

Annual Groundwater Monitoring Report

Appalachian Power Company
John E. Amos Plant
Bottom Ash Pond CCR Management Unit
Winfield, West Virginia

January 2021

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An **AEP** Company

BOUNDLESS ENERGY™

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I. Overview

This *Annual Groundwater Monitoring and Corrective Action Report* (Report) has been prepared to report the status of activities for the preceding year for an existing Bottom Ash Pond (BAP) CCR unit at Appalachian Power Company's, a wholly-owned subsidiary of American Electric Power Company (AEP) John E. Amos Power Plant. The USEPA's CCR rules require that the Annual Groundwater Monitoring Report be posted to the operating record for the preceding year no later than January 31.

In general, the following activities were completed:

- An assessment monitoring program was established for the AMBAP on April 13, 2018. The CCR unit began 2020 in assessment monitoring and remained in assessment monitoring throughout all of 2020.
- Groundwater samples were collected and analyzed for Appendix III and Appendix IV constituents, as specified in 40 CFR 257.95 *et seq.* and AEP's *Groundwater Sampling and Analysis Plan (2016)* in February, May, and October 2020;
- Groundwater data underwent various validation tests, including tests for completeness, valid values, transcription errors, and consistent units;
- Analytical results of the February, May, and October rounds of sampling are listed in the tables in **Appendix 1**. Also shown are the groundwater flow rates and flow directions;
- Statistical analysis of the May 2020 sampling event revealed were no exceedances over established groundwater protection standards, so the unit remains in assessment monitoring. However, the following statistically significant increases occurred for Appendix III indicator parameters:
 - Calcium at MW-1, MW-1604, MW-1605, and MW-1606
 - Chloride at MW-1, MW-1605, and MW-1606
 - Sulfate at MW-1, MW-1605, and MW-1606
 - Total dissolved solids (TDS) at MW-1, MW-1605, and MW-1606
- The statistical analysis report for May 2020 assessment monitoring event was completed in September 2020 and is included in **Appendix 2**.
- October 2020 sampling event data has been received, however, statistical analysis is not yet completed. The statistical analysis will be completed in early 2021. If no SSL's are identified, the unit will remain in assessment monitoring. If SSL's are identified, the unit will either:
 - Attempt an alternative source demonstration, or

- Transition to the Assessment of Corrective Measures program and make the appropriate transition notifications.
- The AMBAP CCR Unit remains in the Assessment Monitoring Program per the federal CCR Rule at this time.

The major components of this annual report, to the extent applicable at this time, are presented in sections that follow:

- A map/aerial photograph showing the BAP Complex CCR management unit, all groundwater monitoring wells, and monitoring well identification numbers.
- All of the monitoring data collected, including the rate and direction of groundwater flow, plus a summary showing the number of samples collected per monitoring well, the dates the samples were collected and whether the sample was collected as part of detection monitoring or assessment monitoring programs (**Appendix 1**).
- Statistical analysis reports completed in 2020 for the May 2020 groundwater monitoring event (**Appendix 2**).
- Discussion of any alternative source demonstrations completed (Appendix 3). This is not applicable.
- The notification of the establishment of an assessment monitoring program (**Appendix 4**).
- Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a statement as to why that happened, if applicable (Appendix 5). This is not applicable.
- Other information required to be included in the annual report such as assessment of corrective measures, if applicable.

In addition, this report summarizes key actions completed, and where applicable, describes any problems encountered and actions taken to resolve those problems. The report includes a projection of key activities for the upcoming year.

II. Groundwater Monitoring Well Locations and Identification Numbers

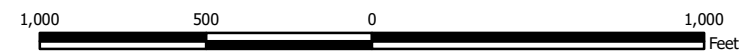
Figure 1 depicts the PE-certified groundwater monitoring network, the monitoring well locations, and their corresponding identification numbers. The monitoring well distribution adequately covers downgradient and upgradient areas as detailed in the *Groundwater Monitoring Network Evaluation Report* that was placed in the American Electric Power CCR public internet site on March 9, 2017. The *Groundwater Monitoring Network Evaluation Report* was updated in October 2020 to display the AMBAP CCR unit boundary appropriately. The revised report did not change the groundwater monitoring network or any aspect of the groundwater monitoring program. The CCR unit boundary was simply displayed incorrectly and was corrected in this revision. The CCR groundwater quality monitoring network includes the following:

- Four upgradient wells MW-6, MW-1601, MW-1602A, and MW-1603A; and
- Six downgradient wells MW-1, MW-4, MW-5, MW-1604, MW-1605, and MW-1606.



Legend
Monitoring Well Network
 Upgradient Sampling Location
 Downgradient Sampling Location
 Ash Pond System

Notes
 - Monitoring well coordinates provided by AEP.
 - Site features based on information available in the Ash Pond- CCR Groundwater Monitoring Well Network Evaluation - Amos Plant (Arcadis, 2016) provided by AEP.
 - Rev. 1: Updated CCR Unit boundary. September 13, 2018



**Site Layout
 Ash Pond System**

AEP Amos Generating Plant
 Winfield, West Virginia

Geosyntec
 consultants

Columbus, Ohio

2018/12/24

Figure

1

III. Monitoring Wells Installed or Decommissioned

There were no monitoring wells installed or decommissioned in 2019 at the Amos Plant Bottom Ash Pond Complex. The network design, as summarized in the *Groundwater Monitoring Network Evaluation Report (October 2020)* and as posted at the CCR web site for John E. Amos Plant, did not change. That evaluation report, viewable on the AEP CCR web site, discusses the facility location, the hydrogeological setting, the hydrostratigraphic units, the uppermost aquifer, and the design of the groundwater monitoring well network including downgradient and upgradient monitoring well locations.

IV. Groundwater Quality Data and Static Water Elevation Data, With Flow Rate and Direction Calculations and Discussion

Appendix 1 contains tables showing the groundwater quality data collected and received during the establishment of background quality and the groundwater monitoring samples collected and received through 2020. Static water elevation data from each monitoring event in 2020 are also shown in **Appendix 1**, along with the groundwater velocity calculations, groundwater flow direction and potentiometric maps developed after each sampling event.

V. Groundwater Quality Data Statistical Analysis

Statistical analysis of the assessment monitoring samples taken in May 2020 was completed in September 2020. No SSLs above a GWPS were identified.

However, the following statistically significant increases occurred for Appendix III indicator parameters:

- Calcium at MW-1, MW-1604, MW-1605, and MW-1606
- Chloride at MW-1, MW-1605, and MW-1606
- Sulfate at MW-1, MW-1605, and MW-1606
- Total dissolved solids (TDS) at MW-1, MW-1605, and MW-1606

The full report is included in **Appendix 2**. Statistical analysis of the groundwater monitoring samples from the October 2020 assessment monitoring event is ongoing and will be completed in early 2021, within 90 days of completing sampling and analysis.

VI. Alternative Source Demonstration

No alternative source demonstrations were performed in 2020.

VII. Discussion About Transition Between Monitoring Requirements or Alternate Monitoring Frequency

The Amos BAP transitioned from detection monitoring to assessment monitoring on April 13, 2018. The notification per 40 CFR 257.94(e)(3) is included in **Appendix 4**.

Regarding defining an alternate monitoring frequency, the groundwater velocity and monitoring well production are high enough at this facility that no modification to the monitoring frequency is needed.

VIII. Other Information Required

The BAP has progressed from detection monitoring to its current status in assessment monitoring since April 2018. All required information has been included in this annual groundwater monitoring report.

IX. Description of Any Problems Encountered in 2020 and Actions Taken

The May 2020 assessment monitoring event encountered a shipping issue. The MW-5 sample along with a duplicate sample and an equipment blank were in a cooler that was rerouted by the shipping company. The samples were not available to the laboratory in time, so resample was necessary. The resample occurred in July 2020. The July 2020 sample data is included in the compliance sampling monitoring data set.

X. A Projection of Key Activities for the Upcoming Year

Key activities for 2021 include:

- Complete statistical analysis on the sampling results from the October 2020 assessment monitoring event
- Respond to any new data received in light of what the CCR rule requires.
- Preparation of the 2021 annual groundwater report.

APPENDIX 1 - GW Quality Data, GW Flow Directions, GW Flow Rates

Figures and Tables follow showing data collected and the rate and direction of groundwater flow. The dates that the samples were collected is shown, as well as, whether the data were collected under background, detection, or assessment monitoring.

Table 1 - Groundwater Data Summary: MW-1**Amos - BAP****Appendix III Constituents**

| Collection Date | Monitoring Program | Boron | Calcium | Chloride | Fluoride | pH | Sulfate | Total Dissolved Solids |
|-----------------|--------------------|--------|---------|----------|----------|------|---------|------------------------|
| | | mg/L | mg/L | mg/L | mg/L | SU | mg/L | mg/L |
| 7/26/2016 | Background | 0.042 | 41.6 | 61.6 | < 0.05 U | 5.0 | 146 | 320 |
| 8/22/2016 | Background | 0.051 | 41.6 | 60.3 | < 0.05 U | 4.9 | 148 | 320 |
| 10/19/2016 | Background | 0.031 | 43.7 | 64.9 | < 0.05 U | 5.1 | 150 | 348 |
| 11/7/2016 | Background | -- | -- | -- | -- | 5.1 | -- | -- |
| 12/13/2016 | Background | 0.053 | 42.9 | 69.0 | < 0.05 U | 5.0 | 153 | 318 |
| 2/7/2017 | Background | 0.056 | 40.4 | 62.9 | 0.03 J | 5.5 | 139 | 314 |
| 3/13/2017 | Background | 0.108 | 38.1 | 64.2 | 0.02 J | 5.2 | 140 | 330 |
| 5/22/2017 | Background | 0.082 | 35.7 | 62.6 | 0.03 J | 6.1 | 138 | 316 |
| 6/20/2017 | Background | 0.092 | 38.2 | 65.1 | < 0.02 U | 5.2 | 147 | 348 |
| 11/1/2017 | Detection | 0.039 | 43.7 | 75.8 | 0.03 J | 5.0 | 156 | 358 |
| 1/9/2018 | Detection | -- | 43.2 | 83.2 | -- | 4.9 | 164 | 362 |
| 5/3/2018 | Assessment | 0.095 | 39.9 | 71.8 | 0.02 J | 7.3 | 154 | 328 |
| 9/4/2018 | Assessment | 0.094 | 38.3 | 67.9 | 0.03 J | 5.1 | 145 | 338 |
| 3/14/2019 | Assessment | 0.2 J | 38.4 | 55.2 | 0.03 J | 5.2 | 138 | 321 |
| 6/10/2019 | Assessment | 0.08 J | 35.9 | 64.4 | 0.03 J | 10.2 | 141 | 330 |
| 7/22/2019 | Assessment | 0.05 J | 36.8 | 57.4 | 0.02 J | 4.9 | 143 | 362 |
| 2/12/2020 | Assessment | -- | -- | -- | 0.03 J | 5.3 | -- | -- |
| 5/7/2020 | Assessment | 0.126 | 32.9 | 53.4 | 0.02 J | 5.0 | 137 | 336 |
| 10/27/2020 | Assessment | 0.04 J | 39.9 | 64.0 | 0.03 J | 4.8 | 161 | 374 |

Notes:

mg/L: milligrams per liter

SU: standard unit

<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.

J: Estimated value. Parameter was detected at concentration below the reporting limit

--: Not analyzed

Table 1 - Groundwater Data Summary: MW-1

Amos - BAP

Appendix IV Constituents

| Collection Date | Monitoring Program | Antimony | Arsenic | Barium | Beryllium | Cadmium | Chromium | Cobalt | Combined Radium | Fluoride | Lead | Lithium | Mercury | Molybdenum | Selenium | Thallium |
|-----------------|--------------------|----------|---------|--------|-----------|---------|----------|--------|-----------------|----------|----------|-----------|-----------|------------|----------|----------|
| | | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | pCi/L | mg/L | µg/L | mg/L | µg/L | µg/L | µg/L |
| 7/26/2016 | Background | 0.02 J | 0.13 | 30.2 | 0.107 | 2.09 | 0.1 | 10.7 | 0.528 | < 0.05 U | 0.134 | 0.004 | < 0.002 U | 1.67 | 0.09 J | 0.04 J |
| 8/22/2016 | Background | 0.01 J | 0.12 | 28.5 | 0.105 | 2.02 | 0.1 | 12.3 | 0.725 | < 0.05 U | 0.081 | 0.003 | < 0.002 U | 1.48 | 0.1 | 0.04 J |
| 10/19/2016 | Background | 0.02 J | 0.15 | 31.1 | 0.119 | 2.33 | 0.510 | 13.9 | 1.86 | < 0.05 U | 0.133 | 0.0008 J | < 0.002 U | 2.33 | 0.1 | 0.066 |
| 11/7/2016 | Background | -- | -- | -- | -- | -- | -- | -- | 0.615 | -- | -- | -- | -- | -- | -- | -- |
| 12/13/2016 | Background | 0.01 J | 0.16 | 28.9 | 0.115 | 2.55 | 1.24 | 14.6 | 0.136 | < 0.05 U | 0.102 | 0.014 | < 0.002 U | 1.38 | 0.2 | 0.04 J |
| 2/7/2017 | Background | 0.01 J | 0.20 | 25.4 | 0.115 | 2.43 | 0.141 | 14.9 | 0.609 | 0.03 J | 0.093 | 0.004 | < 0.002 U | 0.79 | 0.1 | 0.056 |
| 3/13/2017 | Background | 0.02 J | 0.14 | 26.3 | 0.112 | 2.36 | 0.566 | 12.5 | 0.675 | 0.02 J | 0.129 | 0.002 | < 0.002 U | 1.15 | 0.1 | 0.03 J |
| 5/22/2017 | Background | 0.03 J | 0.09 | 25.8 | 0.114 | 2.54 | 0.113 | 9.69 | 0.707 | 0.03 J | 0.066 | 0.006 | 0.002 J | 0.31 | 0.1 J | 0.04 J |
| 6/20/2017 | Background | 0.02 J | 0.10 | 27.7 | 0.123 | 2.65 | 0.173 | 9.38 | 0.587 | < 0.02 U | 0.062 | 0.005 | < 0.002 U | 0.34 | 0.09 J | 0.04 J |
| 5/3/2018 | Assessment | 0.01 J | 0.13 | 27.8 | 0.143 | 3.12 | 0.093 | 15.1 | 1.74 | 0.02 J | 0.068 | 0.004 | < 0.002 U | 0.62 | 0.2 | 0.04 J |
| 9/4/2018 | Assessment | 0.22 | 0.18 | 29.4 | 0.130 | 2.97 | 0.548 | 17.7 | 0.575 | 0.03 J | 1.16 | 0.003 | -- | 0.34 | 0.2 | 0.05 J |
| 3/14/2019 | Assessment | 0.05 J | 0.12 | 26.9 | 0.131 | 3.48 | 0.255 | 10.3 | 0.887 | 0.03 J | 0.252 | < 0.09 U | -- | 0.5 J | 0.09 J | < 0.1 U |
| 6/10/2019 | Assessment | 0.02 J | 0.11 | 27.5 | 0.125 | 2.14 | 0.2 J | 12.8 | 0.998 | 0.03 J | 0.08 J | < 0.009 U | < 0.002 U | < 0.4 U | 0.1 J | < 0.1 U |
| 7/22/2019 | Assessment | < 0.02 U | 0.09 J | 26.4 | 0.136 | 2.47 | 0.06 J | 13.5 | 0.825 | 0.02 J | 0.08 J | 0.00257 | -- | < 0.4 U | 0.2 J | < 0.1 U |
| 2/12/2020 | Assessment | < 0.02 U | 0.09 J | 25.7 | 0.139 | 2.22 | 0.2 J | 18.6 | 1.1 | 0.03 J | 0.07 J | 0.00259 | < 0.002 U | < 0.4 U | 0.1 J | < 0.1 U |
| 5/7/2020 | Assessment | < 0.02 U | 0.06 J | 25.7 | 0.126 | 2.43 | 0.1 J | 13.9 | 0.499 | 0.02 J | < 0.05 U | 0.00239 | -- | < 0.4 U | 0.08 J | < 0.1 U |
| 10/27/2020 | Assessment | < 0.02 U | 0.09 J | 25.4 | 0.130 | 2.42 | 0.1 J | 20.5 | 1.722 | 0.03 J | < 0.05 U | 0.00270 | -- | < 0.4 U | 0.1 J | < 0.1 U |

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.

J: Estimated value. Parameter was detected at concentration below the reporting limit

--: Not analyzed

pCi/L: picocuries per liter

Table 1 - Groundwater Data Summary: MW-4

**Amos - BAP
Appendix III Constituents**

| Collection Date | Monitoring Program | Boron | Calcium | Chloride | Fluoride | pH | Sulfate | Total Dissolved Solids |
|-----------------|--------------------|---------|---------|----------|----------|-----|---------|------------------------|
| | | mg/L | mg/L | mg/L | mg/L | SU | mg/L | mg/L |
| 7/25/2016 | Background | 0.074 | 16.2 | 11.7 | 0.07 J | 5.9 | 44.8 | 190 |
| 8/23/2016 | Background | 0.054 | 17.9 | 10.9 | 0.04 J | 5.5 | 39.2 | 184 |
| 10/18/2016 | Background | 0.070 | 15.2 | 12.2 | < 0.05 U | 5.7 | 44.5 | 206 |
| 11/8/2016 | Background | -- | -- | 12.8 | 0.03 J | 5.7 | 47.3 | 170 |
| 12/12/2016 | Background | 0.079 | 16.3 | 14.0 | 0.04 J | 5.5 | 48.0 | 348 |
| 2/8/2017 | Background | 0.087 | 15.3 | 13.4 | 0.06 J | 5.6 | 46.1 | 176 |
| 3/14/2017 | Background | 0.093 | 15.8 | 12.9 | 0.05 J | 5.8 | 43.5 | 185 |
| 5/22/2017 | Background | 0.099 | 15.3 | 13.2 | 0.04 J | 6.3 | 43.9 | 192 |
| 6/19/2017 | Background | 0.097 | 15.0 | 13.3 | 0.03 J | 5.5 | 50.9 | 196 |
| 11/1/2017 | Detection | 0.073 | 14.2 | 12.3 | 0.06 | 5.5 | 43.0 | 210 |
| 5/3/2018 | Assessment | 0.100 | 15.9 | 14.4 | 0.06 J | 5.9 | 49.2 | 178 |
| 9/5/2018 | Assessment | 0.067 | 13.3 | 13.4 | 0.06 | 7.0 | 42.4 | 179 |
| 3/15/2019 | Assessment | < 0.2 U | 14.5 | 13.3 | 0.06 J | 5.5 | 42.8 | 184 |
| 6/10/2019 | Assessment | 0.06 J | 14.4 | 13.0 | 0.06 | 6.8 | 43.3 | 172 |
| 7/23/2019 | Assessment | 0.06 J | 14.8 | 13.4 | 0.04 J | 5.4 | 44.5 | 186 |
| 2/11/2020 | Assessment | -- | -- | -- | 0.04 J | 5.9 | -- | -- |
| 5/6/2020 | Assessment | 0.135 | 17.6 | 16.9 | 0.04 J | 5.5 | 54.6 | 213 |
| 10/30/2020 | Assessment | 0.085 | 16.0 | 12.9 | 0.05 J | 5.4 | 39.0 | 187 |

Notes:

mg/L: milligrams per liter

SU: standard unit

<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.

J: Estimated value. Parameter was detected at concentration below the reporting limit

--: Not analyzed

Table 1 - Groundwater Data Summary: MW-4

Amos - BAP

Appendix IV Constituents

| Collection Date | Monitoring Program | Antimony | Arsenic | Barium | Beryllium | Cadmium | Chromium | Cobalt | Combined Radium | Fluoride | Lead | Lithium | Mercury | Molybdenum | Selenium | Thallium |
|-----------------|--------------------|----------|---------|--------|-----------|---------|----------|--------|-----------------|----------|-------|-----------|-----------|------------|----------|----------|
| | | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | pCi/L | mg/L | µg/L | mg/L | µg/L | µg/L | µg/L |
| 7/25/2016 | Background | 0.05 J | 13.6 | 101 | 0.068 | 0.18 | 0.5 | 26.6 | 0.539 | 0.07 J | 0.502 | 0.007 | < 0.002 U | 11.1 | 0.07 J | 0.055 |
| 8/23/2016 | Background | 0.02 J | 4.34 | 90.8 | 0.051 | 0.03 | 0.3 | 5.55 | 0.405 | 0.04 J | 0.275 | 0.002 | < 0.002 U | 19.2 | 0.08 J | 0.01 J |
| 10/18/2016 | Background | 0.11 | 15.8 | 84.1 | 0.055 | 0.53 | 0.600 | 85.9 | 1.884 | < 0.05 U | 0.395 | 0.002 | < 0.002 U | 2.44 | 0.1 | 0.156 |
| 11/8/2016 | Background | -- | -- | -- | -- | -- | -- | -- | 0.457 | 0.03 J | -- | -- | -- | -- | -- | -- |
| 12/12/2016 | Background | 0.03 J | 3.35 | 96.0 | 0.049 | 0.09 | 1.18 | 10.9 | 2.116 | 0.04 J | 0.255 | 0.012 | < 0.002 U | 0.75 | 0.1 J | 0.090 |
| 2/8/2017 | Background | 0.02 J | 8.17 | 82.5 | 0.045 | 0.12 | 0.290 | 18.9 | 0.46 | 0.06 J | 0.306 | 0.001 | < 0.002 U | 0.93 | 0.07 J | 0.099 |
| 3/14/2017 | Background | 0.03 J | 5.36 | 91.0 | 0.043 | 0.16 | 0.327 | 23.3 | 1.339 | 0.05 J | 0.192 | 0.0005 J | < 0.002 U | 0.51 | 0.07 J | 0.072 |
| 5/22/2017 | Background | 0.04 J | 6.38 | 96.2 | 0.053 | 0.09 | 0.226 | 20.8 | 0.55 | 0.04 J | 0.188 | 0.008 | < 0.002 U | 0.49 | 0.08 J | 0.068 |
| 6/19/2017 | Background | 0.02 J | 5.65 | 88.5 | 0.049 | 0.08 | 0.216 | 22.1 | 0.929 | 0.03 J | 0.247 | 0.002 | < 0.002 U | 0.31 | 0.1 | 0.069 |
| 5/3/2018 | Assessment | < 0.01 U | 1.15 | 93.1 | 0.046 | 0.04 | 0.175 | 7.93 | 1.569 | 0.06 J | 0.153 | 0.0008 J | < 0.002 U | 0.31 | 0.06 J | 0.01 J |
| 9/5/2018 | Assessment | 0.05 J | 11.0 | 89.1 | 0.037 | 0.21 | 0.200 | 25.8 | 0.623 | 0.06 | 0.083 | 0.003 | -- | 0.28 | 0.06 J | 0.109 |
| 3/15/2019 | Assessment | < 0.02 U | 1.63 | 80.4 | 0.05 J | 0.05 | 0.2 J | 9.81 | 0.501 | 0.06 J | 0.219 | < 0.09 U | -- | < 0.4 U | 0.06 J | < 0.1 U |
| 6/10/2019 | Assessment | < 0.02 U | 2.50 | 90.5 | 0.06 J | 0.07 | 0.274 | 10.5 | 0.787 | 0.06 | 0.406 | < 0.009 U | < 0.002 U | < 0.4 U | 0.08 J | < 0.1 U |
| 7/23/2019 | Assessment | 0.03 J | 2.48 | 84.6 | 0.07 J | 0.05 | 0.236 | 7.24 | 0.486 | 0.04 J | 0.430 | 0.00162 | -- | < 0.4 U | 0.1 J | < 0.1 U |
| 2/11/2020 | Assessment | < 0.02 U | 0.92 | 96.9 | 0.04 J | 0.05 J | 0.2 J | 8.30 | 1.883 | 0.04 J | 0.2 J | 0.00151 | < 0.002 U | 0.9 J | 0.06 J | < 0.1 U |
| 5/6/2020 | Assessment | < 0.02 U | 5.20 | 110 | 0.09 J | 0.05 | 0.367 | 8.17 | 2.176 | 0.04 J | 0.545 | 0.00139 | -- | 1 J | 0.2 J | < 0.1 U |
| 10/30/2020 | Assessment | 0.08 J | 21.7 | 83.5 | 0.07 J | 0.61 | 0.308 | 42.4 | 0.2618 | 0.05 J | 0.416 | 0.00166 | -- | < 0.4 U | 0.09 J | 0.2 J |

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.

J: Estimated value. Parameter was detected at concentration below the reporting limit

--: Not analyzed

pCi/L: picocuries per liter

Table 1 - Groundwater Data Summary: MW-5

**Amos - BAP
Appendix III Constituents**

| Collection Date | Monitoring Program | Boron | Calcium | Chloride | Fluoride | pH | Sulfate | Total Dissolved Solids |
|-----------------|--------------------|----------|---------|----------|----------|-----|---------|------------------------|
| | | mg/L | mg/L | mg/L | mg/L | SU | mg/L | mg/L |
| 7/26/2016 | Background | 0.051 | 19.7 | 21.4 | 0.04 J | 5.8 | 57.7 | 156 |
| 8/23/2016 | Background | 0.014 | 18.4 | 21.3 | 0.04 J | 5.4 | 57.5 | 136 |
| 10/18/2016 | Background | 0.018 | 18.6 | 20.0 | < 0.05 U | 5.9 | 56.0 | 188 |
| 11/8/2016 | Background | -- | -- | 20.1 | 0.05 J | 5.8 | 56.5 | 176 |
| 12/12/2016 | Background | 0.002 J | 18.1 | 20.4 | 0.03 J | 5.7 | 54.1 | 154 |
| 2/8/2017 | Background | 0.032 | 16.3 | 19.6 | 0.05 J | 5.8 | 51.1 | 158 |
| 3/14/2017 | Background | 0.028 | 16.5 | 19.5 | 0.03 J | 5.9 | 51.5 | 172 |
| 5/22/2017 | Background | 0.046 | 16.8 | 18.9 | 0.04 J | 6.6 | 51.1 | 180 |
| 6/19/2017 | Background | 0.060 | 11.4 | 19.1 | 0.03 J | 5.6 | 57.3 | 170 |
| 11/1/2017 | Detection | 0.033 | 15.7 | 17.5 | 0.05 J | 5.7 | 53.9 | 190 |
| 5/3/2018 | Assessment | 0.156 | 16.6 | 17.8 | 0.04 J | 6.3 | 51.9 | 166 |
| 9/4/2018 | Assessment | 0.028 | 15.2 | 17.8 | 0.05 J | 5.8 | 45.4 | 151 |
| 3/15/2019 | Assessment | < 0.2 U | 16.2 | 18.5 | 0.05 J | 5.7 | 51.3 | 180 |
| 6/10/2019 | Assessment | 0.04 J | 15.7 | 16.9 | 0.05 J | 5.9 | 48.4 | 178 |
| 7/23/2019 | Assessment | < 0.04 U | 14.9 | 15.3 | 0.04 J | 5.6 | 45.2 | 162 |
| 2/11/2020 | Assessment | -- | -- | -- | 0.04 J | 6.0 | -- | -- |
| 5/6/2020 | Assessment | -- | -- | -- | -- | 5.5 | -- | -- |
| 7/7/2020 | Assessment | 0.055 | 14.7 | 14.6 | 0.03 J | 6.1 | 45.7 | 156 |
| 10/27/2020 | Assessment | 0.04 J | 14.3 | 14.3 | 0.04 J | 5.5 | 43.5 | 177 |

Notes:

mg/L: milligrams per liter

SU: standard unit

<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.

J: Estimated value. Parameter was detected at concentration below the reporting limit

--: Not analyzed

Table 1 - Groundwater Data Summary: MW-5

Amos - BAP

Appendix IV Constituents

| Collection Date | Monitoring Program | Antimony | Arsenic | Barium | Beryllium | Cadmium | Chromium | Cobalt | Combined Radium | Fluoride | Lead | Lithium | Mercury | Molybdenum | Selenium | Thallium |
|-----------------|--------------------|----------|---------|--------|-----------|----------|----------|--------|-----------------|----------|----------|-----------|-----------|------------|----------|----------|
| | | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | pCi/L | mg/L | µg/L | mg/L | µg/L | µg/L | µg/L |
| 7/26/2016 | Background | 0.03 J | 2.71 | 170 | 0.039 | 0.01 J | 0.2 | 0.966 | 1.264 | 0.04 J | 0.123 | 0.0005 J | < 0.002 U | 2.15 | < 0.03 U | 0.04 J |
| 8/23/2016 | Background | 0.01 J | 2.42 | 157 | 0.029 | 0.007 J | 0.2 | 1.01 | 0.406 | 0.04 J | 0.056 | 0.004 | < 0.002 U | 2.57 | < 0.03 U | 0.01 J |
| 10/18/2016 | Background | 0.05 | 4.00 | 166 | 0.079 | 0.007 J | 0.841 | 1.45 | 1.123 | < 0.05 U | 0.667 | 0.004 | < 0.002 U | 2.20 | 0.09 J | 0.01 J |
| 11/8/2016 | Background | -- | -- | -- | -- | -- | -- | -- | 1.099 | 0.05 J | -- | -- | -- | -- | -- | -- |
| 12/12/2016 | Background | 0.08 | 3.41 | 166 | 0.053 | 0.006 J | 0.892 | 1.14 | 1.46 | 0.03 J | 0.264 | 0.006 | < 0.002 U | 1.01 | 0.04 J | 0.02 J |
| 2/8/2017 | Background | 0.04 J | 3.26 | 141 | 0.051 | 0.006 J | 0.237 | 0.981 | 3.676 | 0.05 J | 0.216 | 0.003 | < 0.002 U | 0.99 | < 0.03 U | 0.01 J |
| 3/14/2017 | Background | 0.03 J | 2.79 | 152 | 0.033 | 0.007 J | 0.170 | 0.949 | 1.055 | 0.03 J | 0.022 | 0.002 | < 0.002 U | 0.49 | < 0.03 U | 0.01 J |
| 5/22/2017 | Background | 0.04 J | 2.74 | 151 | 0.052 | 0.007 J | 0.195 | 1.11 | 1.062 | 0.04 J | 0.236 | 0.013 | < 0.002 U | 0.31 | 0.03 J | < 0.01 U |
| 6/19/2017 | Background | 0.02 J | 3.25 | 155 | 0.053 | 0.006 J | 0.237 | 0.997 | 1.099 | 0.03 J | 0.207 | 0.002 | < 0.002 U | 0.22 | 0.05 J | < 0.01 U |
| 5/3/2018 | Assessment | 0.02 J | 3.18 | 149 | 0.049 | 0.006 J | 0.237 | 1.03 | 1.631 | 0.04 J | 0.147 | 0.0004 J | < 0.002 U | 0.31 | 0.05 J | < 0.01 U |
| 9/4/2018 | Assessment | 0.02 J | 2.34 | 157 | 0.034 | 0.01 J | 0.122 | 1.03 | 0.3383 | 0.05 J | 0.038 | 0.002 | -- | 0.15 | < 0.03 U | 0.03 J |
| 3/15/2019 | Assessment | 0.02 J | 3.63 | 162 | 0.06 J | < 0.01 U | 0.344 | 1.21 | 0.853 | 0.05 J | 0.124 | < 0.09 U | -- | < 0.4 U | < 0.03 U | < 0.1 U |
| 6/10/2019 | Assessment | < 0.02 U | 2.85 | 155 | 0.04 J | < 0.01 U | 0.1 J | 1.13 | 0.89 | 0.05 J | 0.04 J | < 0.009 U | < 0.002 U | < 0.4 U | < 0.03 U | < 0.1 U |
| 7/23/2019 | Assessment | 0.10 | 6.74 | 158 | 0.121 | < 0.01 U | 0.291 | 1.12 | 0.811 | 0.04 J | 0.762 | 0.00153 | -- | < 0.4 U | 0.08 J | < 0.1 U |
| 2/11/2020 | Assessment | 0.03 J | 4.35 | 130 | 0.06 J | < 0.01 U | 0.273 | 1.21 | 1.855 | 0.04 J | 0.201 | 0.00147 | < 0.002 U | < 0.4 U | < 0.03 U | < 0.1 U |
| 7/7/2020 | Assessment | < 0.02 U | 2.77 | 140 | 0.04 J | < 0.01 U | 0.1 J | 1.39 | 1.12 | 0.03 J | 0.08 J | 0.00157 | -- | 0.5 J | 0.06 J | < 0.1 U |
| 10/27/2020 | Assessment | < 0.02 U | 3.18 | 134 | 0.04 J | < 0.01 U | 0.214 | 1.42 | 2.254 | 0.04 J | < 0.05 U | 0.00138 | -- | < 0.4 U | < 0.03 U | < 0.1 U |

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.

