 | ND | ND | ND | ND | ND | ND | ND | -27.5 | -123 | NA |
| PGDW50-0412 | 4/19/2012 | ND | ND | ND | ND | ND | ND | ND | NA | NA | NA |
| PGPW02-0412 | 4/20/2012 | ND | ND | ND | ND | ND | ND | ND | NA | NA | NA |
| EPAMW02-0412-1 | 4/16/2012 | 2.00 | 0.0030 | 0.638 | 0.385 | 0.116 | 0.0373 | 0.0322 | -41.2 | -209.1 | -26.2 |
| EPAMW02-0412-2 | 4/22/2012 | 2.39 | 0.0055 | 0.750 | 0.509 | 0.145 | 0.0520 | 0.0661 | -41.2 | -199.6 | -26.3 |
| EPAMW01-0412 | 4/24/2012 | 1.08 | 0.0012 | 0.253 | 0.214 | 0.075 | 0.0347 | 0.0424 | -38.2 | -205.3 | -26.5 |
| EPAMW01d-0412 | 4/24/2012 | 1.08 | 0.0012 | 0.249 | 0.212 | 0.074 | 0.0345 | 0.0418 | NA | NA | NA |
| EPAMW01-0412-2 | 4/24/2012 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| EPAMW01-0412-3 | 4/24/2012 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| EPAMW01-0412-4 | 4/24/2012 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| EPAMW01-0412-5 | 4/24/2012 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| EPAMW01-0412-6 | 4/24/2012 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| EPAMW01-0412-7 | 4/24/2012 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| EPAMW01-0412-8 | 4/24/2012 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| EPAMW01-0412-9 | 4/24/2012 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| EPAMW01-0412-10 | 4/24/2012 | 0.856 | 0.0007 | 0.215 | 0.166 | 0.062 | 0.0266 | 0.0319 | -38.5 | -205.9 | -26.6 |

## Isotech Gas Isotopes (cont.)

| Sample ID | Date | $\delta^{13}C$ DIC | Tritium | Specific Gravity | BTU | Helium dilution |
|---|---|---|---|---|---|---|
| Units | | ‰ | TU | | | factor |
| PGDW05-0412 | 4/18/2012 | -16.02 | <0.80 | 0.983 | 3 | 0.71 |
| PGDW20-0412 | 4/16/2012 | -17.25 | <0.80 | 0.985 | 6 | 0.73 |
| PGDW20d-0412 | 4/16/2012 | -17.13 | <0.80 | 0.984 | 6 | 0.70 |
| PGDW23-0412 | 4/17/2012 | -14.22 | <0.80 | 0.986 | 10 | 0.73 |
| PGDW30-0412 | 4/17/2012 | -11.95 | <0.80 | 0.959 | 53 | 0.70 |
| PGDW50-0412 | 4/19/2012 | -8.92 | <0.80 | 0.983 | 0 | 0.64 |
| PGPW02-0412 | 4/20/2012 | -9.34 | <0.80 | 0.985 | 0 | 0.56 |
| EPAMW02-0412-1 | 4/16/2012 | ** | <0.80 | 0.657 | 1021 | NA |
| EPAMW02-0412-2 | 4/22/2012 | ** | <0.80 | 0.668 | 1057 | 0.56 |
| EPAMW01-0412 | 4/24/2012 | -11.70 | <0.80 | 0.654 | 951 | 0.33 |
| EPAMW01d-0412 | 4/24/2012 | -12.13 | <0.80 | 0.646 | 969 | 0.30 |
| EPAMW01-0412-2 | 4/24/2012 | NA | NA | NA | NA | NA |
| EPAMW01-0412-3 | 4/24/2012 | NA | NA | NA | NA | NA |
| EPAMW01-0412-4 | 4/24/2012 | NA | NA | NA | NA | NA |
| EPAMW01-0412-5 | 4/24/2012 | NA | NA | NA | NA | NA |
| EPAMW01-0412-6 | 4/24/2012 | NA | NA | NA | NA | NA |
| EPAMW01-0412-7 | 4/24/2012 | NA | NA | NA | NA | NA |
| EPAMW01-0412-8 | 4/24/2012 | NA | NA | NA | NA | NA |
| EPAMW01-0412-9 | 4/24/2012 | NA | NA | NA | NA | NA |
| EPAMW01-0412-10 | 4/24/2012 | -11.94 | <0.80 | 0.679 | 852 | NA |

ND, not detected. EPAMW01d-0412 - sample lost at laboratory. **Not enough inorganic carbon in sample for analysis.

# SECTION B

## B1. Introduction

Sampling and analysis activities were conducted under an approved Quality Assurance Project Plan (QAPP) titled "Groundwater Investigation in Pavillion, Wyoming, version 6" dated 2/17/2012. Deviations from this QAPP are described in Section B9 as well as in an Addendum to this QAPP, approved in September, 2012. In Phase V of the Pavillion study, groundwater samples were collected from April 16 to April 24, 2012. Five domestic wells, one municipal supply well, and two deep monitoring wells were sampled. A total of 457 samples (not including duplicates of glass containers) were collected and delivered to 8 laboratories for analysis: Shaw Environmental, Ada, OK; EPA ORD/NRMRL, Ada, OK; ALS Environmental, Holland, MI; TestAmerica, Savannah, GA; EPA Region 8, Golden, CO; EPA Region 3, Fort Meade, MD; EPA ORD/NERL, Las Vegas, NV; and, Isotech, Champaigne, IL. Measurements were made for over 322 analytes per sample location. Of the 457 samples, 194 samples (42%) were Quality Control (QC) samples, including blanks, field duplicates, matrix spikes, and matrix spike duplicates. This Section describes general Quality Assurance (QA) and results of the QC samples, including discussion of chain of custody, holding times, blank results, field duplicate results, laboratory Quality Assurance narratives, double-lab comparison of volatile organic compounds, Performance Evaluation (PE) samples, QAPP additions and deviations, field QA/QC, application of data qualifiers, tentatively identified compounds (TICs), the Audit of Data Quality (ADQ), and impact on data quality.

All reported data met project requirements unless otherwise indicated by the application of data qualifiers. Data not meeting project requirements are rejected as unusable and are not reported.

## B2. Chain of Custody

Sample types, bottle types, sample preservation methods, analyte holding times, and laboratories receiving samples are listed in Table B1. Samples collected in the field were packed on ice into ice chests for shipment by overnight delivery with completed chain of custody documents and temperature blank containers. With the few exceptions noted below, samples were received by the laboratories in good condition and all temperature blanks read below 5°C.

The first sample shipment to TestAmerica (Methylene Blue Active Substances, MBAS analysis) was delayed in shipment by the carrier. This shipment included samples:PGDW20-0412, PGDW20d-0412, FieldBlk01, and EquipBlk01 (collected 4/16/2012). Because MBAS analysis has a 48 hour holding time, samples in this set were not received in time to make the holding time requirement. Consequently, new samples from PGDW20 were collected on 4/18/2012 and submitted for analysis along with fresh field and equipment blanks. The chain-of-custody form accompanying sample PGDW50-0412 shipped on 4/19/2012 for MBAS analysis was signed for, but the time and date were left off the custody form. The case narrative in the data report indicates the sample was received on 4/20/2012. These observations have no impact on data quality.

An ice chest received by Shaw Environmental on 4/18/2012 was noted to have one of the two custody seals cut, presumably during transport or delivery. The second custody seal was intact and the samples were noted to be in good condition. In other shipments, several glass bottles were received broken (FieldBlk01 for Ethoxylates, 1 L amber glass; PGPW02-0412 for GRO, 40 mL amber glass; EquipBlk03 for EPA Method 8260, 40 mL amber glass; EPAMW02-0412-2 for low molecular weight acids, 40 mL clear glass). Because samples stored in glass bottles were all collected in duplicate in case of breakage, adequate sample was available to perform required analyses. For sample EPAMW02-0412-2, both the primary and duplicate bottles for low molecular weight acids were broken in shipment. A sample preserved with TSP (trisodium phosphate) for VOC analysis was substituted. This preservative differs from the QAPP requirements (sodium hydroxide). TSP is a base and has been used as a preservative for low molecular weight acids. The results for this sample are consistent with a sample taken from the same well several days earlier. There is no impact on data quality. One sample delivered to Isotech (EPAMW01d-0412) was spilled in the laboratory; consequently, dissolved gas isotopic signatures are not available for this field duplicate sample. There is no impact on data quality because the primary sample was analyzed.

**Table B1. Sample containers, preservation, and holding times for groundwater samples in Phase V.**

| Sample Type | Analysis Method (EPA Method) | Sample Bottles/# of bottles* | Preservation/Storage | Holding Time(s) |
|---|---|---|---|---|
| **Dissolved gases** | Shaw Environmental: RSKSOP-194v4 &-175v5 (No EPA Method) | 60 mL serum bottles/2 | No Headspace TSP[†], pH>10; refrigerate ≤6°[††] | 14 days |
| **Metals (filtered)** | Shaw Environmental: RSKSOP-213v4 &-257v3 (EPA Methods 200.7 and 6020); CHEMTECH: EPA CLP Inorganic SOW ISM01.3, Exhibit D – Part B, with method modifications | 125 mL plastic bottle/1 | $HNO_3$, pH<2; room temperature | 6 months (Hg 28 days) |
| **Metals (unfiltered)** | Shaw Environmental: RSKSOP-179v2; RSKSOP-213v4 & RSKSOP-257v3 (EPA Methods 200.7 and 6020) ; CHEMTECH: EPA CLP Inorganic SOW ISM01.3, Exhibit D – Part B, with method modifications | 125 mL plastic bottle/1 | $HNO_3$, pH<2; room temperature | 6 months (Hg 28 days) |
| **$SO_4$, Cl, F, Br** | ORD/NRMRL (Ada): RSKSOP-276v3 (EPA Method 6500) | 30 mL plastic/1 | Refrigerate ≤6°C | 28 days |
| **$NO_3 + NO_2$, $NH_4$** | ORD/NRMRL (Ada): RSKSOP-214v5 (EPA Method 350.1 and 353.2) | 30 mL plastic/1 | $H_2SO_4$, pH<2; refrigerate ≤6°C | 28 days |
| **DIC** | ORD/NRMRL (Ada): RSKSOP-102v5 or 330v0 (EPA Method 9060A) | 40 mL clear glass VOA vial/2 | Refrigerate ≤6°C | 14 days |
| **DOC** | ORD/NRMRL (Ada): RSKSOP-102v5 or 330v0 (EPA Method 9060A) | 40 mL clear glass VOA vial/2 | $H_3PO_4$, pH<2; refrigerate ≤6°C | 28 days |
| **Alcohols, aromatic, and chlorinated hydrocarbons** | Shaw Environmental: RSKSOP-259v1 (EPA Method 5021A plus 8260C) | 40 mL amber glass VOA vial/2 | No Headspace TSP[†], pH>10; refrigerate ≤6°C | 14 days |
| **Volatile Organic Compounds** | Region 8: EPA Method 5035 plus 8260C | 40 mL amber glass VOA vial/2 | No Headspace HCl, pH<2; refrigerate ≤6°C | 14 days |
| **Semi-Volatile Organic Compounds** | Region 8: EPA Method 8270D, ORGM-508 r1.0 | 1 L amber glass/2 | Refrigerate ≤6°C | 7 days until extraction; 30 days post-extraction for analysis |
| **Low Molecular Weight Acids** | Shaw Environmental: RSKSOP-112v6 (No EPA Method) | 40 mL glass VOA vial/2 | NaOH, pH>10; refrigerate ≤6°C | 30 days |
| **O, H stable isotopes of water** | Shaw Environmental: RSKSOP-334v0 (No EPA Method) | 20 mL glass VOA vial/1 | Refrigerate ≤6°C | Stable |
| **$\delta^{13}C$ DIC** | Isotech: gas stripping and IRMS (No EPA Method) | 60 mL plastic bottle/1 | Refrigerate ≤6°C | No information |
| **$\delta^{13}C$ and $\delta D$ of methane** | Isotech: gas stripping and IRMS (No EPA Method) | 1 L plastic bottle/1 | Caplet of benzalkonium chloride; refrigerate ≤6°C | No information |
| **Tritium** | Isotech: electrolytic enrichment and radiometric analysis of $^3H$ (No EPA Method) | 500 mL plastic bottle/1 | Refrigerate ≤6°C | 6 months |



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**Table B1 (cont). Sample containers, preservation, and holding times for groundwater samples in Phase V.**

| Sample Type | Analysis Method (EPA Method) | Sample Bottles/# of bottles* | Preservation/Storage | Holding Time(s) |
|---|---|---|---|---|
| DRO | Region 8: EPA Method 8015D, ORGM-508 r1.0 | 1L amber glass bottle/1 | HCl, pH<2; refrigerate ≤6°C | 7 days until extraction, 40 days after extraction |
| GRO | Region 8: EPA Method 8015D | 40 mL amber glass VOA vial/2 | No headspace; HCl, pH<2; refrigerate ≤6°C | 14 days |
| Glycols | Region 3 method** (No EPA Method) | 40 mL amber glass VOA vial/2 | Refrigerate ≤6°C | 14 days |
| Methanol, propylene glycol, ethylene glycol | ALS Environmental: EPA Method 8015M | 40 mL amber glass VOA vial/2 | HCl, pH<2; refrigerate ≤6°C | 14 days |
| Acrylamide, alkylphenols, ethoxylated alcohols, ethoxylated alkylphenols | ORD/NERL methods (Las Vegas) *** | 1 L amber glass/2 | Refrigerate ≤6°C | 30 days |
| MBAS | TestAmerica: EPA Method 425.1 | 500 mL plastic bottle/1 | Refrigerate ≤6°C | 2 days |

† Trisodium phosphate. †† Above freezing point of water. *Spare bottles made available for laboratory QC samples and for replacement of compromised samples (broken bottle, QC failures, etc.). **EPA Methods 8000C and 8321 were followed for method development and QA/QC; method based on ASTM D773-11. ***Methods modified from ASTM D7458-09 and USGS method O1433-01 for ethoxylated alcohols and alkylphenols; EPA Method 8032A and 8316 were used for acrylamide.

## B3. Holding Times

Holding times are the length of time a sample can be stored after collection and prior to analysis without significantly affecting the analytical results. Holding times vary with the analyte, sample matrix, and analytical methodology. Sample holding times for the various analyses conducted in Phase V are listed in Table B1 and range from 48 hours to 6 months. As noted above, the short holding time for MBAS analysis required that field samples be shipped to the TestAmerica laboratory on the same day as their collection. In one case, arrangements were made for weekend sample receipt and analysis by TestAmerica. All samples for MBAS were analyzed within the specified holding time. Sample PGDW50-0412 was analyzed outside of holding time guidelines for Gasoline Range Organics (GRO). This sample was not preserved in the field to the pH<2 criterion. The GRO analysis holding time for unpreserved samples is reduced from 14 days to 7 days. Sample PGDW50-0412 was analyzed 3 hours after the 7 day holding time expired; GRO data for this sample are flagged as estimated. Several samples for ethoxylated alcohols and alkyphenols were extracted outside the 30-day holding time; these samples exceeding the holding time for extraction are flagged. Generally, estimated analyte concentrations for samples with holding time exceedances are biased low.

## B4. Blank Samples

An extensive series of blank samples was collected in Phase V, including field blanks, equipment blanks, and trip blanks (Table B2). These quality control samples were intended to test for possible bias from potential sources of contamination during field sample collection, equipment cleaning, sample bottle transport to and from the field, and laboratory procedures. The same source water was used for the preparation of all blank samples (Barnstead NANOpure Diamond UV water). Field blanks were collected to evaluate potential contamination from sample bottles and environmental sources. Equipment blanks were collected to determine if cleaning procedures or sample equipment (filters, fittings, tubing) potentially contributed to analyte detections. Trip blanks consisted of serum bottles or VOC vials filled with NANOpure water and sealed in the laboratory. Trip blanks were used to evaluate whether VOC and dissolved gas serum bottles were contaminated during sample storage, sampling, or shipment to and from the field. All other analyses have associated field and equipment blanks, except isotope ratio analyses for which no blank sampling schemes are appropriate. Sample bottle types, preservation, and holding times were applied to blank samples in the same way as they were applied to field samples (Table B1).

**Table B2. Field QC samples for groundwater analysis.**

| QC Sample | Purpose | Method | Frequency |
|---|---|---|---|
| **Trip Blanks (VOCs and Dissolved Gases only)** | Assess contamination during transportation. | Fill bottles with reagent water and preserve, take to field and returned without opening. | One in an ice chest with VOA and dissolved gas samples. |
| **Equipment Blanks** | Assess contamination from field equipment, sampling procedures, decontamination procedures, sample container, preservative, and shipping. | Apply only to samples collected via equipment, such as filtered samples: Reagent water is filtered and collected into bottles and preserved same as filtered samples. | One per day of sampling with submersible pumps. |
| **Field Duplicates** | Represent precision of field sampling, analysis, and site heterogeneity. | One or more samples collected immediately after original sample. | One in every 10 samples, or if <10 samples collected for a water type (ground or surface), collect a duplicate for one sample. |
| **Temperature Blanks** | Measure temperature of samples in the cooler. | Water sample that is transported in cooler to lab. | One per cooler. |
| **Field Blanks*** | Assess contamination introduced from sample container with applicable preservative. | In the field, reagent water is collected into sample containers with preservatives. | One per day of sampling. |

* Blank samples were not collected for isotope ratio measurements, including $^{18}O/^{16}O$, $^{2}H/H$, and $^{13}C/^{12}C$.

The following criteria are used for flagging samples with potential blank contamination. Sample contamination is considered possible if analyte concentrations in blanks are above the method Quantitation Limit (QL) and if the analyte is present in an associated field sample at a level <10◊ the concentration in the blank. In cases where a laboratory, equipment, field, or trip blank are between the MDL and the QL, the associated sample results that are between the MDL and QL are reported as <QL with a U qualifier. Blank samples are associated to field samples by dates of collection; for example, most sample shipments include both field samples and blank samples that are used for blank contamination assessments. See section on QAPP Additions and Deviations for additional information. Results of blanks analyses are reported in Tables B3-B17.

Dissolved methane was reported above the QL (9◊) in one field blank and one equipment blank collected on the same day (4/18/2012; Table B3). These blank detections affect three samples: PGDW05-0412, PGDW50-0412 and PGPW02-0412, all with low-level methane detections. Methane values for these three samples are qualified with a U or B. Because methane, ethane, and propane were identified in the blank samples, this contamination was likely introduced in the laboratory as carry over from calibration standards or analysis of high-concentration samples.

There were no dissolved or total metal concentrations by ICP-OES above QLs in any of the field or equipment blank samples (Tables B4, B5, B6 and B7). Trace metals as determined by ICP-MS showed dissolved chromium and dissolved nickel above the QL in one field blank (FieldBlk02; Table B8). Total copper and total nickel were both present above the QL in one field blank (FieldBlk04; Table B8). None of the associated field samples are impacted by these

blank detections because the metals concentrations did not exceed the QL.

The anions: fluoride, chloride, sulfate, and nitrate+nitrite, were not detected above QLs in any of the blank samples (Table B9). Dissolved inorganic carbon and organic carbon concentrations were not reported above QLs in any of the blank samples (Table B9).

Formate was detected in all field samples and in all blank samples at generally comparable levels (Table B10). The formate data are all rejected due to form ate contamination in the sample vials.

Twelve blank samples were collected for alcohols/aromatic/chlorinated hydrocarbons (Shaw Environmental) and volatile organic compounds (EPA Region 8). Results are presented in Tables B11 and B12. Toluene was detected in one sample (EquipBlk04) by EPA Method 5021A plus 8260C at a concentration of 0.297 µg/L, below the method QL of 0.50 µg/L (Table B11). Toluene was also detected in the same sample by EPA Method 5035 plus 8260C at a concentration of 0.31 µg/L, just above the method QL of 0.25 µg/L (Table B12). This blank detection affects a series of detections of toluene below the QL in EPAMW01 (time series analysis). All other detections of volatile organic compounds in the domestic wells and deep monitoring wells are not impacted by blank contamination.

The only semi-volatile organic contaminant found in field and equipment blanks was isophorone in EquipBlk04 (1.17 µg/L, QL=1.00 µg/L; Table B13). This analyte was not detected in any field sample. Detections of semi-volatile organic compounds in the domestic wells and deep monitoring wells are not impacted by blank contamination.

For DRO and GRO analyses, blank contamination was detected in EquipBlk04 for GRO at a concentration of 22.4 µg/L, just above the QL of 20 µg/L (Table B14). This result impacts none of the associated field samples as all of the EPAMW01 time series samples have GRO concentrations >325 µg/L. Detections of GRO and DRO in the domestic wells and deep monitoring wells are not impacted by blank contamination.

Glycols were not reported above QLs or Minimum Detection Levels (MDLs) in any of the blank samples (Tables B14 and B15). None of the detections of glycols or 2-butoxyethanol in the deep monitoring wells are impacted by blank contamination.

Samples for analysis of acrylamide, alkylphenols, ethoxylated alcohols, and ethoxylated alkylphenols were sent to the EPA ORD/NERL laboratory in Las Vegas. With the exception of acrylamide and octylphenol, other analytes were consistently detec ted in field blanks, equipment blanks, and laboratory blanks (Table B16). Other QA/QC issues associated with these data were noted in the Audit of Data Quality (see Table B30).

Methylene Blue Active Substances (MBAS) were not detected in any of the blank samples (Table B17). Samples collected in the field for MBAS analysis are not impacted by blank contamination.

**Table B3. Dissolved gas blank results for Phase V.**

| Label | Date | Methane | Ethane | Propane | n-Butane |
|---|---|---|---|---|---|
| | | mg/L | mg/L | mg/L | mg/L |
| FieldBlk01 | 4/16/2012 | <0.0003 | <0.0005 | <0.0007 | <0.0007 |
| FieldBlk02 | 4/18/2012 | 0.012 | <0.0005 | BQL 0.0011 | <0.0007 |
| FieldBlk03 | 4/22/2012 | <0.0003 | <0.0005 | <0.0007 | <0.0007 |
| FieldBlk04 | 4/24/2012 | <0.0003 | <0.0005 | <0.0007 | <0.0007 |
| EquipBlk01 | 4/16/2012 | <0.0003 | <0.0005 | <0.0007 | <0.0007 |
| EquipBlk02 | 4/18/2012 | 0.012 | BQL 0.0016 | BQL 0.0008 | <0.0007 |
| EquipBlk04 | 4/24/2012 | <0.0003 | <0.0005 | <0.0007 | <0.0007 |
| TripBlk01 | 4/17/2012 | <0.0003 | <0.0005 | <0.0007 | <0.0007 |
| TripBlk02 | 4/18/2012 | <0.0003 | <0.0005 | <0.0007 | <0.0007 |
| TripBlk03 | 4/22/2012 | <0.0003 | <0.0005 | <0.0007 | <0.0007 |
| TripBlk04 | 4/24/2012 | <0.0003 | <0.0005 | <0.0007 | <0.0007 |
| | | | | | |
| MDL | | 0.0003 | 0.0005 | 0.0007 | 0.0007 |
| QL | | 0.0013 | 0.0027 | 0.0038 | 0.0047 |
| Detections in samples | | 12/12 | 9/12 | 7/12 | 6/12 |
| Concentration min | | BQL 0.0013 | 0.0030 | BQL 0.0016 | BQL 0.0009 |
| Concentration max | | 22.00 | 3.07 | 1.78 | 0.52 |

Units are mg/L. BQL – below quantitation level. MDL – Method Detection Limit. QL – Quantitation Limit. Detections in samples: the number of times the analyte was detected in Phase V sampling compared to the total number of samples collected. Minimum and maximum sample concentrations in Phase V sampling in mg/L are provided for reference.

