STATISTICAL ANALYSIS SUMMARY
FLY ASH POND
Big Sandy Plant
Louisa, Kentucky

Submitted to

1 Riverside Plaza
Columbus, Ohio 43215-2372

Submitted by

Geosyntec consultants

engineers | scientists | innovators

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January 8, 2019

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LIST OF ACRONYMS AND ABBREVIATIONS

AEP	American Electric Power
ASD	Alternative Source Demonstration
CCR	Coal Combustion Residuals
CCV	Continuing Calibration Verification
CFR	Code of Federal Regulations
FAP	Fly Ash Pond
GWPS	Groundwater Protection Standard
LCL	Lower Confidence Limit
LFB	Laboratory Fortified Blanks
LRB	Laboratory Reagent Blanks
MCL	Maximum Contaminant Level
NELAP	National Environmental Laboratory Accreditation Program
QA	Quality Assurance
QC	Quality Control
RSL	Regional Screening Level
SSI	Statistically Significant Increase
SSL	Statistically Significant Level
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 Fly Ash Pond (FAP), an existing CCR unit at the Big Sandy Power Plant located in Louisa, Kentucky.

Based on detection monitoring conducted in 2017 and 2018, statistically significant increases (SSIs) over background were concluded for boron, calcium, chloride, fluoride, total dissolved solids (TDS), and sulfate at the FAP. An alternate source was not identified at the time, so two assessment monitoring events were conducted at the FAP in 2018, in accordance with 40 CFR 257.95.

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 the usability of the data.

The monitoring data were submitted to Groundwater Stats Consulting, LLC for statistical analysis. Groundwater protection standards (GWPSs) were established for the Appendix IV parameters. Confidence intervals were calculated for Appendix IV parameters at the compliance wells to assess whether Appendix IV parameters were present at a statistically significant level (SSL) above the GWPS. SSLs were identified for beryllium, cobalt, and lithium. Thus, either the unit will move to an assessment of corrective measures or an alternative source demonstration (ASD) will be conducted to evaluate if the unit can remain in assessment monitoring. Certification of the selected statistical methods by a qualified professional engineer is documented in Attachment A.

SECTION 2

FLY 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) and 257.95(d)(1). Samples from both sampling events were analyzed for the Appendix III and Appendix IV parameters. A summary of data collected during assessment monitoring 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.9.5 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 FAP 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 to meet the requirements of 40 CFR 257.95(b) and 257.95(d)(1) were screened for potential outliers. No outliers were identified. Outliers identified from the background and detection monitoring events conducted through January 2018 were summarized in a previous report (Geosyntec, 2018).

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 regional screening level (RSL) 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, chromium, fluoride, selenium, and thallium due to apparent non-normal distributions, for mercury due to a high non-detect frequency, and for beryllium due to both an apparent non-normal distribution and a high non-detect frequency. 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.

The following SSLs were identified at the Big Sandy FAP:

- The LCL for beryllium exceeded the GWPS of 0.004 mg/L at MW-1603 (0.0169 mg/L).
- The LCL for cobalt exceeded the GWPS of 0.006 mg/L at MW-1603 (0.0893 mg/L).
- The LCL for lithium exceeded the GWPS of 0.04 mg/L at MW-1603 (0.207 mg/L).

As a result, the Big Sandy FAP will either move to an assessment of corrective measures or an ASD will be conducted to evaluate if the unit can remain in assessment monitoring.

2.3 Conclusions

Two assessment monitoring events were conducted in 2018 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 2018 data. GWPSs were 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 GWPS. SSLs were identified for beryllium, cobalt, and lithium.

Based on this evaluation, the Big Sandy FAP CCR unit will either move to an assessment of corrective measures or an ASD will be conducted to evaluate if the unit can remain in assessment monitoring.

SECTION 3

REFERENCES

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

Geosyntec Consultants (Geosyntec). 2018. Statistical Analysis Summary – Fly Ash Pond, Big Sandy Plant, Louisa, Kentucky. January 15, 2018.