J: Estimated value. Parameter was detected at concentration below the reporting limit

--: Not analyzed

pCi/L: picocuries per liter

Table 1 - Groundwater Data Summary: MW-6

**Amos - BAP
Appendix III Constituents**

| Collection Date | Monitoring Program | Boron | Calcium | Chloride | Fluoride | pH | Sulfate | Total Dissolved Solids |
|-----------------|--------------------|-----------|---------|----------|----------|-----|---------|------------------------|
| | | mg/L | mg/L | mg/L | mg/L | SU | mg/L | mg/L |
| 7/26/2016 | Background | 0.117 | 12.2 | 8.88 | 0.08 J | 6.2 | 2.8 | 204 |
| 8/24/2016 | Background | 0.023 | 12.2 | 10.7 | 0.03 J | 5.5 | 6.1 | 244 |
| 10/19/2016 | Background | 0.006 | 11.3 | 8.67 | 0.04 J | 6.1 | 3.7 | 196 |
| 11/8/2016 | Background | -- | -- | -- | -- | 6.0 | -- | -- |
| 12/13/2016 | Background | < 0.002 U | 12.4 | 9.79 | 0.04 J | 5.9 | 2.1 | 190 |
| 2/8/2017 | Background | 0.051 | 11.6 | 10.3 | 0.06 J | 6.0 | 2.8 | 170 |
| 3/14/2017 | Background | 0.048 | 11.5 | 9.90 | 0.05 J | 6.1 | 2.1 | 203 |
| 5/23/2017 | Background | 0.037 | 11.9 | 11.5 | 0.04 J | 6.2 | 4.4 | 238 |
| 6/20/2017 | Background | 0.183 | 11.6 | 9.61 | 0.07 | 6.0 | 2.5 | 222 |
| 11/1/2017 | Detection | 0.017 | 12.2 | 11.6 | 0.07 | 5.9 | 5.5 | 258 |
| 5/3/2018 | Assessment | 0.056 | 12.0 | 10.1 | 0.07 | 6.3 | 2.9 | 188 |
| 9/4/2018 | Assessment | < 0.002 U | 11.3 | 8.97 | 0.09 | 6.0 | 1.3 | 176 |
| 3/15/2019 | Assessment | < 0.2 U | 12.4 | 10.4 | 0.05 J | 5.9 | 1.6 | 226 |
| 6/10/2019 | Assessment | < 0.02 U | 11.8 | 9.68 | 0.08 | 9.3 | 2.2 | 205 |
| 7/24/2019 | Assessment | 0.04 J | 12.1 | 9.71 | 0.05 J | 5.9 | 2.2 | 199 |
| 2/12/2020 | Assessment | -- | -- | -- | 0.06 | 6.2 | -- | -- |
| 5/5/2020 | Assessment | 0.04 J | 11.7 | 8.55 | 0.09 | 5.5 | 1.3 | 202 |
| 10/28/2020 | Assessment | < 0.02 U | 12.8 | 10.8 | 0.06 J | 5.8 | 2.6 | 244 |

Notes:

mg/L: milligrams per liter

SU: standard unit

<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.

J: Estimated value. Parameter was detected at concentration below the reporting limit

--: Not analyzed

Table 1 - Groundwater Data Summary: MW-6

Amos - BAP

Appendix IV Constituents

| Collection Date | Monitoring Program | Antimony | Arsenic | Barium | Beryllium | Cadmium | Chromium | Cobalt | Combined Radium | Fluoride | Lead | Lithium | Mercury | Molybdenum | Selenium | Thallium |
|-----------------|--------------------|----------|---------|--------|-----------|-----------|----------|--------|-----------------|----------|----------|------------|-----------|------------|----------|----------|
| | | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | pCi/L | mg/L | µg/L | mg/L | µg/L | µg/L | µg/L |
| 7/26/2016 | Background | 0.03 J | 33.6 | 191 | 0.065 | 0.01 J | 1.5 | 13.6 | 1.3779 | 0.08 J | 1.25 | 0.002 | < 0.002 U | 1.77 | 0.2 | 0.075 |
| 8/24/2016 | Background | 0.01 J | 33.4 | 185 | 0.037 | 0.01 J | 1.0 | 12.4 | 0.961 | 0.03 J | 0.581 | 0.003 | < 0.002 U | 0.97 | 0.2 | 0.070 |
| 10/19/2016 | Background | 0.01 J | 34.4 | 171 | 0.026 | 0.006 J | 0.647 | 11.0 | 1.941 | 0.04 J | 0.281 | 0.0005 J | < 0.002 U | 0.78 | 0.2 | 0.185 |
| 11/8/2016 | Background | -- | -- | -- | -- | -- | -- | -- | 1.026 | -- | -- | -- | -- | -- | -- | -- |
| 12/13/2016 | Background | 0.02 J | 33.9 | 169 | 0.038 | 0.007 J | 1.88 | 10.6 | 1.635 | 0.04 J | 0.515 | 0.006 | < 0.002 U | 0.53 | 0.2 | 0.060 |
| 2/8/2017 | Background | 0.02 J | 32.8 | 157 | 0.038 | 0.007 J | 0.817 | 12.3 | 20.83 | 0.06 J | 0.574 | 0.004 | < 0.002 U | 0.60 | 0.2 | 0.055 |
| 3/14/2017 | Background | 0.02 J | 36.3 | 168 | 0.037 | 0.006 J | 1.54 | 12.0 | 1.178 | 0.05 J | 0.416 | < 0.0002 U | < 0.002 U | 0.62 | 0.2 | 0.054 |
| 5/23/2017 | Background | 0.04 J | 33.6 | 183 | 0.032 | 0.006 J | 0.748 | 13.1 | 1.013 | 0.04 J | 0.305 | 0.006 | < 0.002 U | 0.41 | 0.2 | 0.053 |
| 6/20/2017 | Background | 0.02 J | 32.4 | 169 | 0.022 | < 0.005 U | 0.496 | 10.7 | 1.345 | 0.07 | 0.157 | 0.0003 J | < 0.002 U | 0.44 | 0.1 | 0.055 |
| 5/3/2018 | Assessment | 0.01 J | 34.1 | 163 | 0.028 | < 0.005 U | 0.455 | 11.9 | 2.0087 | 0.07 | 0.216 | < 0.0002 U | < 0.002 U | 0.50 | 0.2 | 0.092 |
| 9/4/2018 | Assessment | 0.16 | 29.8 | 147 | 0.01 J | 0.03 | 0.380 | 9.16 | 0.769 | 0.09 | 0.214 | < 0.0002 U | -- | 0.46 | 0.1 | 0.084 |
| 3/15/2019 | Assessment | 0.06 J | 32.0 | 184 | 0.106 | 0.02 J | 1.82 | 14.0 | 0.865 | 0.05 J | 1.72 | < 0.09 U | -- | 0.5 J | 0.4 | 0.1 J |
| 6/10/2019 | Assessment | 0.03 J | 34.3 | 161 | < 0.02 U | < 0.01 U | 0.309 | 9.72 | 0.688 | 0.08 | 0.104 | < 0.009 U | < 0.002 U | 0.5 J | 0.1 J | < 0.1 U |
| 7/24/2019 | Assessment | < 0.02 U | 34.2 | 164 | 0.03 J | < 0.01 U | 0.418 | 8.97 | 0.657 | 0.05 J | 0.2 J | 0.00114 | -- | 0.4 J | 0.1 J | < 0.1 U |
| 2/11/2020 | Assessment | < 0.02 U | 38.5 | 165 | < 0.02 U | < 0.01 U | 0.433 | 9.52 | 1.539 | 0.06 | 0.07 J | 0.00118 | < 0.002 U | 0.5 J | 0.09 J | < 0.1 U |
| 5/5/2020 | Assessment | 0.17 | 37.2 | 149 | < 0.02 U | < 0.01 U | 0.429 | 8.80 | 2.62 | 0.09 | 0.390 | 0.00102 | -- | 1 J | 0.09 J | < 0.1 U |
| 10/28/2020 | Assessment | < 0.02 U | 33.5 | 152 | < 0.02 U | < 0.01 U | 0.406 | 8.57 | 0.573 | 0.06 J | < 0.05 U | 0.00113 | -- | 0.4 J | 0.05 J | < 0.1 U |

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.

J: Estimated value. Parameter was detected at concentration below the reporting limit

--: Not analyzed

pCi/L: picocuries per liter

Table 1 - Groundwater Data Summary: MW-1601

**Amos - BAP
Appendix III Constituents**

| Collection Date | Monitoring Program | Boron | Calcium | Chloride | Fluoride | pH | Sulfate | Total Dissolved Solids |
|-----------------|--------------------|-----------|---------|----------|----------|-----|---------|------------------------|
| | | mg/L | mg/L | mg/L | mg/L | SU | mg/L | mg/L |
| 7/26/2016 | Background | 0.070 | 11.8 | 7.17 | 0.06 J | 5.8 | 54.5 | 120 |
| 8/24/2016 | Background | 0.035 | 10.9 | 6.54 | 0.05 J | 5.6 | 49.1 | 142 |
| 10/18/2016 | Background | < 0.002 U | 10.1 | 6.56 | 0.05 J | 6.0 | 39.6 | 136 |
| 11/7/2016 | Background | -- | -- | 6.79 | 0.05 J | 5.9 | 39.7 | 122 |
| 12/13/2016 | Background | < 0.002 U | 10.4 | 7.79 | 0.04 J | 5.8 | 43.6 | 140 |
| 2/7/2017 | Background | 0.109 | 11.6 | 9.09 | 0.05 J | 6.0 | 55.6 | 168 |
| 3/13/2017 | Background | 0.107 | 11.2 | 9.89 | 0.04 J | 6.0 | 57.4 | 169 |
| 5/23/2017 | Background | 0.170 | 11.2 | 9.75 | 0.04 J | 5.9 | 52.8 | 182 |
| 6/20/2017 | Background | 0.107 | 10.4 | 8.59 | 0.04 J | 5.9 | 51.3 | 184 |
| 11/2/2017 | Detection | 0.087 | 8.91 | 9.91 | 0.05 J | 5.8 | 39.1 | 164 |
| 5/4/2018 | Assessment | 0.070 | 11.0 | 10.3 | 0.05 J | 6.1 | 53.0 | 159 |
| 9/5/2018 | Assessment | < 0.002 U | 11.6 | 10.4 | 0.04 J | 7.8 | 52.2 | 157 |
| 3/19/2019 | Assessment | 0.05 J | 11.9 | 8.80 | < 0.01 U | 5.8 | 52.7 | 176 |
| 6/12/2019 | Assessment | < 0.02 U | 11.0 | 10.0 | 0.05 J | 6.7 | 48.8 | 185 |
| 7/24/2019 | Assessment | < 0.04 U | 10.3 | 10.3 | 0.05 J | 5.9 | 44.6 | 154 |
| 2/12/2020 | Assessment | -- | -- | -- | 0.05 J | 5.9 | -- | -- |
| 5/6/2020 | Assessment | 0.03 J | 9.42 | 19.0 | 0.04 J | 5.6 | 25.9 | 143 |
| 10/28/2020 | Assessment | < 0.02 U | 10.8 | 28.3 | 0.05 J | 5.6 | 24.1 | 156 |

Notes:

mg/L: milligrams per liter

SU: standard unit

<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.

J: Estimated value. Parameter was detected at concentration below the reporting limit

--: Not analyzed

Table 1 - Groundwater Data Summary: MW-1601

Amos - BAP

Appendix IV Constituents

| Collection Date | Monitoring Program | Antimony | Arsenic | Barium | Beryllium | Cadmium | Chromium | Cobalt | Combined Radium | Fluoride | Lead | Lithium | Mercury | Molybdenum | Selenium | Thallium |
|-----------------|--------------------|----------|---------|--------|-----------|---------|----------|--------|-----------------|----------|-------|-----------|-----------|------------|----------|----------|
| | | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | pCi/L | mg/L | µg/L | mg/L | µg/L | µg/L | µg/L |
| 7/26/2016 | Background | 0.01 J | 4.57 | 128 | 0.030 | 0.02 | 0.4 | 7.24 | 0.106 | 0.06 J | 0.366 | 0.003 | < 0.002 U | 0.32 | 0.07 J | 0.01 J |
| 8/24/2016 | Background | < 0.01 U | 5.14 | 120 | 0.02 J | 0.02 J | 0.3 | 6.19 | 0.975 | 0.05 J | 0.109 | 0.007 | < 0.002 U | 0.62 | 0.09 J | 0.02 J |
| 10/18/2016 | Background | 0.01 J | 5.64 | 118 | 0.027 | 0.02 J | 0.688 | 4.04 | 2.413 | 0.05 J | 0.265 | 0.003 | < 0.002 U | 0.26 | 0.1 J | 0.065 |
| 11/7/2016 | Background | -- | -- | -- | -- | -- | -- | -- | 0.842 | 0.05 J | -- | -- | -- | -- | -- | -- |
| 12/13/2016 | Background | 0.02 J | 5.38 | 113 | 0.027 | 0.02 J | 1.35 | 4.67 | 1.101 | 0.04 J | 0.272 | 0.009 | < 0.002 U | 0.16 | 0.1 | 0.02 J |
| 2/7/2017 | Background | < 0.01 U | 5.09 | 107 | 0.025 | 0.02 J | 0.224 | 6.20 | 35.021 | 0.05 J | 0.227 | 0.004 | < 0.002 U | 0.21 | 0.1 | 0.01 J |
| 3/13/2017 | Background | < 0.01 U | 5.54 | 117 | 0.023 | 0.02 J | 0.588 | 6.47 | 0.7405 | 0.04 J | 0.161 | 0.004 | < 0.002 U | 0.16 | 0.05 J | 0.01 J |
| 5/23/2017 | Background | 0.02 J | 7.08 | 122 | 0.051 | 0.02 | 0.740 | 5.48 | 0.573 | 0.04 J | 0.687 | 0.007 | < 0.002 U | 0.21 | 0.2 | 0.02 J |
| 6/20/2017 | Background | 0.02 J | 5.57 | 113 | 0.02 J | 0.02 J | 0.215 | 4.72 | 1.037 | 0.04 J | 0.142 | 0.003 | < 0.002 U | 0.17 | 0.06 J | 0.02 J |
| 5/4/2018 | Assessment | 0.01 J | 6.44 | 112 | 0.038 | 0.02 | 0.353 | 4.43 | 1.723 | 0.05 J | 0.397 | 0.010 | < 0.002 U | 0.20 | 0.1 | 0.02 J |
| 9/5/2018 | Assessment | 0.02 J | 5.39 | 90.4 | 0.01 J | 0.02 | 0.270 | 6.73 | 0.252 | 0.04 J | 0.045 | 0.002 | -- | 0.08 J | < 0.03 U | 0.02 J |
| 3/19/2019 | Assessment | < 0.02 U | 6.55 | 122 | 0.02 J | 0.01 J | 0.1 J | 3.41 | 0.666 | < 0.01 U | 0.105 | 0.02 J | -- | < 0.4 U | 0.04 J | < 0.1 U |
| 6/12/2019 | Assessment | < 0.02 U | 6.02 | 118 | 0.04 J | 0.02 J | 0.2 J | 2.75 | 0.533 | 0.05 J | 0.154 | < 0.009 U | < 0.002 U | < 0.4 U | 0.08 J | < 0.1 U |
| 7/24/2019 | Assessment | < 0.02 U | 6.63 | 130 | 0.02 J | 0.01 J | 0.2 J | 3.01 | 1.005 | 0.05 J | 0.2 J | 0.00141 | -- | < 0.4 U | 0.06 J | < 0.1 U |
| 2/12/2020 | Assessment | 0.03 J | 8.26 | 122 | 0.05 J | 0.02 J | 0.938 | 3.19 | 0.398 | 0.05 J | 0.602 | 0.00159 | < 0.002 U | < 0.4 U | 0.1 J | < 0.1 U |
| 5/6/2020 | Assessment | < 0.02 U | 7.83 | 115 | < 0.02 U | 0.01 J | 0.272 | 2.78 | 2.682 | 0.04 J | 0.2 J | 0.00121 | -- | 0.5 J | 0.04 J | < 0.1 U |
| 10/28/2020 | Assessment | < 0.02 U | 8.68 | 127 | 0.03 J | 0.01 J | 0.369 | 3.04 | 0.447 | 0.05 J | 0.227 | 0.00138 | -- | < 0.4 U | 0.07 J | < 0.1 U |

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.

J: Estimated value. Parameter was detected at concentration below the reporting limit

--: Not analyzed

pCi/L: picocuries per liter

Table 1 - Groundwater Data Summary: MW-1602A

Amos - BAP

Appendix III Constituents

| Collection Date | Monitoring Program | Boron | Calcium | Chloride | Fluoride | pH | Sulfate | Total Dissolved Solids |
|-----------------|--------------------|-----------|---------|----------|----------|-----|---------|------------------------|
| | | mg/L | mg/L | mg/L | mg/L | SU | mg/L | mg/L |
| 7/26/2016 | Background | 0.063 | 18.2 | 38.4 | 0.18 | 7.0 | 18.7 | 172 |
| 8/24/2016 | Background | 0.015 | 18.2 | 37.9 | 0.17 | 6.1 | 17.7 | 200 |
| 10/19/2016 | Background | 0.003 J | 17.3 | 37.2 | 0.1 J | 6.7 | 15.0 | 242 |
| 11/9/2016 | Background | -- | -- | -- | -- | 6.3 | -- | -- |
| 12/13/2016 | Background | < 0.002 U | 18.8 | 39.1 | 0.1 J | 6.5 | 10.7 | 170 |
| 2/8/2017 | Background | 0.051 | 17.7 | 37.3 | 0.1 J | 6.7 | 9.8 | 144 |
| 3/15/2017 | Background | 0.039 | 16.1 | 38.1 | 0.1 J | 6.8 | 11.4 | 209 |
| 5/23/2017 | Background | 0.081 | 18.5 | 38.8 | 0.1 J | 6.7 | 11.4 | 224 |
| 6/20/2017 | Background | 0.090 | 18.5 | 38.3 | 0.1 J | 6.5 | 13.5 | 178 |
| 11/2/2017 | Detection | 0.050 | 18.6 | 38.0 | 0.1 J | 6.5 | 12.8 | 254 |
| 5/10/2018 | Assessment | 0.127 | 19.5 | 39.1 | 0.16 | 7.2 | 13.2 | 184 |
| 9/5/2018 | Assessment | < 0.002 U | 18.1 | 40.0 | 0.14 | 6.4 | 12.7 | 176 |
| 3/19/2019 | Assessment | 0.03 J | 19.6 | 41.0 | 0.14 | 6.6 | 13.2 | 232 |
| 6/11/2019 | Assessment | < 0.02 U | 18.8 | 41.9 | 0.16 | 9.5 | 13.8 | 217 |
| 7/23/2019 | Assessment | < 0.04 U | 16.7 | 39.4 | 0.13 | 6.3 | 10.3 | 201 |
| 2/12/2020 | Assessment | -- | -- | -- | 0.14 | 6.7 | -- | -- |
| 5/6/2020 | Assessment | 0.03 J | 19.3 | 43.2 | 0.11 | 6.3 | 12.7 | 209 |
| 10/30/2020 | Assessment | < 0.02 U | 20.5 | 42.8 | 0.13 | 6.4 | 12.3 | 220 |

Notes:

mg/L: milligrams per liter

SU: standard unit

<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.

J: Estimated value. Parameter was detected at concentration below the reporting limit

--: Not analyzed

Table 1 - Groundwater Data Summary: MW-1602A

Amos - BAP

Appendix IV Constituents

| Collection Date | Monitoring Program | Antimony | Arsenic | Barium | Beryllium | Cadmium | Chromium | Cobalt | Combined Radium | Fluoride | Lead | Lithium | Mercury | Molybdenum | Selenium | Thallium |
|-----------------|--------------------|----------|---------|--------|-----------|-----------|----------|--------|-----------------|----------|-------|------------|-----------|------------|----------|----------|
| | | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | pCi/L | mg/L | µg/L | mg/L | µg/L | µg/L | µg/L |
| 7/26/2016 | Background | 0.12 | 17.6 | 220 | 0.085 | 0.02 J | 1.7 | 4.19 | 7.914 | 0.18 | 7.94 | 0.004 | < 0.002 U | 3.62 | 0.2 | 0.02 J |
| 8/24/2016 | Background | 0.04 J | 18.1 | 209 | 0.036 | 0.006 J | 1.1 | 3.04 | 0.569 | 0.17 | 2.80 | 0.003 | < 0.002 U | 2.80 | 0.2 | 0.01 J |
| 10/19/2016 | Background | 0.10 | 18.3 | 213 | 0.064 | 0.01 J | 1.46 | 2.38 | 2.65 | 0.1 J | 6.56 | 0.003 | 0.003 J | 2.00 | 0.2 | 0.063 |
| 11/9/2016 | Background | -- | -- | -- | -- | -- | -- | -- | 0.874 | -- | -- | -- | -- | -- | -- | -- |
| 12/13/2016 | Background | 0.08 | 19.3 | 217 | 0.048 | 0.01 J | 2.24 | 2.00 | 0.989 | 0.1 J | 4.53 | 0.006 | 0.002 J | 1.90 | 0.2 | 0.02 J |
| 2/8/2017 | Background | 0.05 | 19.1 | 194 | 0.051 | 0.009 J | 0.981 | 1.87 | 6.853 | 0.1 J | 4.07 | 0.005 | < 0.002 U | 1.68 | 0.2 | 0.224 |
| 3/15/2017 | Background | 0.04 J | 21.5 | 198 | 0.055 | 0.008 J | 0.951 | 1.47 | 1.094 | 0.1 J | 2.65 | 0.0005 J | 0.002 J | 1.22 | 0.2 | 0.01 J |
| 5/23/2017 | Background | 0.04 J | 20.8 | 221 | 0.029 | 0.006 J | 0.568 | 1.23 | 1.833 | 0.1 J | 2.11 | 0.005 | < 0.002 U | 1.22 | 0.1 | < 0.01 U |
| 6/20/2017 | Background | 0.07 | 20.3 | 224 | 0.043 | 0.01 J | 0.807 | 1.30 | 0.901 | 0.1 J | 2.68 | < 0.0002 U | < 0.002 U | 1.55 | 0.2 | 0.01 J |
| 5/10/2018 | Assessment | 0.03 J | 20.4 | 223 | 0.022 | < 0.005 U | 0.437 | 0.940 | 0.438 | 0.16 | 0.982 | 0.004 | < 0.002 U | 0.91 | 0.1 | < 0.01 U |
| 9/5/2018 | Assessment | 0.08 | 20.5 | 223 | 0.055 | 0.01 J | 0.855 | 1.05 | 0.941 | 0.14 | 5.99 | 0.001 | -- | 0.71 | 0.2 | 0.03 J |
| 3/19/2019 | Assessment | 0.04 J | 19.7 | 217 | 0.04 J | < 0.01 U | 0.472 | 0.691 | 0.5231 | 0.14 | 2.64 | < 0.009 U | -- | 0.7 J | 0.09 J | < 0.1 U |
| 6/11/2019 | Assessment | < 0.04 U | 20.6 | 229 | < 0.04 U | < 0.02 U | 0.3 J | 0.523 | 1.144 | 0.16 | 0.677 | < 0.009 U | < 0.002 U | < 0.8 U | < 0.06 U | < 0.2 U |
| 7/23/2019 | Assessment | < 0.02 U | 21.7 | 213 | < 0.02 U | < 0.01 U | 0.297 | 0.545 | 0.888 | 0.13 | 1.08 | 0.000908 | -- | 0.7 J | 0.06 J | < 0.1 U |
| 2/12/2020 | Assessment | 0.03 J | 21.9 | 234 | 0.03 J | < 0.01 U | 0.758 | 0.632 | 0.699 | 0.14 | 1.23 | 0.00127 | < 0.002 U | 0.7 J | 0.05 J | < 0.1 U |
| 5/6/2020 | Assessment | 0.02 J | 21.8 | 238 | < 0.02 U | < 0.01 U | 0.361 | 0.468 | 1.429 | 0.11 | 1.22 | 0.000954 | -- | 0.9 J | 0.07 J | < 0.1 U |
| 10/30/2020 | Assessment | 0.05 J | 22.1 | 229 | 0.02 J | < 0.01 U | 0.749 | 0.587 | 1.067 | 0.13 | 1.20 | 0.00117 | -- | 0.8 J | < 0.03 U | < 0.1 U |

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.

J: Estimated value. Parameter was detected at concentration below the reporting limit

--: Not analyzed

pCi/L: picocuries per liter

Table 1 - Groundwater Data Summary: MW-1603A

**Amos - BAP
Appendix III Constituents**

| Collection Date | Monitoring Program | Boron | Calcium | Chloride | Fluoride | pH | Sulfate | Total Dissolved Solids |
|-----------------|--------------------|-----------|---------|----------|----------|-----|----------|------------------------|
| | | mg/L | mg/L | mg/L | mg/L | SU | mg/L | mg/L |
| 7/26/2016 | Background | 0.051 | 17.4 | 4.76 | 0.29 | 7.3 | 0.9 | 116 |
| 8/24/2016 | Background | 0.012 | 16.9 | 5.62 | 0.28 | 6.2 | 0.1 | 84 |
| 10/19/2016 | Background | < 0.002 U | 17.2 | 5.11 | 0.29 | 7.0 | < 0.04 U | 168 |
| 11/9/2016 | Background | -- | -- | 5.60 | 0.28 | 6.5 | < 0.04 U | 90 |
| 12/13/2016 | Background | < 0.002 U | 16.6 | 5.41 | 0.20 | 6.7 | < 0.04 U | 93 |
| 2/9/2017 | Background | 0.038 | 15.5 | 5.00 | 0.22 | 7.0 | < 0.04 U | 80 |
| 3/15/2017 | Background | 0.025 | 15.6 | 5.12 | 0.24 | 7.1 | < 0.04 U | 102 |
| 5/24/2017 | Background | 0.061 | 15.2 | 5.35 | 0.23 | 6.8 | < 0.04 U | 108 |
| 6/20/2017 | Background | 0.069 | 14.6 | 4.93 | 0.23 | 6.7 | < 0.04 U | 100 |
| 11/2/2017 | Detection | 0.035 | 15.2 | 5.61 | 0.24 | 6.7 | < 0.04 U | 150 |
| 5/2/2018 | Assessment | 0.051 | 17.2 | 5.18 | 0.28 | 6.8 | < 0.04 U | 100 |
| 9/5/2018 | Assessment | < 0.002 U | 15.8 | 4.99 | 0.28 | 6.7 | < 0.04 U | 89 |
| 3/15/2019 | Assessment | < 0.2 U | 15.5 | 5.65 | 0.27 | 7.1 | < 0.06 U | 95 |
| 6/11/2019 | Assessment | < 0.02 U | 15.5 | 5.70 | 0.31 | 8.8 | < 0.06 U | 95 |
| 7/24/2019 | Assessment | < 0.04 U | 14.4 | 5.73 | 0.28 | 6.8 | < 0.06 U | 102 |
| 2/11/2020 | Assessment | -- | -- | -- | 0.24 | 6.9 | -- | -- |
| 5/6/2020 | Assessment | 0.02 J | 15.5 | 5.87 | 0.23 | 6.5 | < 0.06 U | 121 |
| 10/30/2020 | Assessment | < 0.02 U | 16.3 | 6.03 | 0.25 | 6.9 | < 0.06 U | 115 |

Notes:

mg/L: milligrams per liter

SU: standard unit

<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.

J: Estimated value. Parameter was detected at concentration below the reporting limit

--: Not analyzed

Table 1 - Groundwater Data Summary: MW-1603A

Amos - BAP

Appendix IV Constituents

| Collection Date | Monitoring Program | Antimony | Arsenic | Barium | Beryllium | Cadmium | Chromium | Cobalt | Combined Radium | Fluoride | Lead | Lithium | Mercury | Molybdenum | Selenium | Thallium |
|-----------------|--------------------|----------|---------|--------|-----------|----------|----------|--------|-----------------|----------|-------|------------|-----------|------------|----------|----------|
| | | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | pCi/L | mg/L | µg/L | mg/L | µg/L | µg/L | µg/L |
| 7/26/2016 | Background | 0.04 J | 78.0 | 303 | 0.052 | 0.01 J | 1.2 | 1.04 | 1.619 | 0.29 | 1.35 | 0.002 | < 0.002 U | 2.11 | 0.09 J | 0.01 J |
| 8/24/2016 | Background | 0.03 J | 77.6 | 264 | 0.044 | 0.008 J | 1.0 | 0.725 | 0.726 | 0.28 | 1.07 | 0.007 | < 0.002 U | 1.36 | 0.1 J | < 0.01 U |
| 10/19/2016 | Background | 0.04 J | 73.7 | 258 | 0.096 | 0.01 J | 1.94 | 1.23 | 2.39 | 0.29 | 2.18 | < 0.0002 U | < 0.002 U | 1.34 | 0.2 | 0.02 J |
| 11/9/2016 | Background | -- | -- | -- | -- | -- | -- | -- | 1.039 | 0.28 | -- | -- | -- | -- | -- | -- |
| 12/13/2016 | Background | 0.05 J | 78.3 | 270 | 0.102 | 0.01 J | 3.27 | 1.13 | 0.524 | 0.20 | 1.81 | 0.009 | < 0.002 U | 1.22 | 0.2 | 0.03 J |
| 2/9/2017 | Background | 0.01 J | 78.3 | 229 | 0.055 | 0.008 J | 0.915 | 0.746 | 0.693 | 0.22 | 1.19 | 0.0005 J | < 0.002 U | 1.15 | 0.2 | 0.075 |
| 3/15/2017 | Background | 0.04 J | 83.4 | 245 | 0.070 | 0.01 J | 1.42 | 1.02 | 0.974 | 0.24 | 1.25 | 0.002 | 0.002 J | 1.27 | 0.1 | 0.01 J |
| 5/24/2017 | Background | 0.05 | 63.3 | 233 | 0.033 | 0.009 J | 0.999 | 0.619 | 0.72 | 0.23 | 0.900 | 0.011 | < 0.002 U | 1.56 | 0.09 J | < 0.01 U |
| 6/20/2017 | Background | 0.03 J | 81.3 | 257 | 0.054 | 0.02 | 1.12 | 0.846 | 0.603 | 0.23 | 0.970 | 0.004 | < 0.002 U | 1.11 | 0.1 | 0.01 J |
| 5/2/2018 | Assessment | 0.04 J | 80.0 | 251 | 0.093 | 0.01 J | 1.82 | 1.52 | 0.23065 | 0.28 | 1.60 | 0.0008 J | < 0.002 U | 1.21 | 0.3 | 0.02 J |
| 9/5/2018 | Assessment | 0.02 J | 87.1 | 242 | 0.006 J | 0.007 J | 0.180 | 0.246 | 0.577 | 0.28 | 0.045 | 0.002 | -- | 1.07 | 0.04 J | 0.01 J |
| 3/15/2019 | Assessment | < 0.02 U | 89.9 | 252 | < 0.02 U | < 0.01 U | 0.407 | 0.360 | 1.261 | 0.27 | 0.232 | < 0.09 U | -- | 1 J | 0.05 J | < 0.1 U |
| 6/11/2019 | Assessment | < 0.02 U | 90.3 | 255 | < 0.02 U | < 0.01 U | 0.280 | 0.288 | 0.3562 | 0.31 | 0.163 | < 0.009 U | < 0.002 U | 1 J | 0.04 J | < 0.1 U |
| 7/24/2019 | Assessment | < 0.02 U | 85.8 | 249 | 0.04 J | < 0.01 U | 0.650 | 0.517 | 0.439 | 0.28 | 0.580 | 0.000870 | -- | 1 J | 0.07 J | < 0.1 U |
| 2/11/2020 | Assessment | < 0.02 U | 87.7 | 241 | 0.03 J | < 0.01 U | 0.663 | 0.376 | 0.984 | 0.24 | 0.347 | 0.000630 | < 0.002 U | 1 J | 0.06 J | < 0.1 U |
| 5/6/2020 | Assessment | < 0.02 U | 90.2 | 241 | < 0.02 U | < 0.01 U | 0.362 | 0.255 | 2.242 | 0.23 | 0.2 J | 0.000339 | -- | 1 J | < 0.03 U | < 0.1 U |
| 10/30/2020 | Assessment | 0.03 J | 88.9 | 239 | < 0.02 U | < 0.01 U | 0.293 | 0.209 | 0.384 | 0.25 | 0.1 J | 0.000324 | -- | 1 J | < 0.03 U | < 0.1 U |

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.

J: Estimated value. Parameter was detected at concentration below the reporting limit

--: Not analyzed

pCi/L: picocuries per liter

Table 1 - Groundwater Data Summary: MW-1604

**Amos - BAP
Appendix III Constituents**

| Collection Date | Monitoring Program | Boron | Calcium | Chloride | Fluoride | pH | Sulfate | Total Dissolved Solids |
|-----------------|--------------------|---------|---------|----------|----------|-----|----------|------------------------|
| | | mg/L | mg/L | mg/L | mg/L | SU | mg/L | mg/L |
| 7/26/2016 | Background | 0.116 | 20.5 | 23.0 | 0.1 J | 6.2 | 2.2 | 236 |
| 8/22/2016 | Background | 0.074 | 18.0 | 22.9 | 0.05 J | 6.2 | 0.3 | 168 |
| 10/18/2016 | Background | 0.059 | 18.2 | 22.6 | 0.05 J | 6.3 | 0.3 | 196 |
| 11/8/2016 | Background | -- | -- | 22.5 | 0.05 J | 6.2 | 0.3 | 206 |
| 12/13/2016 | Background | 0.042 | 17.9 | 24.0 | 0.05 J | 6.1 | 0.9 | 182 |
| 2/8/2017 | Background | 0.094 | 16.6 | 23.1 | 0.09 | 6.2 | 0.7 | 172 |
| 3/14/2017 | Background | 0.083 | 16.1 | 24.1 | 0.08 | 6.4 | 0.9 | 204 |
| 5/23/2017 | Background | 0.129 | 17.4 | 26.1 | 0.08 | 6.1 | 2.2 | 222 |
| 6/20/2017 | Background | 0.152 | 16.2 | 25.2 | 0.09 | 6.2 | 1.2 | 224 |
| 11/1/2017 | Detection | 0.153 | 16.8 | 23.4 | 0.10 | 6.1 | 0.5 | 228 |
| 5/3/2018 | Assessment | 0.200 | 17.8 | 25.5 | 0.13 | 6.4 | < 0.04 U | 210 |
| 9/5/2018 | Assessment | 0.043 | 15.1 | 22.8 | 0.12 | 7.2 | < 0.04 U | 180 |
| 3/15/2019 | Assessment | < 0.2 U | 13.1 | 16.6 | 0.09 | 6.3 | < 0.06 U | 170 |
| 6/10/2019 | Assessment | 0.09 J | 16.5 | 24.4 | 0.11 | 8.7 | < 0.06 U | 60 |
| 7/24/2019 | Assessment | 0.132 | 18.7 | 27.0 | 0.07 | 5.9 | < 0.06 U | 242 |
| 2/12/2020 | Assessment | -- | -- | -- | 0.08 | 6.3 | -- | -- |
| 5/6/2020 | Assessment | 0.175 | 20.8 | 29.4 | 0.06 J | 6.0 | < 0.06 U | 241 |
| 10/28/2020 | Assessment | 0.200 | 19.5 | 27.7 | 0.08 | 6.0 | < 0.06 U | 266 |

Notes:

mg/L: milligrams per liter

SU: standard unit

<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.