**Table B4. ICP-OES blank results for undigested samples (field filtered).**

| Label | Date | Al | Ag | B | Ba | Be | Ca | Co | Fe | K | Mg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| FieldBlk01 | 4/16/2012 | <0.148 | <0.004 | <0.100 | <0.001 | <0.001 | <0.086 | <0.001 | <0.020 | <0.106 | <0.030 |
| FieldBlk02 | 4/18/2012 | <0.148 | <0.004 | <0.100 | <0.001 | <0.001 | <0.086 | <0.001 | <0.020 | <0.106 | <0.030 |
| FieldBlk03 | 4/22/2012 | <0.148 | <0.004 | <0.100 | <0.001 | <0.001 | <0.086 | <0.001 | <0.020 | <0.106 | <0.030 |
| FieldBlk04 | 4/24/2012 | <0.148 | <0.004 | <0.100 | <0.001 | <0.001 | <0.086 | <0.001 | <0.020 | <0.106 | <0.030 |
| EquipBlk01 | 4/16/2012 | <0.148 | <0.004 | <0.100 | <0.001 | <0.001 | <0.086 | <0.001 | <0.020 | <0.106 | <0.030 |
| EquipBlk02 | 4/18/2012 | <0.148 | <0.004 | <0.100 | <0.001 | <0.001 | <0.086 | <0.001 | <0.020 | <0.106 | <0.030 |
| EquipBlk04 | 4/24/2012 | <0.148 | <0.004 | <0.100 | <0.001 | <0.001 | <0.086 | <0.001 | <0.020 | <0.106 | <0.030 |
| | | | | | | | | | | | |
| MDL | | 0.148 | 0.004 | 0.100 | 0.001 | 0.001 | 0.086 | 0.001 | 0.020 | 0.106 | 0.030 |
| QL | | 0.494 | 0.014 | 0.333 | 0.004 | 0.003 | 0.287 | 0.004 | 0.067 | 0.354 | 0.100 |
| Detections in samples | | 6/20 | 0/20 | 19/20 | 20/20 | 0/20 | 20/20 | 0/20 | 4/20 | 20/20 | 18/20 |
| Concentration min | | BQL 0.205 | -- | BQL 0.108 | 0.005 | -- | 3.17 | -- | BQL 0.055 | 0.469 | BQL 0.069 |
| Concentration max | | 0.816 | -- | BQL 0.285 | 0.147 | -- | 314 | -- | 0.201 | 31.4 | 12.8 |

Units are mg/L. BQL – below quantitation level. MDL – Method Detection Limit. QL – Quantitation Limit. Detections in samples: the number of times the analyte was detected in Phase V sampling compared to the total number of samples collected. Minimum and maximum sample concentrations in Phase V sampling in mg/L are provided for reference.



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**Table B5. ICP-OES blank results for undigested samples (field filtered).**

| Label | Date | Mn | Mo | Na | Sb | Sr | Ti | Zn | Si | S | P |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| FieldBlk01 | 4/16/2012 | <0.004 | <0.005 | <0.513 | <0.005 | <0.001 | <0.002 | <0.015 | <0.130 | <0.138 | <0.018 |
| FieldBlk02 | 4/18/2012 | <0.004 | <0.005 | <0.513 | <0.005 | <0.001 | <0.002 | <0.015 | <0.130 | <0.138 | <0.018 |
| FieldBlk03 | 4/22/2012 | <0.004 | <0.005 | <0.513 | <0.005 | <0.001 | <0.002 | <0.015 | <0.130 | <0.138 | <0.018 |
| FieldBlk04 | 4/24/2012 | <0.004 | <0.005 | <0.513 | <0.005 | <0.001 | <0.002 | <0.015 | <0.130 | <0.138 | <0.018 |
| EquipBlk01 | 4/16/2012 | <0.004 | <0.005 | <0.513 | <0.005 | <0.001 | <0.002 | <0.015 | <0.130 | <0.138 | <0.018 |
| EquipBlk02 | 4/18/2012 | <0.004 | <0.005 | <0.513 | <0.005 | <0.001 | <0.002 | <0.015 | <0.130 | <0.138 | <0.018 |
| EquipBlk04 | 4/24/2012 | <0.004 | <0.005 | <0.513 | <0.005 | <0.001 | <0.002 | <0.015 | <0.130 | <0.138 | <0.018 |
| | | | | | | | | | | | |
| MDL | | 0.004 | 0.005 | 0.513 | 0.005 | 0.001 | 0.002 | 0.015 | 0.130 | 0.138 | 0.018 |
| QL | | 0.014 | 0.017 | 1.71 | 0.017 | 0.004 | 0.007 | 0.050 | 0.434 | 0.460 | 0.060 |
| Detections in samples | | 4/20 | 5/20 | 20/20 | 0/20 | 20/20 | 1/20 | 0/20 | 20/20 | 20/20 | 0/20 |
| Concentration min | | 0.008 | BQL 0.005 | 190 | -- | 0.053 | 0.003 | -- | 4.71 | 7.38 | -- |
| Concentration max | | 0.090 | BQL 0.008 | 1290 | -- | 3.00 | -- | -- | 12.0 | 1120 | -- |

Units are mg/L. BQL – below quantitation level. MDL – Method Detection Limit. QL – Quantitation Limit. Detections in samples: the number of times the analyte was detected in Phase V sampling compared to the total number of samples collected. Minimum and maximum sample concentrations in Phase V sampling in mg/L are provided for reference.

**Table B6. ICP-OES blank results for digested samples (unfiltered).**

| Label | Date | Al | Ag | B | Ba | Be | Ca | Co | Fe | K | Mg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| **FieldBlk01** | 4/16/2012 | <0.164 | BQL 0.005 | <0.111 | <0.001 | <0.003 | <0.095 | <0.001 | <0.022 | <0.118 | <0.033 |
| **FieldBlk02** | 4/18/2012 | <0.164 | <0.004 | <0.111 | <0.001 | <0.003 | <0.095 | <0.001 | <0.022 | <0.118 | <0.033 |
| **FieldBlk03** | 4/22/2012 | <0.164 | <0.004 | <0.111 | <0.001 | <0.003 | <0.095 | <0.001 | <0.022 | <0.118 | <0.033 |
| **FieldBlk04** | 4/24/2012 | <0.164 | <0.004 | <0.111 | <0.001 | <0.003 | <0.095 | <0.001 | <0.022 | <0.118 | <0.033 |
| **EquipBlk01** | 4/16/2012 | <0.164 | <0.004 | <0.111 | <0.001 | <0.003 | <0.095 | <0.001 | <0.022 | <0.118 | <0.033 |
| **EquipBlk02** | 4/18/2012 | <0.164 | <0.004 | <0.111 | <0.001 | <0.003 | <0.095 | <0.001 | <0.022 | <0.118 | <0.033 |
| **EquipBlk04** | 4/24/2012 | <0.164 | <0.004 | <0.111 | <0.001 | <0.003 | <0.095 | <0.001 | <0.022 | <0.118 | <0.033 |
| | | | | | | | | | | | |
| **MDL** | | 0.164 | 0.004 | 0.111 | 0.001 | 0.003 | 0.095 | 0.001 | 0.022 | 0.118 | 0.033 |
| **QL** | | 0.548 | 0.016 | 0.370 | 0.004 | 0.011 | 0.319 | 0.004 | 0.074 | 0.393 | 0.111 |
| **Detections in samples** | | 4/12 | 3/12 | 10/12 | 12/12 | 0/12 | 12/12 | 0/12 | 9/12 | 12/12 | 11/12 |
| **Concentration min** | | BQL 0.198 | BQL 0.005 | BQL 0.112 | 0.005 | -- | 3.34 | -- | BQL 0.025 | 0.426 | BQL 0.081 |
| **Concentration max** | | 1.11 | BQL 0.010 | BQL 0.215 | 0.158 | -- | 315 | -- | 2.33 | 31.7 | 6.15 |

Units are mg/L. BQL – below quantitation level. MDL – Method Detection Limit. QL – Quantitation Limit. Detections in samples: the number of times the analyte was detected in Phase V sampling compared to the total number of samples collected. Minimum and maximum sample concentrations in Phase V sampling in mg/L are provided for reference.



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## Table B7. ICP-OES blank results for digested samples (unfiltered).

| Label | Date | Mn | Mo | Na | Sb | Sr | Ti | Zn | Si | S | P |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| **FieldBlk01** | 4/16/2012 | <0.004 | <0.006 | <0.569 | <0.006 | <0.001 | <0.002 | <0.017 | <0.144 | <0.153 | <0.020 |
| **FieldBlk02** | 4/18/2012 | <0.004 | <0.006 | <0.569 | BQL 0.006 | <0.001 | <0.002 | <0.017 | <0.144 | <0.153 | <0.020 |
| **FieldBlk03** | 4/22/2012 | <0.004 | <0.006 | <0.569 | <0.006 | <0.001 | <0.002 | <0.017 | <0.144 | <0.153 | <0.020 |
| **FieldBlk04** | 4/24/2012 | <0.004 | <0.006 | <0.569 | <0.006 | <0.001 | <0.002 | <0.017 | <0.144 | <0.153 | <0.020 |
| **EquipBlk01** | 4/16/2012 | <0.004 | <0.006 | <0.569 | <0.006 | <0.001 | <0.002 | <0.017 | <0.144 | <0.153 | <0.020 |
| **EquipBlk02** | 4/18/2012 | <0.004 | <0.006 | <0.569 | BQL 0.007 | <0.001 | <0.002 | <0.017 | <0.144 | <0.153 | <0.020 |
| **EquipBlk04** | 4/24/2012 | <0.004 | <0.006 | <0.569 | <0.006 | <0.001 | <0.002 | <0.017 | <0.144 | <0.153 | <0.020 |
| | | | | | | | | | | | |
| **MDL** | | 0.004 | 0.006 | 0.569 | 0.006 | 0.001 | 0.002 | 0.017 | 0.144 | 0.153 | 0.020 |
| **QL** | | 0.016 | 0.019 | 1.90 | 0.019 | 0.004 | 0.007 | 0.056 | 0.482 | 0.511 | 0.067 |
| **Detections in samples** | | 6/12 | 5/12 | 12/12 | 2/12 | 12/12 | 3/12 | 1/12 | 12/12 | 12/12 | 0/12 |
| **Concentration min** | | BQL 0.005 | BQL 0.007 | 189 | BQL 0.006 | 0.056 | BQL 0.003 | 0.168 | 4.80 | 5.35 | -- |
| **Concentration max** | | 0.092 | BQL 0.010 | 1290 | BQL 0.011 | 2.94 | 0.011 | -- | 11.9 | 1130 | -- |

Units are mg/L. BQL – below quantitation level. MDL – Method Detection Limit. QL – Quantitation Limit. Detections in samples: the number of times the analyte was detected in Phase V sampling compared to the total number of samples collected. Minimum and maximum sample concentrations in Phase V sampling in mg/L are provided for reference.

## Table B8. ICP-MS blank results for undigested and digested samples.

| Label | Date | As | Cd | Cr | Cu | Ni | Pb | Sb | Se | Tl |
|---|---|---|---|---|---|---|---|---|---|---|
| *Undigested (filtered)* | | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L |
| **FieldBlk01** | 4/16/2012 | <1.00 | <1.00 | BQL 0.96 | BQL 1.1 | <1.00 | BQL 0.23 | <2.00 | <5.0 | <1.00 |
| **FieldBlk02** | 4/18/2012 | BQL 0.24 | <1.00 | 13.4 | BQL 1.7 | 13.5 | BQL 0.94 | <2.00 | <5.0 | <1.00 |
| **FieldBlk03** | 4/22/2012 | <1.00 | BQL 0.14 | BQL 1.4 | BQL 1.3 | <1.00 | BQL 0.59 | BQL 0.30 | <5.0 | BQL 0.35 |
| **FieldBlk04** | 4/24/2012 | <1.00 | BQL 0.45 | BQL 1.5 | BQL 1.3 | <1.00 | BQL 0.55 | BQL 0.20 | <5.0 | BQL 0.10 |
| **EquipBlk01** | 4/16/2012 | <1.00 | BQL 0.23 | BQL 0.29 | BQL 0.87 | <1.00 | BQL 0.13 | BQL 0.13 | <5.0 | <1.00 |
| **EquipBlk02** | 4/18/2012 | <1.00 | BQL 0.10 | BQL 0.40 | BQL 0.90 | <1.00 | BQL 0.13 | BQL 0.11 | <5.0 | <1.00 |
| **EquipBlk04** | 4/24/2012 | <1.00 | BQL 0.12 | BQL 0.78 | BQL 1.1 | <1.00 | BQL 0.39 | BQL 0.09 | <5.0 | <1.00 |
| | | | | | | | | | | |
| **MDL** | | 0.18 | 0.063 | 0.062 | 0.11 | 0.11 | 0.025 | 0.084 | 1.2 | 0.043 |
| **QL** | | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | 1.00 | 2.00 | 5.0 | 1.00 |
| | | | | | | | | | | |
| **Label** | **Date** | **As** | **Cd** | **Cr** | **Cu** | **Ni** | **Pb** | **Sb** | **Se** | **Tl** |
| *Digested (total)* | | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L |
| **FieldBlk01** | 4/16/2012 | <1.00 | <1.00 | BQL 0.35 | BQL 0.52 | <1.00 | BQL 0.17 | <2.00 | <5.0 | BQL 0.31 |
| **FieldBlk02** | 4/18/2012 | <1.00 | BQL 0.09 | BQL 0.45 | BQL 0.45 | <1.00 | BQL 0.16 | <2.00 | <5.0 | BQL 0.12 |
| **FieldBlk03** | 4/22/2012 | <1.00 | <1.00 | BQL 0.30 | BQL 0.32 | <1.00 | <1.00 | <2.00 | <5.0 | BQL 0.07 |
| **FieldBlk04** | 4/24/2012 | <1.00 | <1.00 | BQL 1.4 | 3.4 | 1.4 | BQL 0.40 | <2.00 | <5.0 | BQL 0.05 |
| **EquipBlk01** | 4/16/2012 | BQL 0.42 | BQL 0.10 | BQL 0.37 | BQL 0.37 | <1.00 | <1.00 | BQL 0.30 | <5.0 | BQL 0.41 |
| **EquipBlk02** | 4/18/2012 | <1.00 | <1.00 | BQL 1.1 | BQL 0.63 | <1.00 | BQL 0.28 | BQL 0.18 | <5.0 | BQL 0.13 |
| **EquipBlk04** | 4/24/2012 | <1.00 | <1.00 | BQL 0.50 | BQL 0.31 | <1.00 | <1.00 | BQL 0.12 | <5.0 | BQL 0.07 |
| | | | | | | | | | | |
| **MDL** | | 0.18 | 0.063 | 0.062 | 0.11 | 0.11 | 0.025 | 0.084 | 1.2 | 0.043 |
| **QL** | | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | 1.00 | 2.00 | 5.0 | 1.00 |

Units are µg/L. BQL – below quantitation level. MDL – Method Detection Limit. QL – Quantitation Limit. Note: non-detect concentration values are reported as below the QL.



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**Table B9. Blank results for capillary electrophoresis, Lachat flow injection analysis, inorganic carbon and organic carbon analyses in Phase V.**

| Label | Date | Cl | $SO_4$ | F | $NO_3$+$NO_2$ | $NH_4$ | DIC | DOC |
|---|---|---|---|---|---|---|---|---|
| | | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| **FieldBlk01** | 4/16/2012 | <0.106 | <0.049 | <0.029 | <0.008 | <0.006 | BQL 0.220 | <0.044 |
| **FieldBlk02** | 4/18/2012 | <0.106 | <0.049 | <0.029 | BQL 0.009 | <0.006 | BQL 0.229 | BQL 0.076 |
| **FieldBlk03** | 4/22/2012 | <0.106 | <0.049 | <0.029 | <0.008 | <0.006 | BQL 0.203 | <0.044 |
| **FieldBlk04** | 4/24/2012 | <0.106 | <0.049 | <0.029 | BQL 0.028 | <0.006 | BQL 0.220 | BQL 0.067 |
| **EquipBlk01** | 4/16/2012 | <0.106 | <0.049 | <0.029 | <0.008 | <0.006 | BQL 0.214 | <0.044 |
| **EquipBlk02** | 4/18/2012 | <0.106 | <0.049 | <0.029 | BQL 0.008 | <0.006 | BQL 0.208 | <0.044 |
| **EquipBlk04** | 4/24/2012 | <0.106 | <0.049 | <0.029 | <0.008 | <0.006 | BQL 0.203 | BQL 0.067 |
| | | | | | | | | |
| **MDL** | | 0.106 | 0.049 | 0.029 | 0.008 | 0.006 | 0.067 | 0.044 |
| **QL** | | 1.00 | 1.00 | 0.200 | 0.050 | 0.100 | 0.50 | 1.00 |
| **Detections in samples** | | 20/20 | 20/20 | 20/20 | 10/20 | 12/20 | 12/12 | 12/12 |
| **Concentration min** | | 8.51 | 13.5 | BQL 0.382 | BQL 0.019 | BQL 0.062 | 1.25 | BQL 0.370 |
| **Concentration max** | | 495 | 3470 | 2.37 | 0.138 | 2.61 | 19.8 | 19.4 |

Units are mg/L. BQL – below quantitation level. MDL – Method Detection Limit. QL – Quantitation Limit. Detections in samples: the number of times the analyte was detected in Phase V sampling compared to the total number of samples collected. Minimum and maximum sample concentrations in Phase V sampling in mg/L are provided for reference.

**Table B10. Blank results for organic acid analyses in Phase V.**

| Label | Date | Lactate | Formate | Acetate | Propionate | Isobutyrate | Butyrate |
|---|---|---|---|---|---|---|---|
| | | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| **FieldBlk01** | 4/16/2012 | <0.009 | 1.69 | <0.009 | <0.016 | <0.008 | <0.009 |
| **FieldBlk02** | 4/18/2012 | <0.009 | 1.77 | <0.009 | <0.016 | <0.008 | <0.009 |
| **FieldBlk03** | 4/22/2012 | <0.009 | 2.12 | <0.009 | <0.016 | <0.008 | <0.009 |
| **FieldBlk04** | 4/24/2012 | <0.009 | 2.67 | <0.009 | <0.016 | <0.008 | <0.009 |
| **EquipBlk01** | 4/16/2012 | <0.009 | 1.63 | <0.009 | <0.016 | <0.008 | <0.009 |
| **EquipBlk02** | 4/18/2012 | <0.009 | 1.83 | <0.009 | <0.016 | <0.008 | <0.009 |
| **EquipBlk04** | 4/24/2012 | <0.009 | 2.67 | <0.009 | <0.016 | <0.008 | <0.009 |
| | | | | | | | |
| **MDL** | | 0.009 | 0.012 | 0.009 | 0.016 | 0.008 | 0.009 |
| **QL** | | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 |
| **Detections in samples** | | 1/12 | 12/12 | 5/12 | 5/12 | 0/12 | 0/12 |
| **Concentration min** | | 0.25 | 0.55 | 2.84 | BQL 0.075 | -- | -- |
| **Concentration max** | | -- | 3.06 | 6.08 | 0.844 | -- | -- |

Units are mg/L. BQL – below quantitation level. MDL – Method Detection Limit. QL – Quantitation Limit. Detections in samples: the number of times the analyte was detected in Phase V sampling compared to the total number of samples collected. Minimum and maximum sample concentrations in Phase V sampling in mg/L are provided for reference.



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**Table B11. Blank results for alcohols, aromatic, and chlorinated hydrocarbons (µg/L) in Phase V (Shaw Environmental, Ada, OK).**

| Label | FieldBlk01 | FieldBlk02 | FieldBlk03 | FieldBlk04 | EquipBlk01 | EquipBlk02 | EquipBlk04 | TripBlk01 | TripBlk02 | TripBlk03 | TripBlk04 | MDL | QL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | 4/16/12 | 4/18/12 | 4/22/12 | 4/24/12 | 4/16/12 | 4/18/12 | 4/24/12 | 4/17/12 | 4/18/12 | 4/22/12 | 4/24/12 | | |
| | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L |
| Vinyl chloride | <0.14 | <0.14 | <0.14 | <0.14 | <0.14 | <0.14 | <0.14 | <0.14 | <0.14 | <0.14 | <0.14 | 0.14 | 1.0 |
| 1,1-Dichloroethene | <0.07 | <0.07 | <0.07 | <0.07 | <0.07 | <0.07 | <0.07 | <0.07 | <0.07 | <0.07 | <0.07 | 0.07 | 0.5 |
| Methylene Chloride | <0.19 | <0.19 | <0.19 | <0.19 | <0.19 | <0.19 | <0.19 | <0.19 | <0.19 | <0.19 | <0.19 | 0.19 | 0.5 |
| trans-1,2-Dichloroethene | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 0.05 | 0.5 |
| 1,1-dichloroethane | <0.15 | <0.15 | <0.15 | <0.15 | <0.15 | <0.15 | <0.15 | <0.15 | <0.15 | <0.15 | <0.15 | 0.15 | 0.5 |
| cis-1,2-Dichloroethene | <0.07 | <0.07 | <0.07 | <0.07 | <0.07 | <0.07 | <0.07 | <0.07 | <0.07 | <0.07 | <0.07 | 0.07 | 0.5 |
| Chloroform | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | 0.03 | 0.5 |
| 1,1,1-Trichloroethane | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | 0.04 | 0.5 |
| Carbon Tetrachloride | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | 0.03 | 0.5 |
| 1,2-Dichloroethane | <0.07 | <0.07 | <0.07 | <0.07 | <0.07 | <0.07 | <0.07 | <0.07 | <0.07 | <0.07 | <0.07 | 0.07 | 0.5 |
| Trichloroethene | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | 0.03 | 0.5 |
| 1,1,2-Trichloroethane | <0.09 | <0.09 | <0.09 | <0.09 | <0.09 | <0.09 | <0.09 | <0.09 | <0.09 | <0.09 | <0.09 | 0.09 | 0.5 |
| Tetrachloroethene | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | 0.04 | 0.5 |
| Chlorobenzene | <0.06 | <0.06 | <0.06 | <0.06 | <0.06 | <0.06 | <0.06 | <0.06 | <0.06 | <0.06 | <0.06 | 0.06 | 0.5 |
| 1,3-Dichlorobenzene | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | 0.04 | 0.5 |
| 1,4-Dichlorobenzene | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | 0.03 | 0.5 |
| 1,2-Dichlorobenzene | <0.11 | <0.11 | <0.11 | <0.11 | <0.11 | <0.11 | <0.11 | <0.11 | <0.11 | <0.11 | <0.11 | 0.11 | 1.0 |
| Ethanol | <24.7 | <24.7 | <24.7 | <24.7 | <24.7 | <24.7 | <24.7 | <24.7 | <24.7 | <24.7 | <24.7 | 24.7 | 100 |
| Isopropanol | <11.4 | <11.4 | <11.4 | <11.4 | <11.4 | <11.4 | <11.4 | <11.4 | <11.4 | <11.4 | <11.4 | 11.4 | 100 |
| n-Propanol | <13.5 | <13.5 | <13.5 | <13.5 | <13.5 | <13.5 | <13.5 | <13.5 | <13.5 | <13.5 | <13.5 | 13.5 | 100 |
| Isobutanol | <15.6 | <15.6 | <15.6 | <15.6 | <15.6 | <15.6 | <15.6 | <15.6 | <15.6 | <15.6 | <15.6 | 15.6 | 100 |



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**Table B11. Blank results for alcohols, aromatic, and chlorinated hydrocarbons (µg/L) in Phase V (Shaw Environmental, Ada, OK) cont.**

| Label | FieldBlk01 | FieldBlk02 | FieldBlk03 | FieldBlk04 | EquipBlk01 | EquipBlk02 | EquipBlk04 | TripBlk01 | TripBlk02 | TripBlk03 | TripBlk04 | MDL | QL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | 4/16/12 | 4/18/12 | 4/22/12 | 4/24/12 | 4/16/12 | 4/18/12 | 4/24/12 | 4/17/12 | 4/18/12 | 4/22/12 | 4/24/12 | | |
| | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L |
| n-Butanol | <15.5 | <15.5 | <15.5 | <15.5 | <15.5 | <15.5 | <15.5 | <15.5 | <15.5 | <15.5 | <15.5 | 15.5 | 100 |
| Acetone | <3.97 | <3.97 | <3.97 | <3.97 | <3.97 | <3.97 | <3.97 | <3.97 | <3.97 | <3.97 | <3.97 | 3.97 | 5.0 |
| tert-Butyl Alcohol | <1.72 | <1.72 | <1.72 | <1.72 | <1.72 | <1.72 | <1.72 | <1.72 | <1.72 | <1.72 | <1.72 | 1.72 | 5.0 |
| Methyl tert-Butyl Ether | <0.11 | <0.11 | <0.11 | <0.11 | <0.11 | <0.11 | <0.11 | <0.11 | <0.11 | <0.11 | <0.11 | 0.11 | 0.5 |
| di-Isopropyl Ether | <0.11 | <0.11 | <0.11 | <0.11 | <0.11 | <0.11 | <0.11 | <0.11 | <0.11 | <0.11 | <0.11 | 0.11 | 0.5 |
| Ethyl tert-Butyl Ether | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | 0.03 | 0.5 |
| Benzene | <0.06 | <0.06 | <0.06 | <0.06 | <0.06 | <0.06 | <0.06 | <0.06 | <0.06 | <0.06 | <0.06 | 0.06 | 0.5 |
| tert-Amyl Methyl Ether | <0.06 | <0.06 | <0.06 | <0.06 | <0.06 | <0.06 | <0.06 | <0.06 | <0.06 | <0.06 | <0.06 | 0.06 | 0.5 |
| 2,5-Dimethylfuran | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | 0.03 | 0.5 |
| Toluene | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | BQL 0.297 | <0.03 | <0.03 | <0.03 | <0.03 | 0.03 | 0.5 |
| 1,2-Dibromoethane | <0.09 | <0.09 | <0.09 | <0.09 | <0.09 | <0.09 | <0.09 | <0.09 | <0.09 | <0.09 | <0.09 | 0.09 | 1.0 |
| Ethyl Benzene | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | 0.03 | 0.5 |
| m+p Xylene | <0.08 | <0.08 | <0.08 | <0.08 | <0.08 | <0.08 | <0.08 | <0.08 | <0.08 | <0.08 | <0.08 | 0.08 | 0.5 |
| o-Xylene | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | 0.03 | 0.5 |
| 1,3,5-Trimethylbenzene | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | 0.04 | 1.0 |
| 1,2,4-Trimethylbenzene | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | 0.02 | 1.0 |
| 1,2,3-Trimethylbenzene | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | 0.04 | 1.0 |
| Naphthalene | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | 0.03 | 1.0 |

Results in µg/L. BQL – below quantitation level. MDL – Method Detection Limit. QL – Quantitation Limit.



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**Table B12. Blank results for Volatile Organic Compounds (µg/L) in Phase V (Region 8 laboratory, Golden, CO).**

| Label | FieldBlk01 | FieldBlk02 | FieldBlk03 | FieldBlk04 | EquipBlk01 | EquipBlk02 | EquipBlk03 | EquipBlk04 | TripBlk01 | TripBlk02 | TripBlk03 | TripBlk04 | QL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | 4/16/12 | 4/18/12 | 4/22/12 | 4/24/12 | 4/16/12 | 4/18/12 | 4/22/12 | 4/24/12 | 4/17/12 | 4/18/12 | 4/22/12 | 4/24/12 | |
| | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L |
| 1,1,1,2-Tetrachloroethane | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| 1,1,1-Trichloroethane | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| 1,1,2,2-Tetrachloroethane | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| 1,1,2-Trichloroethane | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| 1,1-Dichloroethane | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| 1,1-Dichloroethene | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| 1,1-Dichloropropene | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| 1,2,3-Trichlorobenzene | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| 1,2,3-Trichloropropane | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| 1,2,4-Trichlorobenzene | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| 1,2,4-Trimethylbenzene | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| 1,2-Dibromo-3-chloropropane | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| 1,2-Dibromoethane (EDB) | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| 1,2-Dichlorobenzene | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| 1,2-Dichloroethane | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| 1,2-Dichloropropane | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| 1,3,5-Trimethylbenzene | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| 1,3-Dichlorobenzene | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| 1,3-Dichloropropane | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| 1,3-Dimethyl adamantane | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| 1,4-Dichlorobenzene | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |



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**Table B12. Blank results for Volatile Organic Compounds (µg/L) in Phase V (Region 8 laboratory, Golden, CO) cont.**

| Label | FieldBlk01 | FieldBlk02 | FieldBlk03 | FieldBlk04 | EquipBlk01 | EquipBlk02 | EquipBlk03 | EquipBlk04 | TripBlk01 | TripBlk02 | TripBlk03 | TripBlk04 | QL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | 4/16/12 | 4/18/12 | 4/22/12 | 4/24/12 | 4/16/12 | 4/18/12 | 4/22/12 | 4/24/12 | 4/17/12 | 4/18/12 | 4/22/12 | 4/24/12 | |
| | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L |
| 2,2-Dichloropropane | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| 2-Butanone | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | 0.50 |
| 2-Chlorotoluene | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| 2-Hexanone | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| 4-Chlorotoluene | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| 4-Methyl-2-pentanone | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| Acetone | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Acrylonitrile | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| Adamantane | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| Allyl chloride | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| Benzene | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| Bromobenzene | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| Bromochloromethane | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| Bromodichloromethane | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| Bromoform | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| Bromomethane | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| Carbon disulfide | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| Carbon tetrachloride | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| Chlorobenzene | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| Chlorodibromomethane | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| Chloroethane | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |



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**Table B12. Blank results for Volatile Organic Compounds (µg/L) in Phase V (Region 8 laboratory, Golden, CO) cont.**

| Label | FieldBlk01 | FieldBlk02 | FieldBlk03 | FieldBlk04 | EquipBlk01 | EquipBlk02 | EquipBlk03 | EquipBlk04 | TripBlk01 | TripBlk02 | TripBlk03 | TripBlk04 | QL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | 4/16/12 | 4/18/12 | 4/22/12 | 4/24/12 | 4/16/12 | 4/18/12 | 4/22/12 | 4/24/12 | 4/17/12 | 4/18/12 | 4/22/12 | 4/24/12 | |
| | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L |
| Chloroform | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| Chloromethane | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | 0.25 |
| cis-1,2-Dichloroethene | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| cis-1,3-Dichloropropene | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| Dibromomethane | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| Dichlorodifluoromethane | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Ethyl Ether | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| Ethylbenzene | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| Hexachlorobutadiene | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| Hexachloroethane | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| Iodomethane | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| Isopropylbenzene | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| m,p-Xylene | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | 0.50 |
| Methacrylonitrile | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| Methyl Acrylate | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| Methyl tert-Butyl Ether | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| Methylene chloride | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| Naphthalene | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| n-Butyl Benzene | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| n-Propyl Benzene | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| o-Xylene | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |



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**Table B12. Blank results for Volatile Organic Compounds (µg/L) in Phase V (Region 8 laboratory, Golden, CO) cont.**

| Label | FieldBlk01 | FieldBlk02 | FieldBlk03 | FieldBlk04 | EquipBlk01 | EquipBlk02 | EquipBlk03 | EquipBlk04 | TripBlk01 | TripBlk02 | TripBlk03 | TripBlk04 | QL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | 4/16/12 | 4/18/12 | 4/22/12 | 4/24/12 | 4/16/12 | 4/18/12 | 4/22/12 | 4/24/12 | 4/17/12 | 4/18/12 | 4/22/12 | 4/24/12 | |
| | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L |
| p-Isopropyltoluene | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| sec-Butylbenzene | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | 0.25 |
| Styrene | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| tert-Butylbenzene | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| Tetrachloroethene | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| Toluene | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.310 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| trans-1,2-Dichloroethene | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| trans-1,3-Dichloropropene | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| Trichloroethene | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| Trichlorofluoromethane | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| Vinyl chloride | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 | 0.25 |
| Xylenes (total) | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |

Results in µg/L . QL – Quantitation Limit. Note all values flagged as estimated due to missing second source calibration verification.



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**Table B13. Blank results for Semi-Volatile Organic Compounds (µg/L) in Phase V (Region 8 laboratory, Golden, CO).**

| Label | FieldBlk01 | FieldBlk02 | FieldBlk03 | FieldBlk04 | EquipBlk01 | EquipBlk02 | EquipBlk03 | EquipBlk04 | QL |
|---|---|---|---|---|---|---|---|---|---|
| Date | 4/16/12 | 4/18/12 | 4/22/12 | 4/24/12 | 4/16/12 | 4/18/12 | 4/22/12 | 4/24/12 | |
| | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L |
| Limonene | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| 1,2,4-Trichlorobenzene | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| 1,2-Dichlorobenzene | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| 1,2-Dinitrobenzene | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| 1,3-Dichlorobenzene | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| 1,3-Dinitrobenzene | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| 1,3-Dimethyl adamantane | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| 1,4-Dichlorobenzene | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| 1,4-Dinitrobenzene | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| 1-Methylnaphthalene | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| 2,3,4,6-Tetrachlorophenol | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | 2.00 |
| 2,3,5,6-Tetrachlorophenol | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | 2.00 |
| 2,4,5-Trichlorophenol | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | 2.00 |
| 2,4,6-Trichlorophenol | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | 2.00 |
| 2,4-Dichlorophenol | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | 2.00 |
| 2,4-Dimethylphenol | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | 2.00 |
| 2,4-Dinitrophenol | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | 3.00 |
| 2,4-Dinitrotoluene | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| 2,6-Dinitrotoluene | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| 2-Butoxyethanol | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| 2-Butoxyethanol phosphate | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |



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**Table B13. Blank results for Semi-Volatile Organic Compounds (µg/L) in Phase V (Region 8 laboratory, Golden, CO) cont.**

| Label | FieldBlk01 | FieldBlk02 | FieldBlk03 | FieldBlk04 | EquipBlk01 | EquipBlk02 | EquipBlk03 | EquipBlk04 | QL |
|---|---|---|---|---|---|---|---|---|---|
| Date | 4/16/12 | 4/18/12 | 4/22/12 | 4/24/12 | 4/16/12 | 4/18/12 | 4/22/12 | 4/24/12 | |
| | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L |
| 2-Chloronaphthalene | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| 2-Chlorophenol | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | 2.00 |
| 2-Methylnaphthalene | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| 2-Methylphenol | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | 2.00 |
| 2-Nitroaniline | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| 2-Nitrophenol | <2.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 2.00 |
| 3&4-Methylphenol | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 | 5.00 |
| 3,3′-Dichlorobenzidine | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| 3-Nitroaniline | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | 3.00 |
| 4,6-Dinitro-2-methylphenol | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | 2.00 |
| 4-Bromophenyl phenyl ether | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| 4-Chloro-3-methylphenol | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | 2.00 |
| 4-Chloroaniline | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | 3.00 |
| 4-Chlorophenyl phenyl ether | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| 4-Nitroaniline | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | 3.00 |
| 4-Nitrophenol | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | 3.00 |
| Acenaphthene | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Acenaphthylene | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Adamantane | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Aniline | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Anthracene | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |

**Table B13. Blank results for Semi-Volatile Organic Compounds (µg/L) in Phase V (Region 8 laboratory, Golden, CO) cont.**

| Label | FieldBlk01 | FieldBlk02 | FieldBlk03 | FieldBlk04 | EquipBlk01 | EquipBlk02 | EquipBlk03 | EquipBlk04 | QL |
|---|---|---|---|---|---|---|---|---|---|
| Date | 4/16/12 | 4/18/12 | 4/22/12 | 4/24/12 | 4/16/12 | 4/18/12 | 4/22/12 | 4/24/12 | |
| | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L |
| Azobenzene | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Benzo (a) anthracene | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Benzo (a) pyrene | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Benzo (b) fluoranthene | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Benzo (g,h,i) perylene | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Benzo (k) fluoranthene | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Benzoic acid | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | 3.00 |
| Benzyl alcohol | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Bis(2-chloroethoxy)methane | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Bis(2-chloroethyl)ether | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Bis(2-chloroisopropyl)ether | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Bis(2-Ethylhexyl) adipate | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Bis(2-ethylhexyl)phthalate | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | 2.00 |
| Butyl benzyl phthalate | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Carbazole | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | <3.00 | 3.00 |
| Chrysene | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Dibenz (a,h) anthracene | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Dibenzofuran | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Diethyl phthalate | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Dimethyl phthalate | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Di-n-butyl phthalate | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |

**Table B13. Blank results for Semi-Volatile Organic Compounds (µg/L) in Phase V (Region 8 laboratory, Golden, CO) cont.**

| Label | FieldBlk01 | FieldBlk02 | FieldBlk03 | FieldBlk04 | EquipBlk01 | EquipBlk02 | EquipBlk03 | EquipBlk04 | QL |
|---|---|---|---|---|---|---|---|---|---|
| Date | 4/16/12 | 4/18/12 | 4/22/12 | 4/24/12 | 4/16/12 | 4/18/12 | 4/22/12 | 4/24/12 | |
| | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L |
| Di-n-octyl phthalate | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Diphenylamine | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Fluoranthene | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Fluorene | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Hexachlorobenzene | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Hexachlorobutadiene | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Hexachlorocyclopentadiene | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Hexachloroethane | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Indeno (1,2,3-cd) pyrene | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Isophorone | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.17 | 1.00 |
| Naphthalene | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Nitrobenzene | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| N-Nitrosodimethylamine | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| N-Nitrosodi-n-propylamine | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Pentachlorophenol | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | 2.00 |
| Phenanthrene | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Phenol | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | 2.00 |
| Pyrene | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Pyridine | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |
| Squalene | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 | 2.00 |
| Terpinol | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | <1.00 | 1.00 |

Results in µg/L. QL – Quantitation Limit.



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**Table B14. Blank results for GRO and DRO analyses in Phase V (Region 8 laboratory, Golden, CO) and blank results for 2-butoxyethanol and glycol ethers in Phase V sampling (Region 3 laboratory, Fort Meade, MD).**

| | FieldBlk01 | FieldBlk02 | FieldBlk03 | FieldBlk04 | EquipBlk01 | EquipBlk02 | EquipBlk03 | EquipBlk04 | QL |
|---|---|---|---|---|---|---|---|---|---|
| Date | 4/16/12 | 4/18/12 | 4/22/12 | 4/24/12 | 4/16/12 | 4/18/12 | 4/22/12 | 4/24/12 | |
| | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L |
| Gasoline Range Organics | <20.0 | <20.0 | <20.0 | <20.0 | <20.0 | <20.0 | <20.0 | 22.4 | 20.0 |
| Diesel Range Organics | <20.0 | <20.0 | <20.0 | <20.0 | <20.0 | <20.0 | <20.0 | <20.0 | 20.0 |
| | | | | | | | | | |
| 2-Butoxyethanol | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | -- | <5.0 | 5.0 |
| Diethylene Glycol | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | -- | <5.0 | 5.0 |
| Triethylene Glycol | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | -- | <10.0 | 10.0 |
| Tetraethylene Glycol | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | -- | <10.0 | 10.0 |

Results in µg/L. QL - Quantitation Limit. - No sample.

**Table B15. Blank results for methanol, propylene glycol, and ethylene glycol (ALS Environmental, Holland, MI).**

| | FieldBlk01 | FieldBlk02 | FieldBlk03 | FieldBlk04 | EquipBlk01 | EquipBlk02 | EquipBlk04 | QL |
|---|---|---|---|---|---|---|---|---|
| Date | 4/16/12 | 4/18/12 | 4/22/12 | 4/24/12 | 4/16/12 | 4/18/12 | 4/24/12 | |
| | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L |
| Methanol | <5000 | <5000 | <5000 | <5000 | <5000 | <5000 | <5000 | 5000 |
| Propylene Glycol | <5000 | <5000 | <5000 | <5000 | <5000 | <5000 | <5000 | 5000 |
| Ethylene Glycol | <5000 | <5000 | <5000 | <5000 | <5000 | <5000 | <5000 | 5000 |

Results in µg/L. QL - Quantitation Limit.

**Table B16. Blank results for ethoxylates, alkylphenols, and acrylamide (EPA ORD/NERL Las Vegas).**

| | FieldBlk01 | FieldBlk02 | FieldBlk03 | FieldBlk04 | EquipBlk01 | EquipBlk02 | EquipBlk03 | EquipBlk04 | QL |
|---|---|---|---|---|---|---|---|---|---|
| Date | 4/16/12 | 4/18/12 | 4/22/12 | 4/24/12 | 4/16/12 | 4/18/12 | 4/22/12 | 4/24/12 | |
| | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | |
| Nonylphenol ethoxylate | 0.37 | 0.09 | 0.07 | 0.09 | 0.17 | 0.09 | 0.07 | 0.16 | 0.2 |
| Nonylphenol | 0.42 | 0.06 | <0.05 | 0.07 | 0.05 | 0.06 | 0.07 | <0.05 | 0.05 |
| Octylphenol | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 0.05 |
| Ethoxylated alcohol C12 | 0.30 | 0.24 | <0.05 | 0.08 | 0.10 | 0.44 | 0.12 | 0.05 | 0.05 |
| Ethoxylated alcohol C13 | 0.58 | <0.05 | 0.05 | 0.06 | 0.15 | <0.05 | 0.17 | 0.09 | 0.05 |
| Ethoxylated alcohol C14 | 0.38 | 0.65 | 0.06 | 0.24 | 0.14 | 1.16 | 0.12 | 0.11 | 0.05 |
| Ethoxylated alcohol C15 | <0.05 | <0.05 | <0.05 | <0.05 | 0.06 | <0.05 | 0.07 | <0.05 | 0.05 |
| Acrylamide | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | 0.2 |

**Table B17. Blank results for Methylene Blue Active Substances (TestAmerica, Savannah, GA).**

| | FieldBlk01 | FieldBlk02 | FieldBlk03 | FieldBlk04 | EquipBlk01 | EquipBlk02 | EquipBlk04 | | QL |
|---|---|---|---|---|---|---|---|---|---|
| Date | 4/16/12 | 4/18/12 | 4/22/12 | 4/24/12 | 4/16/12 | 4/18/12 | 4/24/12 | | |
| | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | | mg/L |
| Methylene Blue Active Substances (MBAS) | * | <0.20 | <0.20 | <0.20 | * | <0.20 | <0.20 | | 0.20 |

QL - Quantitation Limit. *- samples lost during shipment. Units are in mg/L as linear alkyl benzene sulfonate (LAS, molecular weight = 340).



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## B5. Duplicate Samples

Field duplicate samples were collected to measure the reproducibility and precision of field sampling and analytical procedures. Field duplicates were collected for wells PGDW20 and EPAMW01, or for 2 of the 9 wells sampled in Phase V. The relative percent difference was calculated to compare concentration differences between the primary (sample 1) and duplicate sample (sample 2) using the following equation:

RPD(%) = |[2*(sample1-sample2)/((sample1+sample2)]*100|.

RPDs were calculated when constituents in both the primary sample and duplicate sample were above method QLs. Constituents are flagged if RPDs are >30% and if analyte concentrations are >5◊ the QL. RPDs for a majority of the constituents were less than or equal to 10% (81% of the comparisons), and indicated very good precision for most inorganic and organic analytes. Benzoic acid and acetate had RPDs >30% and concentrations >5◊ the QL for samples EPAMW01-0412 and EPAMW01d-0412. Samples with detections of these analytes are flagged accordingly as estimated values.

Analyses of dissolved trace metals by ICP-MS (CLP results) are in poor agreement between the primary sample and duplicate sample for PGDW20-0412, for all metals analyzed (As, Cd, Cr, Cu, Ni, Pb, Sb, Se, and Tl). ICP-MS results for total metals are in reasonable agreement for the PGDW20-0412/PGDW20d-0412 pair, and these results are consistent with dissolved metals concentrations detected in a field duplicate, PGDW20d-0412. Thus, the high levels of metals detected in PGDW20-0412 are likely due to contamination in the laboratory. Consequently, dissolved metals results for sample PGDW20-0412 are rejected. (Note: the trace metal data reported for Phase V were analyzed through EPA's Contract Laboratory Program (CLP). The original trace metal analysis of these samples, conducted by Shaw Environmental, did not show this discrepancy. See section B9 for additional details.). A laboratory duplicate analysis of total metals in sample PGDW30-0412 exceeded QC criteria listed in Table B37 for Cr, Pb, and Ni. Concentration data (totals) for these elements are flagged with the * data qualifier where appropriate (Table B31).

Results of selected duplicate analyses (major constituents, critical analytes) are presented in Tables B18 and B19.

## B6. Laboratory Notes

Tables B20-B29 provide QA/QC requirements for laboratory analyses conducted as part of the Phase V investigation. Table B30 summarizes laboratory QA/QC narratives regarding sample analysis, such as laboratory duplicate analysis, laboratory blank analysis, matrix spike results, calibration, and continuing calibration checks. Impacts on data quality of any issues noted in the QA narratives are also presented in Table B30. Data qualifiers are listed in Table B31. Many of the specific QA/QC observations noted in the Audit of Data Quality are summarized in Table B30.

## B.7 Double-lab Comparison of VOCs

Shaw Environmental and EPA Region 8 analyzed samples for volatile organic compounds using EPA methods (Table B1). Shaw Environmental used EPA Method 5021A plus 8260C (GC-MS, equilibrium headspace analysis). The EPA Region 8 laboratory used EPA Method 5035 plus 8260C (GC-MS, closed-system purge-and-trap). A comparison is made of data for overlapping analytes for two samples collected from MW02 (EPAMW02-0412-1 and EPAMW02-0412-2). These two samples are not field duplicates; they were collected at different stages of well purging. For these two samples, detections were reported by both laboratories for 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, acetone, benzene, ethylbenzene, m,p-xylene, naphthalene, o-xylene, and toluene. Results from the two labs are provided in Table B32 and graphically represented in Figure B1. RPD values for the majority of the constituents are below or equal to 12% (83% of comparisons). Acetone shows the highest deviation, but is within 40% in both comparisons. These results show very good agreement and demonstrate accurate identification and quantitation of volatile organic compounds in groundwater from MW02.