J: Estimated value. Parameter was detected at concentration below the reporting limit

--: Not analyzed

Table 1 - Groundwater Data Summary: MW-1604

Amos - BAP

Appendix IV Constituents

| Collection Date | Monitoring Program | Antimony | Arsenic | Barium | Beryllium | Cadmium | Chromium | Cobalt | Combined Radium | Fluoride | Lead | Lithium | Mercury | Molybdenum | Selenium | Thallium |
|-----------------|--------------------|----------|---------|--------|-----------|-----------|----------|--------|-----------------|----------|-------|------------|-----------|------------|----------|----------|
| | | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | pCi/L | mg/L | µg/L | mg/L | µg/L | µg/L | µg/L |
| 7/26/2016 | Background | 0.05 J | 4.43 | 139 | 0.087 | 0.007 J | 1.9 | 2.06 | 3.5822 | 0.1 J | 1.58 | 0.002 | < 0.002 U | 0.74 | 0.2 | 0.02 J |
| 8/22/2016 | Background | 0.04 J | 5.15 | 147 | 0.063 | 0.02 J | 1.4 | 1.06 | 0.695 | 0.05 J | 1.14 | 0.004 | 0.002 J | 0.64 | 0.2 | 0.02 J |
| 10/18/2016 | Background | 0.03 J | 4.60 | 134 | 0.048 | 0.005 J | 1.27 | 0.805 | 1.387 | 0.05 J | 0.869 | < 0.0002 U | < 0.002 U | 0.30 | 0.2 | 0.01 J |
| 11/8/2016 | Background | -- | -- | -- | -- | -- | -- | -- | 0.512 | 0.05 J | -- | -- | -- | -- | -- | -- |
| 12/13/2016 | Background | 0.02 J | 4.58 | 137 | 0.038 | < 0.004 U | 1.20 | 0.632 | 1.743 | 0.05 J | 0.603 | 0.004 | < 0.002 U | 0.25 | 0.2 | 0.02 J |
| 2/8/2017 | Background | 0.02 J | 4.52 | 125 | 0.039 | < 0.004 U | 0.814 | 0.638 | 1.239 | 0.09 | 0.719 | 0.004 | < 0.002 U | 0.32 | 0.2 | 0.05 J |
| 3/14/2017 | Background | 0.02 J | 4.46 | 132 | 0.038 | < 0.004 U | 0.824 | 0.570 | 0.892 | 0.08 | 0.482 | 0.0008 J | < 0.002 U | 0.22 | 0.2 | < 0.01 U |
| 5/23/2017 | Background | 0.04 J | 3.90 | 142 | 0.042 | < 0.005 U | 0.836 | 0.647 | 0.859 | 0.08 | 0.444 | 0.006 | < 0.002 U | 0.21 | 0.2 | < 0.01 U |
| 6/20/2017 | Background | 0.02 J | 4.44 | 146 | 0.040 | < 0.005 U | 0.706 | 0.601 | 1.459 | 0.09 | 0.406 | 0.003 | < 0.002 U | 0.20 | 0.2 | < 0.01 U |
| 5/3/2018 | Assessment | 0.02 J | 6.33 | 146 | 0.047 | < 0.005 U | 0.556 | 0.494 | 1.334 | 0.13 | 0.230 | < 0.0002 U | < 0.002 U | 0.25 | 0.2 | 0.01 J |
| 9/5/2018 | Assessment | 0.03 J | 6.11 | 135 | 0.043 | < 0.005 U | 0.649 | 0.533 | 0.248 | 0.12 | 0.349 | 0.0008 J | -- | 0.22 | 0.3 | 0.01 J |
| 3/15/2019 | Assessment | 0.04 J | 6.78 | 118 | 0.07 J | < 0.01 U | 0.931 | 0.406 | 0.596 | 0.09 | 1.19 | < 0.09 U | -- | < 0.4 U | 0.2 | < 0.1 U |
| 6/10/2019 | Assessment | 0.05 J | 4.88 | 142 | 0.142 | < 0.01 U | 0.360 | 0.306 | 0.831 | 0.11 | 0.148 | < 0.009 U | < 0.002 U | < 0.4 U | 0.1 J | < 0.1 U |
| 7/24/2019 | Assessment | < 0.02 U | 4.76 | 170 | 0.06 J | < 0.01 U | 1.33 | 0.415 | 0.943 | 0.07 | 0.294 | 0.000485 | -- | 0.4 J | 0.1 J | < 0.1 U |
| 2/12/2020 | Assessment | < 0.02 U | 3.88 | 174 | 0.05 J | < 0.01 U | 0.798 | 0.538 | 1.375 | 0.08 | 0.319 | 0.000626 | < 0.002 U | < 0.4 U | 0.2 J | < 0.1 U |
| 5/6/2020 | Assessment | < 0.02 U | 4.04 | 175 | 0.04 J | < 0.01 U | 0.484 | 0.406 | 1.647 | 0.06 J | 0.1 J | 0.000430 | -- | < 0.4 U | 0.2 J | < 0.1 U |
| 10/28/2020 | Assessment | < 0.02 U | 3.98 | 156 | 0.05 J | < 0.01 U | 0.595 | 0.387 | 0.261 | 0.08 | 0.232 | 0.000515 | -- | < 0.4 U | 0.1 J | < 0.1 U |

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.

J: Estimated value. Parameter was detected at concentration below the reporting limit

--: Not analyzed

pCi/L: picocuries per liter

Table 1 - Groundwater Data Summary: MW-1605

**Amos - BAP
Appendix III Constituents**

| Collection Date | Monitoring Program | Boron | Calcium | Chloride | Fluoride | pH | Sulfate | Total Dissolved Solids |
|-----------------|--------------------|-----------|---------|----------|----------|-----|---------|------------------------|
| | | mg/L | mg/L | mg/L | mg/L | SU | mg/L | mg/L |
| 7/26/2016 | Background | 0.091 | 63.6 | 111 | 0.09 | 6.2 | 170 | 490 |
| 8/22/2016 | Background | 0.038 | 50.8 | 114 | 0.08 | 5.9 | 174 | 440 |
| 10/17/2016 | Background | 0.025 | 57.5 | 108 | 0.06 J | 6.1 | 161 | 446 |
| 11/8/2016 | Background | -- | -- | 116 | 0.06 J | 5.9 | 162 | 456 |
| 12/12/2016 | Background | < 0.002 U | 53.9 | 125 | < 0.05 U | 5.8 | 164 | 920 |
| 2/7/2017 | Background | 0.055 | 47.6 | 110 | < 0.05 U | 5.9 | 161 | 472 |
| 3/13/2017 | Background | 0.039 | 45.7 | 106 | 0.03 J | 5.8 | 173 | 455 |
| 5/22/2017 | Background | 0.071 | 46.4 | 109 | 0.03 J | 6.6 | 171 | 458 |
| 6/19/2017 | Background | 0.103 | 48.1 | 111 | < 0.02 U | 5.5 | 193 | 462 |
| 11/1/2017 | Detection | 0.076 | 50.0 | 113 | 0.03 J | 5.6 | 212 | 488 |
| 1/9/2018 | Detection | -- | 45.9 | 108 | -- | 5.5 | 202 | 462 |
| 5/3/2018 | Assessment | 0.109 | 47.0 | 97.7 | < 0.02 U | 6.1 | 246 | 434 |
| 9/5/2018 | Assessment | < 0.002 U | 49.4 | 97.1 | 0.03 J | 5.6 | 213 | 483 |
| 3/14/2019 | Assessment | < 0.2 U | 45.4 | 92.5 | < 0.01 U | 5.6 | 222 | 507 |
| 6/11/2019 | Assessment | 0.06 J | 45.5 | 91.8 | 0.02 J | 5.7 | 226 | 530 |
| 7/24/2019 | Assessment | 0.06 J | 46.5 | 91.6 | 0.02 J | 5.4 | 226 | 517 |
| 2/11/2020 | Assessment | -- | -- | -- | 0.02 J | 5.7 | -- | -- |
| 5/5/2020 | Assessment | 0.051 | 49.6 | 85.6 | 0.03 J | 5.3 | 236 | 526 |
| 10/27/2020 | Assessment | 0.051 | 49.7 | 84.2 | 0.02 J | 5.3 | 234 | 521 |

Notes:

mg/L: milligrams per liter

SU: standard unit

<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.

J: Estimated value. Parameter was detected at concentration below the reporting limit

--: Not analyzed

Table 1 - Groundwater Data Summary: MW-1605

Amos - BAP

Appendix IV Constituents

Geosyntec Consultants, Inc.

| Collection Date | Monitoring Program | Antimony | Arsenic | Barium | Beryllium | Cadmium | Chromium | Cobalt | Combined Radium | Fluoride | Lead | Lithium | Mercury | Molybdenum | Selenium | Thallium |
|-----------------|--------------------|----------|---------|--------|-----------|-----------|----------|--------|-----------------|----------|--------|-----------|-----------|------------|----------|----------|
| | | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | pCi/L | mg/L | µg/L | mg/L | µg/L | µg/L | µg/L |
| 7/26/2016 | Background | 0.04 J | 5.70 | 83.2 | 0.035 | < 0.004 U | 0.4 | 32.1 | 1.722 | 0.09 | 0.201 | 0.008 | < 0.002 U | 0.66 | 0.05 J | < 0.01 U |
| 8/22/2016 | Background | 0.03 J | 4.96 | 69.1 | 0.027 | < 0.004 U | 0.1 | 24.5 | 0.683 | 0.08 | 0.062 | 0.004 | < 0.002 U | 0.39 | 0.06 J | < 0.01 U |
| 10/17/2016 | Background | 0.02 J | 4.98 | 67.3 | 0.034 | < 0.004 U | 0.244 | 15.8 | 5.063 | 0.06 J | 0.038 | 0.005 | < 0.002 U | 0.27 | 0.06 J | < 0.01 U |
| 11/8/2016 | Background | -- | -- | -- | -- | -- | -- | -- | 1.249 | 0.06 J | -- | -- | -- | -- | -- | -- |
| 12/12/2016 | Background | 0.03 J | 4.33 | 73.8 | 0.060 | 0.005 J | 0.645 | 11.5 | 0.853 | < 0.05 U | 0.159 | 0.011 | < 0.002 U | 0.30 | 0.1 | 0.062 |
| 2/7/2017 | Background | 0.03 J | 4.03 | 68.8 | 0.063 | < 0.004 U | 0.381 | 10.3 | 0.586 | < 0.05 U | 0.298 | 0.004 | < 0.002 U | 0.36 | 0.1 | 0.04 J |
| 3/13/2017 | Background | 0.01 J | 3.70 | 75.1 | 0.056 | < 0.004 U | 0.456 | 9.14 | 1.073 | 0.03 J | 0.059 | 0.005 | < 0.002 U | 0.12 | 0.03 J | < 0.01 U |
| 5/22/2017 | Background | 0.03 J | 3.38 | 80.5 | 0.062 | < 0.005 U | 0.193 | 8.77 | 0.852 | 0.03 J | 0.071 | 0.003 | < 0.002 U | 0.15 | 0.04 J | 0.02 J |
| 6/19/2017 | Background | 0.01 J | 3.64 | 82.2 | 0.061 | < 0.005 U | 0.250 | 9.07 | 0.746 | < 0.02 U | 0.050 | 0.004 | < 0.002 U | 0.12 | 0.08 J | < 0.01 U |
| 5/3/2018 | Assessment | 0.01 J | 3.34 | 80.4 | 0.069 | 0.009 J | 0.176 | 9.75 | 1.068 | < 0.02 U | 0.148 | 0.006 | < 0.002 U | 0.10 | 0.1 | 0.01 J |
| 9/5/2018 | Assessment | 0.02 J | 3.19 | 103 | 0.074 | 0.02 J | 0.260 | 10.7 | 0.916 | 0.03 J | 0.080 | 0.003 | -- | 0.1 J | 0.07 J | 0.02 J |
| 3/14/2019 | Assessment | < 0.02 U | 2.95 | 88.1 | 0.08 J | < 0.01 U | 0.2 J | 8.83 | 0.3036 | < 0.01 U | 0.161 | < 0.09 U | -- | < 0.4 U | 0.05 J | < 0.1 U |
| 6/11/2019 | Assessment | < 0.02 U | 3.01 | 93.2 | 0.07 J | 0.01 J | 0.2 J | 9.09 | 1.061 | 0.02 J | 0.06 J | < 0.009 U | < 0.002 U | < 0.4 U | 0.06 J | < 0.1 U |
| 7/24/2019 | Assessment | < 0.02 U | 2.82 | 108 | 0.09 J | < 0.01 U | 0.306 | 8.57 | 0.739 | 0.02 J | 0.2 J | 0.00255 | -- | < 0.4 U | 0.08 J | < 0.1 U |
| 2/11/2020 | Assessment | < 0.02 U | 2.75 | 89.3 | 0.08 J | < 0.01 U | 0.205 | 9.47 | 2.668 | 0.02 J | 0.1 J | 0.00259 | < 0.002 U | < 0.4 U | 0.07 J | < 0.1 U |
| 5/5/2020 | Assessment | 0.27 | 2.99 | 97.8 | 0.08 J | 0.01 J | 0.363 | 9.99 | 1.427 | 0.03 J | 0.973 | 0.00232 | -- | < 0.4 U | 0.09 J | < 0.1 U |
| 10/27/2020 | Assessment | < 0.02 U | 2.69 | 92.3 | 0.09 J | < 0.01 U | 0.334 | 9.65 | 0.81 | 0.02 J | 0.230 | 0.00234 | -- | < 0.4 U | 0.1 J | < 0.1 U |

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.

J: Estimated value. Parameter was detected at concentration below the reporting limit

--: Not analyzed

pCi/L: picocuries per liter

Table 1 - Groundwater Data Summary: MW-1606

**Amos - BAP
Appendix III Constituents**

| Collection Date | Monitoring Program | Boron | Calcium | Chloride | Fluoride | pH | Sulfate | Total Dissolved Solids |
|-----------------|--------------------|-----------|---------|----------|----------|-----|---------|------------------------|
| | | mg/L | mg/L | mg/L | mg/L | SU | mg/L | mg/L |
| 7/25/2016 | Background | 0.084 | 43.4 | 55.5 | 0.03 J | 5.7 | 189 | 410 |
| 8/23/2016 | Background | 0.023 | 45.6 | 56.8 | < 0.05 U | 5.3 | 186 | 372 |
| 10/17/2016 | Background | 0.013 | 47.3 | 61.5 | < 0.05 U | 5.6 | 202 | 390 |
| 11/7/2016 | Background | -- | -- | -- | -- | 5.5 | -- | -- |
| 12/12/2016 | Background | < 0.002 U | 50.4 | 27.0 | < 0.02 U | 5.3 | 215 | 418 |
| 2/7/2017 | Background | 0.048 | 42.2 | 57.9 | < 0.05 U | 5.7 | 179 | 370 |
| 3/14/2017 | Background | 0.036 | 42.2 | 59.5 | < 0.05 U | 5.6 | 180 | 384 |
| 5/23/2017 | Background | 0.061 | 49.2 | 75.0 | < 0.05 U | 5.6 | 199 | 442 |
| 6/19/2017 | Background | 0.108 | 48.3 | 78.8 | < 0.05 U | 5.3 | 219 | 440 |
| 11/1/2017 | Detection | 0.055 | 51.6 | 91.4 | < 0.05 U | 5.3 | 227 | 462 |
| 1/8/2018 | Detection | -- | 43.9 | 88.3 | -- | 8.4 | 190 | 400 |
| 5/4/2018 | Assessment | 0.077 | 53.0 | 119 | 0.03 J | 7.5 | 232 | 478 |
| 9/5/2018 | Assessment | 0.032 | 51.7 | 133 | < 0.02 U | 5.4 | 202 | 507 |
| 3/15/2019 | Assessment | < 0.2 U | 59.0 | 157 | < 0.01 U | 5.4 | 232 | 597 |
| 6/11/2019 | Assessment | 0.04 J | 56.6 | 177 | 0.02 J | 6.7 | 204 | 571 |
| 7/24/2019 | Assessment | 0.04 J | 52.8 | 186 | 0.02 J | 5.4 | 191 | 597 |
| 2/12/2020 | Assessment | -- | -- | -- | 0.02 J | 5.4 | -- | -- |
| 5/6/2020 | Assessment | 0.03 J | 36.7 | 116 | 0.02 J | 5.2 | 108 | 372 |
| 10/26/2020 | Assessment | 0.03 J | 32.4 | 100 | 0.02 J | 5.6 | 98.5 | 335 |

Notes:

mg/L: milligrams per liter

SU: standard unit

<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.

J: Estimated value. Parameter was detected at concentration below the reporting limit

--: Not analyzed

Table 1 - Groundwater Data Summary: MW-1606

Amos - BAP

Appendix IV Constituents

| Collection Date | Monitoring Program | Antimony | Arsenic | Barium | Beryllium | Cadmium | Chromium | Cobalt | Combined Radium | Fluoride | Lead | Lithium | Mercury | Molybdenum | Selenium | Thallium |
|-----------------|--------------------|----------|---------|--------|-----------|---------|----------|--------|-----------------|----------|-------|------------|-----------|------------|----------|----------|
| | | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | pCi/L | mg/L | µg/L | mg/L | µg/L | µg/L | µg/L |
| 7/25/2016 | Background | 0.04 J | 2.89 | 71.8 | 0.112 | 0.12 | 1.3 | 14.9 | 0.2045 | 0.03 J | 1.01 | 0.005 | < 0.002 U | 0.26 | 0.09 J | 0.03 J |
| 8/23/2016 | Background | 0.02 J | 2.58 | 67.2 | 0.087 | 0.14 | 0.6 | 14.5 | 1.039 | < 0.05 U | 0.483 | 0.007 | < 0.002 U | 0.14 | 0.1 J | 0.01 J |
| 10/17/2016 | Background | 0.03 J | 2.58 | 69.5 | 0.131 | 0.14 | 1.58 | 13.1 | 1.347 | < 0.05 U | 1.20 | 0.006 | 0.002 J | 0.15 | 0.2 | 0.02 J |
| 11/7/2016 | Background | -- | -- | -- | -- | -- | -- | -- | 1.331 | -- | -- | -- | -- | -- | -- | -- |
| 12/12/2016 | Background | 0.03 J | 2.55 | 65.8 | 0.100 | 0.17 | 1.03 | 13.9 | 0.651 | < 0.02 U | 0.588 | 0.010 | < 0.002 U | 0.12 | 0.2 | 0.04 J |
| 2/7/2017 | Background | 0.03 J | 3.50 | 57.5 | 0.134 | 0.31 | 1.76 | 14.2 | 0.886 | < 0.05 U | 1.55 | 0.003 | < 0.002 U | 0.29 | 0.3 | 0.05 J |
| 3/14/2017 | Background | 0.02 J | 3.52 | 56.3 | 0.091 | 0.16 | 0.920 | 13.4 | 2.45 | < 0.05 U | 0.572 | 0.003 | < 0.002 U | 0.14 | 0.1 | 0.01 J |
| 5/23/2017 | Background | 0.02 J | 2.83 | 59.8 | 0.085 | 0.12 | 0.286 | 14.2 | 0.236 | < 0.05 U | 0.448 | 0.007 | < 0.002 U | 0.1 J | 0.1 | 0.01 J |
| 6/19/2017 | Background | 0.03 J | 3.42 | 61.8 | 0.097 | 0.13 | 0.596 | 13.7 | 0.769 | < 0.05 U | 0.666 | < 0.0002 U | < 0.002 U | 0.13 | 0.09 J | 0.02 J |
| 5/4/2018 | Assessment | 0.01 J | 2.81 | 58.7 | 0.088 | 0.15 | 0.289 | 16.9 | 1.012 | 0.03 J | 0.286 | 0.003 | < 0.002 U | 0.07 J | 0.1 | 0.02 J |
| 9/5/2018 | Assessment | 0.01 J | 2.21 | 61.0 | 0.073 | 0.17 | 0.249 | 16.4 | 0.1805 | < 0.02 U | 0.088 | 0.003 | -- | 0.04 J | 0.06 J | 0.01 J |
| 3/15/2019 | Assessment | 0.03 J | 2.94 | 74.6 | 0.152 | 0.19 | 1.24 | 18.2 | 0.295 | < 0.01 U | 1.06 | < 0.09 U | -- | < 0.4 U | 0.2 J | < 0.1 U |
| 6/11/2019 | Assessment | < 0.02 U | 2.44 | 64.1 | 0.08 J | 0.18 | 0.2 J | 16.5 | 0.4433 | 0.02 J | 0.181 | < 0.009 U | < 0.002 U | < 0.4 U | 0.06 J | < 0.1 U |
| 7/24/2019 | Assessment | 0.03 J | 3.44 | 72.9 | 0.140 | 0.21 | 1.14 | 16.2 | 0.743 | 0.02 J | 1.11 | 0.00340 | -- | < 0.4 U | 0.2 J | < 0.1 U |
| 2/12/2020 | Assessment | 0.04 J | 2.82 | 50.2 | 0.112 | 0.19 | 0.680 | 10.1 | 1.515 | 0.02 J | 0.644 | 0.00256 | < 0.002 U | < 0.4 U | 0.07 J | < 0.1 U |
| 5/6/2020 | Assessment | 0.03 J | 3.43 | 51.3 | 0.08 J | 0.18 | 0.645 | 11.7 | 1.529 | 0.02 J | 0.549 | 0.00239 | -- | < 0.4 U | 0.09 J | < 0.1 U |
| 10/26/2020 | Assessment | < 0.02 U | 2.26 | 41.8 | 0.06 J | 0.26 | 0.286 | 11.6 | 0.2071 | 0.02 J | 0.1 J | 0.00228 | -- | < 0.4 U | < 0.03 U | < 0.1 U |

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

<: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL) followed by a 'U' flag.

J: Estimated value. Parameter was detected at concentration below the reporting limit

--: Not analyzed

pCi/L: picocuries per liter

**Table 1: Residence Time Calculation Summary
Amos Bottom Ash Pond**

| CCR Management Unit | Monitoring Well | Well Diameter (inches) | 2020-02 | | 2020-05 | | 2020-10 | |
|------------------------|-------------------------|------------------------|--------------------------------|-----------------------------------|--------------------------------|-----------------------------------|--------------------------------|-----------------------------------|
| | | | Groundwater Velocity (ft/year) | Groundwater Residence Time (days) | Groundwater Velocity (ft/year) | Groundwater Residence Time (days) | Groundwater Velocity (ft/year) | Groundwater Residence Time (days) |
| Bottom Ash Pond | MW-1 ^[2] | 2.0 | 21.2 | 2.9 | 24.7 | 2.5 | 21.5 | 2.8 |
| | MW-4 ^[2] | 2.0 | 79.1 | 0.8 | 59.4 | 1.0 | 63.1 | 1.0 |
| | MW-5 ^[2] | 2.0 | 41.2 | 1.5 | 40.0 | 1.5 | 43.9 | 1.4 |
| | MW-6 ^[1] | 2.0 | 64.3 | 0.9 | 63.3 | 1.0 | 48.0 | 1.3 |
| | MW-1601 ^[1] | 2.0 | 12.8 | 4.8 | 19.7 | 3.1 | 15.4 | 4.0 |
| | MW-1602A ^[1] | 2.0 | 8.7 | 7.0 | 7.5 | 8.1 | 11.8 | 5.1 |
| | MW-1603A ^[1] | 2.0 | 127.2 | 0.5 | 139.4 | 0.4 | 345.1 | 0.2 |
| | MW-1604 ^[2] | 2.0 | 68.2 | 0.9 | 71.1 | 0.9 | 50.6 | 1.2 |
| | MW-1605 ^[2] | 2.0 | 42.7 | 1.4 | 41.1 | 1.5 | 23.0 | 2.6 |
| MW-1606 ^[2] | 2.0 | 23.3 | 2.6 | 28.0 | 2.2 | 32.0 | 1.9 | |

Notes:

[1] - Background Well

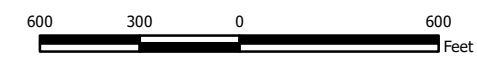
[2] - Downgradient Well



- Legend**
- ◆ Monitoring Well Location
 - ➔ Groundwater Flow Direction
 - Groundwater Elevation Contour

Notes

- Monitoring well coordinates and water level data (collected on February 10, 2020) provided by AEP.
- Groundwater elevation units are feet above mean sea level.
- Site features based on information available in the Ash Pond- CCR Groundwater Monitoring Well Network Evaluation - Amos Plant (Arcadis, 2016) provided by AEP.



**Potentiometric Surface Map - Uppermost Aquifer
February 2020**

AEP Amos Generating Plant - Ash Pond System
Winfield, West Virginia

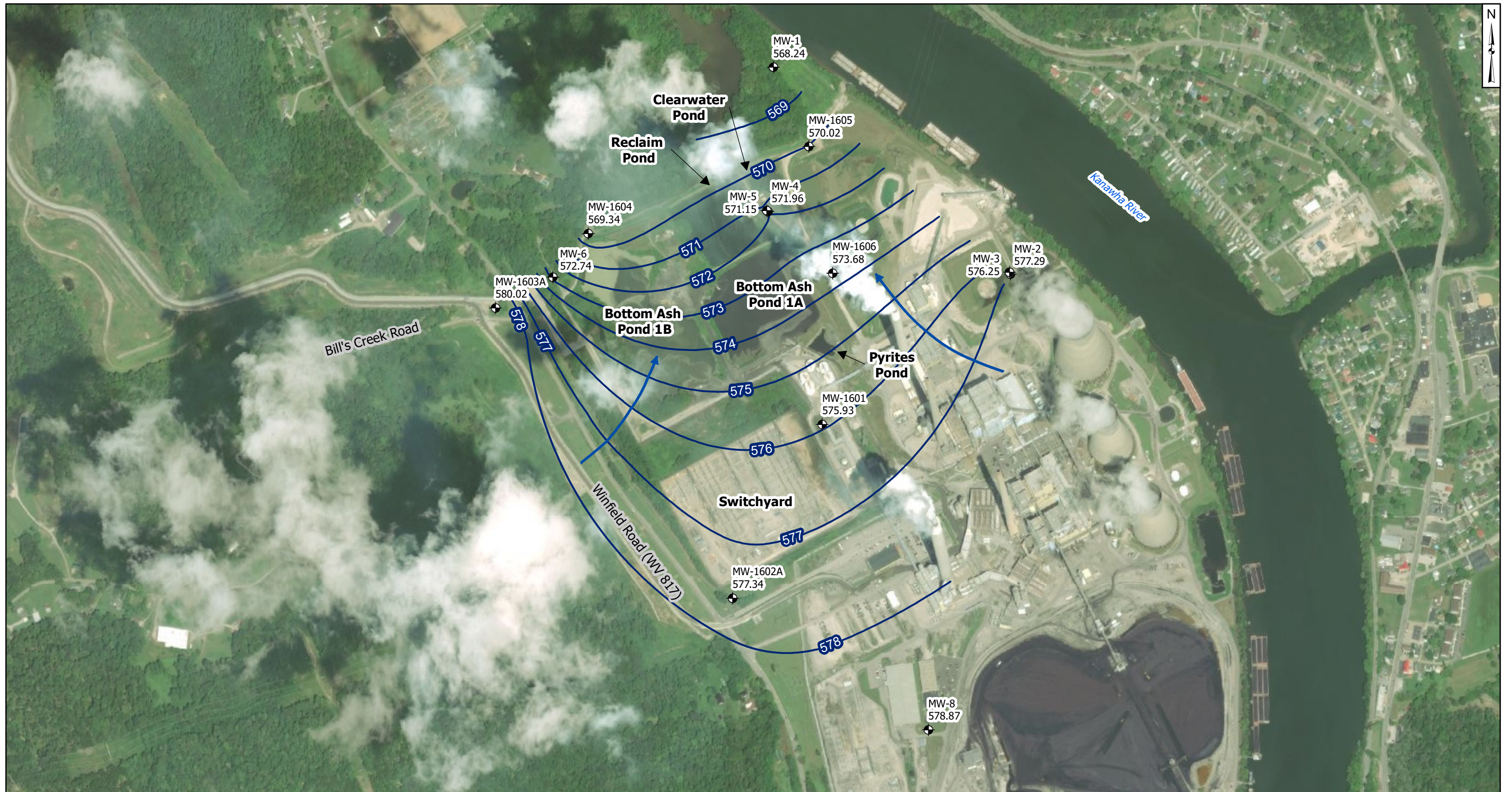
Geosyntec
consultants

Figure

2

Columbus, Ohio

2020/04/22

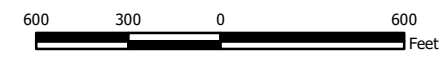


Legend

- ⊕ Monitoring Well Location
- ➔ Groundwater Flow Direction
- Groundwater Elevation Contour

Notes

- Monitoring well coordinates and water level data (collected on May 4, 2020) provided by AEP.
- Groundwater elevation units are feet above mean sea level.
- Site features based on information available in the Ash Pond- CCR Groundwater Monitoring Well Network Evaluation - Amos Plant (Arcadis, 2016) provided by AEP.



**Potentiometric Surface Map - Uppermost Aquifer
May 2020**

AEP Amos Generating Plant - Ash Pond System
Winfield, West Virginia

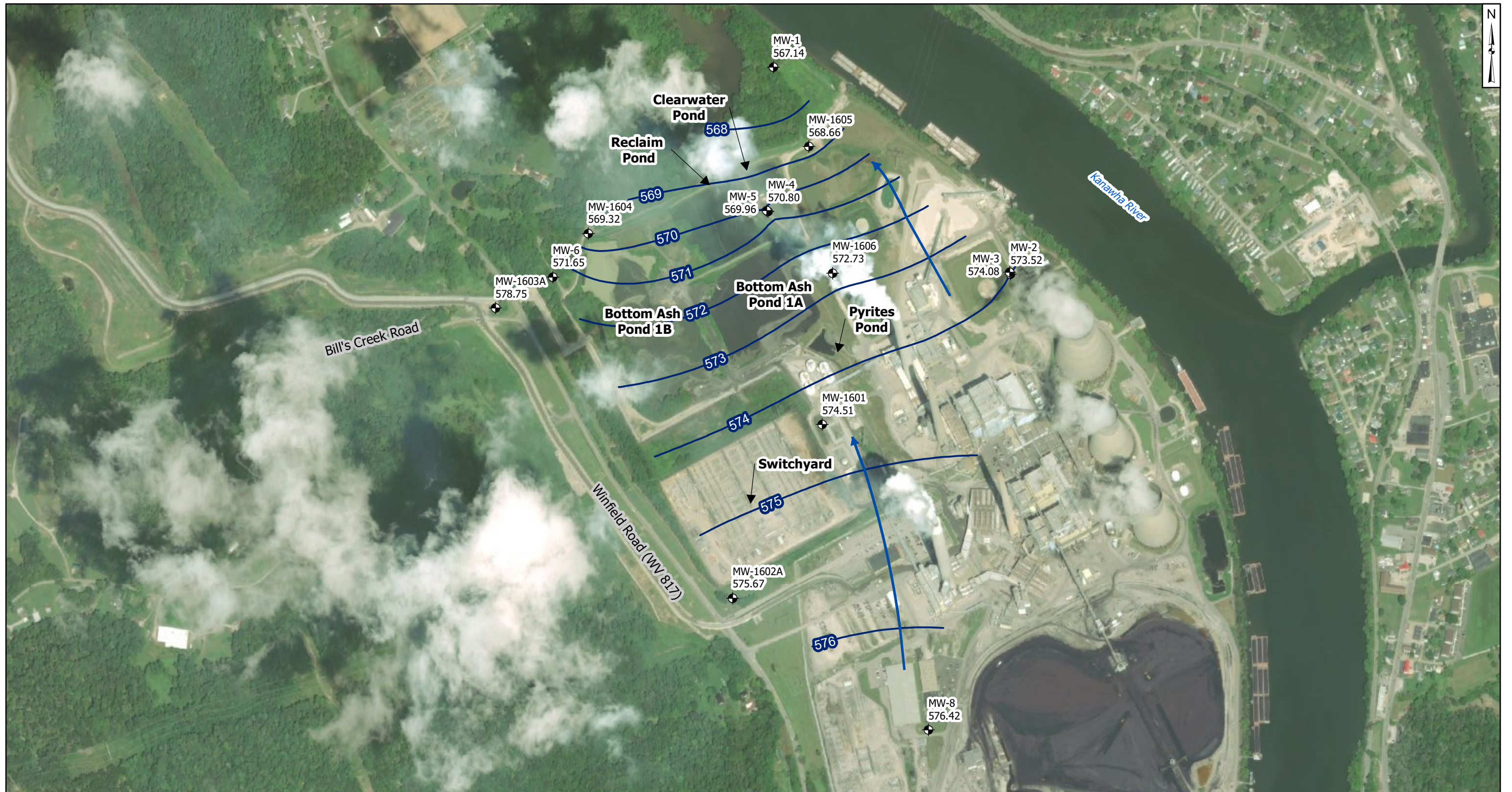
Geosyntec
consultants

Figure

3

Columbus, Ohio

2020/09/10

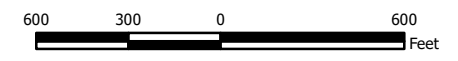


Legend

- Monitoring Well Location
- ➔ Groundwater Flow Direction
- Groundwater Elevation Contour

Notes

- Monitoring well coordinates and water level data (collected on October 26, 2020) provided by AEP.
- MW-1603A (Elevation = 548.75 ft amsl) was not used to generate contours due to anomalous or inconsistent reading.
- Groundwater elevation units are feet above mean sea level.
- Site features based on information available in the Ash Pond- CCR Groundwater Monitoring Well Network Evaluation - Amos Plant (Arcadis, 2016) provided by AEP.



**Potentiometric Surface Map - Uppermost Aquifer
October 2020**

AEP Amos Generating Plant - Ash Pond System
Winfield, West Virginia

Geosyntec
consultants

Figure
4

Columbus, Ohio 2021/01/28

APPENDIX 2 - Statistical Analysis

Statistical analysis reports completed in 2020 follow.

STATISTICAL ANALYSIS SUMMARY
BOTTOM ASH POND
Amos Plant
Winfield, West Virginia

Submitted to



1 Riverside Plaza
Columbus, Ohio 43215-2372

Submitted by



engineers | scientists | innovators

941 Chatham Lane
Suite 103
Columbus, Ohio 43221

September 2, 2020

CHA8473

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LIST OF ATTACHMENTS

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| Attachment A | Certification by Qualified Professional Engineer |
| Attachment B | Statistical Analysis Output |

LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|-------|---|
| AEP | American Electric Power |
| BAP | Bottom Ash Pond |
| CCR | Coal Combustion Residuals |
| CCV | Continuing Calibration Verification |
| CFR | Code of Federal Regulations |
| GWPS | Groundwater Protection Standard |
| LCL | Lower Confidence Limit |
| LFB | Laboratory Fortified Blanks |
| LPL | Lower Prediction Limit |
| LRB | Laboratory Reagent Blanks |
| MCL | Maximum Contaminant Level |
| NELAP | National Environmental Laboratory Accreditation Program |
| QA | Quality Assurance |
| QC | Quality Control |
| SSI | Statistically Significant Increase |
| SSL | Statistically Significant Level |
| SU | Standard Units |
| TDS | Total Dissolved Solids |
| UPL | Upper Prediction Limit |
| USEPA | United States Environmental Protection Agency |
| UTL | Upper Tolerance Limit |

SECTION 1

EXECUTIVE SUMMARY

In accordance with the United States Environmental Protection Agency's (USEPA's) regulations regarding the disposal of coal combustion residuals (CCR) in landfills and surface impoundments (40 CFR 257.90-257.98, "CCR rule"), groundwater monitoring has been conducted at the Bottom Ash Pond (BAP), an existing CCR unit at the Amos Power Plant located in Winfield, West Virginia.

Based on detection monitoring conducted in 2017 and 2018, statistically significant increases (SSIs) over background were concluded for calcium, chloride, total dissolved solids (TDS), and sulfate at the BAP. An alternative source was not identified following the detection monitoring events, so the BAP has been in assessment monitoring since 2018. During the most recent assessment monitoring event, completed in July 2019, no statistically significant levels (SSLs) were identified during this event and the unit remained in assessment monitoring (Geosyntec, 2019). Two assessment monitoring events were conducted at the BAP in February 2020 and May/July 2020, in accordance with 40 CFR 257.95. The statistical summary of the results of these assessment sampling events are documented in this report.

Prior to conducting the statistical analyses, the groundwater data underwent several validation tests, including those for completeness, sample tracking accuracy, transcription errors, and consistent use of measurement units. No data quality issues were identified which would impact data usability .

The monitoring data were submitted to Groundwater Stats Consulting, LLC for statistical analysis. Groundwater protection standards (GWPSs) were re-established for the Appendix IV parameters. Confidence intervals were calculated for Appendix IV parameters at the compliance wells to assess whether any were present at concentrations above the GWPSs. No statistically significant levels (SSLs) were identified; however, concentrations of Appendix III parameters remained above background. Thus, the unit will remain in assessment monitoring. Certification of the selected statistical methods by a qualified professional engineer is documented in Attachment A.

SECTION 2

BOTTOM ASH POND EVALUATION

2.1 Data Validation & QA/QC

During the assessment monitoring program, two sets of samples were collected for analysis from each upgradient and downgradient well to meet the requirements of 40 CFR 257.95(b) (February 2020) and 257.95(d)(1) (May 2020). The sample at MW-5 collected in May 2020 was delayed in transit to the lab and was received outside of hold time for a number of parameters. A replacement sample was collected from MW-5 in July 2020 and this sample was used in statistical analysis in lieu of the May data. Samples from the February 2020 event were analyzed for Appendix IV parameters only, whereas samples from the May/July 2020 sample event were analyzed for all Appendix III and detected Appendix IV parameters based on the results of the February event. A summary of data collected during these assessment monitoring events may be found in Table 1.

Chemical analysis was completed by an analytical laboratory certified by the National Environmental Laboratory Accreditation Program (NELAP). Quality assurance and quality control (QA/QC) samples completed by the analytical laboratory included the use of laboratory reagent blanks (LRBs), continuing calibration verification (CCV) samples, and laboratory fortified blanks (LFBs).

The analytical data were imported into a Microsoft Access database, where checks were completed to assess the accuracy of sample location identification and analyte identification. Where necessary, unit conversions were applied to standardize reported units across all sampling events. Exported data files were created for use with the Sanitas™ v.9.6.26d statistics software. The export file was checked against the analytical data for transcription errors and completeness. No QA/QC issues were noted which would impact data usability.

2.2 Statistical Analysis

Statistical analyses for the BAP were conducted in accordance with the January 2017 *Statistical Analysis Plan* (AEP, 2017), except where noted below. Time series plots and results for all completed statistical tests are provided in Attachment B.

The data obtained in February and May/July 2020 were screened for potential outliers; however, no outliers were identified in either set of data (Attachment B).

2.2.1 **Establishment of GWPSs**

A GWPS was established for each Appendix IV parameter in accordance with 40 CFR 257.95(h) and the *Statistical Analysis Plan* (AEP, 2017). The established GWPS was determined to be the greater value of the background concentration and the maximum contaminant level (MCL) or risk-based level specified in 40 CFR 257.95(h)(2) for each Appendix IV parameter. To determine

background concentrations, an upper tolerance limit (UTL) was calculated using pooled data from the background wells collected during the background monitoring and assessment monitoring events. Generally, tolerance limits were calculated parametrically with 95% coverage and 95% confidence. Non-parametric tolerance limits were calculated for antimony, arsenic, cadmium, fluoride, selenium, and thallium due to apparent non-normal distributions. Non-parametric tolerance limits were calculated for mercury because greater than 50% of the data was non-detect results. Tolerance limits and the final GWPSs are summarized in Table 2.

2.2.2 Evaluation of Potential Appendix IV SSLs

A confidence interval was constructed for each Appendix IV parameter at each compliance well. Confidence limits were generally calculated parametrically ($\alpha = 0.01$); however, non-parametric confidence limits were calculated in some cases (e.g., when the data did not appear to be normally distributed or when the non-detect frequency was too high). An SSL was concluded if the lower confidence limit (LCL) exceeded the GWPS (i.e., if the entire confidence interval exceeded the GWPS). Calculated confidence limits are shown in Attachment B.

No SSLs were identified at the Amos BAP.

2.2.3 Evaluation of Potential Appendix III SSIs

The Appendix III results were analyzed to assess whether concentrations of Appendix III parameters at the compliance wells exceeded background concentrations. Data collected during the May/July 2020 assessment monitoring events from each compliance well were compared to the prediction limits to assess whether the results are above background values. The results from these events and the prediction limits are summarized in Table 3. The following exceedances of the upper prediction limits (UPLs) were noted:

- Calcium concentrations exceeded the interwell UPL of 19.6 mg/L at MW-1 (32.9 mg/L), MW-1604 (20.8 mg/L), MW-1605 (49.6 mg/L), and MW-1606 (36.7 mg/L).
- Chloride concentrations exceeded the interwell UPL of 41.0 mg/L at MW-1 (53.4 mg/L), MW-1605 (85.6 mg/L), and MW-1606 (116 mg/L).
- Sulfate concentrations exceeded the intrawell UPL of 57.4 mg/L at MW-1 (137 mg/L), MW-1605 (236 mg/L), and at MW-1606 (108 mg/L).
- TDS concentrations exceeded the interwell UPL of 260 mg/L at MW-1 (336 mg/L), MW-1605 (526 mg/L), and MW-1606 (372 mg/L).

While the prediction limits were calculated for a one-of-two retesting procedure, SSIs were conservatively assumed if the May/ July 2020 sample was above the UPL or below the LPL. Based on this evaluation, concentrations of Appendix III constituents appear to be above background concentrations and the unit will remain in assessment monitoring.

2.3 Conclusions

A semi-annual assessment monitoring event was conducted in accordance with the CCR Rule. The laboratory and field data were reviewed prior to statistical analysis, with no QA/QC issues identified that impacted data usability. A review of outliers identified no potential outliers in the 2020 data. GWPSs were re-established for the Appendix IV parameters. A confidence interval was constructed at each compliance well for each Appendix IV parameter; SSLs were concluded if the entire confidence interval exceeded the GWPSs. No SSLs were identified.

The Appendix III results were evaluated to assess whether concentrations of Appendix III parameters exceeded background levels. Calcium, chloride, sulfate, and TDS results exceeded background levels at select downgradient wells.

Based on this evaluation, the Amos BAP CCR unit will remain in assessment monitoring.

SECTION 3

REFERENCES

American Electric Power (AEP). 2017. Statistical Analysis Plan – Amos Plant. January 2017.

Geosyntec Consultants (Geosyntec). 2019. Statistical Analysis Summary – Bottom Ash Pond, Amos Plant, Winfield, West Virginia. December 23, 2019.

TABLES

**Table 1 - Groundwater Data Summary
Amos Plant - Bottom Ash Pond**

| Parameter | Unit | MW-1 | | MW-4 | | MW-5 | | MW-6 | | MW-1601 | |
|------------------------|-------|-----------|----------|-----------|----------|-----------|----------|-----------|----------|-----------|----------|
| | | 2/12/2020 | 5/7/2020 | 2/11/2020 | 5/6/2020 | 2/11/2020 | 7/7/2020 | 2/11/2020 | 5/5/2020 | 2/12/2020 | 5/6/2020 |
| Antimony | µg/L | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.03 J | 0.1 U | 0.1 U | 0.17 | 0.03 J | 0.1 U |
| Arsenic | µg/L | 0.09 J | 0.06 J | 0.92 | 5.2 | 4.35 | 2.77 | 38.5 | 37.2 | 8.26 | 7.83 |
| Barium | µg/L | 25.7 | 25.7 | 96.9 | 110 | 130 | 140 | 165 | 149 | 122 | 115 |
| Beryllium | µg/L | 0.139 | 0.126 | 0.04 J | 0.09 J | 0.06 J | 0.04 J | 0.1 U | 0.1 U | 0.05 J | 0.1 U |
| Boron | mg/L | - | 0.126 | - | 0.135 | - | 0.055 | - | 0.04 J | - | 0.03 J |
| Cadmium | µg/L | 2.22 | 2.43 | 0.05 J | 0.05 | 0.05 U | 0.2 U | 0.05 U | 0.05 U | 0.02 J | 0.01 J |
| Calcium | mg/L | - | 32.9 | - | 17.6 | - | 14.7 | - | 11.7 | - | 9.42 |
| Chloride | mg/L | - | 53.4 | - | 16.9 | - | 14.6 | - | 8.55 | - | 19 |
| Chromium | µg/L | 0.2 J | 0.1 J | 0.2 J | 0.367 | 0.273 | 0.1 J | 0.433 | 0.429 | 0.938 | 0.272 |
| Cobalt | µg/L | 18.6 | 13.9 | 8.30 | 8.17 | 1.21 | 1.39 | 9.52 | 8.8 | 3.19 | 2.78 |
| Combined Radium | pCi/L | 1.10 | 0.499 | 1.88 | 2.18 | 1.86 | 1.12 | 1.54 | 2.62 | 0.398 | 2.68 |
| Fluoride | mg/L | 0.03 J | 0.02 J | 0.04 J | 0.04 J | 0.04 J | 0.03 J | 0.06 | 0.09 | 0.05 J | 0.04 J |
| Lead | µg/L | 0.07 J | 0.2 U | 0.2 J | 0.545 | 0.201 | 0.08 J | 0.07 J | 0.39 | 0.602 | 0.2 J |
| Lithium | mg/L | 0.00259 | 0.00239 | 0.00151 | 0.00139 | 0.00147 | 0.00157 | 0.00118 | 0.00102 | 0.00159 | 0.00121 |
| Mercury | µg/L | 0.005 U | - | 0.005 U | - | 0.005 U | - | 0.005 U | - | 0.005 U | - |
| Molybdenum | µg/L | 2 U | 2 U | 0.9 J | 1 J | 2 U | 0.5 J | 0.5 J | 1 J | 2 U | 0.5 J |
| Selenium | µg/L | 0.1 J | 0.08 J | 0.06 J | 0.2 J | 0.2 U | 0.06 J | 0.09 J | 0.09 J | 0.1 J | 0.04 J |
| Sulfate | mg/L | - | 137 | - | 54.6 | - | 45.7 | - | 1.3 | - | 25.9 |
| Thallium | µg/L | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U |
| Total Dissolved Solids | mg/L | - | 336 | - | 213 | - | 156 | - | 202 | - | 143 |
| pH | SU | 5.3 | 5.0 | 5.9 | 5.5 | 6.0 | 6.1 | 6.2 | 5.5 | 5.9 | 5.6 |

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

SU: standard unit

U: Non-detect value. For statistical analysis, parameters which were not detected were replaced with the reporting limit.

J: Estimated value. Parameter was detected in concentrations below the reporting limit.

-: Not analyzed

**Table 1 - Groundwater Data Summary
Amos Plant - Bottom Ash Pond**

| Parameter | Unit | MW-1602A | | MW-1603A | | MW-1604 | | MW-1605 | | MW-1606 | |
|------------------------|-------|-----------|----------|-----------|----------|-----------|----------|-----------|----------|-----------|----------|
| | | 2/12/2020 | 5/6/2020 | 2/11/2020 | 5/6/2020 | 2/12/2020 | 5/6/2020 | 2/11/2020 | 5/5/2020 | 2/12/2020 | 5/6/2020 |
| Antimony | µg/L | 0.03 J | 0.02 J | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.27 | 0.04 J | 0.03 J |
| Arsenic | µg/L | 21.9 | 21.8 | 87.7 | 90.2 | 3.88 | 4.04 | 2.75 | 2.99 | 2.82 | 3.43 |
| Barium | µg/L | 234 | 238 | 241 | 241 | 174 | 175 | 89.3 | 97.8 | 50.2 | 51.3 |
| Beryllium | µg/L | 0.03 J | 0.1 U | 0.03 J | 0.1 U | 0.05 J | 0.04 J | 0.08 J | 0.08 J | 0.112 | 0.08 J |
| Boron | mg/L | - | 0.03 J | - | 0.02 J | - | 0.175 | - | 0.051 | - | 0.03 J |
| Cadmium | µg/L | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.01 J | 0.19 | 0.18 |
| Calcium | mg/L | - | 19.3 | - | 15.5 | - | 20.8 | - | 49.6 | - | 36.7 |
| Chloride | mg/L | - | 43.2 | - | 5.87 | - | 29.4 | - | 85.6 | - | 116 |
| Chromium | µg/L | 0.758 | 0.361 | 0.663 | 0.362 | 0.798 | 0.484 | 0.205 | 0.363 | 0.680 | 0.645 |
| Cobalt | µg/L | 0.632 | 0.468 | 0.376 | 0.255 | 0.538 | 0.406 | 9.47 | 9.99 | 10.1 | 11.7 |
| Combined Radium | pCi/L | 0.699 | 1.43 | 0.984 | 2.24 | 1.38 | 1.65 | 2.67 | 1.4 | 1.52 | 1.5 |
| Fluoride | mg/L | 0.14 | 0.11 | 0.24 | 0.23 | 0.08 | 0.06 J | 0.02 J | 0.03 J | 0.02 J | 0.02 J |
| Lead | µg/L | 1.23 | 1.22 | 0.347 | 0.2 J | 0.319 | 0.1 J | 0.1 J | 0.973 | 0.644 | 0.549 |
| Lithium | mg/L | 0.00127 | 0.000954 | 0.000630 | 0.000339 | 0.000626 | 0.00043 | 0.00259 | 0.00232 | 0.00256 | 0.00239 |
| Mercury | µg/L | 0.005 U | - | 0.005 U | - | 0.005 U | - | 0.005 U | - | 0.005 U | - |
| Molybdenum | µg/L | 0.7 J | 0.9 J | 1 J | 1 J | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U |
| Selenium | µg/L | 0.05 J | 0.07 J | 0.06 J | 0.2 U | 0.2 J | 0.2 J | 0.07 J | 0.09 J | 0.07 J | 0.09 J |
| Sulfate | mg/L | - | 12.7 | - | 0.4 U | - | 0.4 U | - | 236 | - | 108 |
| Thallium | µg/L | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U |
| Total Dissolved Solids | mg/L | - | 209 | - | 121 | - | 241 | - | 526 | - | 372 |
| pH | SU | 6.7 | 6.3 | 6.9 | 6.5 | 6.3 | 6.0 | 5.7 | 5.3 | 5.4 | 5.2 |

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

SU: standard unit

U: Non-detect value. For statistical analysis, parameters which were not detected were replaced with the reporting limit.

J: Estimated value. Parameter was detected in concentrations below the reporting limit.

-: Not analyzed

**Table 2: Groundwater Protection Standards
Amos Plant - Bottom Ash Pond**

| Constituent Name | MCL | CCR Rule-Specified | Calculated UTL |
|--------------------------------|-------|--------------------|----------------|
| Antimony, Total (mg/L) | 0.006 | | 0.0002 |
| Arsenic, Total (mg/L) | 0.01 | | 0.09 |
| Barium, Total (mg/L) | 2 | | 0.3 |
| Beryllium, Total (mg/L) | 0.004 | | 0.0001 |
| Cadmium, Total (mg/L) | 0.005 | | 0.00005 |
| Chromium, Total (mg/L) | 0.1 | | 0.0020 |
| Cobalt, Total (mg/L) | n/a | 0.006 | 0.018 |
| Combined Radium, Total (pCi/L) | 5 | | 2.5 |
| Fluoride, Total (mg/L) | 4 | | 0.31 |
| Lead, Total (mg/L) | n/a | 0.015 | 0.0072 |
| Lithium, Total (mg/L) | n/a | 0.04 | 0.009 |
| Mercury, Total (mg/L) | 0.002 | | 0.000005 |
| Molybdenum, Total (mg/L) | n/a | 0.1 | 0.0024 |
| Selenium, Total (mg/L) | 0.05 | | 0.0003 |
| Thallium, Total (mg/L) | 0.002 | | 0.0005 |

Notes:

Grey cell indicates calculated UTL is higher than MCL or CCR Rule-specified value.

MCL = Maximum Contaminant Level

Calculated UTL (Upper Tolerance Limit) represents site-specific background values.

The higher of the calculated UTL or MCL/Rule-Specified Level is used as the GWPS.

**Table 3: Appendix III Data Summary
Amos Plant - Bottom Ash Pond**

Geosyntec Consultants, Inc.

| Analyte | Unit | Description | MW-1 | MW-1604 | MW-1605 | MW-1606 | MW-4 | MW-5 |
|------------------------|------|----------------------------------|-------------|-------------|-------------|-------------|----------|----------|
| | | | 5/7/2020 | 5/6/2020 | 5/5/2020 | 5/6/2020 | 5/6/2020 | 7/7/2020 |
| Boron | mg/L | Interwell Background Value (UPL) | 0.183 | | | | | |
| | | Analytical Result | 0.126 | 0.175 | 0.051 | 0.03 | 0.135 | 0.04 |
| Calcium | mg/L | Interwell Background Value (UPL) | 19.6 | | | | | |
| | | Analytical Result | 32.9 | 20.8 | 49.6 | 36.7 | 17.6 | 14.7 |
| Chloride | mg/L | Interwell Background Value (UPL) | 41.0 | | | | | |
| | | Analytical Result | 53.4 | 29.4 | 85.6 | 116 | 16.9 | 14.5 |
| Fluoride | mg/L | Intrawell Background Value (UPL) | 0.03 | 0.146 | 0.09 | 0.03 | 0.0822 | 0.05 |
| | | Analytical Result | 0.02 | 0.06 | 0.03 | 0.02 | 0.04 | 0.03 |
| pH | SU | Intrawell Background Value (UPL) | 7.3 | 7.2 | 6.6 | 5.9 | 7.0 | 6.5 |
| | | Intrawell Background Value (UPL) | 4.9 | 6.1 | 5.2 | 5.1 | 5.5 | 5.2 |
| | | Analytical Result | 5.0 | 6.0 | 5.3 | 5.2 | 5.5 | 6.1 |
| Sulfate | mg/L | Interwell Background Value (UPL) | 57.4 | | | | | |
| | | Analytical Result | 137 | 0.06 | 236 | 108 | 54.6 | 46 |
| Total Dissolved Solids | mg/L | Intrawell Background Value (UPL) | 260 | | | | | |
| | | Analytical Result | 336 | 241 | 526 | 372 | 213 | 182 |

Notes:

UPL: Upper prediction limit

LPL: Lower prediction limit

Bold values exceed the background value.

Background values are shaded gray.

ATTACHMENT A

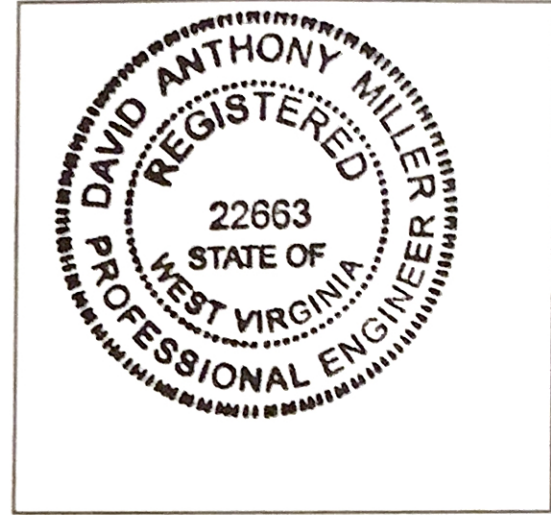
Certification by Qualified Professional Engineer

Certification by Qualified Professional Engineer

I certify that the selected and above described statistical method is appropriate for evaluating the groundwater monitoring data for the Amos Bottom Ash Pond CCR management area and that the requirements of 40 CFR 257.93(f) have been met.

DAVID ANTHONY MILLER
Printed Name of Licensed Professional Engineer

David Anthony Miller
Signature



22663
License Number

WEST VIRGINIA
Licensing State

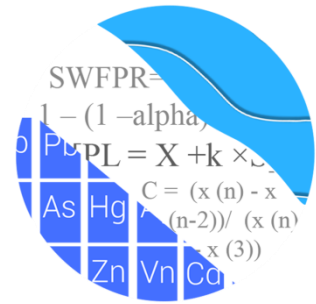
09.04.2020
Date

ATTACHMENT B
Statistical Analysis Output

GROUNDWATER STATS CONSULTING

August 21, 2020

Geosyntec Consultants
Attn: Ms. Allison Kreinberg
941 Chatham Lane, #103
Columbus, OH 43221



Re: Amos Bottom Ash Pond
Assessment Monitoring Summary – July 2020

Dear Ms. Kreinberg,

Groundwater Stats Consulting (GSC), formerly the statistical consulting division of Sanitas Technologies, is pleased to provide the Assessment Monitoring statistical analysis of groundwater data through July 2020 at American Electric Power Company's Amos Bottom Ash Pond. The analysis complies with the federal rule for the Disposal of Coal Combustion Residuals from Electric Utilities (CCR Rule, 2015) as well as with the United States Environmental Protection Agency (USEPA) Unified Guidance (2009).

Sampling began at the site for the CCR program in 2016. The monitoring well network, as provided by Geosyntec Consultants, consists of the following:

- **Upgradient wells:** BAP-MW-1601, BAP-MW-1602A, BAP-MW-1603A, and BAP-MW-6
- **Downgradient wells:** BAP-MW-1, BAP-MW-1604, BAP-MW-1605, BAP-MW-1606, BAP-MW-4, and BAP-MW-5

Data were sent electronically, and the statistical analysis was conducted according to the Statistical Analysis Plan and screening evaluation prepared by GSC and approved by Dr. Kirk Cameron, PhD Statistician with MacStat Consulting, primary author of the USEPA Unified Guidance, and Senior Advisor to GSC. The analysis was reviewed by Kristina Rayner, Groundwater Statistician and Founder of Groundwater Stats Consulting.

The CCR program consists of the following constituents:

- **Appendix IV** (Assessment Monitoring) – antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, combined radium 226 + 228, fluoride, lead, lithium, mercury, molybdenum, selenium, and thallium

Note that no samples were collected during the May 2020 sampling event for mercury because there were no detections during the February 2020 sampling event. Data in this analysis extend through July 2020 to include the February and May 2020 sampling events as well as the July 2020 resampling event for downgradient well BAP-MW-5.

Time series and box plots for Appendix IV parameters are provided for all wells and constituents; and are used to evaluate concentrations over the entire record (Figures A and B, respectively). Values in background, which have previously been flagged as outliers, may be seen in a lighter font and disconnected symbol on the graphs. Additionally, a summary of flagged values follows this letter.

History of Initial Background Screening Conducted in December 2017

Time series plots are used to identify suspected outliers, or extreme values that would result in limits that are not conservative from a regulatory perspective, in proposed background data. Suspected outliers at all wells for Appendix IV parameters were formally tested using Tukey's box plot method and, when identified, flagged in the computer database with "o" and deselected prior to construction of statistical limits.

Tukey's outlier test noted a few outliers and a summary of that report was submitted with the screening at that time. Any values flagged as outliers may be seen on the summary following this letter and are plotted in a lighter font on the time series graph. The test identified an outlier for arsenic in well BAP-MW-1604; however, these concentrations were similar to concentrations in neighboring wells and were not flagged as outliers. A substitution of the most recent reporting limit was applied when varying detection limits existed in data.

No true seasonal patterns were observed on the time series plots for any of the detected data; therefore, no deseasonalizing adjustments were made to the data. When seasonal patterns are observed, data may be deseasonalized so that the resulting limits will correctly account for the seasonality as a predictable pattern rather than random variation or a release.

While trends may be visual, a quantification of the trend and its significance is needed. The Sen's Slope/Mann Kendall trend test was used to evaluate all data at each well to identify statistically significant increasing or decreasing trends. In the absence of suspected contamination, significant trending data are typically not included as part of the background data used for construction of prediction limits. This step serves to eliminate the trend and, thus, reduce variation in background. When statistically significant decreasing trends are present, earlier data are evaluated to determine whether earlier concentration levels are significantly different than current reported concentrations and will be deselected as necessary. When the historical records of data are truncated for the reasons above, a summary report will be provided to show the date ranges used in construction of the statistical limits.

The results of the trend analyses showed a couple statistically significant increasing trends and several statistically significant decreasing trends and a summary of those results were included with the screening. All trends were relatively low in magnitude when compared to average concentrations and data, therefore, no adjustments were required.

Summary of Background Update Conducted in December 2019

Prior to updating Groundwater Water Protection Standards and constructing confidence intervals for the Appendix IV constituents, samples were re-evaluated for all wells using Tukey's outlier test and visual screening through the July 2019 samples. As mentioned above, flagged data may be seen on the summary following this letter and are displayed in a lighter font and as a disconnected symbol on the time series reports, as well as in a lighter font on the accompanying data pages. An updated summary of Tukey's test results was included with the screening.

Evaluation of Appendix IV Parameters – July 2020

Prior to constructing background limits, pooled upgradient well data were screened for outliers and extreme trending patterns that would lead to artificially elevated statistical limits. Tukey's outlier test was used to evaluate suspected outliers for combined radium 226 + 228 and identified outliers in upgradient well BAP-MW-1602A which were flagged and deselected. Tukey's test results and an updated summary of all flagged values, which may be seen on the Outlier Summary, follow this letter (Figure C).

Interwell Tolerance limits were used to calculate background limits from all available pooled upgradient well data through July 2020 for Appendix IV parameters to determine the background limit for each constituent (Figure D). Parametric limits use a target of 95% confidence and 95% coverage. The confidence and coverage levels for nonparametric

tolerance limits are dependent upon the number of background samples. These limits were compared to the Maximum Contaminant Levels (MCLs) and CCR-Rule specified levels in the Groundwater Protection Standard (GWPS) table following this letter to determine the highest limit for use as the GWPS in the Confidence Interval comparisons (Figure E).

Confidence intervals were then constructed on downgradient wells for each of the Appendix IV parameters using the highest limit of the MCL, CCR-Rule specified levels, or background as discussed above (Figure F). Only when the entire confidence interval is above a GWPS is the well/constituent pair considered to exceed its respective standard. No exceedances were noted for any of the well/constituent pairs. A summary of the confidence interval results follows this letter.

Thank you for the opportunity to assist you in the statistical analysis of groundwater quality for the Amos Bottom Ash Pond. If you have any questions or comments, please feel free to contact us.