## B8. Performance Evaluation Samples

A series of performance evaluation (PE) samples were submitted by the EPA Ground Water and Ecosystems Restoration Division QA Manager to selected

laboratories conducting critical analyses to support the Phase V effort at Pavillion. Samples were submitted to the EPA Region 8 laboratory for DRO/GRO, semivolatile, and volatile organic compounds; Shaw Environmental for VOCs, tert-butyl alcohol, and potassium; EPA General Parameters laboratory for chloride; and, to the USGS/TestAmerica contract laboratory for GRO/DRO, gasoline additives, semivolatile and volatile organic compounds, and inorganic compounds. PE Samples were delivered to these labs at about the same time samples arrived from the field. In most cases, the PE samples were run in the same laboratory batches as the field samples. Results of the blind PE tests are presented in Tables B33 to B36. These tables show the results of 233 tests; 100% of the reported values fell within the acceptance range. These blind PE sample results demonstrate the high quality of analytical data reported here.

**Table B18. Field duplicate data for selected major ions, DOC, and DIC in groundwater samples collected during Phase V.**

| Sample | Date | Na | K | Ca | Mg | Ba | Sr | Si | Cl | SO4 | F | NO3 | DOC | DIC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| **PGDW20-0412** | 4/16/2012 | 490 | 1.64 | 57.9 | 5.93 | 0.008 | 0.86 | 5.69 | 32.3 | 1130 | 0.94 | 0.073 | 0.632 | 14.9 |
| **PGDW20d-0412** | 4/16/2012 | 493 | 1.27 | 58.3 | 5.95 | 0.009 | 0.87 | 5.68 | 32.3 | 1240 | 1.03 | BQL 0.045 | 0.627 | 14.8 |
| **RPD (%)** | | 0.4 | 25.4 | 0.7 | 0.3 | 3.6 | 1.0 | 0.2 | 0.0 | 9.3 | 8.8 | NC | 0.8 | 0.7 |
| | | | | | | | | | | | | | | |
| **EPAMW01-0412** | 4/30/2012 | 276 | 17.3 | 9.87 | 0.139 | 0.021 | 0.32 | 10.5 | 19.4 | 390 | 2.29 | 0.120 | 5.63 | 15.2 |
| **EPAMW01d-0412** | 4/30/2012 | 277 | 17.2 | 9.91 | 0.152 | 0.021 | 0.31 | 10.5 | 20.9 | 388 | 2.33 | BQL 0.045 | 5.75 | 15.2 |
| **RPD (%)** | | 0.4 | 0.6 | 0.4 | 8.9 | 1.4 | 3.2 | 0.0 | 7.4 | 0.5 | 1.7 | NC | 2.1 | 0.0 |

RPD is the calculated relative percent difference: RPD = |[2*(sample1-sample2)/((sample1+sample2)]*100 |. NC - not calculated. BQL - below quantitation level. Units are mg/L. RPD is calculated if both the primary and duplicate samples show analyte concentrations above the method quantitation limit (QL).

**Table B19. Field duplicate data for methane and selected dissolved organic compounds in groundwater samples collected during Phase V sampling.**

| Sample | Date | Methane | Benzene | Toluene | m,p-Xylenes | Isopropyl alcohol | Tert-butyl alcohol | Phenol | Diethylene Glycol | Triethylene Glycol | Acetone | DRO | GRO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | mg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L |
| **PGDW20-0412** | 4/16/2012 | 0.111 | <0.06 | <0.03 | <0.08 | <11.4 | <1.72 | <2.0 | <5.0 | <10.0 | <1.0 | <20 | <20 |
| **PGDW20d-0412** | 4/16/2012 | 0.108 | <0.06 | <0.03 | <0.08 | <11.4 | <1.72 | <2.0 | <5.0 | <10.0 | <1.0 | <20 | <20 |
| **RPD (%)** | | 2.7 | NC | NC | NC | NC | NC | NC | NC | NC | NC | NC | NC |
| | | | | | | | | | | | | | |
| **EPAMW01-0412** | 4/30/2012 | 17.3 | <0.06 | BQL 0.262 | <0.08 | BQL 69.8 | <1.72 | 8.09 | 53.9 | 11.5 | 155 | 528 | 484 |
| **EPAMW01 d-0412** | 4/30/2012 | 17.3 | <0.06 | BQL 0.259 | <0.08 | BQL 69.2 | <1.72 | 8.42 | 53.9 | 11.6 | 133 | 539 | 476 |
| **RPD (%)** | | 0.0 | NC | NC | NC | NC | NC | 4.0 | 0.0 | 0.9 | 15.3 | 2.1 | 1.7 |

RPD is the calculated relative percent difference: RPD = |[2*(sample1-sample2)/((sample1+sample2)]*100 |. NC - not calculated. Methane is from the dissolved gas analysis. Benzene, toluene, m,p-xylenes, isopropyl alcohol, and tert-butyl alcohol are from RSKSOP259v1 (alcohols, aromatics, and chlorinated hydrocarbons). Phenol is from EPA Method 8270D (semi-volatile organic compounds). Diethylene and triethylene glycol are from the Region 3 HPLC-MS-MS method. Acetone is from EPA Method 5035 plus 8260C (volatile organic compounds). RPD is calculated if both the primary and duplicate samples show analyte concentrations above the method quantitation limit (QL).

## Table B20. QA/QC requirements for analysis of metals and major ions.

| Measurement | Analysis Method | Blanks (Frequency) | Calibration Checks (Frequency) | Second Source (Frequency) | Duplicates (Frequency) | Matrix Spikes (Frequency) |
|---|---|---|---|---|---|---|
| **Metals * ICP-OES** | RSKSOP-213v4 (EPA Methods 200.7 and 6020) | <QL for 80% of metals; (Beginning and end of each sample queue, 10-15 samples) | 90-110% of known value (Beginning and end of each sample queue, 10-15 samples) | PE sample acceptance limits or 90-110% of known value (Immediately after first calibration check) | RPD<10 for 80% of metals; for results <5x QL, difference of ≤QL (Every 15 samples) | 90-110% Rec. for 80% of metals w/ no individual exceeding 50-150% Rec. (one per sample set, 10-15 samples) |
| **Metals ICP-MS**** | RSKSOP-257v3 (EPA Methods 200.7 and 6020) | <QL for 80% of metals; none>10xMDL (Beginning and end of each sample queue, 10-15 samples) | 90-110% of known value (Beginning and end of each sample queue, 10-15 samples) | PE sample acceptance limits or 90-110% of known value (Immediately after first calibration check) | RPD<10 for 80% of metals; for results <5xQL, difference of <QL (Every 15 samples) | 90-110% Rec. for 80% of metals w/ no individual exceeding 70-130% (one per sample set, 10-15 samples) |
| **$SO_4$, Cl, F, Br** | RSKSOP-276v3 (EPA Method 6500) | <MDL (Beginning and end of each sample queue) | 90-110% Rec. (Beginning, end, and every 10 samples) | PE sample acceptance limits (One per sample set) | RPD<10 (every 15 samples) | 80-120% Rec. (one per every 20 samples) |
| **$NO_3$ + $NO_2$, $NH_4$** | RSKSOP-214v5 (EPA Method 350.1 and 353.2) | <½ lowest calib. std. (Beginning and end of each sample queue) | 90-110% Rec. (Beginning, end, and every 10 samples) | PE sample acceptance limits (One per sample set) | RPD<10 (every 10 samples) | 80-120% Rec. (one per every 20 samples) |

*Note: Modifications made to criteria for RSKSOP-21 3v4 (ICP-OES) as follows. Blank frequency changed to every 10 samples. Digestion blanks frequency changed to every 20 samples. Calibration checks run every 10 samples. Duplicate RPD acceptance increased to ≤15% for 100% of metals ≥50 QL (every 10 samples). For digestions, duplicate RPD acceptance changed to ≤20% for 100% of metals ≥50 QL (every 20 samples). Matrix spike acceptance e xpanded to 80-120% recovery for 100% of metals (every 20 samples). Pre-digestion recovery expanded to 75-125% recovery for 100% of metals; post-digestion analyzed if pre-digestion exceeds limits. **The ICP-MS data using this method were not included in this report. See section B9 for discussion. See Table B37 for EPA CLP QC criteria.

**Table B21. QA/QC requirements for analysis of dissolved gases, DIC/DOC, VOCs, low molecular weight acids and stable isotopes of water.**

| Measurement | Analysis Method | Blanks (Frequency) | Calibration Checks (Frequency) | Second Source (Frequency) | Duplicates (Frequency) | Matrix Spikes (Frequency) |
|---|---|---|---|---|---|---|
| **Dissolved gases** | RSKSOP-194v4 &-175v5 (No EPA Method) | ≤MDL (He/Ar blank, first and last in sample queue; water blank before samples) | 85-115% of known value (After helium/Ar blank at beginning of analysis queue, before helium/Ar blank at end of sample set, and every 15 samples) | 85-115% of known value; after first calibration check | RPD≤20; every 15 samples | NA |
| **DIC/DOC** | RSKSOP- 330v0 (EPA Method 9060A) | <MDL (Beginning and end of sample set) | 90-100% of known value (Beginning and end of sample set and every 10 samples) | PE sample reported acceptance limits. Others: 90-100% recovery (one per sample set) | RPD<10; every 10 samples | 80-120% recovery |
| **Alcohols, aromatics, and chlorinated hydrocarbons*** | RSKSOP-259v1 (EPA Method 5021A plus 8260C) | <MDL (Beginning and end of each sample set) | 80-120% recovery (Beginning, end, and every 20 samples) | 80-120% of known value; at beginning | RPD<25; every 20 samples | 70-130% recovery; every 20 samples |
| **Low Molecular Weight Acids** | RSKSOP-112v6 (No EPA Method) | <MDL (Beginning of a sample queue; every 10 samples; and end of sample queue) | 85-115% recovery; prior to sample analysis; every 10 samples; end of sample queue | 85-115% recovery; prior to sample analysis | <15 RPD; every 20 samples through a sample queue | 80-120% recovery; every 20 samples through a sample queue |
| **O, H stable isotopes of water**** | RSKSOP-334v0 (No EPA Method) | NA | Difference of calibrated/true < 1.5‰ for $\delta^2$H & <0.3‰ for $\delta^{18}$O (Beginning, end, and every 20 samples) | Working stds calibrated against IAEA stds.† (Beginning, end, and every tenth sample) | Difference ≤ 1.5‰ for $\delta^2$H and <0.3‰ for $\delta^{18}$O (Beginning and end of sample set and every twenty samples) | NA |

*Surrogate compounds spiked at 100 µg/L: p-bromofluorobenzene and 1,2-dichlorobenzene-d4, 85-115% recovery. **Additional checks: internal reproducibility prior to each sample set, std dev ≤1‰ for $\delta^2$H and ≤0.2‰ for $\delta^{18}$O. †International Atomic Energy Agency (VSMOW, GISP, and SLAP). Corrective actions are outlined in the SOPs. MDL = Method Detection Limit. QL = Quantitation Limit. PE = Performance Evaluation.



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**Table B22. Region 8 laboratory QA/QC requirements for semi-volatiles, GRO, DRO.**

| QC Type | Semivolatiles | DRO | GRO | Frequency |
|---|---|---|---|---|
| **Method Blanks** | <RL<br>Preparation or Method Blank, one with each set of extraction groups. Calibration Blanks are also analyzed | <RL<br>Preparation or Method Blank | <RL<br>Preparation or Method Blank and IBL | At least one per sample set |
| **Surrogate Spikes** | Limits based upon DoD statistical study (rounded to 0 or 5) for the target compound analyses. | 60-140% of expected value | 70-130% of expected value | Every field and QC sample |
| **Internal Standards Verification** | Every sample,<br>EICP area within -50% to +100% of last ICV or first CCV. | NA | NA | Every field and QC sample |
| **Initial multilevel calibration** | ICAL: minimum of 6 levels (0.25 - 12.5 µg/L) , one is at the MRL (0.50 µg/L), prior to sample analysis (not daily)<br>RSD≤20%, $r^2$≥0.990 | ICAL: 10-500 µg/L<br>RSD<=20% or $r^2$≥0.990 | ICAL: .25-12.5 ug/L for gasoline<br>(different range for other compounds)<br><br>RSD<=20% or $r^2$≥0.990 | As required (not daily if pass ICV) |
| **Initial and Continuing Calibration Checks** | 80-120% of expected value | 80-120% of expected value | 80-120% of expected value | At beginning of sample set, every tenth sample, and end of sample set |
| **Second Source Standards** | ICV1<br>70-130% of expected value | ICV1<br>80-120% of expected value | ICVs<br>80-120% of expected value | Each time calibration performed |
| **Laboratory Control Samples (LCS)** | Statistical Limits from DoD LCS Study (rounded to 0 or 5) or if SRM is used based on those certified limits | Use an SRM: Values of all analytes in the LCS should be within the limits determined by the supplier.<br><br>Otherwise 70-130% of expected value | Use and SRM: Values of all analytes in the LCS should be within the limits determined by the supplier.<br><br>Otherwise 70-130% of expected value | One per analytical batch or every 20 samples, whichever is greater |
| **Matrix Spikes (MS)** | Same as LCS | Same as LCS | 70-130% of expected value | One per sample set or every 20 samples, whichever is more frequent |
| **MS/MSD** | % Recovery same as MS<br>RPD≤30 | % Recovery same as MS<br>RPD≤25 | % Recovery same as MS<br>RPD≤25 | One per sample set or every 20 samples, whichever is more frequent |
| **Reporting Limits*** | 0.1 µg/L (generally)[1]for target compounds HF special compounds are higher | 20 µg/L[1] | 20 µg/L[2] | NA |

[1]Based on 1000 mL sample to 1 mL extract. [2]Based on a 5 mL purge.

**Table B23. Isotech Laboratory QA/QC requirements for $\delta^{13}C$ of DIC (Dissolved Inorganic Carbon).**

| QC Type | Performance Criteria | Frequency |
|---|---|---|
| **Mass Spec Calibration Check** | Difference of calibrated/true ≤0.5‰ | One at beginning of day, and one after samples are analyzed. |
| **Mass Spec Zero Enrichment Check** | 0 ± 0.1‰ | Once a day |
| **Lab Duplicates** | ≤1‰ | 1 per every 5 samples** |

Working standards calibrated against IAEA (International Atomic Energy Agency) standard LSVEC and NBS-19; referenced to $\delta^{13}C$ of the Peedee belemnite (NIST material). **If < 5 samples are submitted, run a duplicate regardless of total number.

**Table B24. Isotech Laboratory QA/QC requirements for $\delta^{13}C$ of dissolved methane (and >C1) and δD of dissolved methane.**

| QC Type | Performance Criteria | Frequency |
|---|---|---|
| **Mass Spec Calibration Check** | Difference of calibrated/true ≤0.5‰ for $\delta^{13}C$ and ≤3‰ for δD | One at beginning of day and after samples are analyzed for $\delta^{13}C$*; one at beginning of day and every tenth sample for δD** |
| **Mass Spec Zero Enrichment Check** | 0±0.1‰ for $\delta^{13}C$ and 0 ±1 ‰ for δD | Once a day for $\delta^{13}C$ and every tenth sample for δD |
| **Lab Duplicates** | ≤1‰ for $\delta^{13}C$ and ≤3‰ for δD | 1 per every 10 samples*** |
| **Preparation System Check/Reference Standards** | ≤1 ‰ for $\delta^{13}C$ and ≤3‰ for δD | One per every 10 samples |

*Working standards calibrated against IAEA (International Atomic Energy Agency) standard LSVEC and NBS-19; referenced to δ13C of the PeeDee belemnite (NIST material). **Working standards calibrated against VSMOW, SLAP, and GISP; referenced to VSMOW. ***If < 10 samples are submitted, run a duplicate regardless of total number.

**Table B25. QA/QC requirements for LC/MS/MS analysis of glycols.**

| QC Type | Performance Criteria | Frequency |
|---|---|---|
| **Method Blanks** | <RL | One per every 20 samples |
| **Solvent Blanks** | <RL | One per every 10 samples |
| **Initial and Continuing Calibration Checks** | 80-120% of expected value | At beginning of sample set, after every tenth sample, and end of sample set |
| **Second Source Standards** | 80-120% of expected value | Each time calibration performed |
| **Laboratory Control Samples (LCS)** | 80-120% of expected value | One per analytical batch or every 20 samples, whichever is greater |
| **Matrix Spikes (MS)** | 70-130% of expected value | One per sample set or every 20 samples, whichever is more frequent |
| **MS/MSD** | RPD≤25 | One per sample set or every 20 samples, whichever is more frequent |

RL = Reporting Limit. Corrective Actions: If re-analysis was not possible (such as lack of sample volume), data were qualified with a determination about the impact on the sample data.

**Table B26. Isotech Laboratory QA/QC requirements for tritium.**

| QC Type | Performance Criteria | Frequency |
|---|---|---|
| **Calibration Check** | Accuracy criteria based on 1 sigma limits of existing data | Dead water blank in every set or minimum of 1 per 12 samples; calibrated with NIST 4361C, 1 per every 12 samples |
| **Lab Duplicates** | Precision based on 1 sigma limits of existing data | 1 per every 10 samples |
| **Preparation System Check/Reference Standards** | Accuracy criteria based on 1 sigma limits of existing data | One per every 12 samples, checks against prepared dilutions of NIST 4361C |

**Table B27. ALS Environmental QA/QC requirements for methanol, ethylene glycol, and propylene glycol.**

| Blanks (frequency) | Calibration Checks (frequency) | Second Source (frequency) | Duplicates (frequency) | Matrix Spikes |
|---|---|---|---|---|
| <½QL (1 per batch of 20 or less samples) | 85-115% of known value (after calibration, every 20 samples, end) | 85-115% of known value ( Each new calibration) | RPD≤50 For MS/MSD pair (every 20 samples or less) | 50-150% recovery (One per 20 samples, or less) |

**Table B28. TestAmerica QA/QC requirements for MBAS.**

| Blanks (frequency) | Calibration Checks (frequency) | Second Source (frequency) | Duplicates (frequency) | Matrix Spikes |
|---|---|---|---|---|
| Method Blank, 1 per batch, result <0.5 RL of 0.2 mg/L | At beginning and at end and after every 10 samples, 90-110% | After initial calibration, 90-110% of known value | RPD<10 | 80-120% recovery (one per 20 or every set) |

The holding time for this analysis is 2 days.

**Table B29. ORD/NERL laboratory QA/QC requirements for ethoxylated alcohols, alkylphenols, and acrylamide.**

| QC Check | Frequency | Precision | Accuracy | Corrective Action |
|---|---|---|---|---|
| **5-point calibration** | Prior to sample analysis | <30% | $R^2 > 0.99$ | No samples will be run until calibration passes criteria. |
| **Laboratory blank** | One per batch of samples[a] | <50% | < PQL[b] | Inspect the system and reanalyze the blank. Samples must be bracketed by acceptable QC or they will be invalidated. |
| **Instrument blank** | In between samples | <50% | < PQL[b] | Inspect the system and reanalyze the blank. Samples must be bracketed by acceptable QC or they will be invalidated. |
| **Laboratory control sample** | One per batch of samples[a] | <30% | >70% | Check the system and reanalyze the standard. Re-prepare the standard if necessary. Recalibrate the instrument if the criteria cannot be met. Samples must be bracketed by acceptable QC or they will be invalidated. |
| **Laboratory fortified matrix** | One per batch of samples[a] | <30% | >70% recovery | Review data to determine whether matrix interference is present. If so, narrate interference and flag recovery. If no interference is evident, verify the instrument is functioning properly by running a lab blank. Reanalyze recollected sample to verify recovery. Samples must be bracketed by acceptable QC or they will be invalidated. |
| **Laboratory replicates** | One per batch of samples[a] | <30% | >70% recovery | Inspect the system, narrate discrepancy. Samples must be bracketed by acceptable QC or they will be invalidated. |
| **Continuing calibration verification** | One at beginning of each 8-hr analytical day, one at beginning of each batch of samples[a], and one at end of analytical day | <30% | >70% recovery | Inspect system and perform maintenance as needed. If system still fails CCV, perform a new 5-point calibration curve. Samples must be bracketed by acceptable QC or they will be invalidated. |
| **Laboratory fortified blank** | One per batch of samples[a] | <30% | >70% recovery | Inspect the system and reanalyze the standard. Re-prepare the standard if necessary. Re-calibrate the instrument if the criteria cannot be met. Samples must be bracketed by acceptable QC or they will be invalidated. |
| **Minimum detection limit** | Each chemical | TBD for each HF chemical | TBD for each HF chemical | TBD for each HF chemical. |

[a]Batch of samples not to exceed 20. [b]PQL=practical quantitation limit, 5 times the MDL.