For Groundwater Stats Consulting,

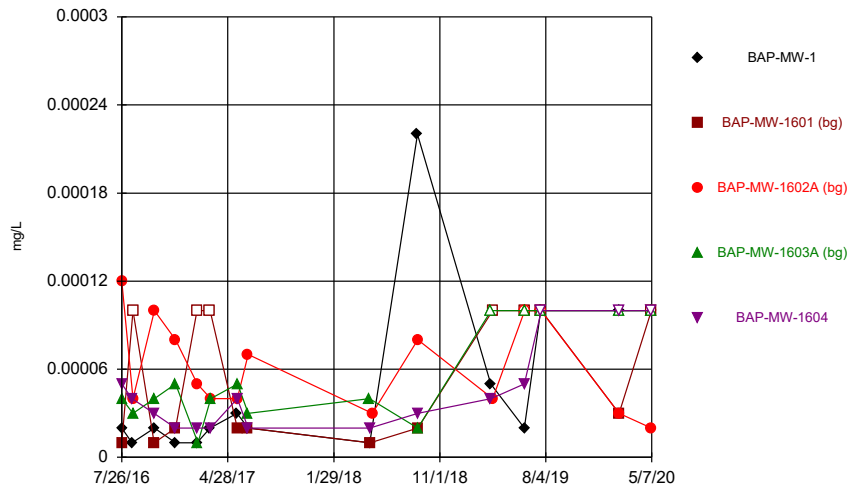


Andrew T. Collins
Project Manager



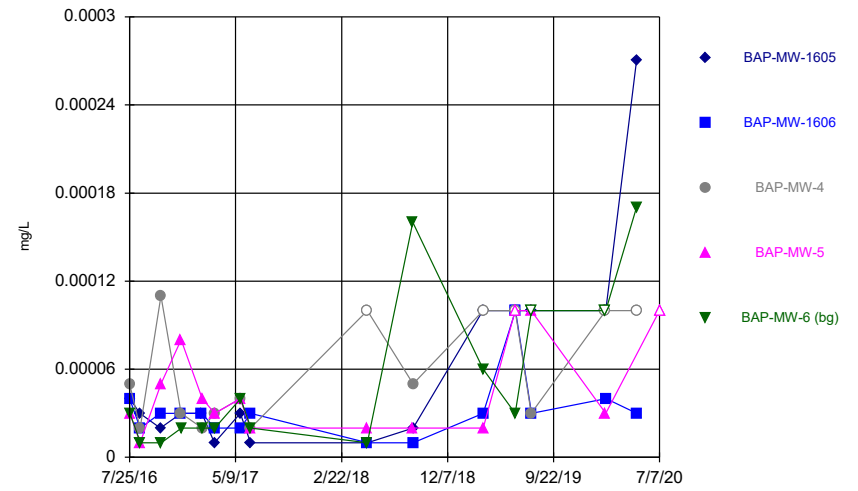
Kristina L. Rayner
Groundwater Statistician

Time Series



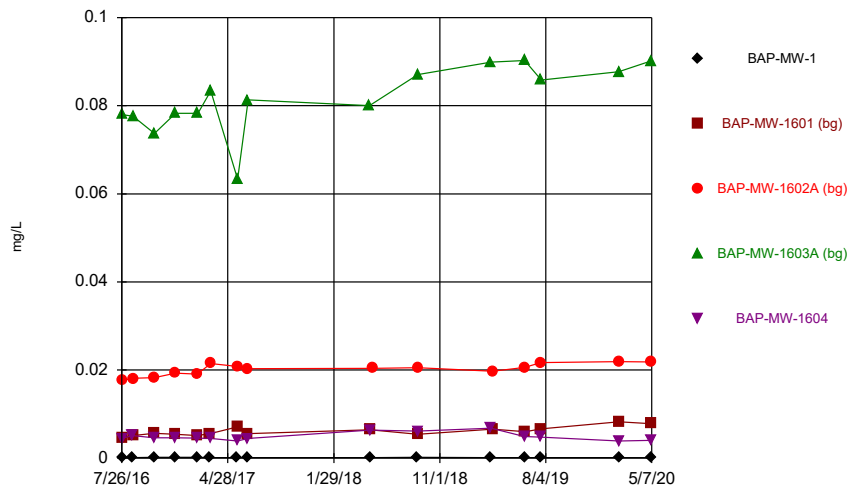
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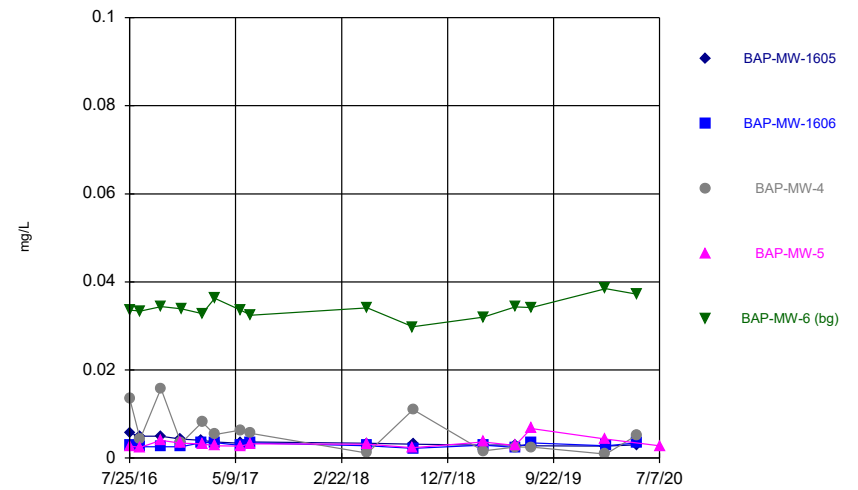
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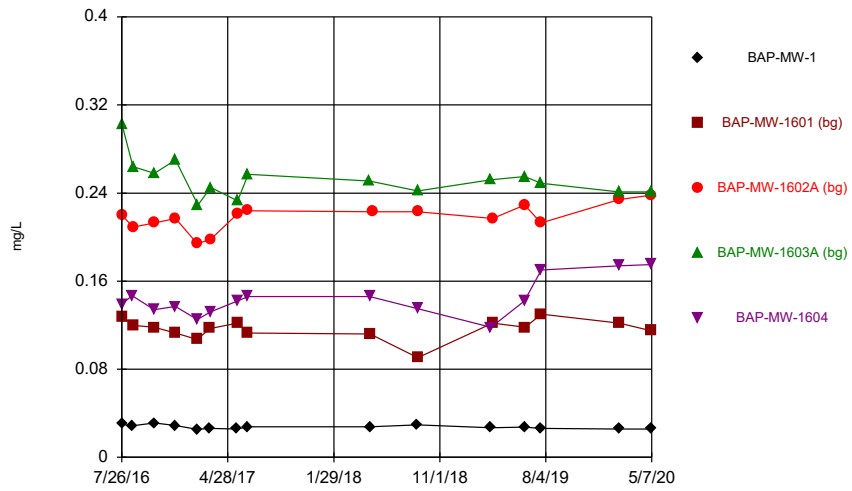
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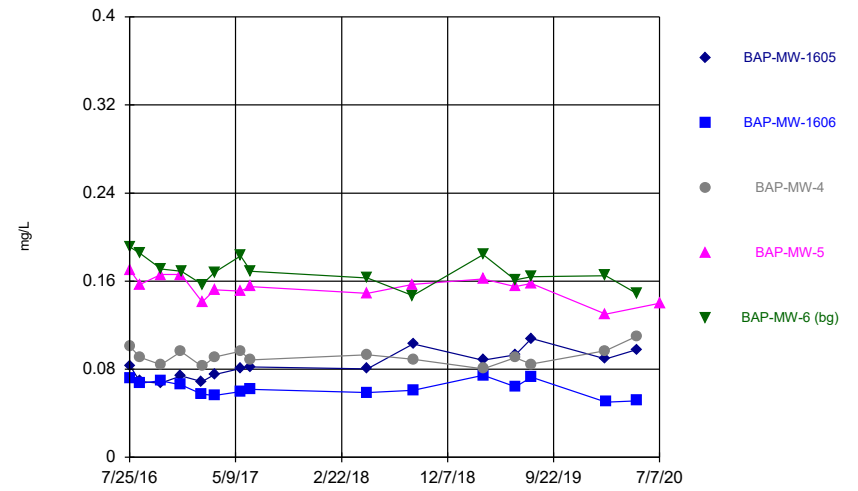
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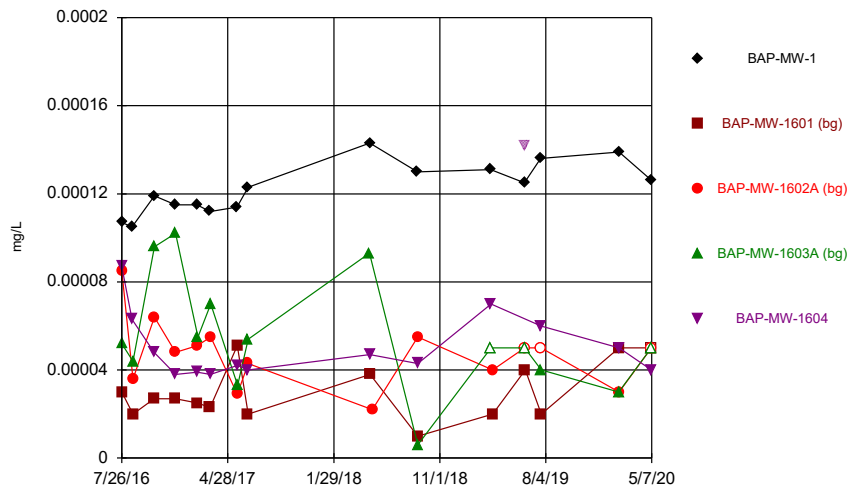
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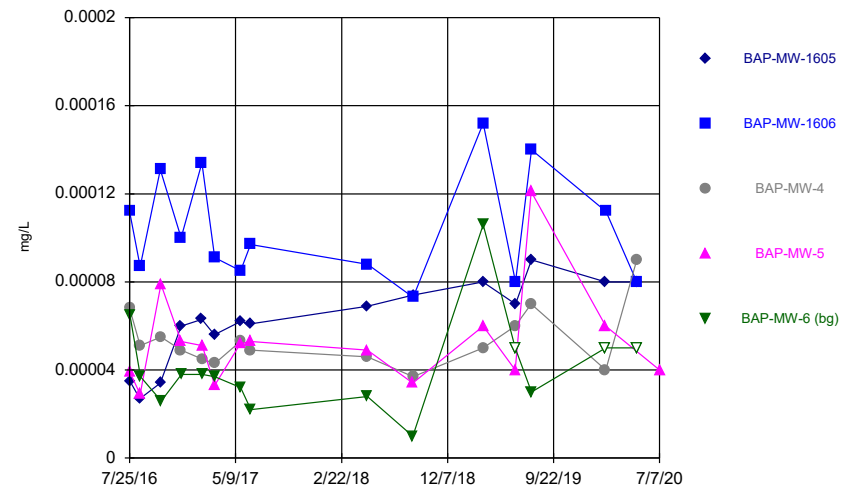
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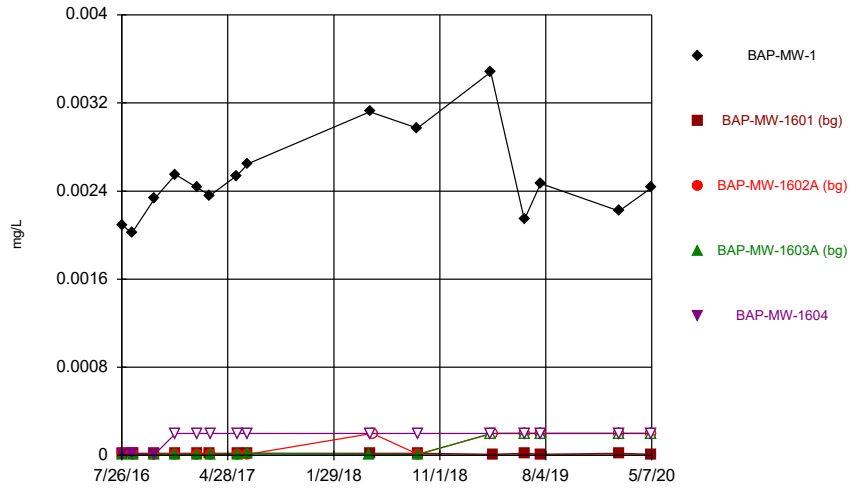
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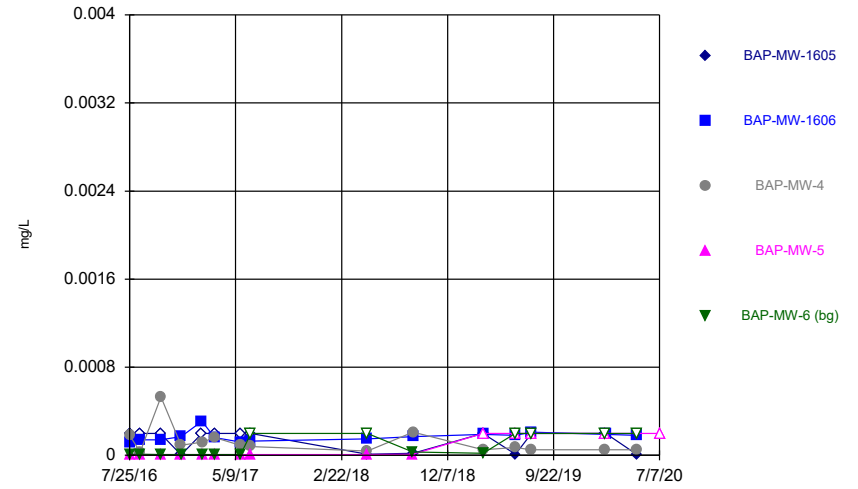
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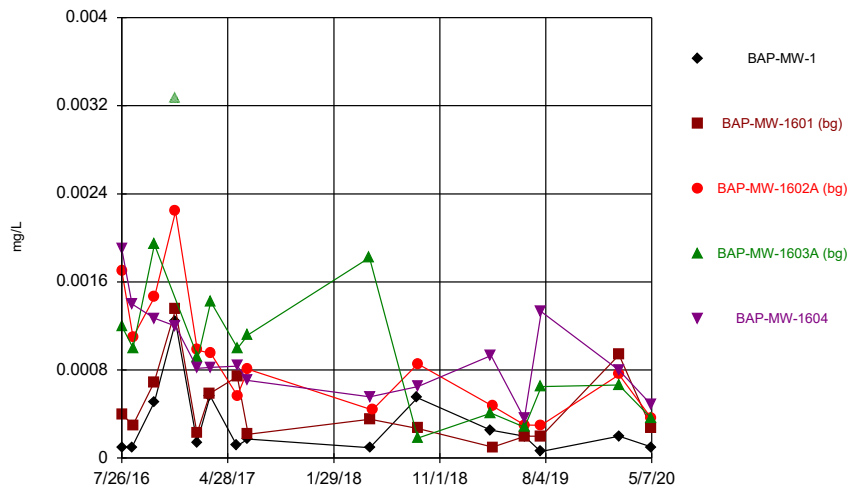
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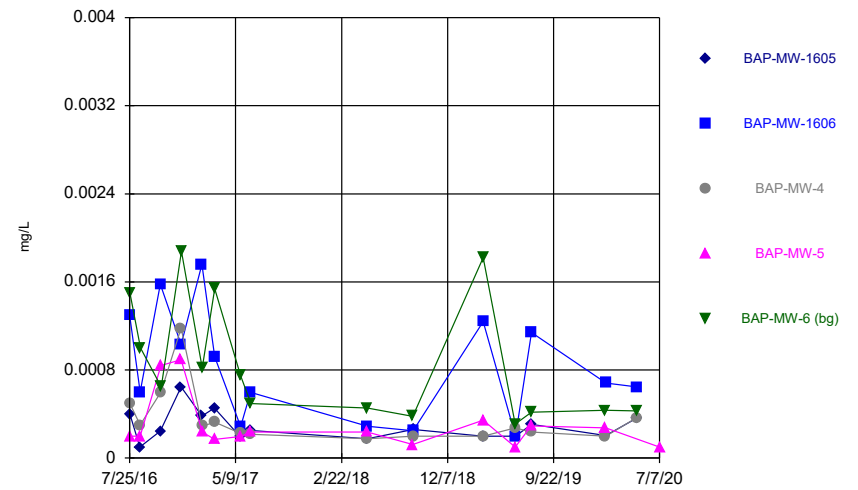
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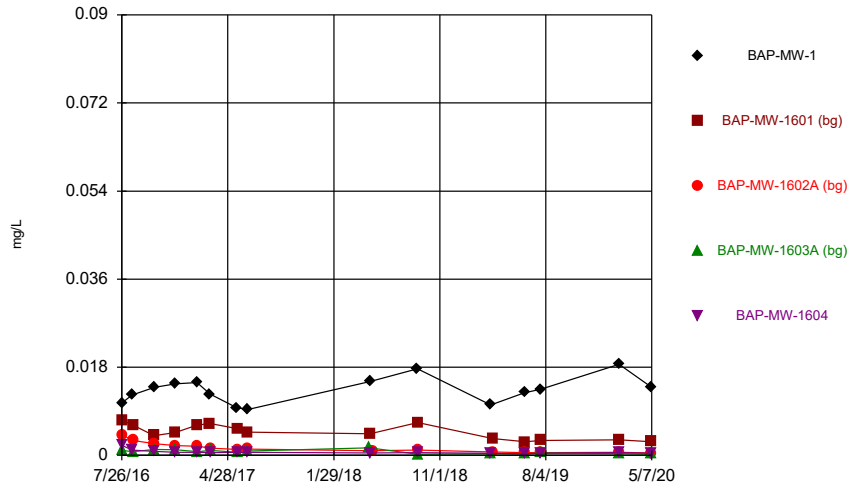
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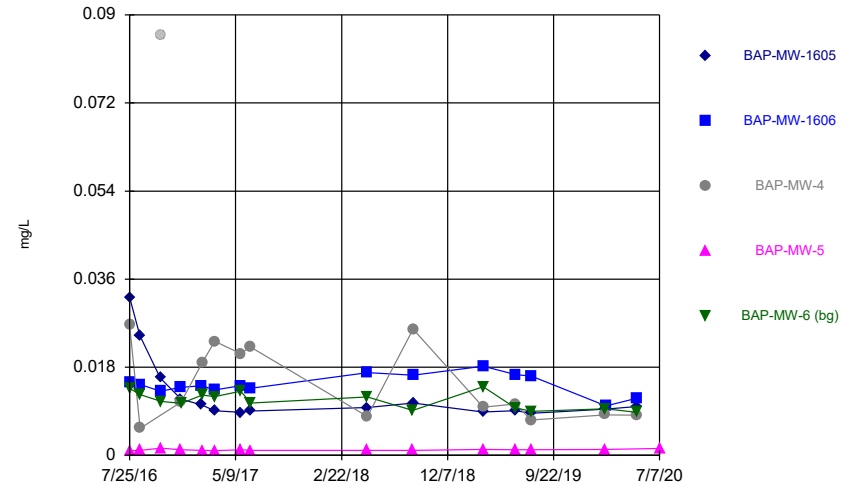
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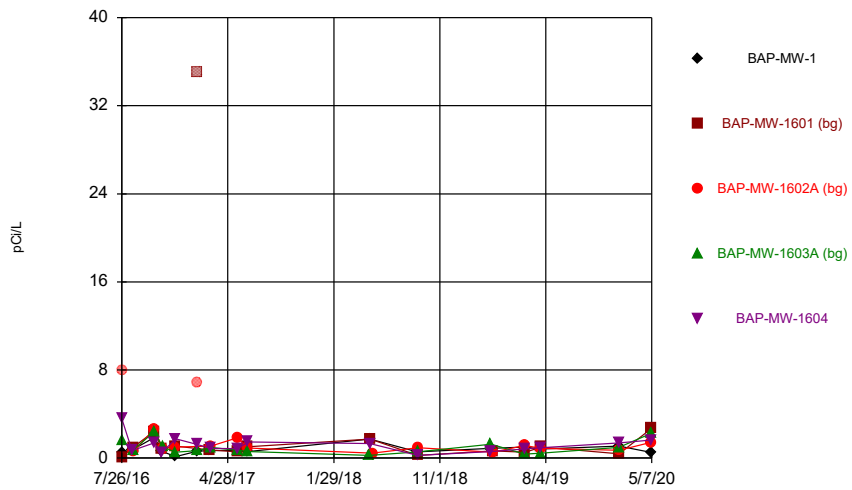
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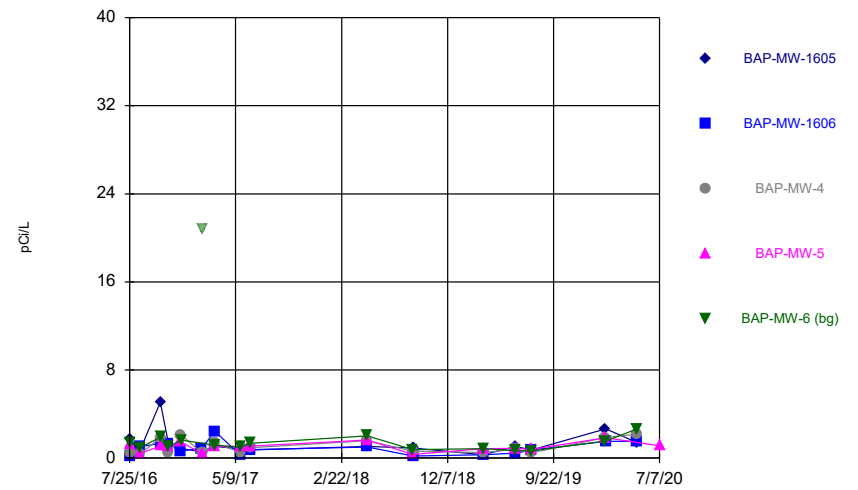
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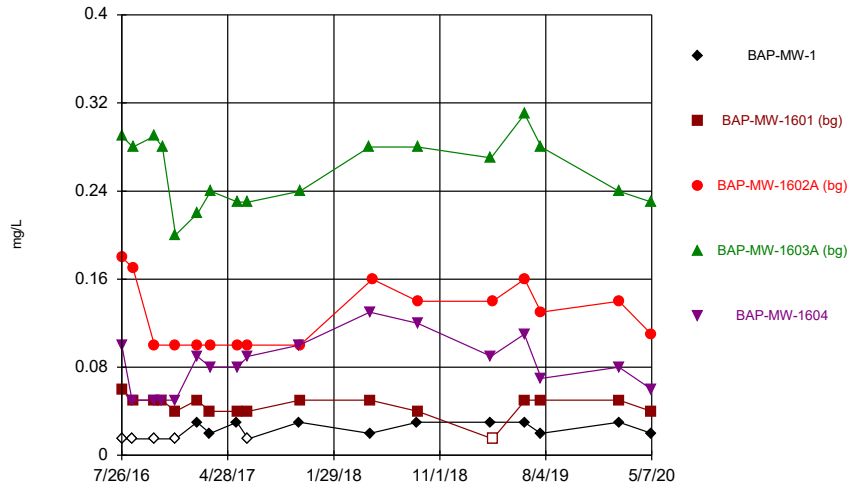
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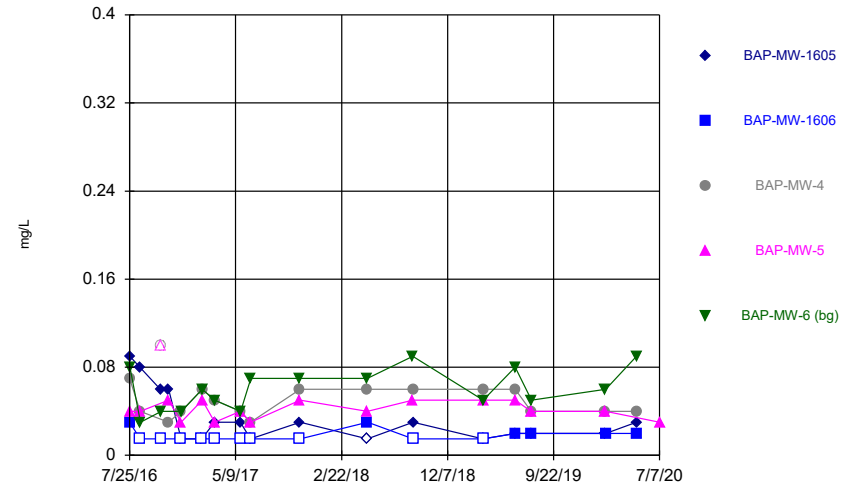
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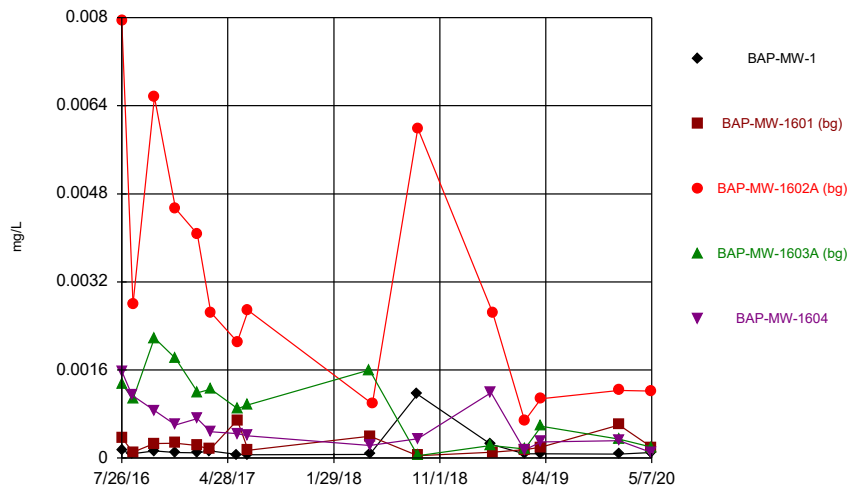
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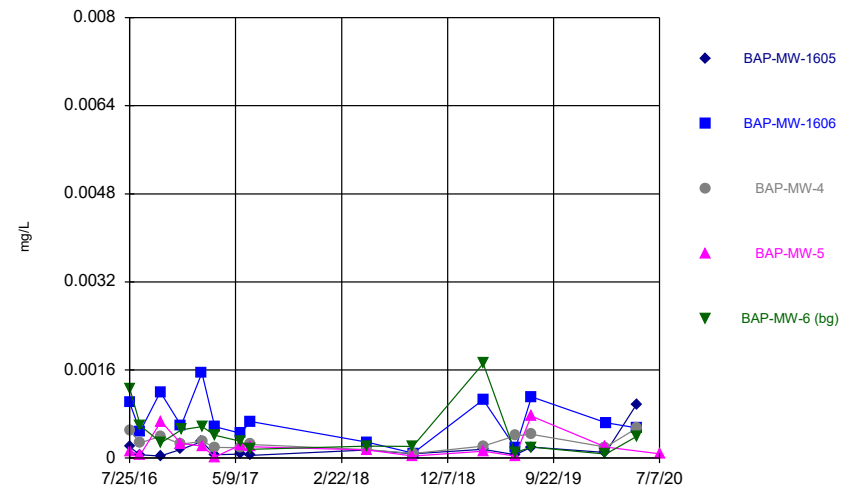
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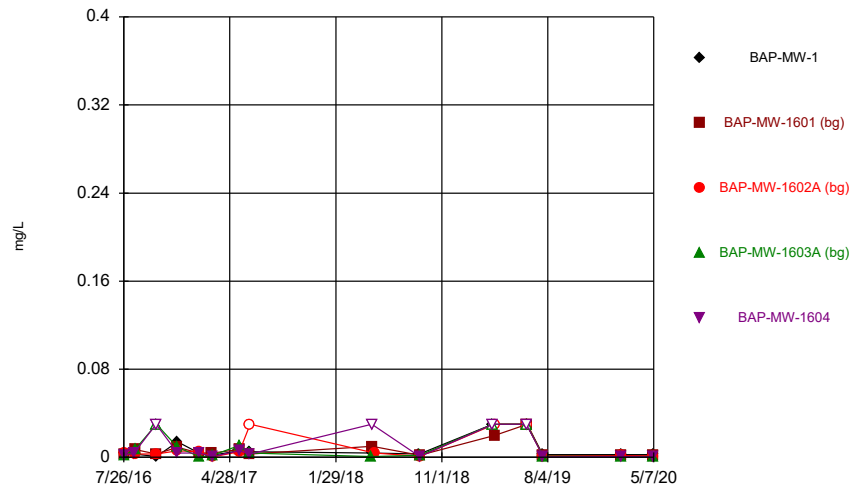
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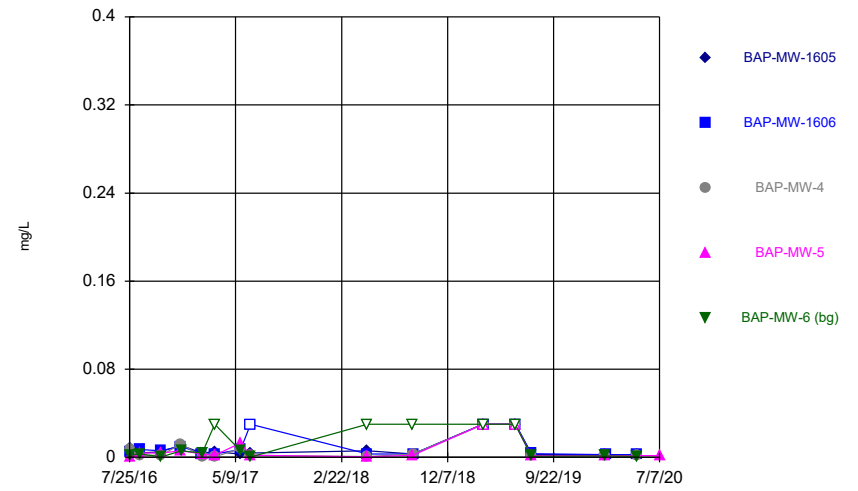
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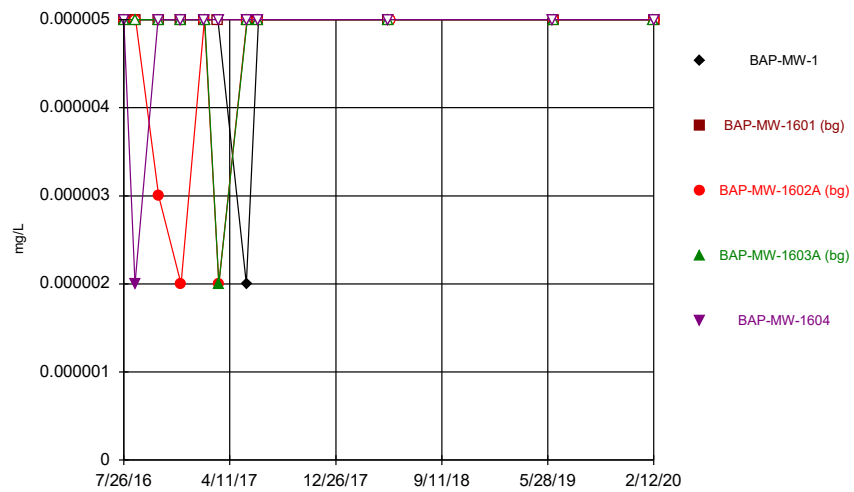
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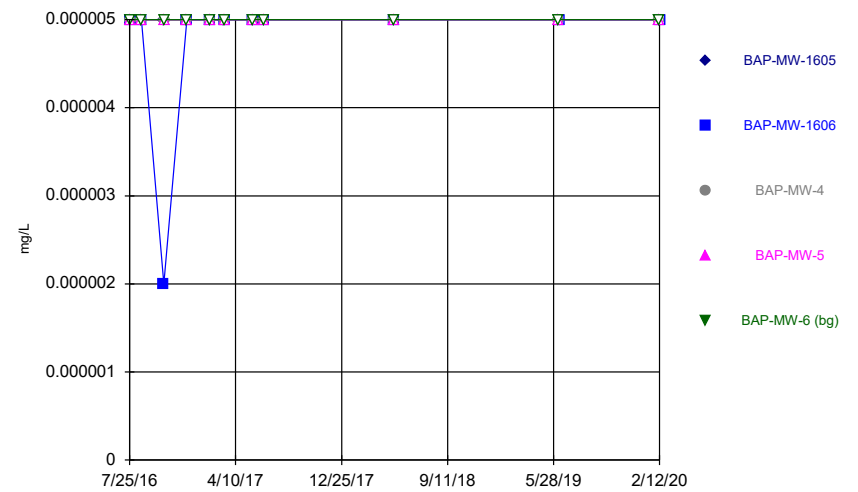
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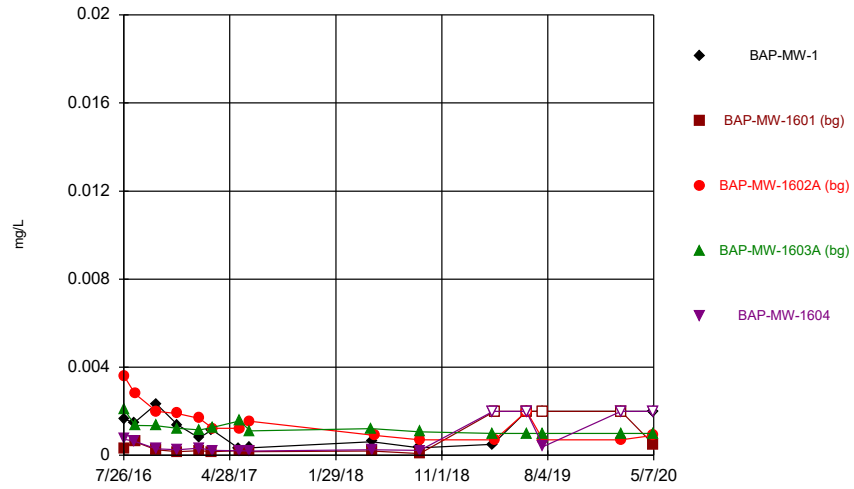
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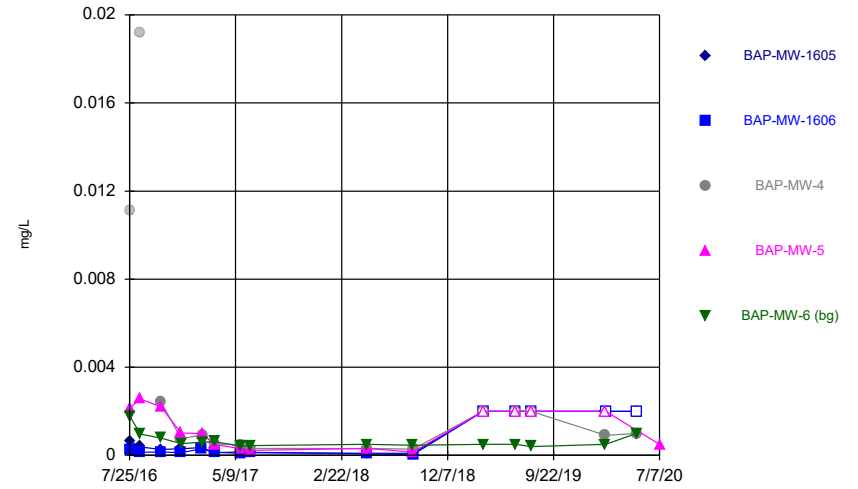
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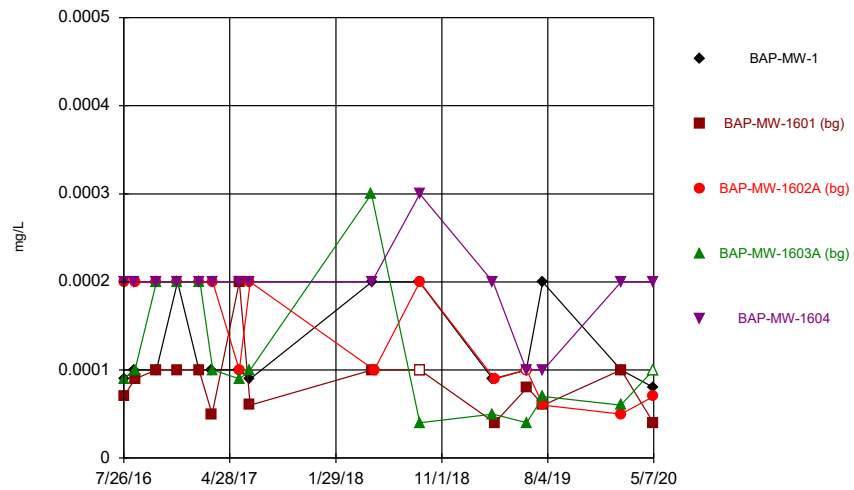
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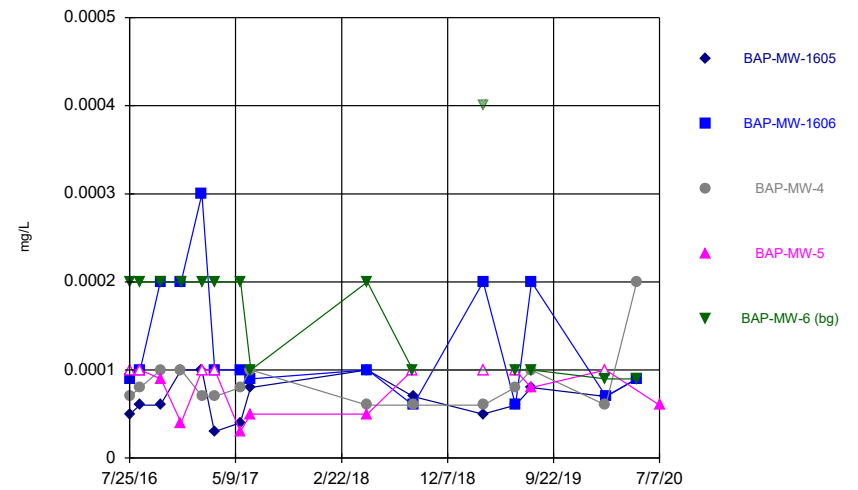
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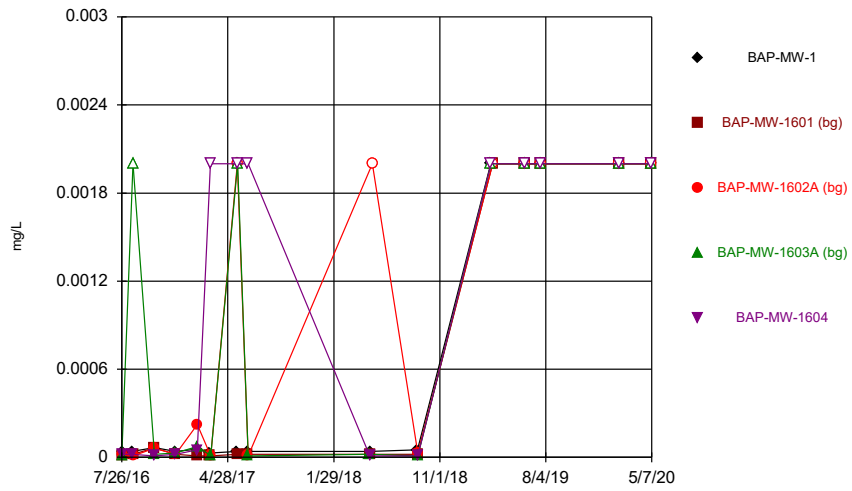
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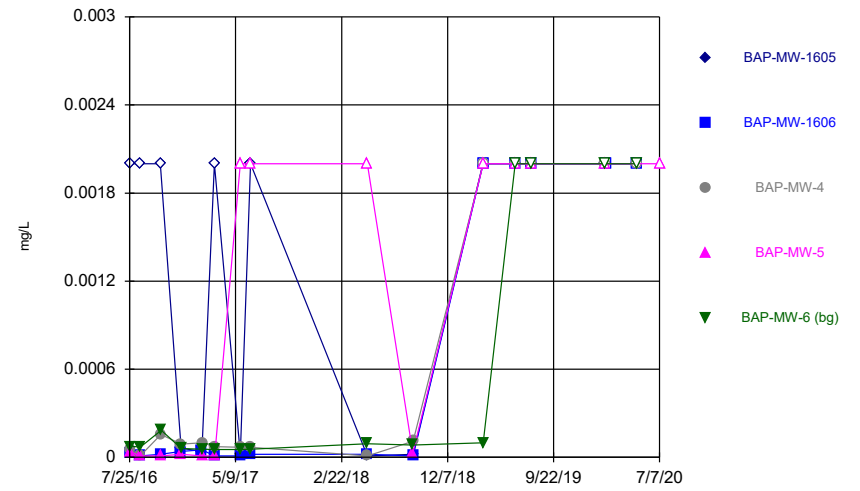
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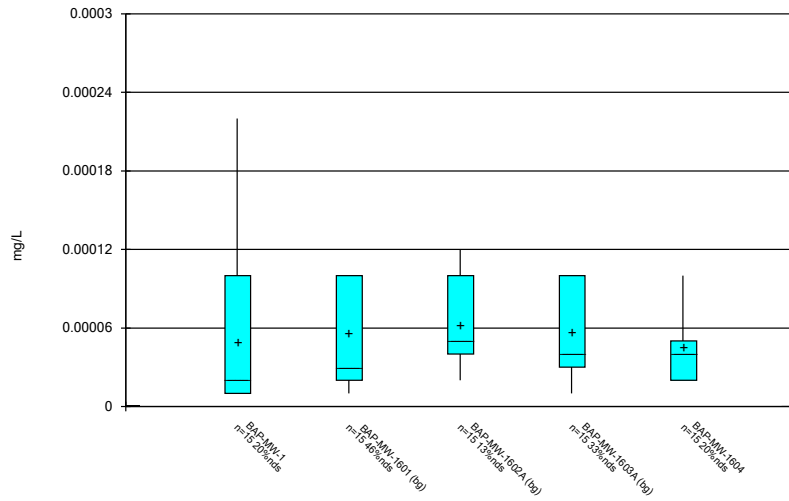
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 Amos BAP Client: Geosyntec Data: Amos BAP

Time Series



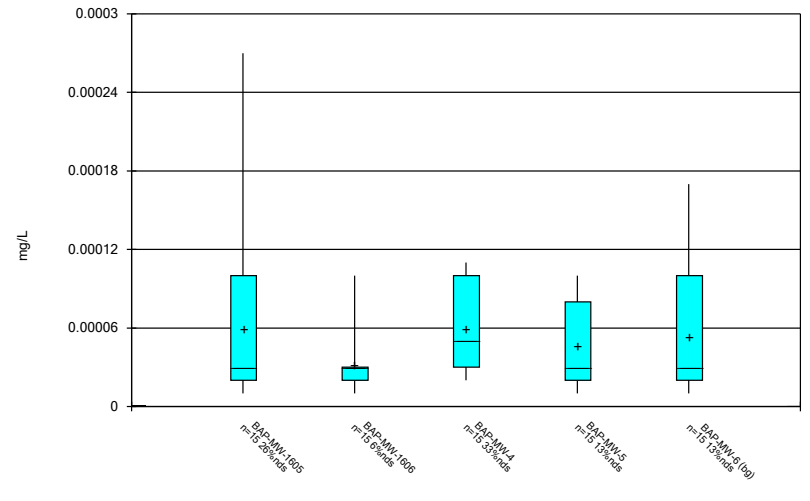
Constituent: Thallium, total Analysis Run 8/21/2020 2:48 PM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



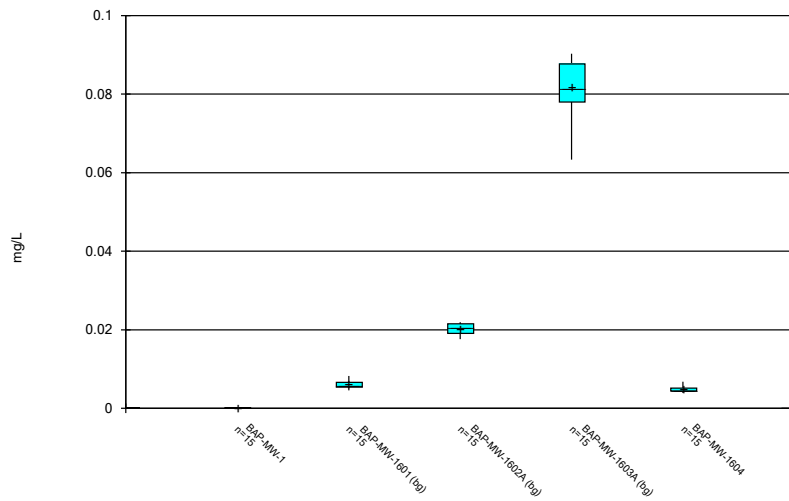
Constituent: Antimony, total
Amos BAP
Analysis Run 8/21/2020 2:51 PM
Client: Geosyntec
Data: Amos BAP
View: Appendix IV

Box & Whiskers Plot



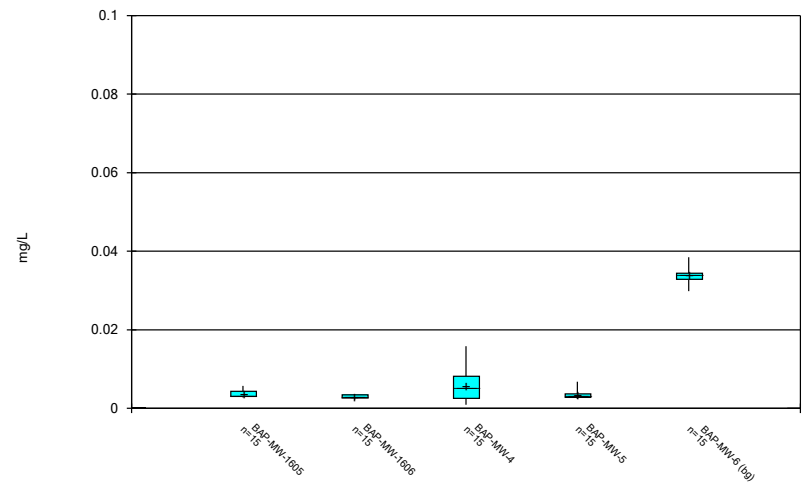
Constituent: Antimony, total
Amos BAP
Analysis Run 8/21/2020 2:51 PM
Client: Geosyntec
Data: Amos BAP
View: Appendix IV

Box & Whiskers Plot



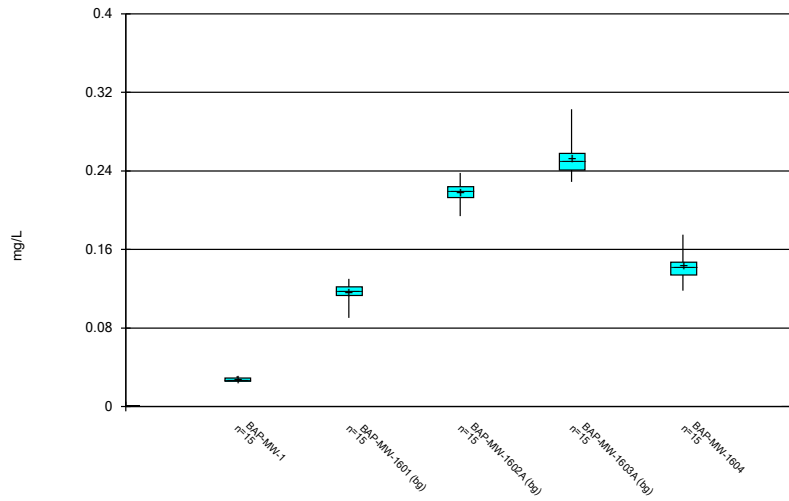
Constituent: Arsenic, total
Amos BAP
Analysis Run 8/21/2020 2:51 PM
Client: Geosyntec
Data: Amos BAP
View: Appendix IV

Box & Whiskers Plot



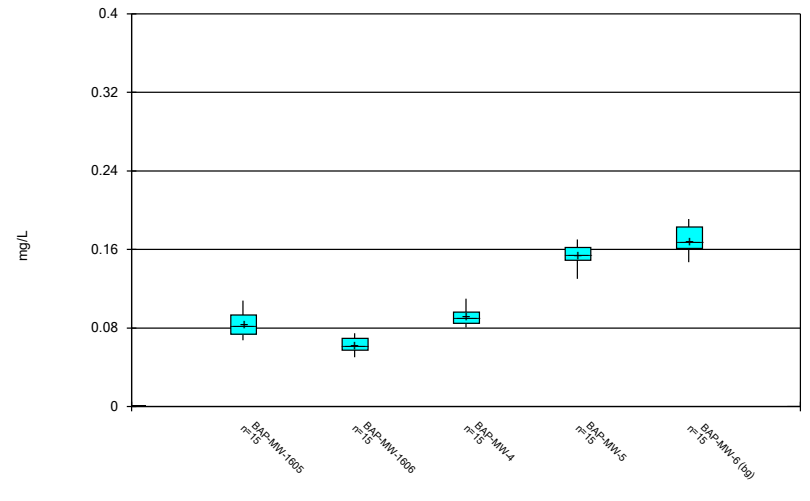
Constituent: Arsenic, total
Amos BAP
Analysis Run 8/21/2020 2:51 PM
Client: Geosyntec
Data: Amos BAP
View: Appendix IV

Box & Whiskers Plot



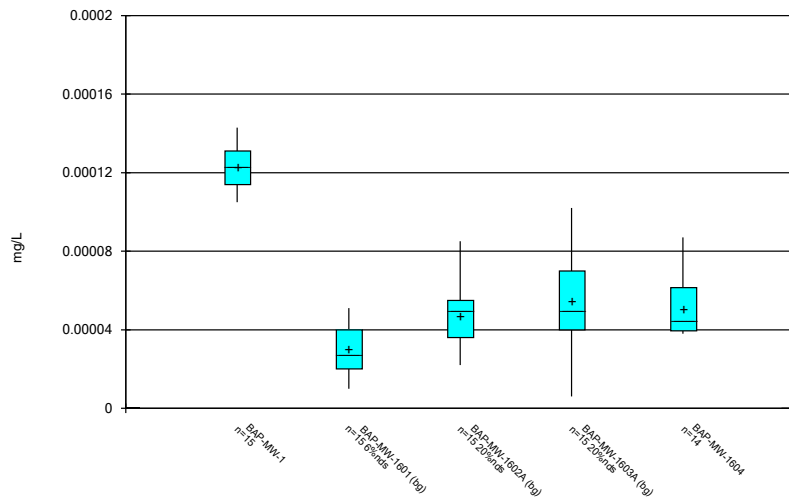
Constituent: Barium, total Analysis Run 8/21/2020 2:51 PM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



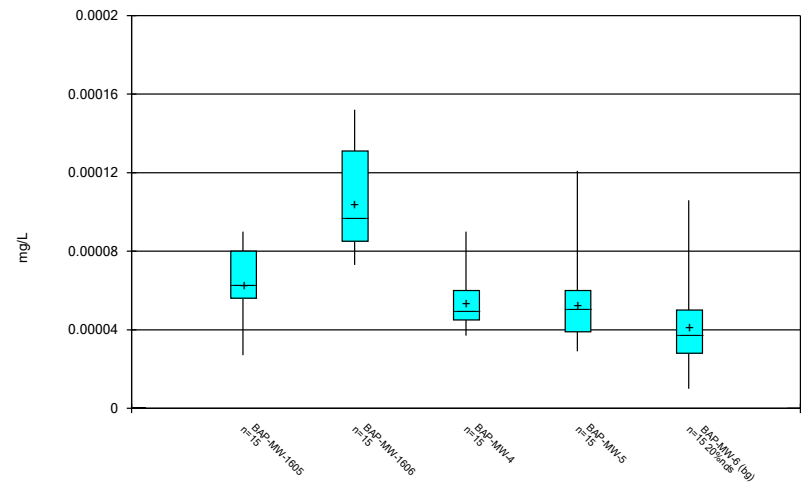
Constituent: Barium, total Analysis Run 8/21/2020 2:51 PM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



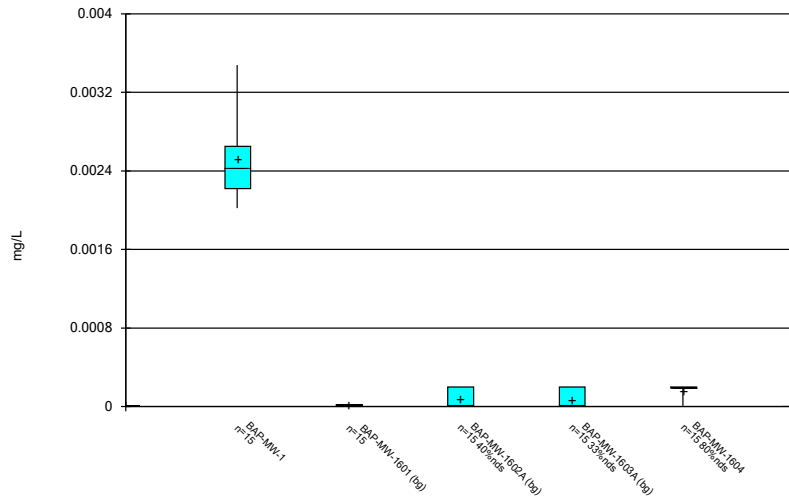
Constituent: Beryllium, total Analysis Run 8/21/2020 2:51 PM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



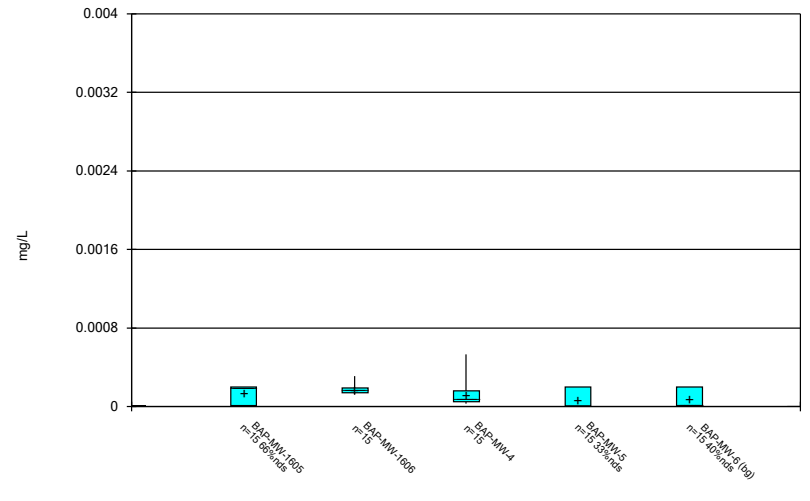
Constituent: Beryllium, total Analysis Run 8/21/2020 2:51 PM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



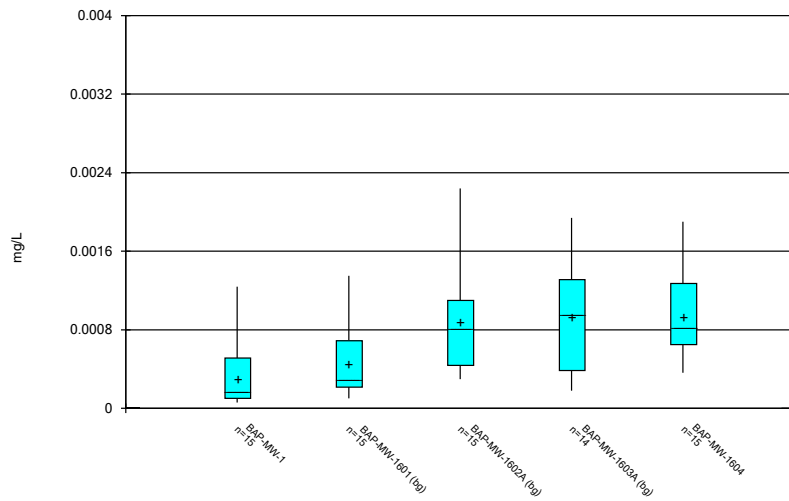
Constituent: Cadmium, total Analysis Run 8/21/2020 2:51 PM View: Appendix IV
Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



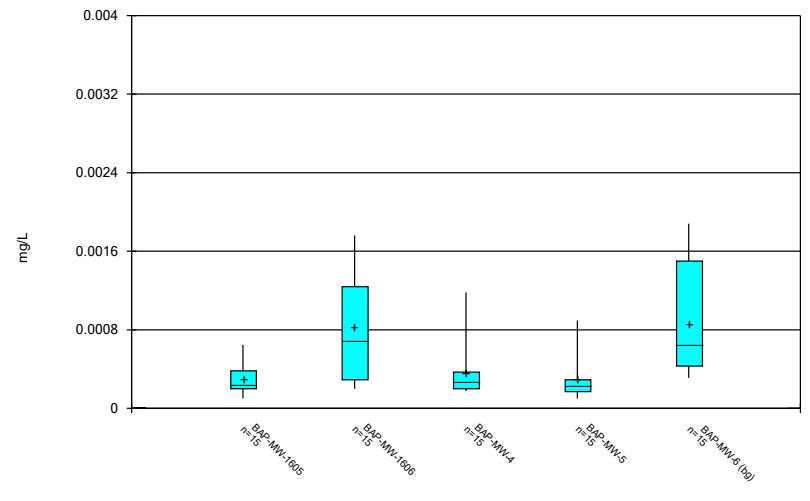
Constituent: Cadmium, total Analysis Run 8/21/2020 2:51 PM View: Appendix IV
Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



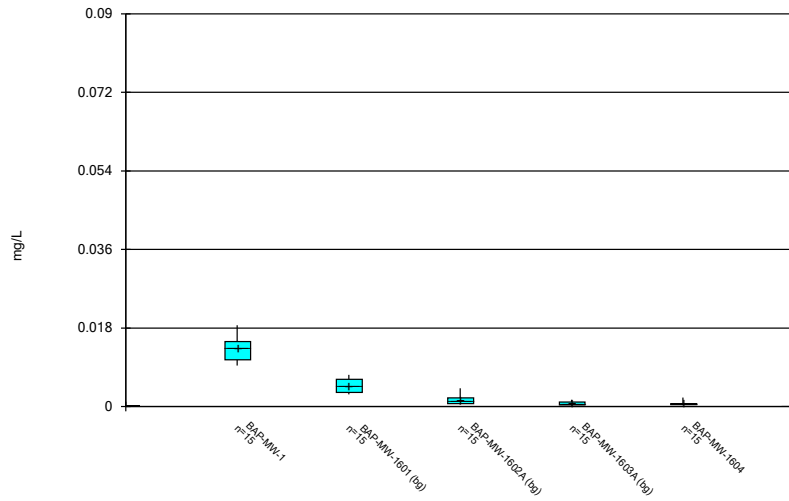
Constituent: Chromium, total Analysis Run 8/21/2020 2:51 PM View: Appendix IV
Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



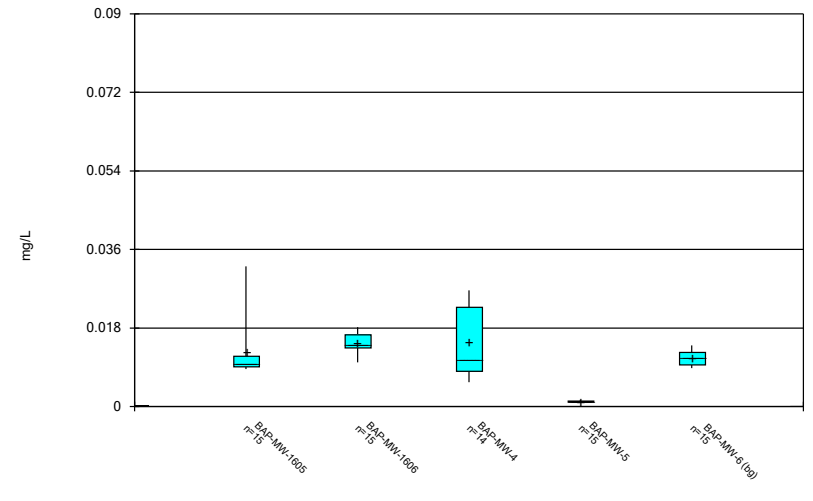
Constituent: Chromium, total Analysis Run 8/21/2020 2:51 PM View: Appendix IV
Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



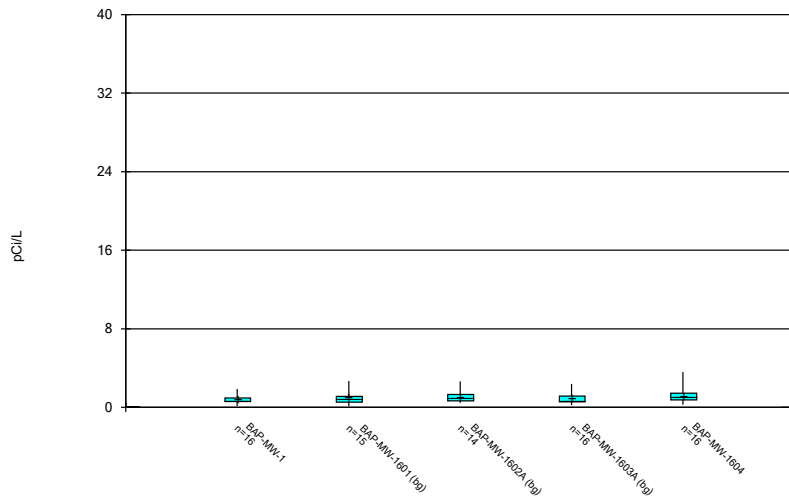
Constituent: Cobalt, total Analysis Run 8/21/2020 2:51 PM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



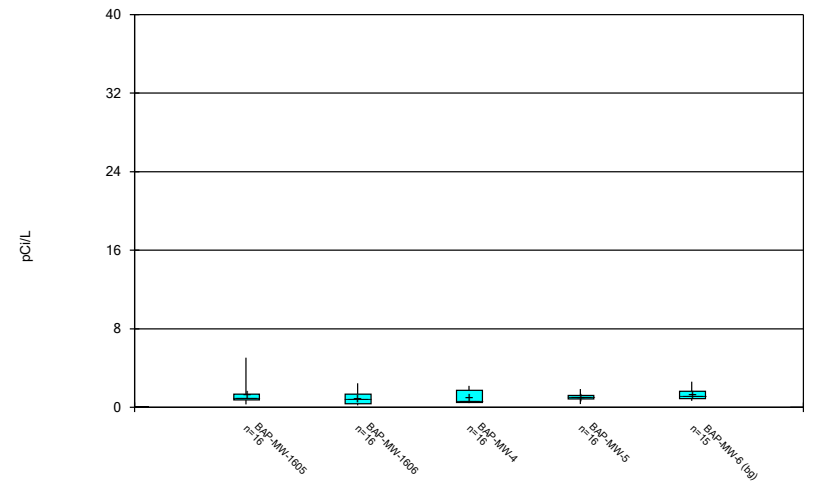
Constituent: Cobalt, total Analysis Run 8/21/2020 2:51 PM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



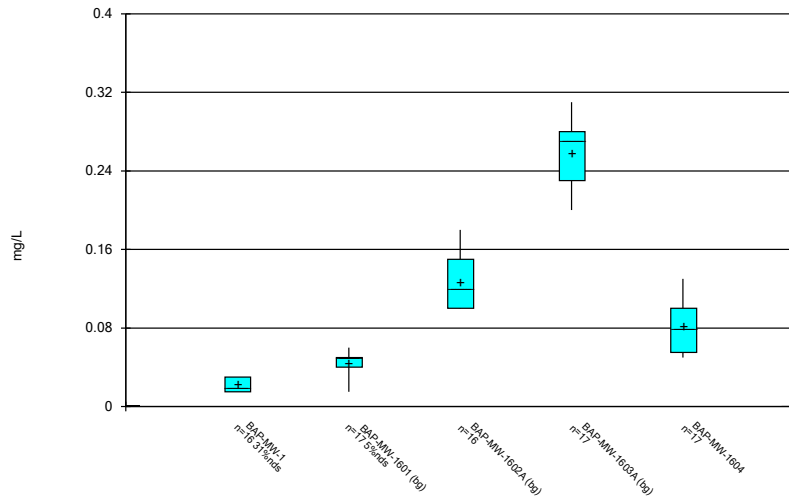
Constituent: Combined Radium 226 + 228 Analysis Run 8/21/2020 2:51 PM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



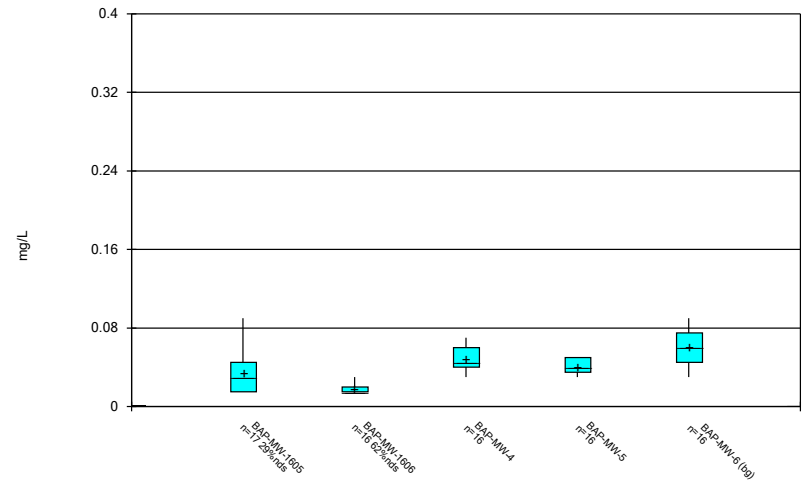
Constituent: Combined Radium 226 + 228 Analysis Run 8/21/2020 2:51 PM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



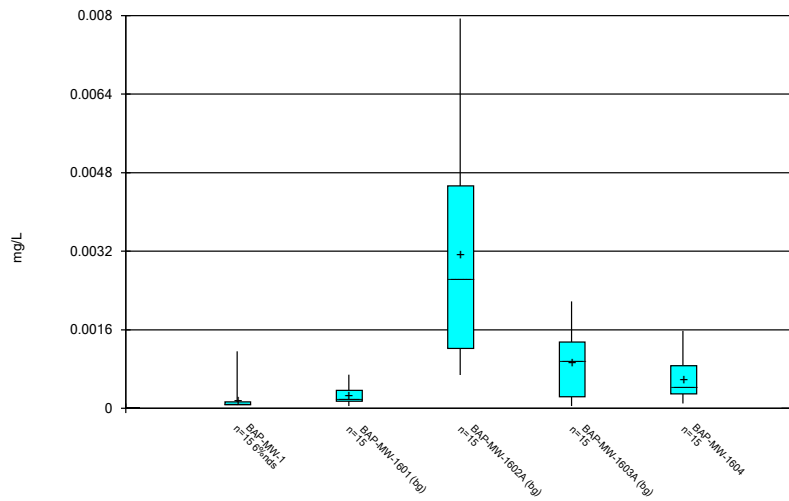
Constituent: Fluoride, total Analysis Run 8/21/2020 2:51 PM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



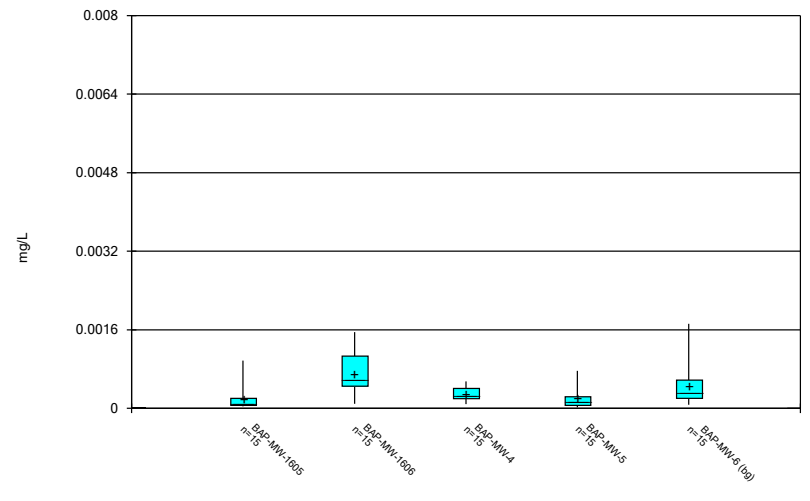
Constituent: Fluoride, total Analysis Run 8/21/2020 2:51 PM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



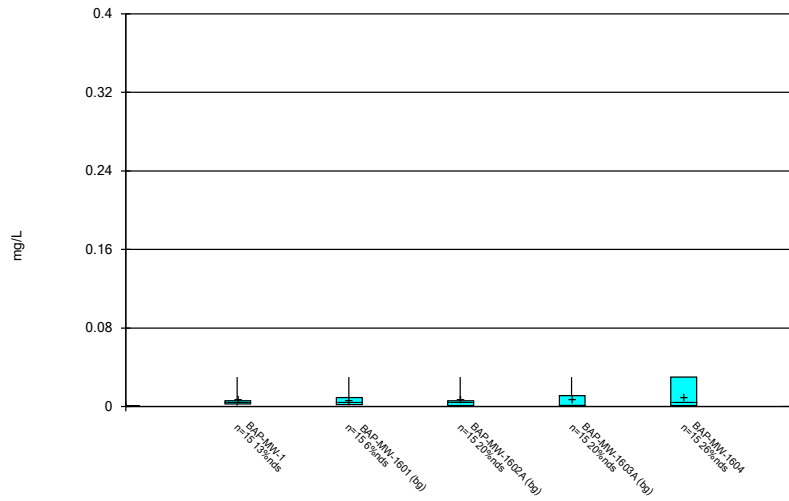
Constituent: Lead, total Analysis Run 8/21/2020 2:51 PM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



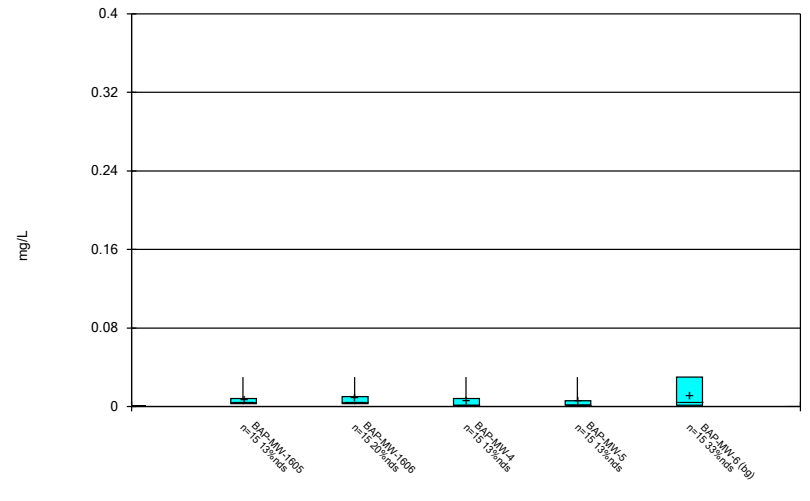
Constituent: Lead, total Analysis Run 8/21/2020 2:51 PM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