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**Table B30. QA/QC narrative associated with laboratory analysis of Phase V samples.**

| Analysis/Lab | QC Narrative | Impact on Data |
|---|---|---|
| **Dissolved gases/Shaw Environmental** | EPAMW02 -0412-2 arrived with 15 mm bubble; EPAMW01-0412 arrived with 6 mm bubble; EPAMW01d-0412 arrived with 7 mm bubble; EPAMW01-0412-10 arrived with 12 mm bubble; TripBlk03 arrived with 7 mm bubble; TripBlk04 arrived with 6 mm bubble; TripBlk01 arrived with 10 mm bubble; FieldBlk01 arrived with 5mm bubble; PGDW50 arrived with 6 mm bubble. | Detections below the QL are flagged as J. Bubbles in samples from EPAMW01 and EPAMW02 are from gas exsolution and pressure change. Trip Blank bubbles result from pressure changes and filling and sealing sample vials in lab prior to deployment in the field. Bubbles are included in the headspace generation and analysis; therefore, there is no impact on data quality. |
| **Metals (filtered)/Shaw Environmental & CLP** | ICP-OES: Performance Evaluation (PE) sample was run for K in same sample set. PE result met acceptance criteria (measured value = 25.6 mg K/L; certified value 26.6 mg/L; acceptance limits = 21.9 - 31.7 mg/L). The ICP-OES dissolved metals analysis of filtered samples took place over two analytical runs. For both analytical runs, the analytes Ag, Al, B, Ba, K, Na, P, S, and Si were not included in the initial calibration verification (ICV) check. However, the analytes were included in a second source standard that was analyzed right after the calibration standards and prior to analysis of any other QC checks or any samples. The percent recoveries of all analytes in the second source standard for both runs were acceptable according to the QA criteria of 90 – 110% of known value. The percent recoveries for the nine analytes in question ranged from 93.6 – 103% recovery, indicating that the analytical method was in control for these analytes at the beginning of the sample analyses. The percent recoveries for these nine analytes in the ending CCVs ranged from 91.5 – 101% recovery, indicating that the analytical method was in control for these analytes at the end of the sample analysis. For the second run, eleven samples were analyzed, and then CCVs for the nine analytes in question were analyzed at the end of the sample analysis. The percent recoveries for these nine analytes in the ending CCVs ranged from 93.6 – 99.3% recovery, indicating that the analytical method was in control for these analytes at the end of the sample analysis. All laboratory blanks were <QL for all analytes, QC checks for analysis of laboratory duplicates were acceptable for all analytes, and matrix spikes were acceptable for all analytes except for Si, which had a high percent recovery, possibly due to the fact that the spiking concentration was too low compared to the concentration found in the spiked sample. Matrix spike recoveries for Na were unable to be calculated for either analytical run because the spiking concentration was less than 20% of the concentration found in the spiked sample. For the first analytical run, the matrix spike for S had an acceptable 85.0% recovery, but for the second analytical run, the matrix spike recovery for S was unable to be calculated because the spiking concentration was less than 20% of the concentration found in the spiked sample.<br><br>Shaw ICP-MS: Samples analyzed initially with a report date of 5/14/12 were not analyzed using the CCT-KED, ICS (Interference Check Standards), LLICV (Low Level Initial Calibration Verification), or LCS (Laboratory Control Sample). | ICP-OES: Detections below the QL have the J data qualifier applied. All of the dissolved metals results for Ag, Al, B, Ba, K, Na, P, S, and Si have the J data qualifier applied due to incomplete calibration check frequency. All of the dissolved metals results for Si have the J+ data qualifier applied due to high % recovery in a matrix spike.<br><br>CLP ICP-MS: CLP ICP-MS data (dissolved) for sample PGDW20 were rejected due to sample contamination. High dissolved concentrations of metals in this sample were not indicated in total concentrations or in previous ICP-MS analyses. |

| | | |
|---|---|---|
| | CLP ICP-MS: The samples were reanalyzed through the EPA Superfund Analytical Services Contract Laboratory Program (EPA CLP). Samples were sent for analysis under the EPA CLP Inorganic Statement of Work ISMO1.3, Exhibit D – Part B, "Analytical Methods for Inductively Coupled Plasma – Mass Spectrometry". Reanalysis included the metals As, Cd, Cu, Cr, Pb, Ni, Se, Sb, and Tl. | |
| **Metals (unfiltered)/Shaw Environmental & CLP** | ICP-OES: The analytes Ag, Al, B, Ba, K, Na, P, S, and Si were not included in the QC standard that was designated as the initial calibration verification (ICV) check. However, the analytes were included in a QA standard designated as a second source standard that is analyzed right after the calibration standards and prior to analysis of any other QC checks or any samples. The percent recoveries of all analytes in the second source standard for both runs were acceptable according to the QA criteria of 90 – 110% of known value. The percent recoveries for the nine analytes in question ranged from 94.8 – 103% recovery, indicating that the analytical method was in control for these analytes at the beginning of the sample analyses. Twenty-seven samples were analyzed, and then CCVs for the nine analytes in question were analyzed at the end of the sample analysis. The percent recoveries for these nine analytes in the ending CCVs ranged from 97.0 – 109% recovery, indicating that the analytical method was in control for these analytes at the end of the sample analysis. All laboratory blanks were <QL for all analytes, Duplicate QC checks were acceptable for all analytes, and pre- and post-digestion matrix spikes were acceptable for all analytes except for Ag, Na, S, and Si (further discussed below).<br><br>All of the unfiltered samples, plus several QC check samples (i.e. a digestion duplicate, a pre-digestion matrix spike, and a digestion blank) are put through the RSKSOP179 Rev. 3 digestion procedure. RSKSOP179 Rev. 3 is similar to EPA Method 3015A with the following notable deviations: no laboratory control sample (analytes spiked into an appropriate blank matrix) is digested, and the total digestion time is 40 minutes instead of the 20 minutes recommended by EPA Method 3015A. The longer total digestion time has the potential to result in more complete digestion of the sample and, hence, influence the results with potentially a high bias compared to 3015A performed with the standard, shorter digestion time.<br><br>Shaw ICP-MS: Hg analyzed using mass 201 due to possible interferences from $^{186}W^{15}O$. Total lead and thorium were above the quantitation limits (QL) in the digestion blank. Lead was 0.274 µg/L and thorium was 0.076 µg/L. Samples analyzed initially with a report date of 5/14/12 were not analyzed using the CCT-KED, ICS (Interference Check Standards), LLICV (Low Level Initial Calibration Verification), or LCS (Laboratory Control Sample). | ICP-OES: Detections below the QL have the J data qualifier applied. All of the total metals results for Ag, Al, B, Ba, K, Na, P, S, and Si have the J data qualifier applied due to incomplete calibration check frequency. All of the total metals results for Ag have the J- data qualifier applied due to low % recovery in a pre-digestion matrix spike. All of the total metals results for Si have the J+ data qualifier applied due to high % recovery in a pre-digestion matrix spike. |

| | | |
|---|---|---|
| | CLP ICP-MS: The samples were reanalyzed through the EPA Superfund Analytical Services Contract Laboratory Program (EPA CLP). Samples were sent for analysis under the EPA CLP Inorganic Statement of Work ISMO1.3, Exhibit D – Part B, "Analytical Methods for Inductively Coupled Plasma – Mass Spectrometry". Reanalysis included the metals As, Cd, Cu, Cr, Pb, Ni, Se, Sb, and Tl. | |
| **Anions/EPA ORD/NRMRL** | Sample analysis required dilutions for bromide, chloride, sulfate, and fluoride (up 51x). | Fluoride detections below the QL have the J data qualifier applied. |
| **$NO_3 + NO_2$, $NH_4$/EPA ORD/NRMRL** | | Nitrate+nitrite and ammonium detections below the QL have the J data qualifier applied. |
| **DIC/EPA ORD/NRMRL** | | Inorganic carbon detections below the QL have the J data qualifier applied. |
| **DOC/EPA ORD/NRMRL** | | Organic carbon detections below the QL have the J data qualifier applied. |
| **Alcohols, aromatic, and chlorinated hydrocarbons)/Shaw Environmental** | Sample analysis required dilutions for TBA and acetone. Low matrix spike recovery for n-propanol noted; matrix effect indicated. Mass spectral interferences noted for isobutanol, n-butanol, MTBE, TAME, acetone, chloroform, and ethanol due to co-eluting hydrocarbons. | Detections below the QL have the J data qualifier. The J- data qualifier is used for n-propanol, the analyte may be biased low. |
| **Volatile Organic Compounds/Region 8** | EPAMW02-0412-1 and EPAMW02-0412-2 were analyzed after dilution. Pentachloroethane did not produce acceptable calibration curves. Initial calibrations were not immediately verified by a second source calibration standard. | Pentachloroethane data are not reported. All VOC data are flagged as estimated because laboratory QA/QC acceptance criteria were not met (J). These data are qualified but are considered to be reliable based on comparisons between USGS results and Shaw results from EPAMW02. The J flag was applied to all data >QL to be consistent with the lab report. |
| **Semi-Volatile Organic Compounds /Region 8** | The extract for sample EPAMW02-0412-1 was dark yellow and foamy. Some samples were diluted prior to analysis. Various calibration acceptance criteria were not met for some analytes. The matrix spikes included with the data have several analytes that were either high recovery (2,4 dimethylphenol, 2-butoxyethanol, carbazole) or low recovery (4-chloroaniline, 4-nitroaniline, terpinol in sample EPAMW02-0412-1). | Some samples flagged with J for estimated value, laboratory calibration criteria not met. Some samples are flagged with J for estimated value, laboratory QA/QC acceptance criteria not met. J+ or J- data qualifiers were appropriately applied to analytes not meeting matrix spike acceptance criteria. |
| **Low Molecular Weight Acids/Shaw Environmental** | Isobutyrate in matrix spike co-eluted with large peak; caused low matrix spike recoveries. The field duplicate pair for EPAMW01-0412 had RPDs above the 30% limit for acetate and formate. Note that the lab dup for this same sample was below 15%, so this is likely due to true differences between the field samples; therefore, only the results for acetate and formate in source sample EPAMW01-0412/duplicate need to be qualified as *. Trisodium phosphate was used as the preservative for sample EPAMW02-0412-2. | Isobutyrate data are not reported. EPAMW01-0412/duplicate is flagged with the * data qualifier. Sample EPAMW02-0412-2 had a baseline problem (dipping and rising), but identification and integration of analyte peaks do not appear to be affected. |
| **O, H stable isotopes of water/ Shaw Environmental** | All method quality objectives were met for the reproducibility test, laboratory duplicate analyses, QC check standard, and calibration curve linearity. Two samples failed the replicate injection test (standard deviation of the 3 analyses averaged for the reported isotope ratio). The replicate injections of the oxygen isotopes for sample PGDW20d-0412 just exceeded the limits. The difference was 0.11‰ for $\delta^{18}O$, above the criteria of ≤0.1‰. The laboratory report identified this issue and it is believed that rounding is part of the cause for this failure. | Sample PGDW20d-0412 is flagged with the J data qualifier. |

| | | |
|---|---|---|
| **$\delta^{13}$C DIC/Isotech** | Samples EPAMW02-0412-1 and EPAMW02-0412-2 did not have enough dissolved inorganic carbon for isotopic discrimination. | No data problems are suspected. |
| **$\delta^{13}$C and δD of methane/Isotech** | $\delta^{13}$C of methane determined for samples PGDW05, PGDW20, PGDW23, PGDW30, EPAMW01, and EPAMW02. δD of methane determined for samples PGDW23, PGDW30, EPAMW01, and EPAMW02. One laboratory duplicate analysis of sample EPAMW02-0412-1 exceeded the QAPP precision limits of <3‰ for δD. The original and duplicate results were -204.6‰ and -208.3‰, respectively, with a difference of 3.7‰. Isotech re-analyzed and reported this sample on 7/17/12 and precision was within acceptance limits. | No data problems are suspected. |
| **Tritium/Isotech** | All samples <0.80 TU. | No data problems are suspected. |
| **DRO/Region 8** | | No data problems are suspected. |
| **GRO/Region 8** | EPAMW02-0412-1 and EPAMW02-0412-2 had high surrogate recovery due to hydrocarbon interference. | Surrogate recovery was obviously affected by hydrocarbon interference. No data problems are suspected. |
| **Glycols/Region 3** | Sample analysis required dilution for diethylene glycol in sample EPAMW02-0412-1. Data for 2-butoxyethanol and glycols are reported for detections below QLs but above MDLs. Matrix spike yielded low result for EPAMW02-0412-1. For continuing calibration verification (CCV) / blank spikes (BS), the following issues were found in the respective analysis runs: 4-20-21/2012 resulted in 0% recovery for TeG, and 22% for TriG in the low BS 5 ppb; 5/1-2/2012 resulted in 0% recovery for both TriG and TeG in the low BS at 5 ppb; 5/2-3/2012 resulted in 35% recovery for TriG and 34% recovery for TeG in the low BS at 10 ppb, for the low BS at 5 ppb 58% DiG, 0% TriG/TeG and 52% 2-Bu recovery. Note the quantification limit was raised from 5 to 10 ppb for TeG and TriG based on the low blank spike recoveries for the 5 ppb level. Non-detect results for all 4 analytes in samples analyzed on 5/2/2012 and 5/3/2012 are qualified because of the BSs (10 and 5 ppb) that are at the QL and had low recovery, below the 80% lower limit. Matrix Spike 1 and its duplicate (MS1/MSD1) were below the 70-130% limits for all 4 analytes and the RPD was above 25% for 2-Bu and TriG. The laboratory addressed these issues by including an "A" qualifier next to the spiked sample results. MS1/MSD1 were made from source sample PGDW30-0412 (analyzed 4/20-21/2012). | The method was modified from SW846/ASTM D773-11 to allow for quantification of glycols at lower detection limits. All sample results with detection greater than QL have had the J qualifier applied because the method is still under development. EPAMW02-0412-1 detection of diethylene glycol is flagged with the J qualifier because the concentration exceeded the high calibration point. Samples analyzed on 4/20 and 4/21 are qualified as J- due to the low MS recoveries. |
| **Methanol, propylene glycol, ethylene glycol/ALS Environmental** | All samples were below QLs. | No data problems are suspected. |
| **Acrylamide, alkylphenols, ethoxylated alcohols, ethoxylated alkyphenols/EPA ORD/NERL** | Certified standards were not available for C12-15 ethoxylated alcohols. A technical mixture (Shell, 25-9) was used for calibration of these analytes. Technical mixtures were also used for nonylphenol ethoxylate and octylphenol ethoxylate. Lab report noted lab blank issues and low spike recoveries. Extraction logs indicate that extraction holding times were missed for several samples. No laboratory-fortified blank was analyzed on 4/30 (ethoxylates). However, multiple matrix spike samples were analyzed on this date along with the required calibration checks. Matrix spike recoveries were low for alkylphenols and ethoxylates. Based upon the multiple instances of low recoveries of the fortified blanks and matrix spikes, the laboratory stated the quantitation values for the ethoxylated alcohols should not be considered more than estimates of the actual values. | Methods modified from ASTM D 7458-09 and USGS Method O1433-01 for ethoxylated alcohols and ethoxylated alkylphenols (methods in development). Acrylamide analyzed by EPA Method 8032A and 8316. Multiple QA/QC factors impact these samples including significant lab and field blank contamination (B), matrix spike failures (J-), missed extraction holding times (H), and calibration control issues (J). Data for ethoxylates are flagged as R. Alkylphenol data are retained with qualifiers. All sample results with detection greater than QL have had the J qualifier applied because the method is still under development. |

| | | |
|---|---|---|
| **MBAS/TestAmerica** | All samples below QLs. No second source standard was included in the analyses. Laboratory control samples were analyzed, but it is unclear how these differ from the calibration standards. In addition, there is no information in the data reports on the calibration check standards. The run logs indicate that a continuing calibration verification standard was run prior to, and bracketing the samples as required, but the recovery for MBAS in these standards was not reported. Matrix spike recoveries were reported and are within the QAPP limits of 80-120%. | All reported values are below the QL. |

**Table B31. Data qualifiers.**

| Qualifier | Definition |
|---|---|
| **U** | The analyte was analyzed for, but was not detected above the reported quantitation limit (QL). |
| **J** | The analyte was positively identified. The associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the QL). |
| **J+** | The result is an estimated quantity, but the result may be biased high. |
| **J-** | The result is an estimated quantity, but the result may be biased low. |
| **B** | The analyte is found in a blank sample above the QL and the concentration found in the sample is less than 10 times the concentration found in the blank. |
| **H** | The sample was prepared or analyzed beyond the specified holding time. Sample results may be biased low. |
| * | Relative percent difference of a field or lab duplicate is outside acceptance criteria. |
| **R** | The data are unusable. The sample results are rejected due to serious deficiencies in the ability to analyze the sample and/or meet quality control criteria. Sample results are not reported. The analytes may or may not be present in the sample. |
| | |
| **NA** | Data not reported or collected. |

**Table B32. Volatile organic compounds reported by Shaw Environmental and EPA Region 8 laboratories for samples EPAMW02-0412-1 and EPAMW02-0412-2.**

| | EPAMW02-0412-1 | | | EPAMW02-0412-2 | | |
|---|---|---|---|---|---|---|
| **Compound** | Shaw | EPA R8 | RPD | Shaw | EPA R8 | RPD |
| | µg/L | µg/L | % | µg/L | µg/L | % |
| **1,2,4-TMB** | 74.9 | 77 (J) | 2.8 | 137 | 148 (J) | 7.7 |
| **1,3,5-TMB** | 39.5 | 39.5 (J) | 0.0 | 71.4 | 74 (J) | 3.6 |
| **Acetone** | 1460 | 982 (J) | 39.1 | 231 | 157 (J) | 38.1 |
| **Benzene** | 166 | 175 (J) | 5.3 | 232 | 247 (J) | 6.3 |
| **Ethylbenzene** | 61.1 | 57 (J) | 6.9 | 101 | 89.6 (J) | 12.0 |
| **m,p-Xylene** | 549 | 578 (J) | 5.1 | 894 | 973 (J) | 8.5 |
| **Naphthalene** | 4.89 | 7.19 (J) | 38.1 | 7.49 | 7.2 (J) | 3.9 |
| **o-Xylene** | 161 | 164 (J) | 1.8 | 245 | 253 (J) | 3.2 |
| **Toluene** | 402 | 437 (J) | 8.3 | 607 | 677 (J) | 10.9 |

Note: J flags for Region 8 data are because a second source verification standard was not run immediately after the samples (see Table B30).

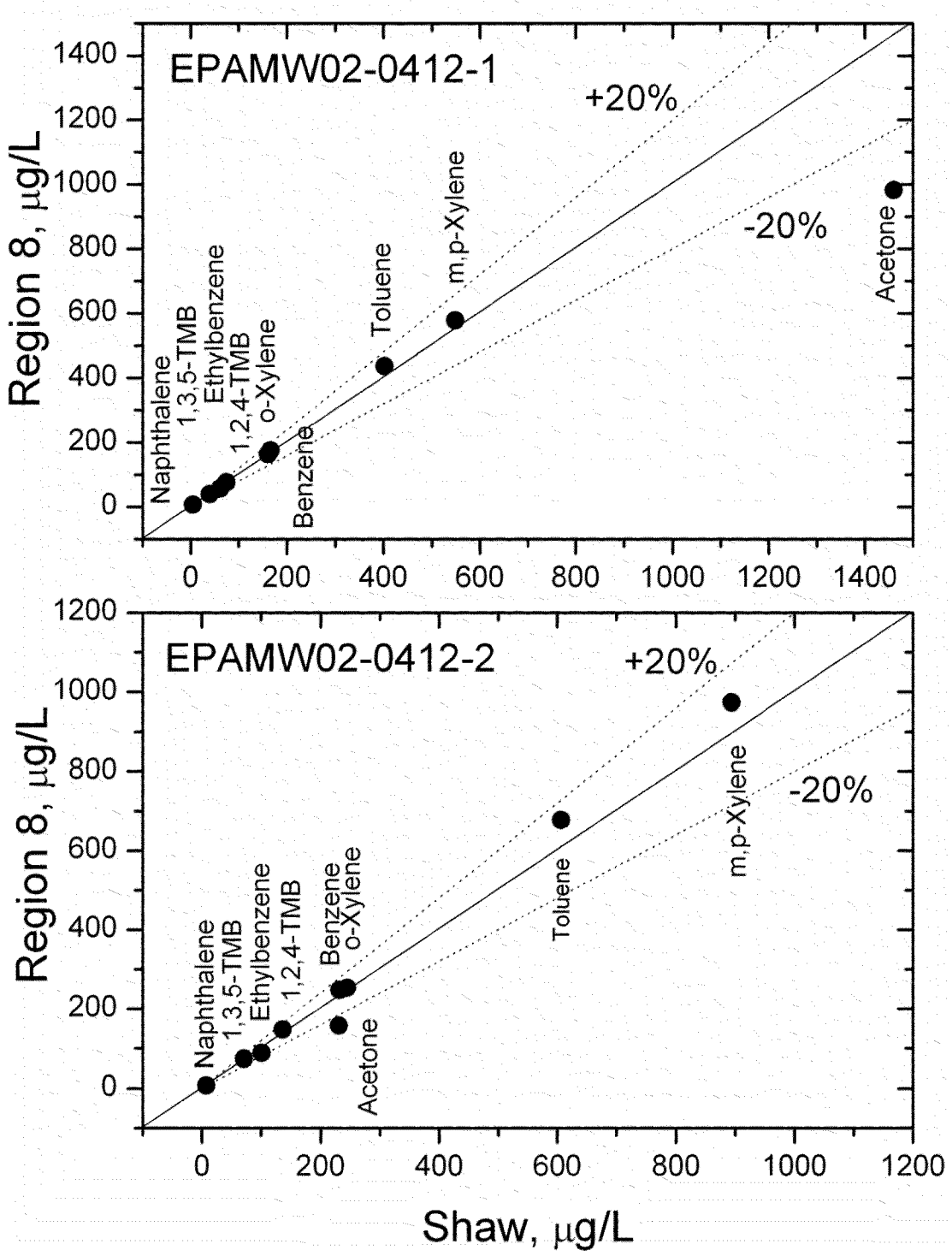


**Figure B1. Comparison of volatile organic compound concentrations determined at two laboratories.**

**Table B33. Performance Evaluation sample results returned by EPA Region 8 laboratory for Gasoline Range Organics, Diesel Range Organics, Semivolatile Organic Compounds, and Volatile Organic Compounds.**

*Gasoline Range Organics by GC PID/FID (Lot #P192-762). Region 8 – EPA Method 8021B and 8015D (SOP ORGM-506v10)*

| Analyte | Reported Value, µg/L | Certified Value, µg/L | Acceptance Range | Performance Evaluation |
|---|---|---|---|---|
| Gasoline Range Organics (GRO) | 2540 | 2370 | 921-4180 | Acceptable |
| Benzene in GRO | 28.5 | 25.3 | 10.9-42.4 | Acceptable |
| Ethylbenzene in GRO | 81.9 | 76.1 | 43.9-105 | Acceptable |
| Toluene in GRO | 201 | 224 | 118-293 | Acceptable |
| Xylene, total in GRO[A] | 249 | 224 | 128-302 | Acceptable |

*Diesel Range Organics (Lot #P192-764). Region 8 – EPA Method 8015D (SOP ORGM-508-508v10)*

| Analyte | Reported Value, µg/L | Certified Value, µg/L | Acceptance Range | Performance Evaluation |
|---|---|---|---|---|
| Diesel Range Organics (DRO) | 2690 | 2960 | 714-3830 | Acceptable |