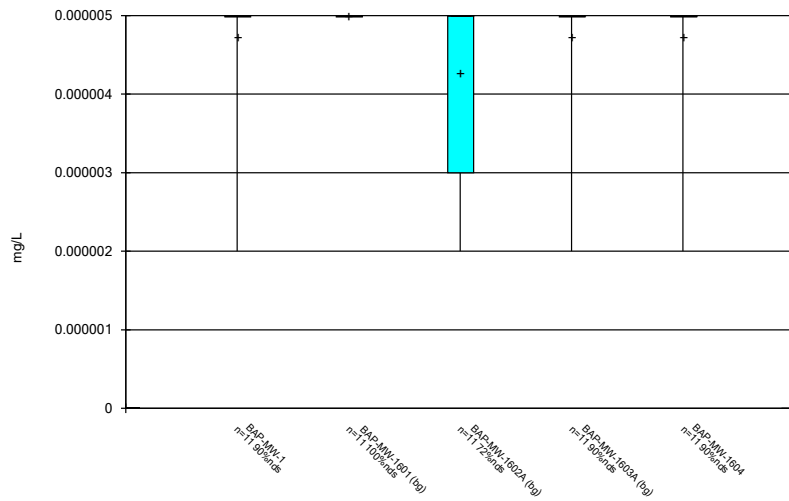
Constituent: Lithium, total Analysis Run 8/21/2020 2:51 PM View: Appendix IV
Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



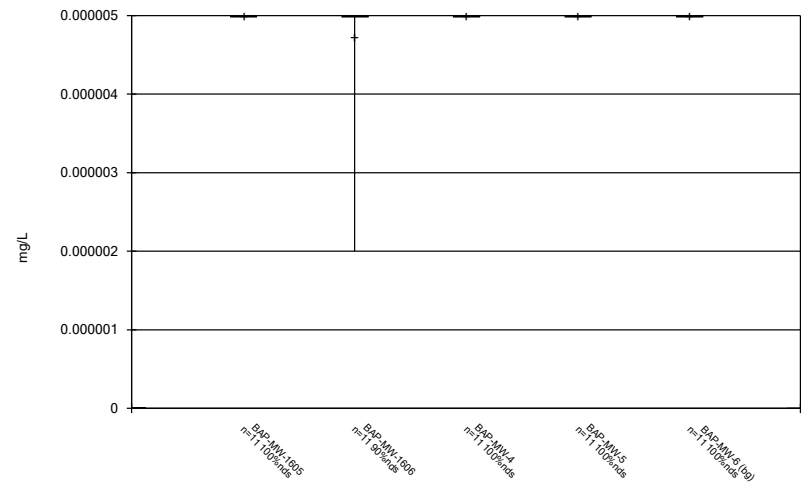
Constituent: Lithium, total Analysis Run 8/21/2020 2:51 PM View: Appendix IV
Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



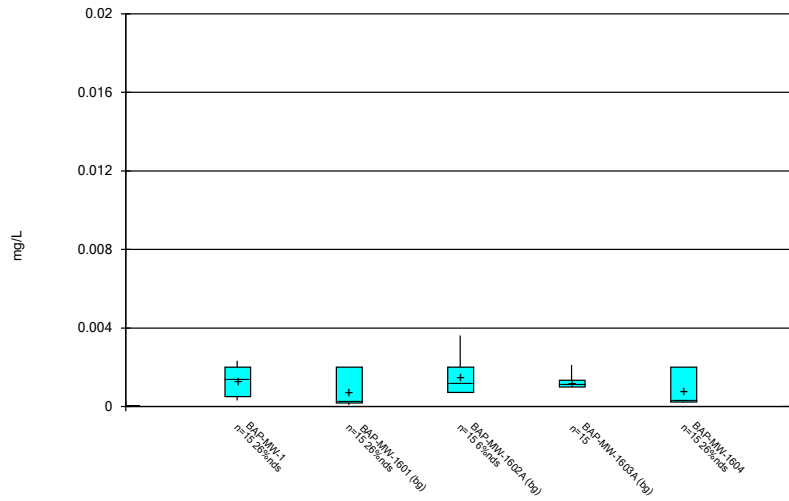
Constituent: Mercury, total Analysis Run 8/21/2020 2:51 PM View: Appendix IV
Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



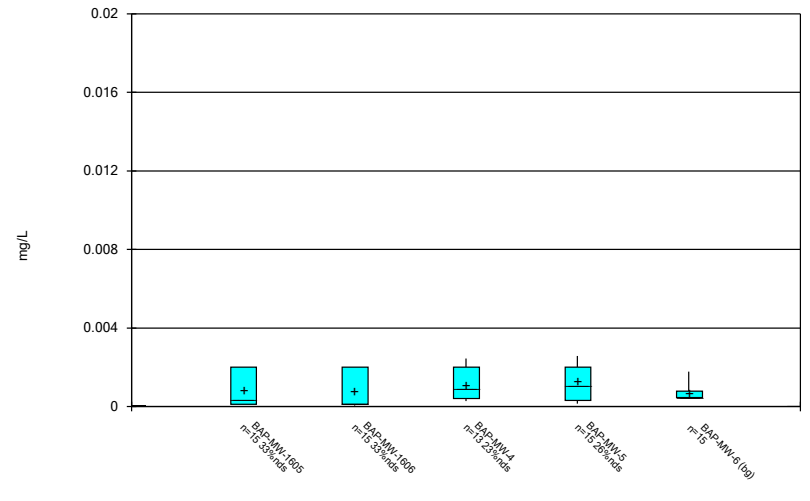
Constituent: Mercury, total Analysis Run 8/21/2020 2:51 PM View: Appendix IV
Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



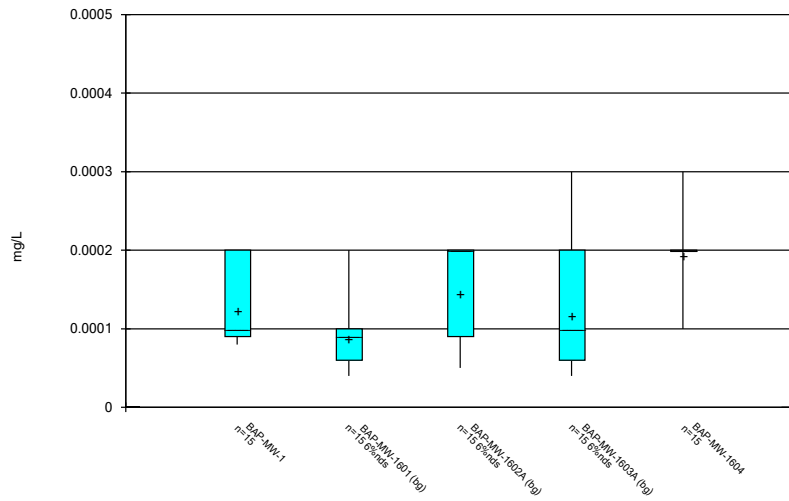
Constituent: Molybdenum, total Analysis Run 8/21/2020 2:51 PM View: Appendix IV
Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



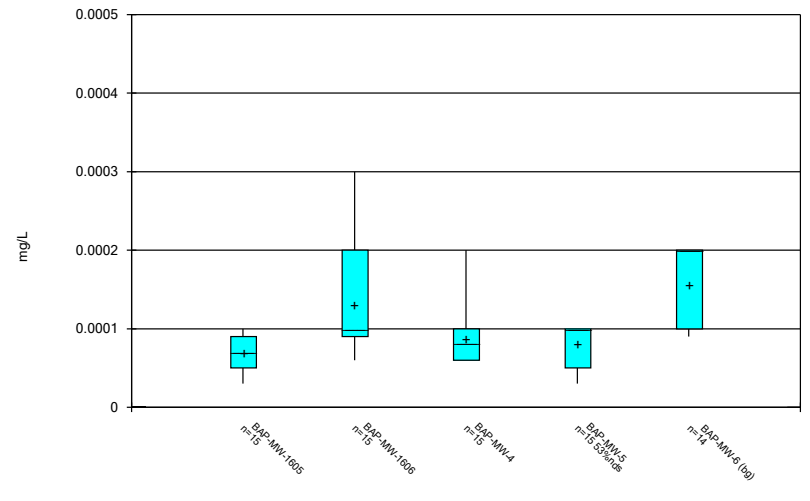
Constituent: Molybdenum, total Analysis Run 8/21/2020 2:51 PM View: Appendix IV
Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



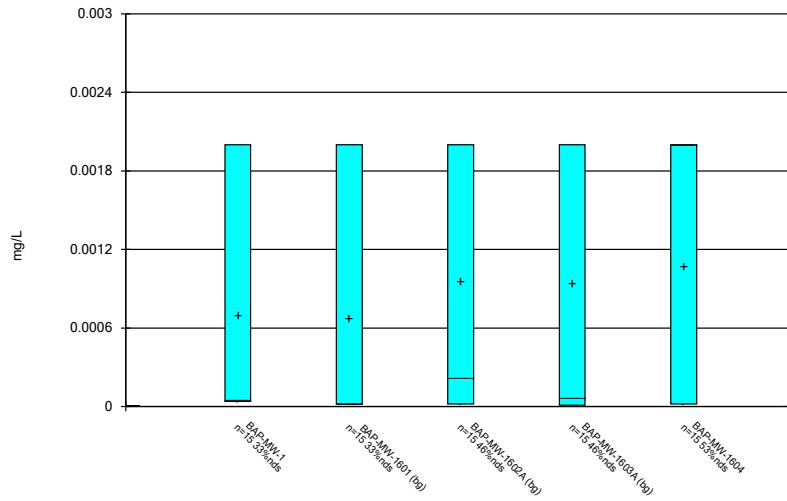
Constituent: Selenium, total Analysis Run 8/21/2020 2:51 PM View: Appendix IV
Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



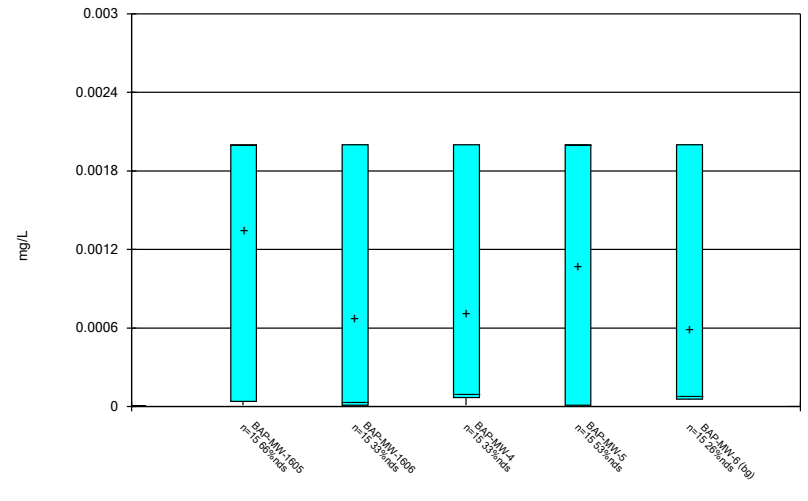
Constituent: Selenium, total Analysis Run 8/21/2020 2:51 PM View: Appendix IV
Amos BAP Client: Geosyntec Data: Amos BAP

Box & Whiskers Plot



Constituent: Thallium, total
Amos BAP
Analysis Run 8/21/2020 2:51 PM
Client: Geosyntec
View: Appendix IV
Data: Amos BAP

Box & Whiskers Plot



Constituent: Thallium, total
Amos BAP
Analysis Run 8/21/2020 2:51 PM
Client: Geosyntec
View: Appendix IV
Data: Amos BAP

Tukey's Outlier Analysis - Upgradient Wells - Significant Results

Amos BAP Client: Geosyntec Data: Amos BAP Printed 8/21/2020, 2:55 PM

| <u>Constituent</u> | <u>Well</u> | <u>Outlier</u> | <u>Value(s)</u> | <u>Date(s)</u> | <u>Method</u> | <u>N</u> | <u>Distribution</u> | <u>Normality Test</u> |
|-----------------------------------|----------------------|----------------|-------------------------|-------------------|---------------|----------|---------------------|-----------------------|
| Chromium, total (mg/L) | BAP-MW-1601,BAP-M... | Yes | 0.00327 | n/a w/combined bg | NP | 60 | normal | ShapiroFrancia |
| Combined Radium 226 + 228 (pCi/L) | BAP-MW-1601,BAP-M... | Yes | 35.02,7.914,6.853,20.83 | n/a w/combined bg | NP | 64 | normal | ShapiroFrancia |
| Lead, total (mg/L) | BAP-MW-1601,BAP-M... | Yes | 0.00794,0.00656,0.00599 | n/a w/combined bg | NP | 60 | normal | ShapiroFrancia |
| Molybdenum, total (mg/L) | BAP-MW-1601,BAP-M... | Yes | 0.00362 | n/a w/combined bg | NP | 60 | normal | ShapiroFrancia |

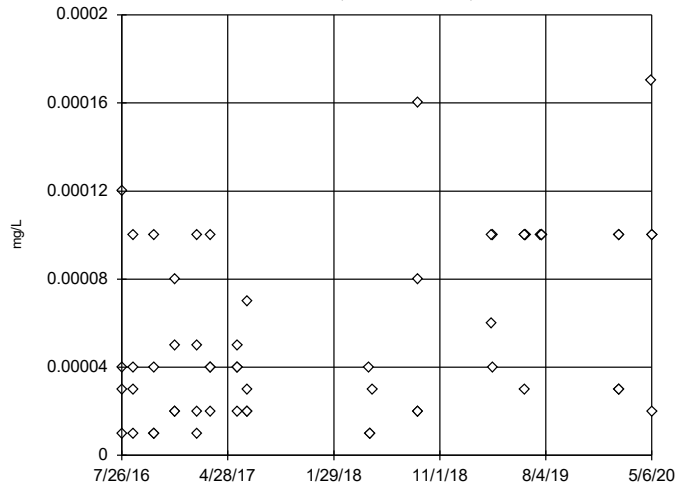
Tukey's Outlier Analysis - Upgradient Wells - All Results

Amos BAP Client: Geosyntec Data: Amos BAP Printed 8/21/2020, 2:55 PM

| Constituent | Well | Outlier | Value(s) | Date(s) | Method | N | Distribution | Normality Test |
|--|-----------------------------|------------|--------------------------------|--------------------------|-----------|-----------|---------------|-----------------------|
| Antimony, total (mg/L) | BAP-MW-1601,BAP-M... | No | n/a | n/a w/combined bg | NP | 60 | normal | ShapiroFrancia |
| Arsenic, total (mg/L) | BAP-MW-1601,BAP-M... | No | n/a | n/a w/combined bg | NP | 60 | normal | ShapiroFrancia |
| Barium, total (mg/L) | BAP-MW-1601,BAP-M... | No | n/a | n/a w/combined bg | NP | 60 | normal | ShapiroFrancia |
| Beryllium, total (mg/L) | BAP-MW-1601,BAP-M... | No | n/a | n/a w/combined bg | NP | 60 | normal | ShapiroFrancia |
| Cadmium, total (mg/L) | BAP-MW-1601,BAP-M... | No | n/a | n/a w/combined bg | NP | 60 | normal | ShapiroFrancia |
| Chromium, total (mg/L) | BAP-MW-1601,BAP-M... | Yes | 0.00327 | n/a w/combined bg | NP | 60 | normal | ShapiroFrancia |
| Cobalt, total (mg/L) | BAP-MW-1601,BAP-M... | No | n/a | n/a w/combined bg | NP | 60 | normal | ShapiroFrancia |
| Combined Radium 226 + 228 (pCi/L) | BAP-MW-1601,BAP-M... | Yes | 35.02,7.914,6.853,20.83 | n/a w/combined bg | NP | 64 | normal | ShapiroFrancia |
| Fluoride, total (mg/L) | BAP-MW-1601,BAP-M... | No | n/a | n/a w/combined bg | NP | 66 | normal | ShapiroFrancia |
| Lead, total (mg/L) | BAP-MW-1601,BAP-M... | Yes | 0.00794,0.00656,0.00599 | n/a w/combined bg | NP | 60 | normal | ShapiroFrancia |
| Lithium, total (mg/L) | BAP-MW-1601,BAP-M... | No | n/a | n/a w/combined bg | NP | 60 | normal | ShapiroFrancia |
| Mercury, total (mg/L) | BAP-MW-1601,BAP-M... | n/a | n/a | n/a w/combined bg | NP | 44 | unknown | ShapiroWilk |
| Molybdenum, total (mg/L) | BAP-MW-1601,BAP-M... | Yes | 0.00362 | n/a w/combined bg | NP | 60 | normal | ShapiroFrancia |
| Selenium, total (mg/L) | BAP-MW-1601,BAP-M... | No | n/a | n/a w/combined bg | NP | 60 | normal | ShapiroFrancia |
| Thallium, total (mg/L) | BAP-MW-1601,BAP-M... | No | n/a | n/a w/combined bg | NP | 60 | normal | ShapiroFrancia |

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...

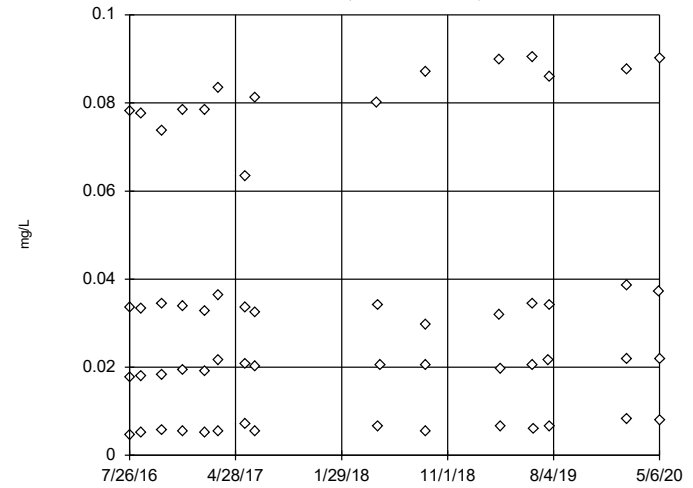


n = 60
 No outliers found.
 Tukey's method selected by user.
 High cutoff = 0.00034,
 low cutoff = -0.00022,
 based on IQR multiplier of 3.

Constituent: Antimony, total Analysis Run 8/21/2020 2:54 PM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...

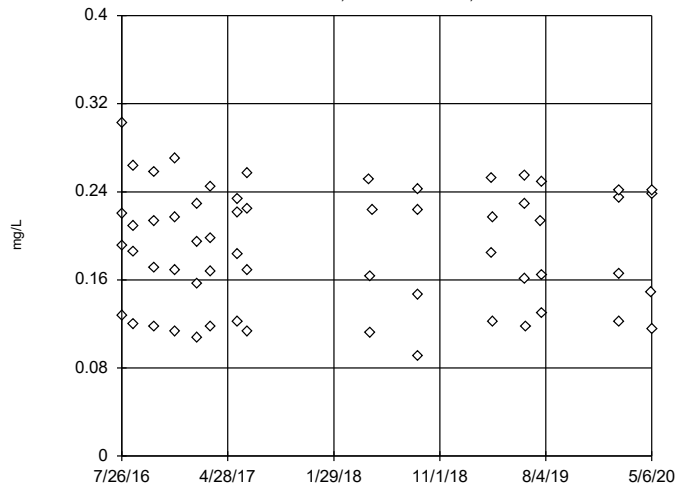


n = 60
 No outliers found.
 Tukey's method selected by user.
 High cutoff = 0.1648,
 low cutoff = -0.101,
 based on IQR multiplier of 3.

Constituent: Arsenic, total Analysis Run 8/21/2020 2:54 PM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...

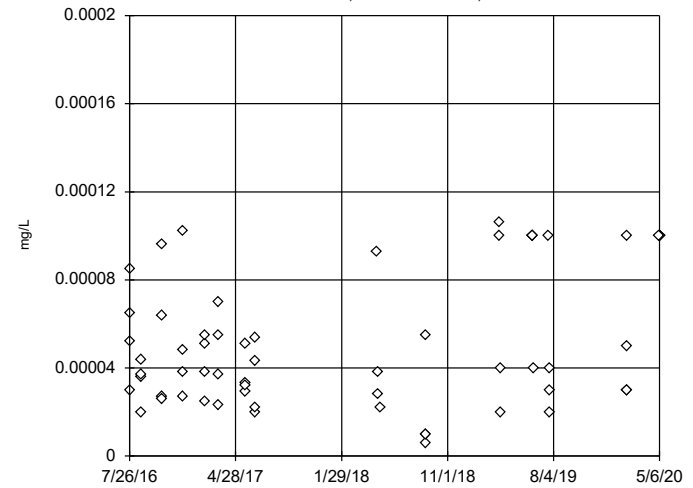


n = 60
 No outliers found.
 Tukey's method selected by user.
 High cutoff = 0.5185,
 low cutoff = -0.1465,
 based on IQR multiplier of 3.

Constituent: Barium, total Analysis Run 8/21/2020 2:54 PM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...

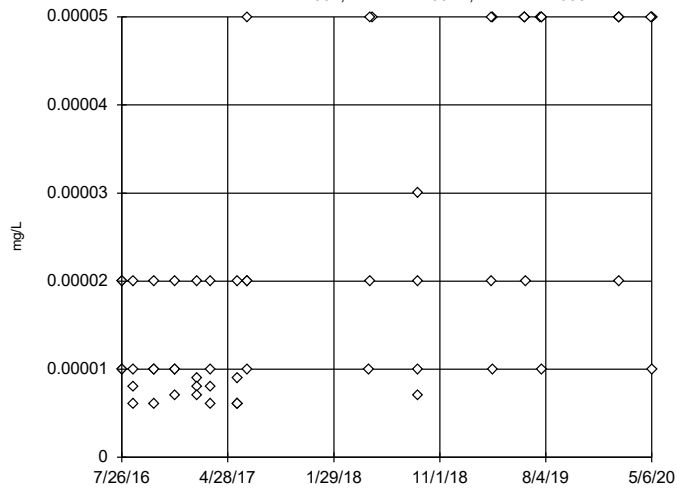


n = 60
 No outliers found.
 Tukey's method selected by user.
 High cutoff = 0.0002245,
 low cutoff = -0.0001185,
 based on IQR multiplier of 3.

Constituent: Beryllium, total Analysis Run 8/21/2020 2:54 PM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...

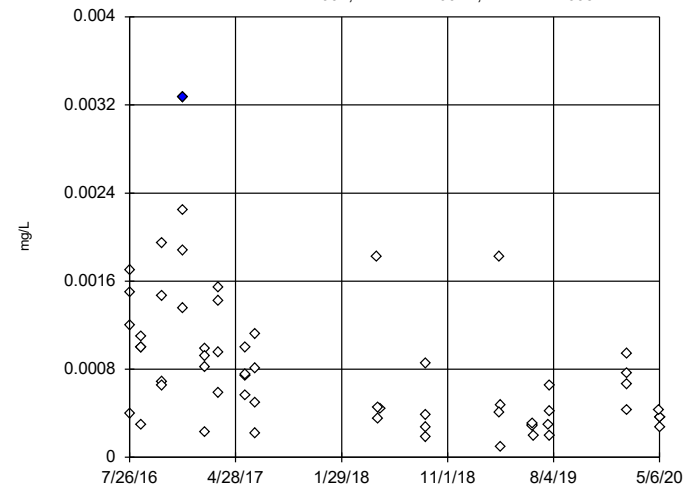


n = 60
 No outliers found.
 Tukey's method selected by user.
 High cutoff = 0.00017,
 low cutoff = -0.00011,
 based on IQR multiplier of 3.

Constituent: Cadmium, total Analysis Run 8/21/2020 2:54 PM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...

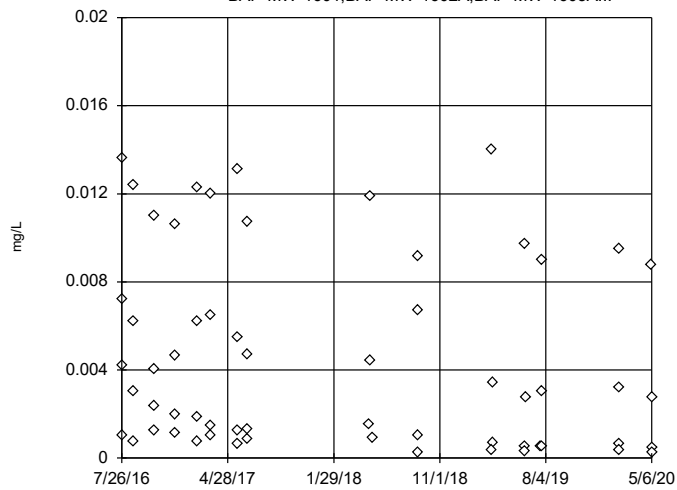


n = 60
 Outlier is drawn as solid.
 Tukey's method selected by user.
 High cutoff = 0.003116,
 low cutoff = -0.001704,
 based on IQR multiplier of 3.

Constituent: Chromium, total Analysis Run 8/21/2020 2:54 PM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...

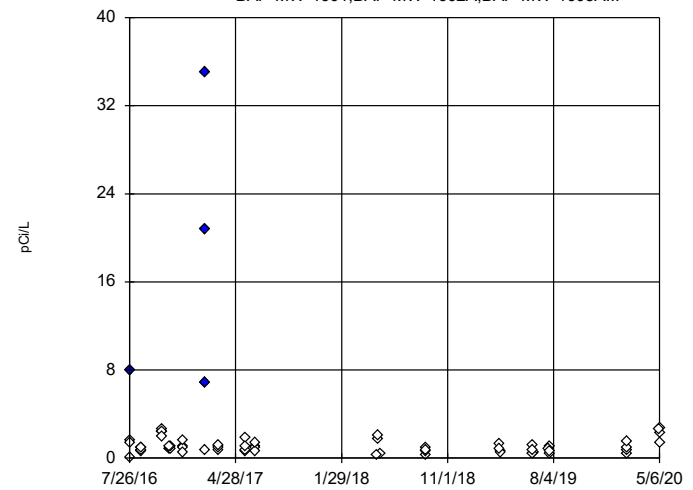


n = 60
 No outliers found.
 Tukey's method selected by user.
 High cutoff = 0.0294,
 low cutoff = -0.02049,
 based on IQR multiplier of 3.

Constituent: Cobalt, total Analysis Run 8/21/2020 2:54 PM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...

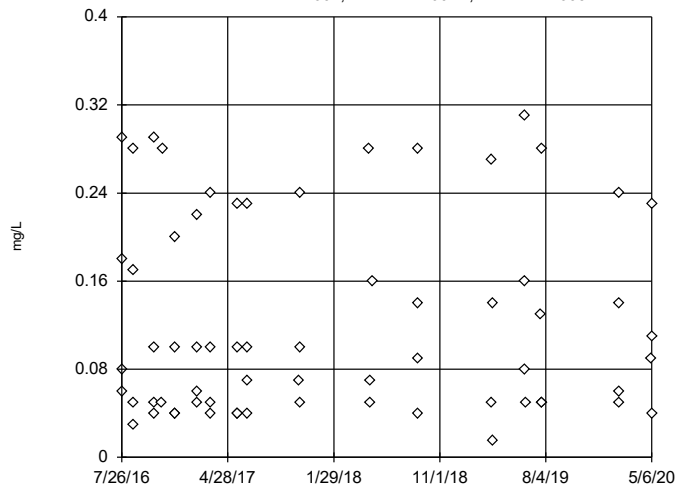


n = 64
 Outliers are drawn as solid.
 Tukey's method selected by user.
 High cutoff = 4.285,
 low cutoff = -2.029,
 based on IQR multiplier of 3.

Constituent: Combined Radium 226 + 228 Analysis Run 8/21/2020 2:54 PM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...

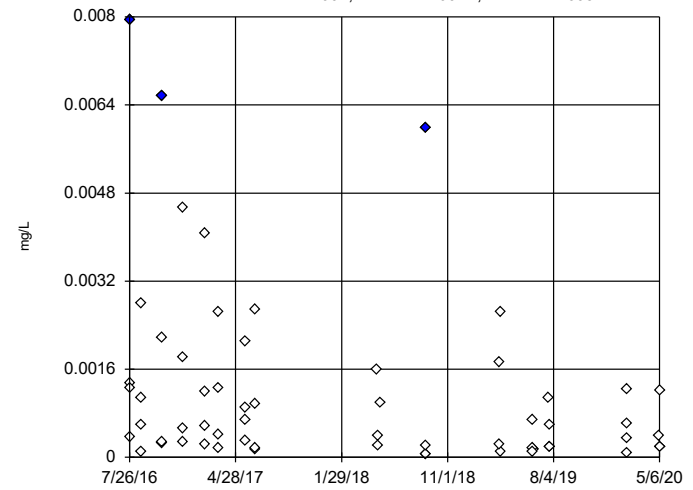


n = 66
 No outliers found.
 Tukey's method selected by user.
 High cutoff = 0.69, low cutoff = -0.43, based on IQR multiplier of 3.

Constituent: Fluoride, total Analysis Run 8/21/2020 2:54 PM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...

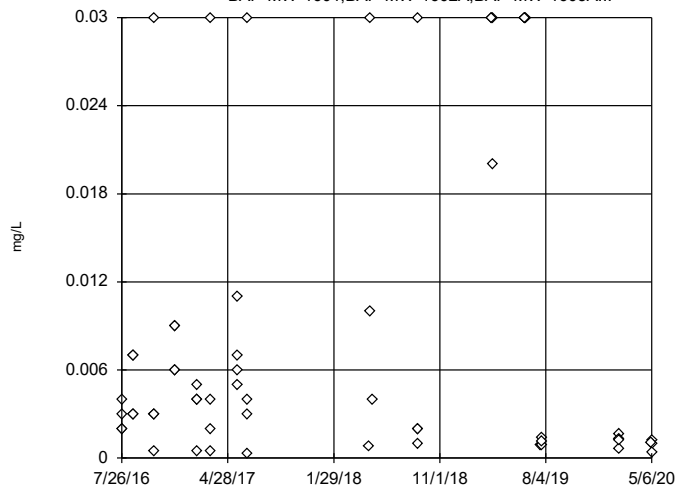


n = 60
 Outliers are drawn as solid.
 Tukey's method selected by user.
 High cutoff = 0.004579, low cutoff = -0.003072, based on IQR multiplier of 3.

Constituent: Lead, total Analysis Run 8/21/2020 2:54 PM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...

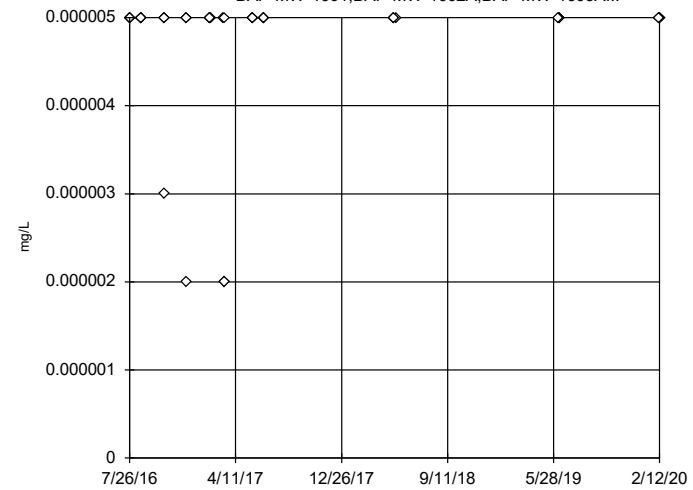


n = 60
 No outliers found.
 Tukey's method selected by user.
 High cutoff = 0.03428, low cutoff = -0.02354, based on IQR multiplier of 3.

Constituent: Lithium, total Analysis Run 8/21/2020 2:54 PM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...

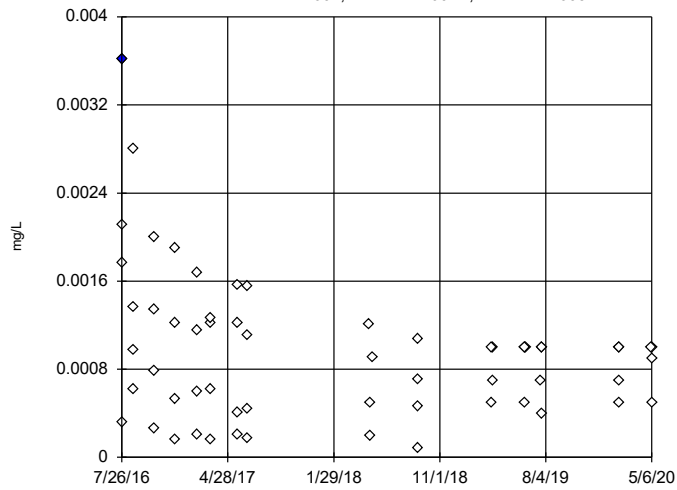


n = 44
 No outliers found.
 Tukey's method selected by user.
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Mercury, total Analysis Run 8/21/2020 2:54 PM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...

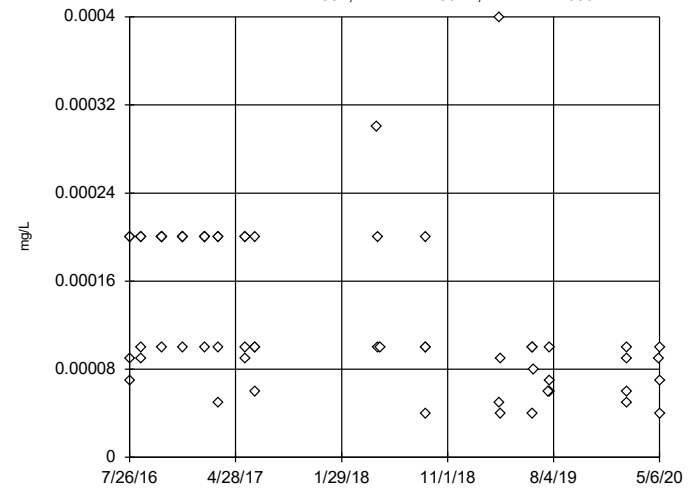


n = 60
 Outlier is drawn as solid.
 Tukey's method selected by user.
 High cutoff = 0.00336,
 low cutoff = -0.001645,
 based on IQR multiplier of 3.

Constituent: Molybdenum, total Analysis Run 8/21/2020 2:54 PM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...

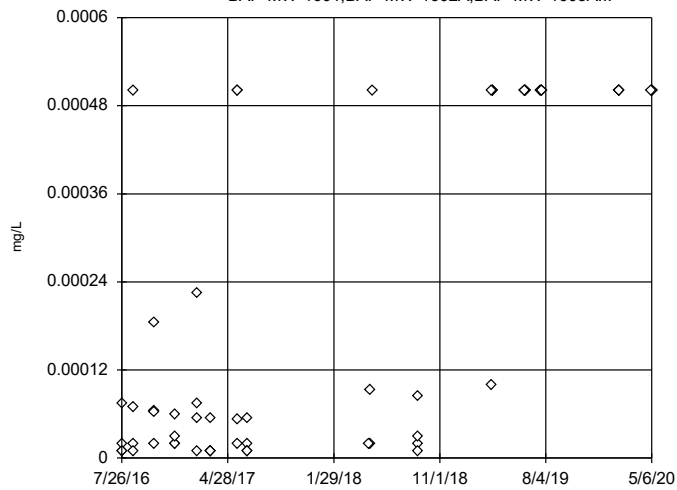


n = 60
 No outliers found.
 Tukey's method selected by user.
 High cutoff = 0.000545,
 low cutoff = -0.00026,
 based on IQR multiplier of 3.

Constituent: Selenium, total Analysis Run 8/21/2020 2:54 PM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Tukey's Outlier Screening, Pooled Background

BAP-MW-1601,BAP-MW-1602A,BAP-MW-1603A...



n = 60
 No outliers found.
 Tukey's method selected by user.
 High cutoff = 0.00194,
 low cutoff = -0.00142,
 based on IQR multiplier of 3.

Constituent: Thallium, total Analysis Run 8/21/2020 2:54 PM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Tolerance Limit Summary Table

Amos BAP Client: Geosyntec Data: Amos BAP Printed 8/21/2020, 2:53 PM

| Constituent | Well | Upper Lim. | Lower Lim. | Date | Observ. | Sig. | Bg N | Bg Mean | Std. Dev. | %NDs | ND Adj. | Transform | Alpha | Method |
|-----------------------------------|------|------------|------------|------|---------|------|------|---------|-----------|-------|--------------|-----------|---------|---------------------|
| Antimony, total (mg/L) | n/a | 0.00017 | n/a | n/a | n/a | n/a | 60 | n/a | n/a | 26.67 | n/a | n/a | 0.04607 | NP Inter(normality) |
| Arsenic, total (mg/L) | n/a | 0.090 | n/a | n/a | n/a | n/a | 60 | n/a | n/a | 0 | n/a | n/a | 0.04607 | NP Inter(normality) |
| Barium, total (mg/L) | n/a | 0.3 | n/a | n/a | n/a | n/a | 60 | 0.1889 | 0.05349 | 0 | None | No | 0.05 | Inter |
| Beryllium, total (mg/L) | n/a | 0.00011 | n/a | n/a | n/a | n/a | 60 | 0.03101 | 0.00813 | 16.67 | Kaplan-Meier | x^(1/3) | 0.05 | Inter |
| Cadmium, total (mg/L) | n/a | 0.000050 | n/a | n/a | n/a | n/a | 60 | n/a | n/a | 28.33 | n/a | n/a | 0.04607 | NP Inter(normality) |
| Chromium, total (mg/L) | n/a | 0.002 | n/a | n/a | n/a | n/a | 59 | 0.02636 | 0.009233 | 0 | None | sqrt(x) | 0.05 | Inter |
| Cobalt, total (mg/L) | n/a | 0.018 | n/a | n/a | n/a | n/a | 60 | 0.1463 | 0.05643 | 0 | None | x^(1/3) | 0.05 | Inter |
| Combined Radium 226 + 228 (pCi/L) | n/a | 2.5 | n/a | n/a | n/a | n/a | 60 | 0.999 | 0.2949 | 0 | None | sqrt(x) | 0.05 | Inter |
| Fluoride, total (mg/L) | n/a | 0.31 | n/a | n/a | n/a | n/a | 66 | n/a | n/a | 1.515 | n/a | n/a | 0.03387 | NP Inter(normality) |
| Lead, total (mg/L) | n/a | 0.0072 | n/a | n/a | n/a | n/a | 60 | -7.471 | 1.261 | 0 | None | ln(x) | 0.05 | Inter |
| Lithium, total (mg/L) | n/a | 0.0088 | n/a | n/a | n/a | n/a | 60 | -6.794 | 1.024 | 20 | Kaplan-Meier | ln(x) | 0.05 | Inter |
| Mercury, total (mg/L) | n/a | 0.0000050 | n/a | n/a | n/a | n/a | 44 | n/a | n/a | 90.91 | n/a | n/a | 0.1047 | NP Inter(NDs) |
| Molybdenum, total (mg/L) | n/a | 0.0024 | n/a | n/a | n/a | n/a | 60 | 0.02912 | 0.01009 | 8.333 | None | sqrt(x) | 0.05 | Inter |
| Selenium, total (mg/L) | n/a | 0.00030 | n/a | n/a | n/a | n/a | 59 | n/a | n/a | 5.085 | n/a | n/a | 0.04849 | NP Inter(normality) |
| Thallium, total (mg/L) | n/a | 0.00050 | n/a | n/a | n/a | n/a | 60 | n/a | n/a | 38.33 | n/a | n/a | 0.04607 | NP Inter(normality) |

| AMOS BAP GWPS | | | | |
|--------------------------------|------------|---------------------------|-------------------|-------------|
| Constituent Name | MCL | CCR Rule-Specified | Background | GWPS |
| Antimony, Total (mg/L) | 0.006 | | 0.00017 | 0.006 |
| Arsenic, Total (mg/L) | 0.01 | | 0.09 | 0.09 |
| Barium, Total (mg/L) | 2 | | 0.3 | 2 |
| Beryllium, Total (mg/L) | 0.004 | | 0.00011 | 0.004 |
| Cadmium, Total (mg/L) | 0.005 | | 0.00005 | 0.005 |
| Chromium, Total (mg/L) | 0.1 | | 0.002 | 0.1 |
| Cobalt, Total (mg/L) | | 0.006 | 0.018 | 0.018 |
| Combined Radium, Total (pCi/L) | 5 | | 2.5 | 5 |
| Fluoride, Total (mg/L) | 4 | | 0.31 | 4 |
| Lead, Total (mg/L) | 0.015 | | 0.0072 | 0.015 |
| Lithium, Total (mg/L) | | 0.04 | 0.0088 | 0.04 |
| Mercury, Total (mg/L) | 0.002 | | 0.000005 | 0.002 |
| Molybdenum, Total (mg/L) | | 0.1 | 0.0024 | 0.1 |
| Selenium, Total (mg/L) | 0.05 | | 0.0003 | 0.05 |
| Thallium, Total (mg/L) | 0.002 | | 0.0005 | 0.002 |

Grey cell indicates Background is higher than MCL or CCR-Rule Specified Level

MCL = Maximum Contaminant Level

CCR = Coal Combustion Residual

GWPS - Groundwater Protection Standard

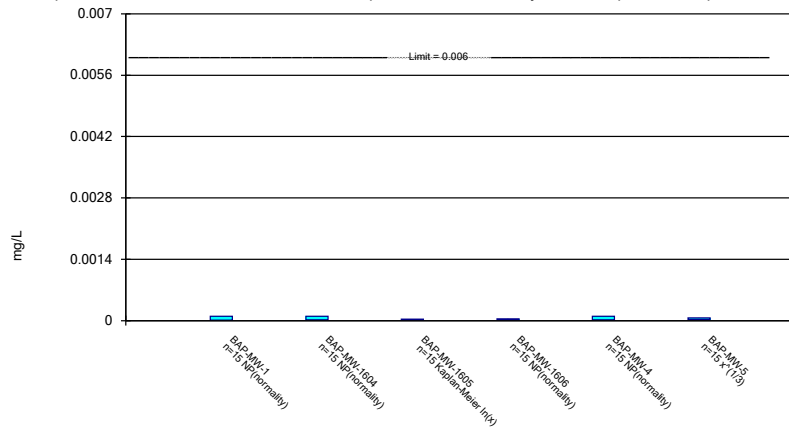
Confidence Intervals Summary Table - All Results (No Significant) Page 2

Amos BAP Client: Geosyntec Data: Amos BAP Printed 8/26/2020, 9:25 AM

| Constituent | Well | Upper Lim. | Lower Lim. | Compliance | Sig. | N | Mean | Std. Dev. | %NDs | ND Adj. | Transform | Alpha | Method |
|--------------------------|-------------|------------|------------|------------|------|----|-------------|------------|-------|--------------|-----------|-------|----------------|
| Lead, total (mg/L) | BAP-MW-1604 | 0.0008829 | 0.0003002 | 0.015 | No | 15 | 0.0005915 | 0.00043 | 0 | None | No | 0.01 | Param. |
| Lead, total (mg/L) | BAP-MW-1605 | 0.0002068 | 0.00006611 | 0.015 | No | 15 | 0.0001773 | 0.000232 | 0 | None | ln(x) | 0.01 | Param. |
| Lead, total (mg/L) | BAP-MW-1606 | 0.0009732 | 0.0004182 | 0.015 | No | 15 | 0.0006957 | 0.0004095 | 0 | None | No | 0.01 | Param. |
| Lead, total (mg/L) | BAP-MW-4 | 0.000384 | 0.0002021 | 0.015 | No | 15 | 0.0002931 | 0.0001342 | 0 | None | No | 0.01 | Param. |
| Lead, total (mg/L) | BAP-MW-5 | 0.0003089 | 0.00007383 | 0.015 | No | 15 | 0.0002122 | 0.0002189 | 0 | None | sqrt(x) | 0.01 | Param. |
| Lithium, total (mg/L) | BAP-MW-1 | 0.008705 | 0.002288 | 0.04 | No | 15 | 0.007557 | 0.0096 | 13.33 | None | ln(x) | 0.01 | Param. |
| Lithium, total (mg/L) | BAP-MW-1604 | 0.001892 | 0.0005569 | 0.04 | No | 15 | 0.009743 | 0.01275 | 26.67 | Kaplan-Meier | ln(x) | 0.01 | Param. |
| Lithium, total (mg/L) | BAP-MW-1605 | 0.011 | 0.00259 | 0.04 | No | 15 | 0.008031 | 0.009213 | 13.33 | None | No | 0.01 | NP (normality) |
| Lithium, total (mg/L) | BAP-MW-1606 | 0.03 | 0.00256 | 0.04 | No | 15 | 0.00969 | 0.01073 | 20 | None | No | 0.01 | NP (normality) |
| Lithium, total (mg/L) | BAP-MW-4 | 0.007207 | 0.001303 | 0.04 | No | 15 | 0.006855 | 0.009935 | 13.33 | None | ln(x) | 0.01 | Param. |
| Lithium, total (mg/L) | BAP-MW-5 | 0.007223 | 0.001294 | 0.04 | No | 15 | 0.006765 | 0.009925 | 13.33 | None | ln(x) | 0.01 | Param. |
| Mercury, total (mg/L) | BAP-MW-1 | 0.000005 | 0.000005 | 0.002 | No | 11 | 0.000004727 | 9.0e-7 | 90.91 | None | No | 0.006 | NP (NDs) |
| Mercury, total (mg/L) | BAP-MW-1604 | 0.000005 | 0.000005 | 0.002 | No | 11 | 0.000004727 | 9.0e-7 | 90.91 | None | No | 0.006 | NP (NDs) |
| Mercury, total (mg/L) | BAP-MW-1605 | 0.000005 | 0.000005 | 0.002 | No | 11 | 0.000005 | 0 | 100 | None | No | 0.006 | NP (NDs) |
| Mercury, total (mg/L) | BAP-MW-1606 | 0.000005 | 0.000005 | 0.002 | No | 11 | 0.000004727 | 9.0e-7 | 90.91 | None | No | 0.006 | NP (NDs) |
| Mercury, total (mg/L) | BAP-MW-4 | 0.000005 | 0.000005 | 0.002 | No | 11 | 0.000005 | 0 | 100 | None | No | 0.006 | NP (NDs) |
| Mercury, total (mg/L) | BAP-MW-5 | 0.000005 | 0.000005 | 0.002 | No | 11 | 0.000005 | 0 | 100 | None | No | 0.006 | NP (NDs) |
| Molybdenum, total (mg/L) | BAP-MW-1 | 0.001363 | 0.0005438 | 0.1 | No | 15 | 0.001261 | 0.0007261 | 26.67 | Kaplan-Meier | No | 0.01 | Param. |
| Molybdenum, total (mg/L) | BAP-MW-1604 | 0.002 | 0.00022 | 0.1 | No | 15 | 0.0007833 | 0.0007751 | 26.67 | None | No | 0.01 | NP (normality) |
| Molybdenum, total (mg/L) | BAP-MW-1605 | 0.002 | 0.00012 | 0.1 | No | 15 | 0.000838 | 0.0008626 | 33.33 | None | No | 0.01 | NP (normality) |
| Molybdenum, total (mg/L) | BAP-MW-1606 | 0.002 | 0.0001 | 0.1 | No | 15 | 0.0007627 | 0.0009078 | 33.33 | None | No | 0.01 | NP (normality) |
| Molybdenum, total (mg/L) | BAP-MW-4 | 0.00105 | 0.000375 | 0.1 | No | 13 | 0.001071 | 0.0007668 | 23.08 | Kaplan-Meier | sqrt(x) | 0.01 | Param. |
| Molybdenum, total (mg/L) | BAP-MW-5 | 0.00215 | 0.00031 | 0.1 | No | 15 | 0.00126 | 0.0008867 | 26.67 | None | No | 0.01 | NP (normality) |
| Selenium, total (mg/L) | BAP-MW-1 | 0.0002 | 0.00009 | 0.05 | No | 15 | 0.0001233 | 0.00004821 | 0 | None | No | 0.01 | NP (normality) |
| Selenium, total (mg/L) | BAP-MW-1604 | 0.0003 | 0.0001 | 0.05 | No | 15 | 0.0001933 | 0.00004577 | 0 | None | No | 0.01 | NP (normality) |
| Selenium, total (mg/L) | BAP-MW-1605 | 0.00008437 | 0.0000543 | 0.05 | No | 15 | 0.00006933 | 0.00002219 | 0 | None | No | 0.01 | Param. |
| Selenium, total (mg/L) | BAP-MW-1606 | 0.0001622 | 0.00008241 | 0.05 | No | 15 | 0.0001307 | 0.00007086 | 0 | None | ln(x) | 0.01 | Param. |
| Selenium, total (mg/L) | BAP-MW-4 | 0.0001 | 0.00006 | 0.05 | No | 15 | 0.000086 | 0.00003521 | 0 | None | No | 0.01 | NP (normality) |
| Selenium, total (mg/L) | BAP-MW-5 | 0.0001 | 0.00005 | 0.05 | No | 15 | 0.00008 | 0.00002619 | 53.33 | None | No | 0.01 | NP (NDs) |
| Thallium, total (mg/L) | BAP-MW-1 | 0.002 | 0.00004 | 0.002 | No | 15 | 0.0006961 | 0.0009544 | 33.33 | None | No | 0.01 | NP (normality) |
| Thallium, total (mg/L) | BAP-MW-1604 | 0.002 | 0.00001 | 0.002 | No | 15 | 0.001076 | 0.001023 | 53.33 | None | No | 0.01 | NP (NDs) |
| Thallium, total (mg/L) | BAP-MW-1605 | 0.002 | 0.00002 | 0.002 | No | 15 | 0.001343 | 0.0009611 | 66.67 | None | No | 0.01 | NP (NDs) |
| Thallium, total (mg/L) | BAP-MW-1606 | 0.002 | 0.00001 | 0.002 | No | 15 | 0.0006813 | 0.0009652 | 33.33 | None | No | 0.01 | NP (normality) |
| Thallium, total (mg/L) | BAP-MW-4 | 0.002 | 0.000055 | 0.002 | No | 15 | 0.0007159 | 0.0009406 | 33.33 | None | No | 0.01 | NP (normality) |
| Thallium, total (mg/L) | BAP-MW-5 | 0.002 | 0.00001 | 0.002 | No | 15 | 0.001075 | 0.001023 | 53.33 | None | No | 0.01 | NP (NDs) |

Parametric and Non-Parametric (NP) Confidence Interval

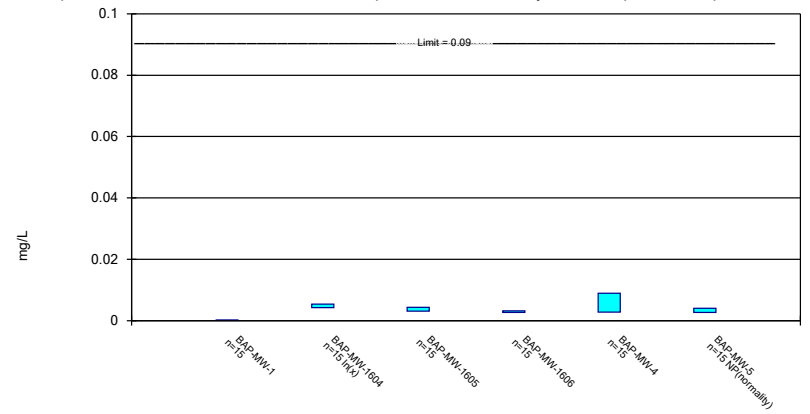
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Antimony, total Analysis Run 8/26/2020 9:21 AM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Parametric and Non-Parametric (NP) Confidence Interval

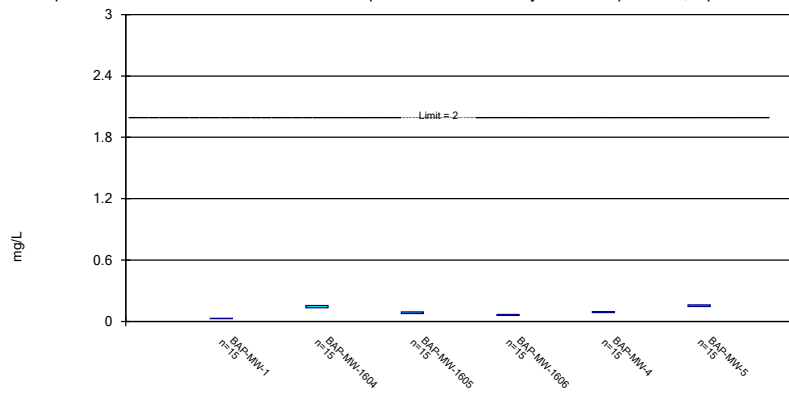
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Arsenic, total Analysis Run 8/26/2020 9:21 AM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Parametric Confidence Interval

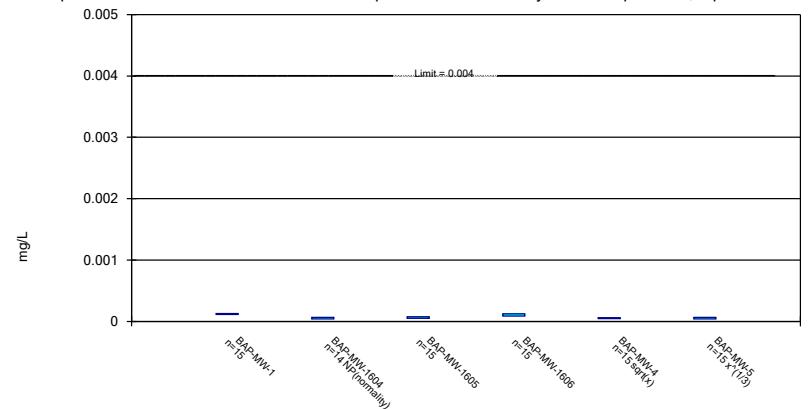
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium, total Analysis Run 8/26/2020 9:21 AM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Parametric and Non-Parametric (NP) Confidence Interval

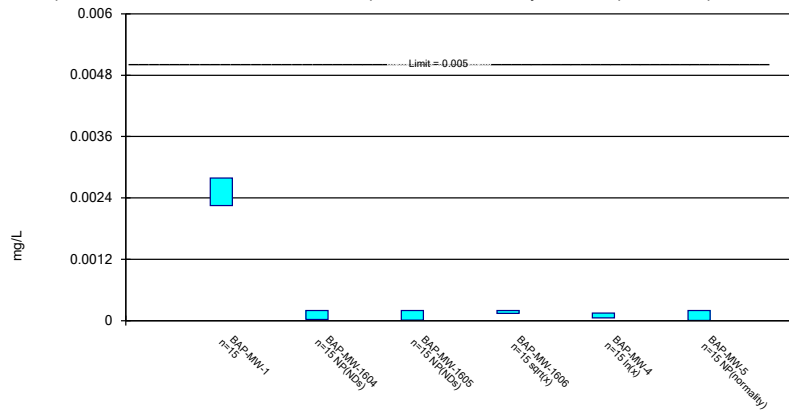
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Beryllium, total Analysis Run 8/26/2020 9:21 AM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Parametric and Non-Parametric (NP) Confidence Interval

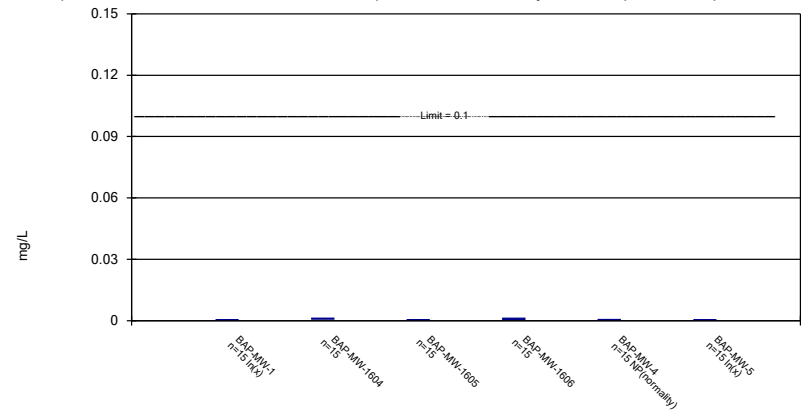
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cadmium, total Analysis Run 8/26/2020 9:21 AM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Parametric and Non-Parametric (NP) Confidence Interval

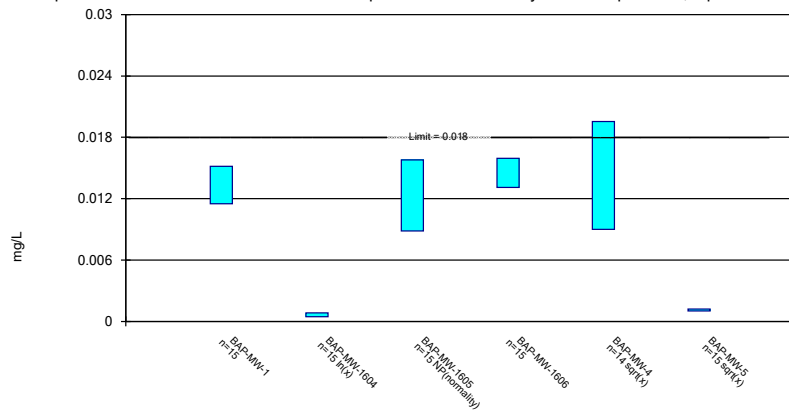
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium, total Analysis Run 8/26/2020 9:21 AM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Parametric and Non-Parametric (NP) Confidence Interval

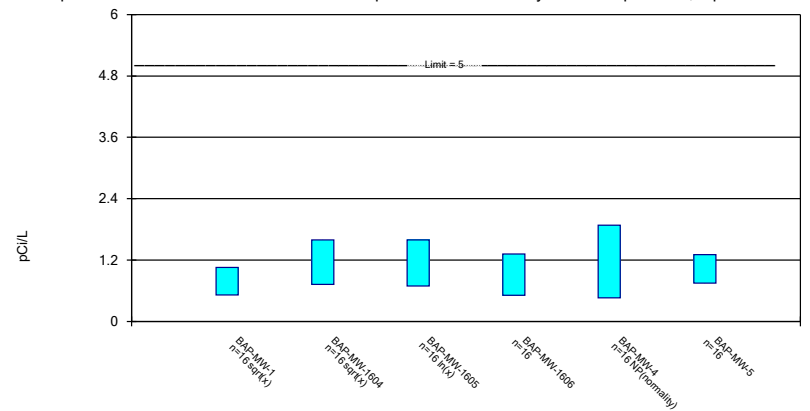
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt, total Analysis Run 8/26/2020 9:21 AM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Parametric and Non-Parametric (NP) Confidence Interval

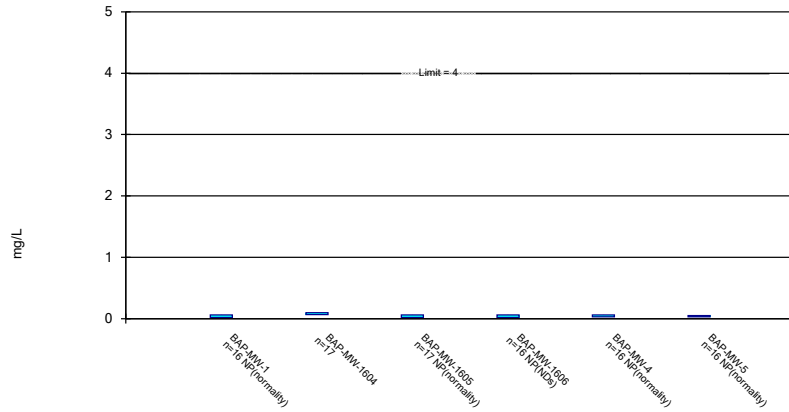
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 + 228 Analysis Run 8/26/2020 9:21 AM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Parametric and Non-Parametric (NP) Confidence Interval

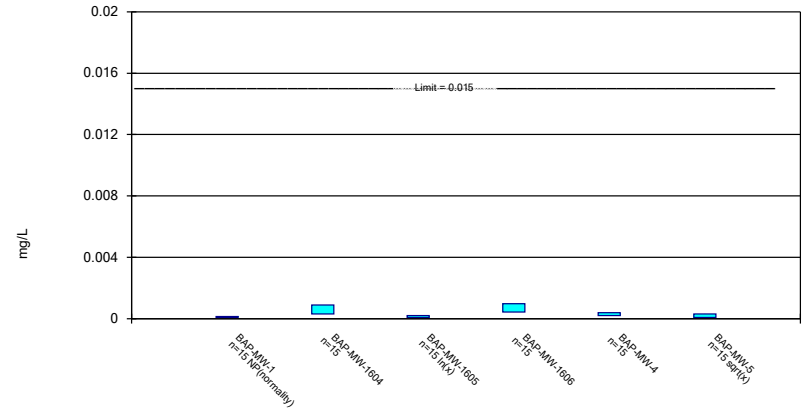
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Constituent: Fluoride, total Analysis Run 8/26/2020 9:21 AM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Parametric and Non-Parametric (NP) Confidence Interval

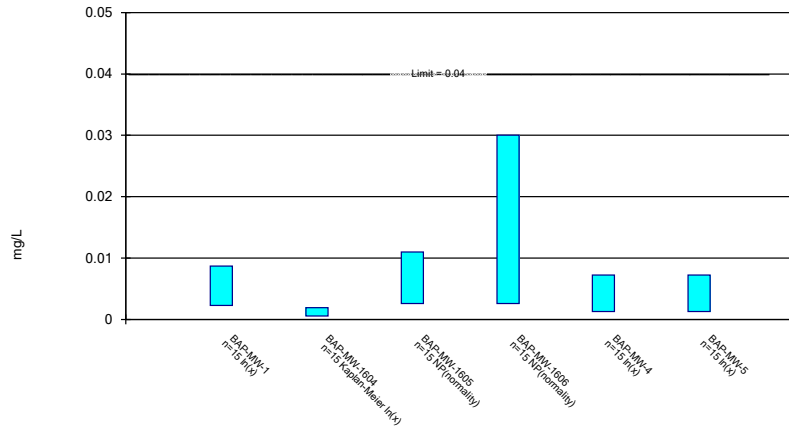
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Constituent: Lead, total Analysis Run 8/26/2020 9:21 AM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Parametric and Non-Parametric (NP) Confidence Interval

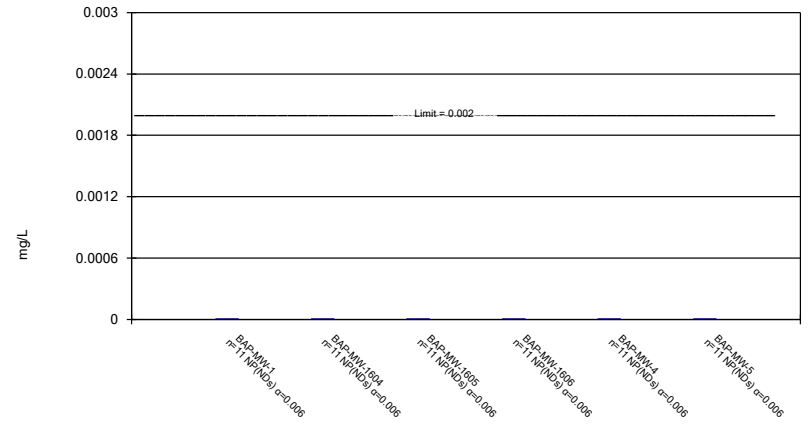
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium, total Analysis Run 8/26/2020 9:21 AM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Non-Parametric Confidence Interval

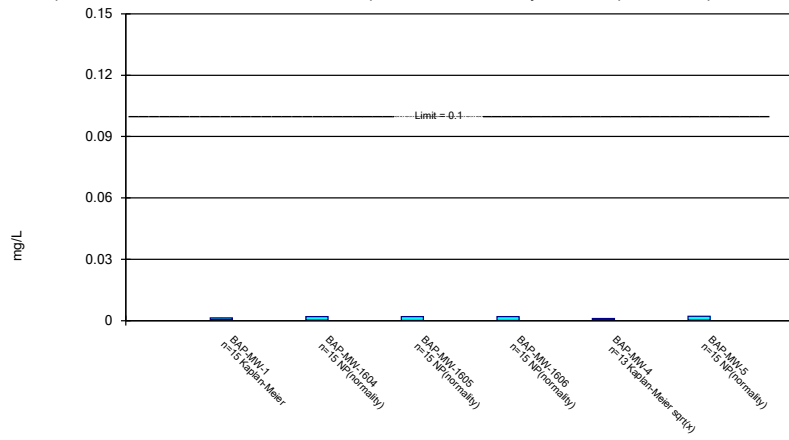
Compliance Limit is not exceeded.



Constituent: Mercury, total Analysis Run 8/26/2020 9:21 AM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Parametric and Non-Parametric (NP) Confidence Interval

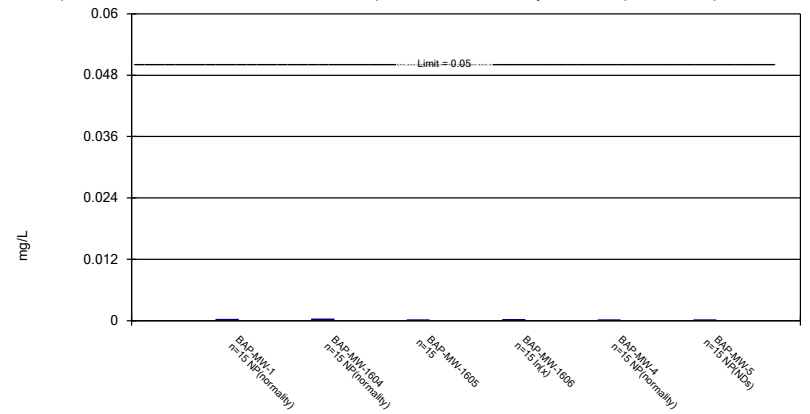
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Molybdenum, total Analysis Run 8/26/2020 9:21 AM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Parametric and Non-Parametric (NP) Confidence Interval

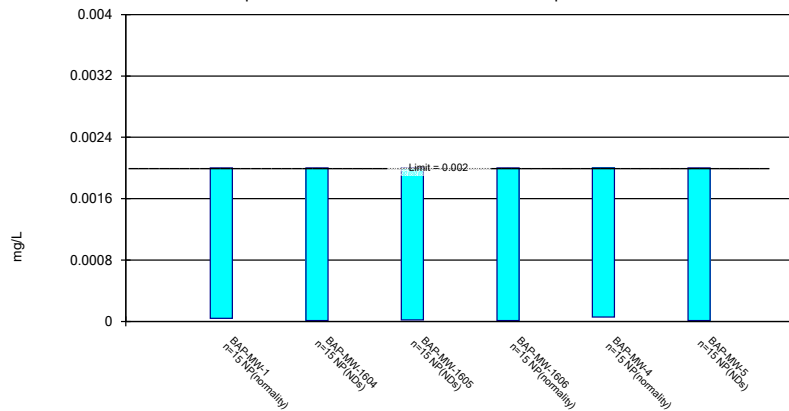
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Selenium, total Analysis Run 8/26/2020 9:21 AM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

Non-Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Thallium, total Analysis Run 8/26/2020 9:21 AM View: Appendix IV
 Amos BAP Client: Geosyntec Data: Amos BAP

APPENDIX 3 – Alternative Source Demonstrations

Not applicable.

APPENDIX 4 – Notice of Transition between Monitoring Programs

The notification of the establishment of an assessment monitoring program follows.

John Amos Plant

Notice of Assessment Monitoring Program Establishment

Bottom Ash Pond

On January 15, 2018, it was determined that Amos Plant's Bottom Ash Pond had statistically significant increases over background for Calcium, Chloride, Sulfate, and Total Dissolved Solids (TDS). An alternative source demonstration was not successful within the 90 day period as allowed for in 257.94(e)(2) prompting the initiation of an assessment monitoring program, which was established on April 13, 2018. Therefore this notice is being placed in the operating record in accordance with the requirement of 257.94(e)(3).

APPENDIX 5 – Well Installation/Decommissioning Logs

Not applicable.