*Semivolatiles base/neutrals by GC/MS (Lot #P186-711 &712). Region 8 – EPA Method 8270D (SOP ORGM-515)*

| Analyte | Reported Value, µg/L | Certified Value, µg/L | Acceptance Range | Performance Evaluation |
|---|---|---|---|---|
| Acenaphthene | 67.7 | 76.7 | 30.8 - 91.9 | Acceptable |
| Benzo(b)fluoranthene | 27.5 | 28.7 | 9.38 - 40.2 | Acceptable |
| Benzo(k)fluoranthene | 57.6 | 60.8 | 14.6 - 89.3 | Acceptable |
| Benzo(g,h,i)perylene | 18.2 | 25.4 | 5.35 - 38.1 | Acceptable |
| 4-Bromophenyl-phenylether | 26.7 | 28.6 | 10.8 - 40.2 | Acceptable |
| Butylbenzylphthalate | 118 | 123 | 23.7 - 175 | Acceptable |
| bis(2-Chloroethoxy)methane | 43.1 | 49.5 | 19.3 - 60.0 | Acceptable |
| bis(2-Chloroethyl)ether | 161 | 175 | 46.0 - 211 | Acceptable |
| bis(2-Chloroisopropyl)ether | 36.5 | 37.6 | 11.2 - 49.4 | Acceptable |
| 2-Chloronaphthalene | 27.4 | 29.8 | 8.47 - 37.3 | Acceptable |
| 4-Chlorophenyl-phenylether | 115 | 120 | 44.9 - 149 | Acceptable |
| Chrysene | 31.3 | 34.7 | 14.6 - 47.6 | Acceptable |
| Dibenzofuran | 29.0 | 32.1 | 12.5 - 43.6 | Acceptable |
| Di-n-butylphthalate | 82.9 | 88.4 | 29.2 - 117 | Acceptable |
| 1,2-Dichlorobenzene | 75.0 | 93.8 | 11.2 - 113 | Acceptable |
| 1,3-Dichlorobenzene | 111 | 142 | 17.0 - 164 | Acceptable |
| Diethylphthalate | 117 | 122 | 22.6 - 167 | Acceptable |
| Dimethylphthalate | 135 | 132 | 13.2 - 190 | Acceptable |
| Di-n-octylphthalate | 146 | 141 | 27.6 - 207 | Acceptable |
| bis(2-Ethylhexyl)phthalate | 74.3 | 81.4 | 24.3 - 113 | Acceptable |
| Fluoranthene | 56.2 | 57.4 | 26.2 - 71.9 | Acceptable |
| Fluorene | 62.5 | 66.2 | 27.4 - 81.3 | Acceptable |
| Hexachlorocyclopentadiene | 118 | 179 | 17.9 - 230 | Acceptable |
| Hexachloroethane | 92.8 | 116 | 12.2 - 136 | Acceptable |
| Isophorone | 93.0 | 105 | 41.1 - 135 | Acceptable |
| 2-Methylnaphthalene | 49.5 | 53.4 | 8.89 - 67.8 | Acceptable |
| Naphthalene | 99.3 | 114 | 30.1 - 135 | Acceptable |

| | | | | |
|---|---|---|---|---|
| Nitrobenzene | 53.8 | 56.0 | 18.1 - 69.8 | Acceptable |
| N-Nitroso-di-n-propylamine | 86.1 | 89.2 | 25.8 - 115 | Acceptable |
| Pyrene | 40.1 | 41.1 | 13.3 - 59.4 | Acceptable |
| Benzoic acid | <30.0 | <30 | - | Acceptable |
| 4-Chloro-3-methylphenol | 150 | 160 | 63.1 - 206 | Acceptable |
| 2-Chlorophenol | 156 | 176 | 49.4 - 220 | Acceptable |
| 2,4-Dichlorophenol | 117 | 137 | 44.6 - 168 | Acceptable |
| 2,4,Dimethylphenol | 159 | 173 | 39.0 - 226 | Acceptable |
| 4,6-Dinitro-2-methylphenol | 128 | 152 | 53.9 - 217 | Acceptable |
| 2,4-Dinitrophenol | 79.5 | 121 | 12.1 - 170 | Acceptable |
| 2-Methylphenol | 153 | 152 | 28.6 - 187 | Acceptable |
| 4-Methylphenol [B] | 103 | 104 | 10.4 - 135 | Acceptable |
| 2-Nitrophenol | 60.4 | 72.2 | 20.3 - 91.9 | Acceptable |
| 4-Nitrophenol | 77.2 | 108 | 10.8 - 146 | Acceptable |
| Pentachlorophenol | 57.7 | 69.7 | 15.8 - 96.3 | Acceptable |
| Phenol | 163 | 177 | 17.7 - 237 | Acceptable |
| 2,3,4,6-Tetrachlorophenol | 89.7 | 98.2 | 22.1 - 132 | Acceptable |
| 2,4,5-Trichlorophenol | 56.0 | 64.4 | 24.3 - 85.1 | Acceptable |
| 2,4,6-Trichlorophenol | 50.5 | 54.2 | 17.3 - 70.9 | Acceptable |
| | | | | |
| *Volatiles by GC/MS (Lot #P186-710). Region 8 – EPA Method 8260C (SOP ORGM-501)* [C] | | | | |
| **Analyte** | **Reported Value, µg/L** | **Certified Value, µg/L** | **Acceptance Range** | **Performance Evaluation** |
| Benzene | 20.2 | 20.0 | 13.6 - 26.4 | Acceptable |
| Bromodichloromethane | 20.8 | 20.1 | 13.8 - 27.0 | Acceptable |
| Bromoform | 30.2 | 30.2 | 18.6 - 41.2 | Acceptable |
| 2-Butanone (MEK) | 138 | 110 | 32.0 - 172 | Acceptable |
| t-Butyl methyl ether (MTBE) | 44.2 | 43.7 | 27.1 - 62.1 | Acceptable |
| Carbon tetrachloride | 34.2 | 31.8 | 17.7 - 43.7 | Acceptable |
| Chlorobenzene | 88.0 | 84.7 | 61.1 - 106 | Acceptable |
| Chlorodibromomethane | 119 | 107 | 73.5 - 142 | Acceptable |
| Chloroform | 64.6 | 63.0 | 43.6 - 81.0 | Acceptable |
| 1,2-Dichlorobenzene | 78.3 | 80.7 | 56.2 - 104 | Acceptable |
| 1,3-Dichlorobenzene | 67.6 | 71.0 | 48.2 - 90.4 | Acceptable |
| 1,4-Dichlorobenzene | 66.9 | 68.0 | 46.1 - 85.2 | Acceptable |
| 1,2-Dichloroethane | 22.6 | 22.7 | 15.7 - 30.7 | Acceptable |
| c-1,2-Dichloroethene | 26.6 | 26.0 | 17.9 - 34.8 | Acceptable |
| c-1,3-Dichloropropylene | 45.0 | 45.0 | 31.5 - 58.5 | Acceptable |
| Ethylbenzene | 47.6 | 43.0 | 29.5 - 54.9 | Acceptable |
| Methylene chloride | 87.4 | 90.5 | 55.5 - 125 | Acceptable |
| 4-Methyl-2-pentanone (MIBK) | 81.7 | 78.0 | 36.0 - 117 | Acceptable |
| Naphthalene | 29.8 | 32.8 | 11.1 - 42.6 | Acceptable |
| 1,1,2,2-Tetrachloroethane | 50.0 | 55.7 | 31.8 - 82.5 | Acceptable |
| Tetrachloroethylene | 27.5 | 45.9 | 25.3 - 60.1 | Acceptable |
| Toluene | 36.6 | 35.5 | 24.7 - 44.9 | Acceptable |
| 1,2,4-Trichlorobenzene | 68.1 | 70.5 | 14.6 - 86.0 | Acceptable |
| 1,1,1-Trichloroethane | 28.4 | 27.3 | 17.2 - 36.5 | Acceptable |
| 1,1,2-Trichloroethane | 35.0 | 35.8 | 25.0 - 47.3 | Acceptable |
| Trichloroethylene | 72.4 | 69.9 | 44.4 - 91.1 | Acceptable |
| Trichlorofluoromethane | <1.25 | <5.0 | - | Acceptable |

| | | | | |
|---|---|---|---|---|
| 1,2,3-Trichloropropane (TCP) | <1.25 | <5.0 | - | Acceptable |
| Vinyl Acetate | <1.25 | <5.0 | - | Acceptable |
| Vinyl Chloride | <1.25 | <5.0 | - | Acceptable |
| o-Xylene | 20.4 | 18.9 | 13.4 - 23.4 | Acceptable |
| Total Xylenes | 93.7 | 85.6 | 48.6 - 116 | Acceptable |

A. m,p-xylene and o-xylene analyzed separately, value indicates total xylene. B. Analyzed as 3&4 methylphenol. C. All values in the volatile organic compound scan are qualified as estimated (J) because initial calibrations were not immediately verified by a second source calibration standard. The table only shows results where analytes in the lab method matched analytes in the blind sample, i.e., other compounds were present in the PE sample but they were not included in the method SOP or were not requested for analysis.

**Table B34. Performance Evaluation sample results returned by Shaw Environmental for Volatile Organic Compounds, Gasoline Additives, and Minerals.**

| *Volatiles by GC/MS (Lot #P186-710). Shaw Environmental – EPA Method 5021A and 8260C (RSKSOP259v1)* | | | | |
|---|---|---|---|---|
| **Analyte** | **Reported Value, µg/L** | **Certified Value, µg/L** | **Acceptance Range** | **Performance Evaluation** |
| Benzene | 18.5 | 20.0 | 13.6 - 26.4 | Acceptable |
| Carbon tetrachloride | 20.5 | 31.8 | 17.7 - 43.7 | Acceptable |
| Chlorobenzene | 89.8 | 84.7 | 61.1 - 106 | Acceptable |
| 1,2-Dichlorobenzene | 74.7 | 80.7 | 56.2 - 104 | Acceptable |
| 1,4-Dichlorobenzene | 67.1 | 68.0 | 46.1 - 85.2 | Acceptable |
| 1,2-Dichloroethane | 24.9 | 22.7 | 15.7 - 30.7 | Acceptable |
| 1,1-Dichloroethene | <0.07 | <5.0 | - | Acceptable |
| c-1,2-Dichloroethene | 24.6 | 26.0 | 17.9 - 34.8 | Acceptable |
| t-1,2-Dichloroethene | <0.05 | <5.0 | - | Acceptable |
| Ethylbenzene | 40.4 | 43.0 | 29.5 - 54.9 | Acceptable |
| Methylene chloride | 89.6 | 90.5 | 55.5 - 125 | Acceptable |
| Tetrachloroethylene | 32.9 | 45.9 | 25.3 - 60.1 | Acceptable |
| Toluene | 32.5 | 35.5 | 24.7 - 44.9 | Acceptable |
| 1,1,1-Trichloroethane | 21.0 | 27.3 | 17.2 - 36.5 | Acceptable |
| 1,1,2-Trichloroethane | 33.5 | 35.8 | 25.0 - 47.3 | Acceptable |
| Trichloroethylene | 66.8 | 69.9 | 44.4 - 91.1 | Acceptable |
| Vinyl Chloride | <0.14 | <5.0 | - | Acceptable |
| o-Xylene | 18.6 | 18.9 | 13.4 - 23.4 | Acceptable |
| Total Xylenes | 84.3 | 85.6 | 48.6 - 116 | Acceptable |
| *Gasoline Additives by GC/MS (Lot #S183-909)[A]. Shaw Environmental – EPA Method 5021A and 8260C (RSKSOP259v1)* | | | | |
| **Analyte** | **Reported Value, µg/L** | **Certified Value, µg/L** | **Acceptance Range** | **Performance Evaluation** |
| t-Butyl Alcohol | 50.8 | 46.6 | 28.0 - 65.2 | Acceptable |
| *Minerals by ICP-OES (Lot #P202-506)[B]. EPA Method 200.7 (RSKSOP-213v4).* | | | | |
| **Analyte** | **Reported Value, mg/L** | **Certified Value, mg/L** | **Acceptance Range** | **Performance Evaluation** |
| Potassium | 25.6 | 26.6 | 21.9 - 31.7 | Acceptable |

A. Only tert-butyl alcohol was requested for evaluation. B. Only potassium was requested for evaluation. ND – not detected. The table only shows results where analytes in the lab method matched analytes in the blind sample, i.e., other compounds were present in the PE sample but they were not included in the method SOP or were not requested for analysis.

**Table B35. Performance Evaluation sample results returned by EPA General Parameters Lab for chloride.**

| *Minerals (Lot# P202-506)[A]. EPA General Parameters Lab – EPA Method 6500 (RSKSOP-276v4)* | | | | |
|---|---|---|---|---|
| **Analyte** | **Reported Value, mg/L** | **Certified Value, mg/L** | **Acceptance Range** | **Performance Evaluation** |
| Chloride | 34.7 | 36.0 | 30.2 - 42.5 | Acceptable |

A. Only chloride was requested for evaluation.

**Table B36. Performance Evaluation sample results returned by USGS/TestAmerica for Gasoline Range Organics, Diesel Range Organics, Gasoline Additives, Semivolatile Organic Compounds, and Inorganic Compounds.**

*Gasoline Range Organics by GC PID/FID (Lot #P192-762). USGS/TestAmerica - EPA Method 8015B*

| Analyte | Reported Value, µg/L | Certified Value, µg/L | Acceptance Range | Performance Evaluation |
|---|---|---|---|---|
| Gasoline Range Organics (GRO) | 2900 | 2370 | 921 - 4180 | Acceptable |

*Diesel Range Organics (Lot #P192-764). USGS/TestAmerica - EPA Method 8015B*

| Analyte | Reported Value, µg/L | Certified Value, µg/L | Acceptance Range | Performance Evaluation |
|---|---|---|---|---|
| Diesel Range Organics (DRO) | 2400 | 2960 | 714 - 3830 | Acceptable |

*Gasoline Additives by GC/MS (Lot #S183-909)[A]. USGS/TestAmerica – EPA Method 8260B*

| Analyte | Reported Value, µg/L | Certified Value, µg/L | Acceptance Range | Performance Evaluation |
|---|---|---|---|---|
| t-Amyl methyl ether | 33 | 36.8 | 22.1 - 51.5 | Acceptable |
| t-Butyl Alcohol | 52 | 46.6 | 28.0 - 65.2 | Acceptable |
| t-Butyl ethyl ether | 12 | 15.3 | 9.18 - 21.4 | Acceptable |
| t-Butyl methyl ether | 12 | 13.9 | 8.34 - 19.5 | Acceptable |
| Diisopropyl ether | 40 | 40.0 | 24.0 - 56.0 | Acceptable |
| Trichlorofluoromethane (Freon 11) | 25 | 21.9 | 13.1 - 30.7 | Acceptable |

*Semivolatiles base/neutrals and acids by GC/MS (Lot #P186-711&712). USGS/TestAmerica – EPA Method 8270C*

| Analyte | Reported Value, µg/L | Certified Value, µg/L | Acceptance Range | Performance Evaluation |
|---|---|---|---|---|
| Acenaphthene[B] | 62 | 76.7 | 30.8 - 91.9 | Acceptable |
| Acenaphthylene[B] | ND | <10 | - | Acceptable |
| Aniline | ND | <10 | - | Acceptable |
| Anthracene[B] | ND | <10 | - | Acceptable |
| Benzo(a)anthracene[B] | 0.27 | <10 | - | Acceptable |
| Benzo(b)fluoranthene[B] | 24 | 28.7 | 9.38 - 40.2 | Acceptable |
| Benzo(k)fluoranthene[B] | 53 | 60.8 | 14.6 - 89.3 | Acceptable |
| Benzo(g,h,i)perylene[B] | 21 | 25.4 | 5.35 - 38.1 | Acceptable |
| Benzo(a)pyrene[B] | 0.15 | <10 | - | Acceptable |
| Benzyl alcohol | 0.55 | <10 | - | Acceptable |
| 4-Bromophenyl-phenylether | 19 | 28.6 | 10.8 - 40.2 | Acceptable |
| Butylbenzylphthalate | 110 | 123 | 23.7 - 175 | Acceptable |
| Carbazole | ND | <10 | - | Acceptable |
| 4-Chloroaniline | ND | <10 | - | Acceptable |
| bis(2-Chloroethoxy)methane | 41 | 49.5 | 19.3 - 60.0 | Acceptable |
| bis(2-Chloroethyl)ether | 150 | 175 | 46.0 - 211 | Acceptable |
| bis(2-Chloroisopropyl)ether | 33 | 37.6 | 11.2 - 49.4 | Acceptable |
| 2-Chloronaphthalene | 12 | 29.8 | 8.47 - 37.3 | Acceptable |
| 4-Chlorophenyl-phenylether | 82 | 120 | 44.9 - 149 | Acceptable |
| Chrysene[B] | 29 | 34.7 | 14.6 - 47.6 | Acceptable |
| Dibenz(a,h)anthracene[B] | ND | <10 | - | Acceptable |
| Dibenzofuran | 18 | 32.1 | 12.5 - 43.6 | Acceptable |

| | | | | |
|---|---|---|---|---|
| Di-n-butylphthalate | 73 | 88.4 | 29.2 - 117 | Acceptable |
| 3,3'-Dichlorobenzidine | ND | <10 | - | Acceptable |
| Diethylphthalate | 110 | 122 | 22.6 - 167 | Acceptable |
| Dimethylphthalate | 130 | 132 | 13.2 - 190 | Acceptable |
| 2,4-Dinitrotoluene | ND | <10 | - | Acceptable |
| 2,6-Dinitrotoluene | ND | <10 | - | Acceptable |
| Di-n-octylphthalate | 150 | 141 | 27.6 - 207 | Acceptable |
| bis(2-Ethylhexyl)phthalate | 75 | 81.4 | 24.3 - 113 | Acceptable |
| Fluoranthene [B] | 47 | 57.4 | 26.2 - 71.9 | Acceptable |
| Fluorene [B] | 58 | 66.2 | 27.4 - 81.3 | Acceptable |
| Hexachlorobenzene | ND | <10 | - | Acceptable |
| Hexachlorocyclopentadiene | 18 | 179 | 17.9 - 230 | Acceptable |
| Hexachloroethane | 13 | 116 | 12.2 - 136 | Acceptable |
| Indeno(1,2,3-cd)pyrene [B] | ND | <10 | - | Acceptable |
| Isophorone | 89 | 105 | 41.1 - 135 | Acceptable |
| 2-Methylnaphthalene [B] | 38 | 53.4 | 8.89 - 67.8 | Acceptable |
| Naphthalene | 34 | 114 | 30.1 - 135 | Acceptable |
| 2-Nitroaniline | ND | <10 | - | Acceptable |
| 3-Nitroaniline | ND | <10 | - | Acceptable |
| 4-Nitroaniline | ND | <10 | - | Acceptable |
| Nitrobenzene | 47 | 56.0 | 18.1 - 69.8 | Acceptable |
| N-Nitrosodiethylamine | ND | <10 | - | Acceptable |
| N-Nitroso-di-n-propylamine | 80 | 89.2 | 25.8 - 115 | Acceptable |
| Phenanthrene [B] | ND | <10 | - | Acceptable |
| Pyrene [B] | 31 | 41.1 | 13.3 - 59.4 | Acceptable |
| Pyridine | ND | <10 | - | Acceptable |
| Benzoic acid | ND | <30 | - | Acceptable |
| 4-Chloro-3-methylphenol | 160 | 160 | 63.1 - 206 | Acceptable |
| 2-Chlorophenol | 150 | 176 | 49.4 - 220 | Acceptable |
| 2,4-Dichlorophenol | 130 | 137 | 44.6 - 168 | Acceptable |
| 2,4,Dimethylphenol | 150 | 173 | 39.0 - 226 | Acceptable |
| 4,6-Dinitro-2-methylphenol | 160 | 152 | 53.9 - 217 | Acceptable |
| 2,4-Dinitrophenol | 110 | 121 | 12.1 - 170 | Acceptable |
| 2-Methylphenol | 150 | 152 | 28.6 - 187 | Acceptable |
| 4-Methylphenol [C] | 92 | 104 | 10.4 - 135 | Acceptable |
| 2-Nitrophenol | 62 | 72.2 | 20.3 - 91.9 | Acceptable |
| 4-Nitrophenol | 130 | 108 | 10.8 - 146 | Acceptable |
| Pentachlorophenol | 63 | 69.7 | 15.8 - 96.3 | Acceptable |
| Phenol | 170 | 177 | 17.7 - 237 | Acceptable |
| 2,3,4,6-Tetrachlorophenol | 98 | 98.2 | 22.1 - 132 | Acceptable |
| 2,4,5-Trichlorophenol | 62 | 64.4 | 24.3 - 85.1 | Acceptable |
| 2,4,6-Trichlorophenol | 51 | 54.2 | 17.3 - 70.9 | Acceptable |

*Volatiles by GC/MS (Lot #P186-710). USGS/TestAmerica – EPA Method 8260B.*

| Analyte | Reported Value, µg/L | Certified Value, µg/L | Acceptance Range | Performance Evaluation |
|---|---|---|---|---|
| Acetone | ND | <5.0 | - | Acceptable |
| Acrylonitrile | ND | <5.0 | - | Acceptable |
| Benzene | 18 | 20.0 | 13.6 - 26.4 | Acceptable |
| Bromodichloromethane | 23 | 20.1 | 13.8 - 27.0 | Acceptable |

| | | | | |
|---|---|---|---|---|
| Bromoform | 36 | 30.2 | 18.6 - 41.2 | Acceptable |
| Bromomethane | ND | <5.0 | - | Acceptable |
| 2-Butanone (MEK) | 110 | 110 | 32.0 - 172 | Acceptable |
| t-Butyl methyl ether (MTBE) | 42 | 43.7 | 27.1 - 62.1 | Acceptable |
| Carbon disulfide | ND | <5.0 | - | Acceptable |
| Carbon tetrachloride | 36 | 31.8 | 17.7 - 43.7 | Acceptable |
| Chlorobenzene | 75 | 84.7 | 61.1 - 106 | Acceptable |
| Chlorodibromomethane | 120 | 107 | 73.5 - 142 | Acceptable |
| Chloroethane | ND | <5.0 | - | Acceptable |
| Chloroform | 64 | 63.0 | 43.6 - 81.0 | Acceptable |
| Chloromethane | ND | <5.0 | - | Acceptable |
| 1,2-Dibromo-3-chloropropane | ND | <5.0 | - | Acceptable |
| 1,2-Dibromoethane (EDB) | ND | <5.0 | - | Acceptable |
| 1,2-Dichlorobenzene | 70 | 80.7 | 56.2 - 104 | Acceptable |
| 1,3-Dichlorobenzene | 60 | 71.0 | 48.2 - 90.4 | Acceptable |
| 1,4-Dichlorobenzene | 60 | 68.0 | 46.1 - 85.2 | Acceptable |
| Dichlorodifluoromethane (Freon 12) | ND | <5.0 | - | Acceptable |
| 1,1-Dichloroethane | ND | <5.0 | - | Acceptable |
| 1,2-Dichloroethane | 27 | 22.7 | 15.7 - 30.7 | Acceptable |
| 1,1-Dichloroethene | 0.58 | <5.0 | - | Acceptable |
| c-1,2-Dichloroethene | 24 | 26.0 | 17.9 - 34.8 | Acceptable |
| t-1,2-Dichloroethene | ND | <5.0 | - | Acceptable |
| 1,2-Dichloropropane | ND | <5.0 | - | Acceptable |
| c-1,3-Dichloropropylene | 39 | 45.0 | 31.5 - 58.5 | Acceptable |
| t-1,3-Dichloropropylene | ND | <5.0 | - | Acceptable |
| Ethylbenzene | 40 | 43.0 | 29.5 - 54.9 | Acceptable |
| Hexachlorobutadiene | ND | <5.0 | - | Acceptable |
| 2-Hexanone | ND | <5.0 | - | Acceptable |
| Methylene chloride | 92 | 90.5 | 55.5 - 125 | Acceptable |
| 4-Methyl-2-pentanone (MIBK) | 83 | 78.0 | 36.0 - 117 | Acceptable |
| Naphthalene | 30 | 32.8 | 11.1 - 42.6 | Acceptable |
| Styrene | ND | <5.0 | - | Acceptable |
| 1,1,1,2-Tetrachloroethane | ND | <5.0 | - | Acceptable |
| 1,1,2,2-Tetrachloroethane | 53 | 55.7 | 31.8 - 82.5 | Acceptable |
| Tetrachloroethylene | 42 | 45.9 | 25.3 - 60.1 | Acceptable |
| Toluene | 33 | 35.5 | 24.7 - 44.9 | Acceptable |
| 1,2,4-Trichlorobenzene | 62 | 70.5 | 14.6 - 86.0 | Acceptable |
| 1,1,1-Trichloroethane | 28 | 27.3 | 17.2 - 36.5 | Acceptable |
| 1,1,2-Trichloroethane | 36 | 35.8 | 25.0 - 47.3 | Acceptable |
| Trichloroethylene | 64 | 69.9 | 44.4 - 91.1 | Acceptable |
| Trichlorofluoromethane | ND | <5.0 | - | Acceptable |
| 1,2,3-Trichloropropane (TCP) | ND | <5.0 | - | Acceptable |
| Vinyl Chloride | ND | <5.0 | - | Acceptable |
| o-Xylene | 18 | 18.9 | 13.4 - 23.4 | Acceptable |
| Total Xylenes | 81 | 85.6 | 48.6 - 116 | Acceptable |

| *Minerals (Lot# P202-506)[D], USGS/TestAmerica – EPA Method 6010B* | | | | |
|---|---|---|---|---|
| **Analyte** | **Reported Value, mg/L** | **Certified Value, mg/L** | **Acceptance Range** | **Performance Evaluation** |
| Potassium | 26 | 26.6 | 21.9 - 31.7 | Acceptable |
| Sodium | 44 | 42.5 | 36.1 - 48.9 | Acceptable |

| *Minerals (Lot# P202-506)[E], USGS/TestAmerica* | | | | |
|---|---|---|---|---|
| **Analyte** | **Reported Value, mg/L** | **Certified Value, mg/L** | **Acceptance Range** | **Performance Evaluation** |
| Chloride | 37 | 36.0 | 30.2 - 42.5 | Acceptable |
| Sulfate | 27 | 28.0 | 22.3 - 33.0 | Acceptable |
| Fluoride | 1.9 | 1.82 | 1.47 - 2.17 | Acceptable |
| Total Dissolved Solids | 210 | 196 | 177 - 249 | Acceptable |

A. Only tert-butyl alcohol was requested for evaluation. B. EPA Method 8270C-SIM was used with sample dilution of 20x. C. Analyzed as 3&4 methylphenol. D. Only potassium was requested for analysis. E. Only chloride was requested for analysis. ND - not detected. The table only shows results where analytes in the lab method matched analytes in the blind sample, i.e., other compounds were present in the PE sample but they were not included in the method SOP or were not requested for analysis.

**Table B37. Contract Laboratory Program QC checks for ICP-MS.**

| QC Type or Operation | Acceptance Criterion | Frequency |
|---|---|---|
| Instrument Calibration | The acceptance criterion for the initial calibration correlation coefficient is r≥0.998. | Each time instrument is turned on or set up, after ICV or CCV failure, and after major instrument adjustment. The lowest non-blank standard shall be set at the CRQL for all analytes. |
| Initial Calibration Verification | 90-110% Recovery; RSD≤5% for all replicate integrations | Following each instrument calibration for each mass used. |
| Initial Calibration Blank | ≤CRQL | Following each instrument calibration, immediately after the ICV. |
| Continuing Calibration Verification | 90-110% Recovery; RSD≤5% for all replicate integrations | For each mass used, at a frequency of at least after every 10 analytical runs, at the beginning of each day, and at the beginning and end of each run. |
| Low Level (at CRQL) Calibration Verification | 70-130% Recovery | The Laboratory shall re-analyze the low-level (at CRQL) calibration standard at the end of each run. |
| Continuing Calibration Blank | ≤CRQL | At a frequency of at least after every 10 analytical runs, at the beginning of each day, and at the beginning and end of each run. Performed immediately after the last CCV. |

| | | |
|---|---|---|
| Interference Check Sample | ±20% of the analyte's true value or ±2 times the CRQL of the analyte's true value, whichever is greater. | At the beginning of the run after the ICB but before the CCV. |
| Serial Dilution for ICP | If the analyte concentration is sufficiently high (minimally a factor of 50 above the MDL in the original sample), the serial dilution (a five-fold dilution) shall then agree within 10% of the original determination after correction for dilution. | For each matrix type or for each SDG, whichever is more frequent. |
| Preparation Blank | ≤CRQL | For each SDG or each sample preparation and analysis procedure per batch of prepared samples, whichever is more frequent. |
| Laboratory Control Sample | 70-130% Recovery | For each SDG or each sample preparation and analysis procedure per batch of prepared samples, whichever is more frequent. |
| Spike Sample | 75-125% Recovery | For each matrix type or for each SDG, whichever is more frequent. |
| Post-Digestion Spike | 75-125% Recovery | Each time Spike Sample Recovery is outside QC limits. |
| Duplicate Sample Analysis | RPD<20 for sample values ≥5x CRQL; for sample values <5xCRQL, control limit = CRQL | For each matrix type or for each SDG, whichever is more frequent. |
| ICP-MS Tune | Mass calibration must be within 0.1 amu over the range of 6 to 210 amu, or the percent Relative Standard Deviation (%RSD) of all the integrations of the absolute signals of the analytes must be ≤5.0%. | Prior to calibration. |
| Internal Standards | The absolute response of any one internal standard must not deviate more than 60-125% from the original response in the calibration blank. | Internal standards shall be present in all samples, standards, and blanks (except the tuning solution) at identical levels. |
| Determination of Method Detection Limits | | Prior to contract award, annually thereafter, and after major instrument adjustment. |

## B9. QAPP Additions and Deviations

An Addendum to the QAPP, Revision No. 6, was prepared and finalized in September, 2012, to document changes in the sampling and analysis as well as the evaluation of the data. These additions and deviations to the QAPP are presented here.

**Time-Series Analysis -** An important addition was made to the sampling approach for MW01 following the preparation and approval of version 6 of the QAPP. This addition was documented in an email (4/12/2012) from a Principal Investigator to the QA Manger overseeing this project. The email text is provided below.

*The following is a change to the sampling strategy for MW01. The sampling methodology below supersedes the presentation in the QAPP titled "Ground-Water Investigation in Pavillion, Wyoming" (v6, 2/17/2012, QA ID NO. G-14478).*

*The USGS-EPA technical workgroup, upon consensus agreement, determined that samples were to be collected at MW01 after attainment of stabilization parameters and after purging one borehole volume. Subsequently, a letter from WYDEQ to USGS provided direction for USGS to additionally remove three casing (now borehole, based on current USGS Sampling and Analysis Plan) volumes prior to sampling at MW01. Thus, two sample collection events, at 1 and 3 borehole volumes, respectively, are currently planned. There should be no expectation that the exact same concentration of various analytes will be observed at both sampling points due to laboratory variability and oscillatory behavior frequently observed in published studies on time series testing during purging. When there is oscillatory behavior, two samples cannot define a trend. Also purge volume may impact observed sample concentrations. Consequently, it is necessary for EPA to conduct a time-series analysis at MW01 to fully characterize expected variability in concentration during purging. Time-series analysis typically involves collection of at least 10 samples over time.*

*The following approach will be followed by EPA during the April 2012 sampling of MW01.*

*1) A sample will be collected after purging 1 borehole volume (approx. 410 gallons) and after stabilization of field parameters. This is similar to the approach used during the Phase IV sampling event and the approach was agreed on by the USGS-EPA technical workgroup. This sample will be collected in duplicate (labeled EPAMW01-0412 and EPAMW01d-0412).*

*2) Samples will be collected after approx. every 90 gallons of continuous purging for dissolved metals (filtered), anions (filtered), water isotopes (filtered), RSKSOP259 (alcohols and volatile organics), and GRO. An identical sampling approach will be utilized as described in the QAPPv6 (same bottles, preservation, storage). Sequential samples will be labeled with -x, e.g., EPAMW01-0412-2 or EPAMW01-04 12-5, for the second and fifth sample collected in series, respectively. This series of samples is intended to provide reasonable time-dependent data for major and minor elements as well as organic compounds of interest (e.g., GRO and isopropanol). The water isotope data will useful in evaluating whether significantly different water sources are pulled into the screened during interval during the prolonged purging.*

*3) After approximately every 270 gallons, in additi on to the samples noted in 2) above, samples for glycols, MBAS, ethoxylated compounds, DRO, and SVOCs will be colle cted for analysis. Again see QAPPv6 for sample collection details. These samples are needed to track time-dependent (volume-dependent) behavior of critical organic analytes.*

*4) Finally after approx. 3 borehole volumes and stabilization of parameters, a final complete sample set will be collected. This sample will be labeled EPAMW01-0412-10.*

*After each sample is collected, the time will be noted and water volume pumped will be noted in order to corre late the sampling point with geochemical parameters recorded in the purge log and recorded water levels in the well.*

Overall this approach was followed in the field, except the order of samples had to be changed in order to deal with unexpected delays in collecting the first sample.

**VOC Preservation -** On 3/29/2012, the QAM was notified of a QAPP deviation regarding preservation of Volatile Organic Compound samples collected for the Region 8 laboratory. The QAPP stated that trisodium phosphate would be used as a sample preservative. Based on input from the laboratory, it was decided to use HCl to preserve samples to pH<2 because it was determined that one or more analytes would be affected by base hydrolysis, and because the lab's existing calibration and QC was based on the HCl preservative. Results presented in Section B.7 of this Appendix suggest that the method of preservation had no impact on the analytical results.

**Blank Sample Collection -** During the course of the field sampling, a deviation occurred from the guidelines outlined in the QAPP. The QAPP stated that field and equipment blanks would be collected on each day of sampling (Table B2). Sampling occurred on seven days from April 16 to April 24. Collecting

blanks on each sampling day would have resulted in an unnecessarily large number of blank samples submitted for analysis. Consequently, field blanks were collected on the 16th, 18th, 22nd, and 24th of April. Samples collected on April 17th (PGDW23 and PGDW30) were evaluated for blank contamination using blank samples from April 16th. Samples collected on April 19 and April 20 (PGDW20 and PGPW02) were evaluated for blank contamination using blank samples from April 18th. Importantly, blank samples were collected on each occasion that MW01 and MW02 were sampled. Also, Trip Blanks were included in all sample shipments to the analytical laboratories in accordance with original QAPP guidelines (Table B2).

**Trace Metal Analysis by ICP-MS -** Analysis of the original ICP-MS results for Phase V found that the laboratory did not analyze interference check solutions (ICSs) as described in EPA Method 6020A. These ICSs would have enabled the laboratory to evaluate the analytical method's ability to appropriately handle known potential interferences and other matrix effects. In ICP-MS analysis, the ICS is used to verify that interference levels are corrected by the data system within quality control limits. Because of the importance of this missing quality control check, it was necessary to reject the data from the original analysis.

The samples were analyzed through the EPA Superfund Analytical Services Contract Laboratory Program (EPA CLP). Samples were sent for analysis under the EPA CLP Inorganic Statement of Work ISMO1.3, Exhibit D - Part B, "Analytical Methods for Inductively Coupled Plasma - Mass Spectrometry", with some minor requested modifications. The contract laboratory was requested to analyze water/aqueous samples for Cd, Cr, As, Cu, Pb, Ni, Se, Tl and Sb by ICP-MS. The reanalysis did not include Hg, Th, or U. Mercury was excluded because the sample holding time was exceeded. Th and U were excluded because the specialized low-level quantitation request for these elements could not be accommodated in the necessary timeframe. Table B37 summarizes the acceptance criteria and frequency for the QC checks conducted during the course of sample reanalysis by ICP-MS.

Other items addressed in the QAPP Addendum were data qualifiers, application of data qualifiers to samples impacted by lab, field, equipment, and trip blanks, and revisions to QC criteria for metals analysis by ICP-OES (Table B20).

## B10. Field QA/QC

Field measurements in Phase V consisted of YSI Model 556 flow-cell readings for temperature, specific conductance, pH, oxidation-reduction potential, and dissolved oxygen. YSI electrodes were calibrated in the morning. Performance checks were conducted at mid-day and at the end of each day. NIST-traceable 1413 µS/cm specific conductance standard was used for calibration and performance checks. In one case, YSI confidence solution was used to check the electrodes. NIST-traceable buffer solutions (7.00 and 10.01) were used for pH calibration and performance checks. Prior to and after sampling the deep monitoring wells, a pH 12.46 buffer solution was used as an electrode performance check. Orion ORP standard was used for calibration and performance checks of redox potential measurements. Dissolved oxygen sensors were calibrated with air, and low-oxygen measurement performance was tested with a zero-oxygen solution (sodium sulfite). Table B38 provides the results of mid-day and end-of-the-day performance checks. Prior to field deployment, the electrode assembly and meter had been serviced. On 4/22/2012, the conductivity electrode was slightly out of calibration at the end of the day. This affects the specific conductance value recorded for EPAMW02-0412-2; the value is flagged as estimated. In all other cases performance checks were within acceptance limits (Table B38).

## B11. Data Qualifiers

Data qualifiers are listed in Table B31. Many factors can impact the quality of data reported for environmental samples, including factors related to sample collection in the field, transport of samples to laboratories, and the work conducted by various analytical laboratories. The list of qualifiers in Table B31 is based on the Data Qualifier Definitions presented in the USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Superfund Organic Methods Data Review (USEPA/540/R-01, 2008), with the addition of data qualifiers H and B which are necessary for communicating issues that occur during analysis in laboratories not bound by the CLP statement of work. The R qualifier is used in

**Table B38. Field QC data for YSI electrode measurements.**

| Standard Solution for Mid-day and End-of-the-day Electrode Performance Checks Standard Solution | Electrode Reading | Acceptance Range |
|---|---|---|
| 4/16/2012 Mid-day | | |
| pH 7.00 | 7.12 | 6.80-7.20 |
| Specific Conductance 7630-7970 µS/cm | 7970 µS/cm | 7630-7970 |
| pH 12.46 | 12.49 | 12.26-12.66 |
| | | |
| 4/16/2012 End-of -day | | |
| pH 10.01 | 10.05 | 9.81-10.21 |
| pH 12.46 | 12.40 | 12.26-12.66 |
| Specific Conductance 1413 µS/cm | 1400 µS/cm | 1342-1484 |
| Zero-oxygen | 0.05 mg/L | 0.00-0.10 |
| | | |
| 4/17/2012 Mid-day | | |
| pH 7.00 | 7.02 | 6.80-7.20 |
| Specific Conductance 1413 µS/cm | 1390 µS/cm | 1342-1484 |
| | | |
| 4/17/2012 End-of -day | | |
| pH 10.01 | 9.98 | 9.81-10.21 |
| Specific Conductance 1413 µS/cm | 1382 µS/cm | 1342-1484 |
| | | |
| 4/18/2012 Mid-day | | |
| pH 12.46 | 12.49 | 12.26-12.66 |
| Specific Conductance 1413 µS/cm | 1390 µS/cm | 1342-1484 |
| | | |
| 4/18/2012 End-of -day | | |
| pH 10.01 | 9.97 | 9.81-10.21 |
| pH 12.46 | 12.42 | 12.26-12.66 |
| Specific Conductance 1413 µS/cm | 1380 µS/cm | 1342-1484 |
| Zero-oxygen | 0.01 mg/L | 0.00-0.10 |
| | | |
| 4/19/2012 Mid-day (completed sampling) | | |
| pH 7.00 | 7.03 | 6.80-7.20 |
| Specific Conductance 1413 µS/cm | 1398 µS/cm | 1342-1484 |
| Zero-oxygen | 0.02 mg/L | 0.00-0.10 |
| | | |
| 4/20/2012 Mid-day | | |
| pH 12.46 | 12.43 | 12.26-12.66 |
| Specific Conductance 1413 µS/cm | 1390 µS/cm | 1342-1484 |
| | | |
| 4/20/2012 End-of -day | | |
| pH 10.01 | 9.99 | 9.81-10.21 |
| Specific Conductance 1413 µS/cm | 1387 µS/cm | 1342-1484 |



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| | | |
|---|---|---|
| 4/22/2012 Initial calibration checks | | |
| pH 10.01 | 10.01 | 9.81-10.21 |
| pH 12.46 | 12.41 | 12.26-12.66 |
| Specific Conductance 1413 µS/cm | 1410 µS/cm | 1342-1484 |
| Zero-oxygen | 0.01 mg/L | 0.00-0.10 |
| | | |
| 4/22/2012 End-of -day | | |
| pH 12.46 | 12.35 | 12.26-12.66 |
| Specific Conductance 1413 µS/cm | 1490 µS/cm | 1342-1484 |
| Zero-oxygen | 0.00 mg/L | 0.00-0.10 |
| | | |
| 4/24/2012 Initial calibration checks | | |
| pH 10.01 | 10.01 | 9.81-10.21 |
| pH 12.46 | 12.41 | 12.26-12.66 |
| Specific Conductance 1413 µS/cm | 1410 µS/cm | 1342-1484 |
| Zero-oxygen | 0.01 mg/L | 0.00-0.10 |
| | | |
| 4/24/2012 End-of -day | | |
| pH 12.46 | 12.61 | 12.26-12.66 |
| Specific Conductance 1413 µS/cm | 1370 µS/cm | 1342-1484 |
| Zero-oxygen | 0.02 mg/L | 0.00-0.10 |



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cases where it is determined that data need to be rejected. Data rejection can occur for many reasons that must be explained in QA/QC narratives. In this data set, formate concentration data are rejected because of sample container contamination. Data for ethoxylated alcohols are rejected because of lab and field blank contamination as well as other laboratory QA/QC issues (see Table B29). Trace metal data by ICP-MS (dissolved, CLP data) were rejected for sample PGDW20-0412 because of obvious contamination.

## B12. Tentatively Identified Compounds (TICs)

The Region 8 laboratory reported tentatively identified compounds (TICs) from VOC and SVOC analyses. Twenty-one VOC TICs and thirty-seven SVOC TICs were identified in samples and blanks (Tables B39 and B40). To be identified as a TIC, a peak had to have an area at least 10% as large as the area of the nearest internal standard and a match quality greater than 80. The TIC match quality is based on the number and ratio of the major fragmentation ions. A perfect match has a value of 99. Although the TIC report is essentially a qualitative report, an estimated concentration is calculated based on a response factor of 1.00 and the area of the nearest internal standard. The search for TICs includes the whole chromatogram from approximately 3.0 to 32.0 minutes (for VOCs) and 3.0 to 41.0 minutes for SVOCs, respectfully. TICs are compounds that can be detected, but, without the analysis of standards, cannot be confirmed or reliably quantified. Oftentimes TICs are representative of a class of compounds rather than indicating a specific compound. Only the top TIC is reported for each peak.

## B13. Audits of Data Quality (ADQ)

An Audit of Data Quality (ADQ) was performed per EPA's National Risk Management Research Laboratory (NRMRL) SOP, Performing Audits of Data Quality (ADQs), to verify that requirements of the Quality Assurance Project Plan (QAPP) were properly implemented for the analysis of samples submitted to laboratories identified in the QAPP associated with this project. The ADQ was performed by Neptune and Company, Inc. and reviewed by NRMRL QA staff. NRMRL QA staff provided the ADQ results to the project Principal Investigators for response and assisted in the implementation of corrective actions. The ADQ process is an important element of Category I (highest of four levels in EPA) Quality Assurance Projects, which this study has operated under for all aspects of groundwater collection and analysis.

Complete data packages were provided to the auditors for the Pavillion Wyoming April 2012 sampling event. A complete data package consists of the following: sample information, method information, data summary, laboratory reports, raw data including QC results, and data qualifiers. The QAPP was used to identify data quality indicator requirements and goals, and a checklist was prepared based on the types of data collected.

The data packages were reviewed against the checklist by tracing a representative set of the data in detail from raw data and instrument readouts through data transcription or transference through data manipulation (either manually or electronically by commercial or customized software) through data reduction to summary data, data calculations, and final reported data. All calibration and QA/QC data were reviewed for all available data packages. Auditors also reviewed the data summary spreadsheet prepared by the Principal Investigator to determine if data had been accurately transcribed from lab summary reports and appropriately qualified based on lab and field QC results.

The critical analytes, as identified in the QAPP, are Gasoline Range Organics (GRO); Diesel Range Organics (DRO); Semivolatile Organic Compounds (SVOCs); Volatile Organic Compounds (VOCs, also known as VOAs) of ethanol, isopropyl alcohol, tert butyl alcohol, naphthalene, benzene, toluene, ethylbenzene, and xylene; and the major ions potassium and chloride. Also included in the ADQ were the following analytes: dissolved inorganic and organic carbon; dissolved gases by GC; stable oxygen and hydrogen isotopes of water; low molecular weight acids by HPLC; stable carbon isotope ratio of dissolved inorganic carbon, stable carbon and hydrogen isotope ratios of dissolved methane; tritium; MBAS (methylene blue active substances), glycols; ethoxylated alcohols and alklyphenols; acrylamide; methanol, ethylene glycol, and propylene glycol.

The findings of an ADQ can consist of the following categories: finding (a deficiency that has or may have

a significant effect on the quality of the reported results; a corrective action response is required), or observation (a deficiency that does not have a significant effect on the quality of the reported results; a corrective action response is required). The ADQ noted a series of 14 observations, most of which resulted in the addition of data qualifiers to a data summary spreadsheet (corrective action), or specific additions to this Appendix on QA/QC. Many ADQ observations are included to Table B30 (QA/QC narrative associated with laboratory analysis of Phase V samples).

A separate ADQ was performed by NRMRL QA Managers on the reanalysis of total and dissolved metals by ICP-MS by the EPA Contract Laboratory Program. A Data Assessment was conducted on these data by the EPA CLP Sample Management Office. See Section B9 for a description of metals analysis by ICP-MS. The ADQ noted a series of 6 observations relating to data qualifiers, reports issued by the CLP lab, and data transcription errors.

**Table B39. Tentatively identified compounds (TICs) for VOCs.**

| Well | Compound | Amount, µg/L |
|---|---|---|
| PGDW05-0412 | 2-Methyl-adamantane | 3.39 |
| | cis-1,4- dimethyl-adamantane | 1.37 |
| | 6-Methylene-spiro[4.5]decane | 0.74 |
| PGDW20-0412 | 2-Methyladamantane | 0.67 |
| PGDW20d-0412 | 2-Methyladamantane | 0.67 |
| PGDW30-0412 | 1,4-Dimethyladamantane,1.alpha | 2.33 |
| EPAMW02-0412-1 | 2-Methyl-butane | 5.83 |
| | Pentane | 2.07 |
| | Methyl-cyclohexane | 4.34 |
| | 2-Ethyl-1-hexanol | 2.18 |
| | Isobutane | 92 |
| | Cyclohexane | 25.6 |
| | 1-Ethyl-3-methyl-benzene | 68.6 |
| | 1-Ethyl-4-methyl-benzene | 18.2 |
| EPAMW02-0412-2 | Isobutane | 240 |
| | 2-Methyl-butane | 66.4 |
| | Pentane | 27.0 |
| | Cyclohexane | 73.6 |
| | Methyl-cyclohexane | 44.4 |
| | 1-Ethyl-2-methyl-benzene | 101.4 |
| | Acetic acid, 2-ethylhexyl ester | 24.2 |
| | 1-Ethyl-4-methyl-benzene | 18.2 |
| EPAMW01-0412 | 2-Methyl-butane | 46.0 |
| | Pentane | 27.5 |
| | 2-Methyl-pentane | 12.4 |
| | Hexane | 7.00 |
| | Methyl-cyclopentane | 32.3 |
| | Cyclohexane | 82.3 |
| | Isopropylcyclobutane | 2.96 |
| | Methyl-cyclohexane | 65.2 |

| | | |
|---|---|---|
| EPAMW01d-0412 | 2-Methyl-butane | 44.4 |
| | Pentane | 26.7 |
| | 2-Methyl-pentane | 12.2 |
| | Hexane | 6.8 |
| | Methyl-cyclopentane | 31.9 |
| | Cyclohexane | 81.4 |
| | Isopropylcyclobutane | 3.07 |
| | Methyl-cyclohexane | 64.53 |
| | 2-Ethyl-1-hexanol | 5.06 |
| EPAMW01-0412-10 | 2-Methyl-butane | 39.3 |
| | Pentane | 20.8 |
| | Hexane | 5.06 |
| | Methyl-cyclopentane | 21.2 |
| | Cyclohexane | 52.1 |
| | 1,2-Dimethyl-cis-cyclopentane | 2.65 |
| | Methyl-cyclohexane | 43.2 |

**Table B40. Tentatively identified compounds (TICs) for SVOCs.**

| Well | Compound | Amount, µg/L |
|---|---|---|
| PGDW05-0412 | 2-Methyl-adamantane | 0.84 |
| | Substituted adamantane, isomers | 0.56 |
| | Cyclic octaatomic sulfur | 1.32 |
| PGDW20-0412 | 1-Adamantanecarboxlic acid chloride | 0.71 |
| | Cyclic octaatomic sulfur | 0.87 |
| PGDW20d-0412 | 2-Methyladamantane | 0.57 |
| | Cyclic octaatomic sulfur | 0.65 |
| PGDW30-0412 | Substituted adamantane, isomers | 0.56 |
| EPAMW02-0412-1 | Toluene | 114 |
| | 2-Hexanol, 2-methyl- | 13.5 |
| | Ethylbenzene | 28.8 |
| | *o*-Xylene | 75.5 |
| | 1-Ethyl-3-methyl-benzene | 24.4 |
| | 1,2,3-Trimethyl-benzene | 24.8 |
| | 1-Ethyl-2-methyl-benzene | 18.2 |
| | 1,2,4-Trimethyl-benzene | 68.3 |
| | 3,5-Dimethyl phenol | 11.6 |
| | Ricinoleic acid | 76.5 |
| EPAMW02-0412-2 | 2-Methyl-2-pentanol | 38.9 |
| | Toluene | 142 |
| | Ethylbenzene | 41.2 |
| | *o*-Xylene | 112 |
| | 1-Ethyl-3-methyl-benzene | 46.7 |
| | 1,2,3-Trimethyl-benzene + isomers | 136 |
| | 3,5-Dimethyl benzoic acid | 10.9 |
| | Ricinoleic acid | 89.2 |

| | | |
|---|---|---|
| EPAMW01-0412 | 2-Ethyl-hexanoic acid | 1.8 |
| | Benzothiazole | 0.80 |
| | Benzeneacetic acid | 5.9 |
| | Nonanoic acid | 0.85 |
| | Indolizine | 1.3 |
| | Phthalic anhydride | 1.5 |
| | 5-Hexyldihydro-2(2H)-furanone | 0.91 |
| | Dodecanoic acid | 2.3 |
| | Azelaic acid | 0.77 |
| | Tridecanoic acid | 0.90 |
| | 2-Mercaptobenzothiazole | 1.4 |
| | Cyclic octaatomic sulfur | 1.3 |
| EPAMW01d-0412 | 2-Ethyl-hexanoic acid | 1.9 |
| | Benzeneacetic acid | 5.6 |
| | Nonanoic acid | 0.82 |
| | Indole | 1.4 |
| | 5-Hexyldihydro-2(2H)-furanone | 0.86 |
| | Dodecanoic acid | 2.0 |
| | Tetradecanoic acid | 0.64 |
| | n-Hexadecanoic acid | 1.4 |
| | 2-Mercaptobenzothiazole | 1.4 |
| | Cyclic octaatomic sulfur | 1.1 |
| | Octadecanoic acid | 1.1 |
| | 9-Octadecenoic acid, 12-hydroxy- | 15.7 |



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| | | |
|---|---|---|
| EPAMW01-0412-4 | 2-Octanone | 1.4 |
| | 1-Hexanol, 2-ethyl | 135 |
| | 2-Ethyl-hexanoic acid | 2.4 |
| | Benzeneacetic acid | 8.8 |
| | Nonanoic acid | 1.1 |
| | *p*-Tert-butyl-phenol | 1.7 |
| | Phthalic anhydride | 6.1 |
| | 5-Hexyldihydro-2(2H)-furanone | 1.2 |
| | 2-Mercaptobenzothiazole | 2.6 |
| | Cyclic octaatomic sulfur | 1.0 |
| | 9-Octadecenoic acid, 12-hydroxy- | 40 |
| | 1-Phenanthrenecarboxylic-acid | 1.1 |
| EPAMW01-0412-7 | Benzeneacetic acid | 1.4 |
| | Phthalic anhydride | 1.5 |
| | 5-Hexyldihydro-2(3H)-furanone | 0.72 |
| | Dodecanoic acid | 1.6 |
| | Azelaic acid | 0.67 |
| | Tetradecanoic acid | 0.54 |
| | 2-Mercaptobenzothiazole | 1.4 |
| | Cyclic octaatomic sulfur | 1.4 |
| | Ricinoleic acid | 10.0 |
| EPAMW01-0412-10 | Benzeneacetic acid | 4.3 |
| | Phthalic anhydride | 4.3 |
| | 5-Hexyldihydro-2(3H)-furanone | 0.53 |
| | Dodecanoic acid | 1.2 |
| | 2-Mercaptobenzothiazole | 0.88 |
| | Cyclic octaatomic sulfur | 1.7 |
| | Ricinoleic acid | 3.6 |



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| | | |
|---|---|---|
| EquipBlk1 | 2-Undecanone | 0.53 |
| EquipBlk3 | 2-Undecanone | 0.57 |
| EquipBlk4 | 2-Undecanone | 1.5 |
| | 1-Methyl-2-pyrrolidinone | 2.5 |
| | 2-Nonanone | 1.1 |
| FieldBlk3 | 2-Undecanone | 0.50 |



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# Section C

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August 30, 2012

USGS
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# Transmittal of Contract Laboratory Results and Evaluation of Laboratory-Specific Quality Control Measures, U.S. Environmental Protection Agency Monitoring Well MW02, Pavillion, Wyoming, 2012

Administrative Report Prepared for the U.S. Environmental Protection Agency

Compiled by Gary L. Cottrell and Donna N. Myers

U.S. Department of the Interior
U.S. Geological Survey

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**The following abbreviations are used in this report:**

| | |
|---|---|
| AQA | Analytical Quality Associates, Inc. |
| CCB | Continuing Calibration Blank |
| CCV | Continuing Calibration Verification |
| CoC | Chain-of-custody |
| CRI | Check Standard |
| CRQL | Contract Required Quantitation Limit |
| DLCK | Dilution Check Standard |
| ICB | Initial Calibration Blank |
| ICV | Initial Calibration Verification |
| ISA | Interference Check Sample Solution A |
| ISB | Interference Check Sample Solution AB |
| LCS | Laboratory Control Sample |
| LCSD | Laboratory Control Sample Duplicate |
| MCAWW | Methods for chemical analysis of water and wastes |
| MDL | Method Detection Limit |
| MRL | Minimum Reporting Level |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| ND | Non-detect |
| NELAP | National Environmental Laboratory Accreditation Program |
| NWQL | National Water Quality Laboratory |
| QA | Quality assurance |
| QC | Quality control |
| RCRA | Resource Conservation and Recovery Act |
| RL | Reporting Level |
| RPD | Relative percent deviation |
| SM | Standard methods for the examination of water and wastewater |
| SW846 | Test methods for evaluating solid waste, physical/chemical methods, third edition, November 1986 and its updates |
| TAL | TestAmerica Laboratory, Inc. |
| TAL AUS | TestAmerica Austin |
| TAL DEN | TestAmerica Denver |
| TAL PIT | TestAmerica Pittsburgh |
| TAL SAV | TestAmerica Savannah |
| USEPA | U.S. Environmental Protection Agency |
| USGS | U.S. Geological Survey |

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# Transmittal of Contract Laboratory Results and Evaluation of Laboratory-Specific Quality Control Measures, U.S. Environmental Protection Agency Monitoring Well MW02, Pavillion, Wyoming, 2012

Administrative Report Prepared for the U.S. Environmental Protection Agency

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## Introduction

The U.S. Environmental Protection Agency (USEPA) installed and sampled two deep monitoring wells (MW01 and MW02) near Pavillion, Wyo., as part of a larger investigation of groundwater contamination in the area. The previous phases of the investigation were completed from 2009 to 2011. A USEPA draft report entitled, "Investigation of ground water contamination near Pavillion, Wyo.," (2011a) provides findings from the 2009 to 2011 sample collection and analysis activities at MW01 and MW02 and other wells. A scientific peer panel was organized by the USEPA to review its draft report (USEPA, 2011b). This activity is planned to take place in late 2012.

In February 2012, a technical team was formed, comprised of representatives of the U.S. Geological Survey (USGS), USEPA, the State of Wyoming, the Wind River Environmental Quality Commission, and the Northern Shoshone Business Council. The latter two agencies are Tribal representatives from the Wind River Indian Reservation. The team's purpose was to reach consensus on groundwater sampling, methods of chemical analysis, and quality assurance (QA) and quality control (QC) practices to be used by the USGS to report results of water-quality sampling from wells MW01 and MW02.

The USEPA returned to the Pavillion area in April, 2012, to continue its groundwater investigation by sampling MW01 and MW02—this time in partnership with the USGS, Wyoming Department of Environmental Quality, and the Tribal representatives from the Wind River Indian Reservation.

Although the USGS and USEPA collected and analyzed samples taken from MW01 on April 24, 2012, the USGS did not collect samples from MW02 during a sampling event on April 22 for reasons related to low-yield wells detailed elsewhere (Wright and McMahon, in press). To provide comparison results for the 2011 USEPA sample collection and analysis, the USEPA collected replicate sample aliquots from MW02 on April 22 and sent them to both the USEPA laboratories and to the USGS contract laboratory, TestAmerica Laboratory, Inc. (TAL). The aliquots for TAL were sent to the TAL



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in Arvada, Colorado, with the exception of the aliquots for methylene blue active substance analysis. After arrival at the TAL in Arvada, glycols and methanol aliquots were sent to TAL in Austin, Texas, and the dissolved gases (propane) aliquots to TAL in Pittsburgh, Pennsylvania. Due to the 48-hour holding time, the methylene blue active substance aliquots were sent directly to the TAL in Savannah, Georgia, where that analysis was performed. The sample aliquots sent to TAL were analyzed for selected chemical compounds as identified in table 1. The TAL sample results were reviewed and evaluated for laboratory-specific QC measures by the USGS, and a data validation review was completed by Analytical Quality Associates, Inc. (AQA) in Albuquerque, New Mexico. This report contains the TAL results and laboratory-specific QC measures for MW02 sampled on April 22, 2012.

**Table 1.** Test methods used to analyze sample aliquots collected from U.S. Environmental Protection Agency monitoring well MW02, Pavillion, Wyo., on April 22, 2012.

[GC/MS, gas chromatography/mass spectrometry; DEN, Denver, Colo.; SW846, "Test methods for evaluating solid waste, physical/chemical methods," Third ed., November 1986 and updates; SIM-GC/MS, selected ion monitor-gas chromatography/mass spectrometry; GC, gas chromatography; RSK, "Sample prep and calculations for dissolved gas analysis in water samples using a GC headspace equilibrium technique," RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Laboratory; ICP, inductively coupled plasma; ICP–MS, inductively coupled plasma–mass spectrometry; CVAA, cold vapor atomic absorption; MCAWW, "Methods for chemical analysis of water and wastes," EPA-600/4-79-020, March 1983 and subsequent revisions; EPA, U.S. Environmental Protection Agency; SM, "Standard methods for the examination of water and wastewater;" AUS, Austin, Tex.; PIT, Pittsburgh, Pa.; SAV, Savannah, Ga.]

| Method description | Location | Method | Preparation method |
|---|---|---|---|
| Volatile organic compounds (GC/MS) | DEN[1] | SW846 8260B | SW846 5030B |
| Semivolatile organic compounds (SIM-GC/MS) | DEN | SW846 8270C | SW846 3520C |
| Semivolatile organic compounds (GC/MS) | DEN | SW846 8270C SIM | SW846 3510C |
| Gasoline range organics (GC) | DEN | SW846 8015B | SW846 5030B |
| Dissolved gases (ethane, ethylene, methane) (GC) | DEN | RSK-175 | RSK-175 |
| Diesel range organics (GC) | DEN | SW846 8015B | SW846 3510C |
| Metals (ICP) dissolved | DEN | SW846 6010B | SW846 3005A |
| Metals (ICP) total | DEN | SW846 6010B | SW846 3010A |
| Metals (ICP–MS) dissolved | DEN | SW846 6020 | SW846 3005A |
| Metals (ICP–MS) total | DEN | SW846 6020 | SW846 3020A |
| Mercury (CVAA) dissolved and total | DEN | SW846 7470A | SW846 7470A |
| Nitrogen, ammonia | DEN | MCAWW 350.1 | |
| Nitrogen, nitrate and nitrite | DEN | MCAWW 353.2 | |
| Phosphorus, total (low level) | DEN | EPA 365.1 | MCAWW 365.2/365.3/365 |
| Phosphorus, total (low level) | DEN | EPA 365.1 | MCAWW 365.2/365.3/365 |
| Anions, ion chromatography | DEN | SW846 9056 | |
| Organic carbon, dissolved | DEN | SW846 9060 | |
| Organic carbon, total | DEN | SW846 9060 | |
| Solids, total dissolved | DEN | SM 2540C | |
| Glycols and methanol | AUS[2] | SW846 8015 | |
| Dissolved gases (propane) (GC) | PIT[3] | RSK-175 | |
| Methylene blue active substance surfactants | SAV[4] | EPA 425.1 | |

[1] The location identified as DEN is TestAmerica Denver, 4955 Yarrow Street, Arvada, Colo. 80002, 303-736-0100.

[2] The 8015B glycols and methanol analysis presented in this report was performed at TestAmerica Austin, 14050 Summit Drive, Suite A100, Austin, Tex. 78728, 512-244-0855.

[3] The requested RSK-175 (Propane) analysis presented in this report was performed at TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, Pa. 15238, 412-963-7058.

[4] The requested 425.1 methylene blue active substances surfactants analysis presented in this report was performed at TestAmerica Savannah, 5102 La Roche Avenue, Savannah, Ga. 31404, 912-354-7858.



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The samples collected by the USGS from MW01 on April 24, 2012, and analyzed by TAL are being reported separately by P.R. Wright and others (unpub. data, 2012).

## Purpose and Scope

The purpose of this report is to provide an independent set of laboratory results analyzed by TAL and quality-assured by the USGS and AQA for sample aliquots collected by the USEPA from deep monitoring well MW02 on April 22, 2012. These results provide additional information to the USEPA for comparison purposes for its investigation in Pavillion, Wyoming. The USGS is a non-regulatory agency with a long history of providing scientific data and information to inform and assist in local, state, and national policy decisions.

Results may be compared between the USEPA and TAL laboratories, because the list of chemical compounds and analytical chemistry methods used by the USEPA and TAL laboratories were, wherever possible, well coordinated to provide comparable approaches to sample analysis, QA, and QC (table 1). In some cases, such as alkylphenols and various isotopic analyses, the USGS contract laboratory did not have a matching capability and those tests were not performed by TAL. In the analysis of glycols, the USEPA and TAL methods were not fully comparable. The objective of analyzing replicate sample aliquots by both USEPA and TAL laboratories is to provide a set of quality-assured and independently analyzed results to support the investigation of the chemical composition of groundwater collected from MW02.

The USGS National Water Quality Laboratory (NWQL) and TAL have similar methods, and each is accredited by the National Environmental Laboratory Accreditation Program (NELAP). A USGS contract laboratory was used instead of the NWQL since TAL uses regulatory methods that closely match those identified for use in the USEPA quality assurance project plan, available online at *http://www.epa.gov/region8/superfund/wy/pavillion/EPA_ReportOnPavillion_Dec-8-2011.pdf*. Furthermore, TAL was able to provide some analyses unavailable at the NWQL. The TAL's certifications are available on its home page at *http://www.testamericainc.com/*.

Analytical tests were performed for volatile organic compounds, semivolatile organic compounds, gasoline range organics, diesel range organics, glycols, dissolved organic carbon, total organic carbon, anions, metals, trace elements, and mercury by TAL using USEPA SW-846 methods (table 1). The publication EPA SW-846 is the official compendium of analytical and sampling methods that have been evaluated and approved for use in complying with the Resource Conservation and Recovery Act (RCRA) regulations (USEPA, n.d.). Additional analyses were performed by TAL for dissolved gases, nutrients, and methylene blue active substances using other standard USEPA methods.

Quality controls were in place at each step of the process to ensure data reliability starting with chain-of-custody (CoC) processing upon sample receipt at the laboratory and continuing through final customer (USEPA) review. Standard laboratory QA and (or) QC processes are routinely performed by TAL and include, but are not limited to, analysis of laboratory blanks, laboratory control samples, laboratory control sample duplicates, laboratory matrix spikes, and laboratory matrix spike duplicates



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(table 2). In addition, QA was performed during the review of the data package at the USGS NWQL and through AQA, an independent data validation company. The USEPA also submitted blind performance evaluation samples to TAL for this project.

**Table 2.** Quality assurance and (or) quality control procedures applied to the analysis and data review of sample aliquots collected from U.S. Environmental Protection Agency monitoring well MW02, Pavillion, Wyo., on April 22, 2012.

[QA/QC, quality assurance/quality control; RPD, relative percent deviation; RL, reporting level; USGS, U.S. Geological Survey; USEPA, U.S. Environmental Protection Agency]

| QA/QC type | Purpose | Checking | Performed by |
|---|---|---|---|
| Chain-of-Custody | Ensure sample integrity | Sample integrity | Sample collector and analyzing laboratory |
| Sample receiving checklist | Verify sample condition | Sample condition | Analyzing laboratory |
| Laboratory matrix spikes | Determine matrix effects | Recovery and RPD | Analyzing laboratory |
| Laboratory control samples | Confirm instrument operation | Recovery and RPD | Analyzing laboratory |
| Laboratory blanks | Contamination check | Contamination | Analyzing laboratory |
| Surrogates | Check preparation efficiency | Recovery | Analyzing laboratory |
| Laboratory duplicates | Check reproducibility | Consistency | Analyzing laboratory |
| Method reporting level check | Ensure values near the RL | Run integrity | Analyzing laboratory |
| Serial dilution check | Ensure integrity of diluted results | Dilution integrity | Analyzing laboratory |
| Contract review | Ensure contract compliance | All of the above plus hold-time, and overall meets contract requirements | USGS laboratory |
| Data validation | Provide outside review | Entire data package | Third party contracted by the USGS |
| Performance evaluation samples | Check laboratory performance through blind check samples | Laboratory performance for the analytes of interest | USEPA laboratory (Ada, Okla.) |
| Final customer review | Logic check | Results are reasonable for the sampling location and conditions | USEPA |



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## Methods of Analysis

This project used the standard CoC record form (appendix 1). Sample aliquots were shipped overnight to the appropriate laboratory, primarily TAL Denver (Arvada, Colo.). Upon receipt, each cooler was checked for intact custody seals, correct temperature, and other criteria documented during login. The analyses requested, the location of the TestAmerica laboratory performing the analyses, and the methods used for analysis are presented in table 1. A summary of the QA and (or) QC procedures applied to the analysis and data review of the sample aliquot collected by USEPA is presented in the order of occurrence in table 2. All the steps are routinely performed under the TAL contract, with the exception of the data validation and performance evaluation samples. These additional quality processes were added to provide increased confidence in the laboratory procedures that produced the final analytical data.

Upon delivery of sample results to the NWQL, the data packet was reviewed for contract compliance. Items checked included hold-time compliance, matrix spike results, laboratory control sample results, and duplicate reproducibility. This data quality review determines if laboratory contract requirements have been met and provides an overview of potential problems with the determination and quality of the analytical results. A blank data-review worksheet, used for this review, is included in appendix 2.

The NWQL contract with AQA for data validation services requires the reviewer to (1) review and validate the reported analytical results collectively for the data package as a whole, including laboratory qualifiers; (2) summarize data and QC deficiencies and evaluate the impact on overall data quality; (3) assign appropriate data validation qualifiers, as necessary; and (4) prepare an analytical data validation report.

The USEPA submitted performance evaluation samples to TAL as additional assurance of the laboratory's ability to identify key compounds. The resulting data for the performance evaluation sample were reviewed by USEPA personnel.

## Results

The sample aliquots were shipped and analyzed using CoC protocols. The CoC records and sample preservation were checked upon sample arrival at TAL, as documented in appendix 3. These records indicate (1) that CoC was maintained, (2) the samples were received in good condition, and (3) were at acceptable temperatures.

Based upon the results of the performance evaluation samples and the laboratory certifications provided, there are no laboratory-level qualifications to these results. Sample result-level qualifiers are included in the data files described in table 3 and have been summarized in appendix 4.

With over 400 individual sample results reported, there were 14 detections in the laboratory blank results. Only pyrene had a laboratory blank result greater than one-half of the minimum reporting level, and this pyrene blank result was less than the reporting level and the MW02 environmental sample result was a non-detect. The laboratory control sample results were all within acceptable limits. The laboratory was provided with additional sample volume that they spiked with the compounds of interest



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(matrix spike) for each analytical procedure. A duplicate matrix spike was analyzed for many of the methods as an additional QC measure. There were 31 matrix spike results flagged and eight of these were flagged because the spike amount was much smaller than the concentration of the analyte occurring in the sample (see qualifier code "4"). This number of qualifiers is in the range commonly seen when the samples are of a complex matrix.

Overall, the QC results for the laboratory blanks, laboratory control samples, laboratory matrix spikes, and laboratory control and matrix spike duplicates support that this analytical data set is of good quality and may be used with confidence when the associated qualifiers are included.

The completed worksheet documenting the review of TAL's data package by the NWQL's contracting officer's representative is included in appendix 5. Independent data validation performed by AQA confirmed these findings, as demonstrated in appendix 6. The performance evaluation samples were reviewed by USEPA, and this written communication, dated July 11, 2012, indicated that all results were within acceptable limits, and laboratory performance was therefore satisfactory.

The analytical data are of acceptable quality and are organized into five data files. They are contained on an accompanying compact disc and labeled as appendixes 7 through 11. For convenience, file names and descriptions are summarized in table 3. For easier navigation of the associated files, see appendix 12. This file contains page numbers for key areas of the data package, information on file contents, and definitions for commonly used abbreviations and qualifiers.

**Table 3.** Files of sample results obtained from the analysis of sample aliquots collected from U.S. Environmental Protection Agency monitoring well MW02, Pavillion, Wyo., on April 22, 2012.

[Files are presented as numbered appendixes. CSV, indicates a comma separated variable file; PDF, indicates a portable document format file]

| Appendix | File name | File type | Contents |
|---|---|---|---|
| 7 | 280-28076-1-Glycols and Methanol-QUA08 | CSV | Glycol analytical results |
| 8 | 280-28076-1_Qua08 | CSV | Analytical results other than glycols |
| 9 | J28076-1 Std_Tal_L4_Package_Mini Final Report (1 of 3) | PDF | Laboratory report with supporting documentation |
| 10 | J28076-1 Std_Tal_L4_Package_Mini Final Report (2 of 3) | PDF | Laboratory report with supporting documentation |
| 11 | J28076-1 Std_Tal_L4_Package_Mini Final Report (3 of 3) | PDF | Laboratory report with supporting documentation |



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## References Cited

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U.S. Environmental Protection Agency, 2011a, Draft—Investigation of groundwater contamination near Pavillion, Wyoming: Ada, Okla., USEPA, Region 8, 121 p., available at *http://www.epa.gov/region8/superfund/wy/pavillion/EPA_ReportOnPavillion_Dec-8-2011.pdf*.

U.S. Environmental Protection Agency, 2011b, Draft report on Pavillion groundwater quality: Available at http://www.epa.gov/region8/superfund/wy/pavillion/.

Wright, P.R., and McMahon, P.B., in press, Sampling and analysis plan for the characterization of groundwater quality in two monitoring wells near Pavillion, Wyoming: U.S. Geological Survey Open-File Report 2012–1197.

## Appendixes



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