TABLES

Table 1 – Groundwater Data Summary
Big Sandy – Fly Ash Pond

Geosyntec Consultants, Inc

Parameter	Unit	MW-1011			MW-1012		MW-1203			MW-1601			MW-1602		MW-1603			MW-1604		
		4/26/2018	9/20/2018	10/23/2018	4/26/2018	9/20/2018	4/26/2018	9/20/2018	10/22/2018	4/25/2018	9/20/2018	10/23/2018	4/26/2018	9/20/2018	4/26/2018	9/20/2018	10/23/2018	4/25/2018	9/18/2018	10/22/2018
Antimony	µg/L	0.16	0.18	-	0.65	0.62	0.03 J	0.03	-	0.17	0.29	-	0.05 J	0.03 J	0.04 J	0.020 J	-	0.08	0.06	-
Arsenic	µg/L	13.5	7.25	-	15.8	14	0.3	0.51	-	4.58	3.54	-	3.15	3.92	1.60	1.40	-	0.74	1.47	-
Barium	µg/L	63.1	44.8	-	24.1	24.2	89.1	90.1	-	56.4	75.9	-	60.9	55.1	10.5	11.4	-	58.9	63.5	-
Beryllium	µg/L	0.02 U	0.02 U	-	0.01 J	0.021	0.033	0.076	-	0.005 J	0.007 J	-	0.02 U	-	18.7	19.6	-	0.053	0.061	-
Boron	mg/L	0.139	0.165	-	0.227	0.236	0.147	0.125	-	0.177	0.196	-	0.143	0.07	0.088	0.0850	-	0.052	0.056	-
Cadmium	µg/L	0.02 U	0.009 J	-	0.006 J	0.02 U	0.02 U	0.02 U	-	0.02 U	0.005 J	-	0.02 U	0.02 U	0.74	0.830	-	0.09	0.07	-
Calcium	mg/L	105	72.7	-	1.13	1.11	57.4	53.4	-	50.4	68.8	-	75.2	72.1	83.6	97.5	-	2.96	2.69	-
Chloride	mg/L	4.71	3.43	-	1.34	1.27	5.66	5.37	-	15.2	16.1	-	13.9	15.2	4.12	3.92	-	1.58	1.43	-
Chromium	µg/L	0.207	0.588	-	0.262	0.442	0.171	0.24	-	0.245	0.378	-	0.29	0.328	0.771	0.713	-	0.285	0.388	-
Cobalt	µg/L	3.25	0.683	-	0.062	0.079	0.886	0.916	-	0.794	1.21	-	0.552	0.312	91.1	93.8	-	3.75	4.53	-
Combined Radium	pCi/L	5.69	2.56	-	1.14	0.291	2.48	1.25	-	2.783	0.698	-	1.75	1.04	5.09	6.75	-	0.154	0.951	-
Fluoride	mg/L	0.2	0.28	-	0.82	0.75	0.14	0.12	-	0.36	0.22	-	0.14	0.11	1.16	1.15	-	0.06	0.06 J	-
Lead	µg/L	0.095	0.083	-	0.287	0.346	0.034	0.049	-	0.024	0.041	-	0.049	0.025	5.27	4.39	-	0.263	0.092	-
Lithium	mg/L	0.01	0.009	-	0.006	0.006	0.013	0.013	-	0.033	0.031	-	0.008	0.008	0.187	0.255	-	0.01	0.003	-
Mercury	µg/L	0.007 U	-	0.005 U	0.003 J	0.013	0.007 U	-	0.005 U	0.007 U	-	0.005 U	0.003 J	0.01 U	0.007 U	-	0.005 U	0.005 U	-	0.005 U
Molybdenum	µg/L	0.82	0.82	-	0.89	0.82	0.12	0.11	-	20.6	19.6	-	1.64	1.27	0.03 J	0.04 J	-	0.54	0.86	-
Selenium	µg/L	0.1 U	0.1 U	-	0.05 J	0.08 J	0.1 U	0.1 U	-	0.1	0.2	-	0.4	0.4	8.10	6.30	-	0.3	0.2	-
Total Dissolved Solids	mg/L	456	386	-	541	561	253	253	-	326	448	-	416	492	926	974	-	52	62	-
Sulfate	mg/L	106	76.3	-	36.6	36.6	37.5	32.3	-	72.6	167	-	106	150	661	747	-	8.4	7.8	-
Thallium	µg/L	0.121	0.075	-	0.02 J	0.02 J	0.03 J	0.05 J	-	0.02 J	0.053	-	0.01 J	0.02 J	1.39	1.70	-	0.04 J	0.04 J	-
pH	SU	6.29	6.96	6.94	8.95	9.14	6.02	6.69	6.64	6.93	7.05	7.18	7.95	7.04	2.91	3.1	3.46	5.39	6.12	5.92

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
pCi/L: picocuries per liter
SU: standard unit
U: Component was not present in concentrations above method detection limit and is reported as the reporting limit
J: Estimated value. Component was detected in concentrations below the reporting limit
-: Not sampled

Table 1 – Groundwater Data Summary
Big Sandy – Fly Ash Pond

Parameter	Unit	MW-1605			MW-1606			MW-1607		
		4/25/2018	9/18/2018	10/22/2018	4/25/2018	9/19/2018	10/22/2018	4/25/2018	9/19/2018	10/22/2018
Antimony	µg/L	0.04 J	0.02 J	-	0.05	0.03 J	-	0.27	0.04 J	-
Arsenic	µg/L	0.07	0.04 J	-	0.97	0.97	-	68.5	23.6	-
Barium	µg/L	37.1	29.7	-	767	797	-	37.2	42.6	-
Beryllium	µg/L	0.123	0.104	-	0.008 J	0.01 J	-	0.111	0.02 J	-
Boron	mg/L	0	0.036	-	1.81	1.82	-	0.234	0.255	-
Cadmium	µg/L	0.08	0.06	-	0.02 U	0.02 U	-	0.02 U	0.02 U	-
Calcium	mg/L	1.3	0.93	-	73.7	71.8	-	101	95.6	-
Chloride	mg/L	0.69	0.62	-	31.3	31.1	-	3.66	7.52	-
Chromium	µg/L	2.7	2.58	-	0.301	0.366	-	0.851	0.423	-
Cobalt	µg/L	0.434	0.265	-	0.101	0.155	-	1.57	1.59	-
Combined Radium	pCi/L	0.421	0.694	-	3.22	3.28	-	3.22	0.611	-
Fluoride	mg/L	0.06 U	0.06 U	-	0.26	0.24	-	0.08	0.08	-
Lead	µg/L	0.193	0.092	-	0.077	0.126	-	0.799	0.159	-
Lithium	mg/L	0.009	0.002	-	0.014	0.001	-	0.012	0.001	-
Mercury	µg/L	0.007 U	-	0.005 U	0.007 U	-	0.005 U	0.007 U	-	0.005 U
Molybdenum	µg/L	0.07 J	0.04 J	-	0.58	0.58	-	0.9	0.59	-
Selenium	µg/L	0.3	0.2	-	0.06 J	0.07 J	-	0.7	0.1	-
Total Dissolved Solids	mg/L	37	29	-	350	380	-	430	428	-
Sulfate	mg/L	6.5	4.3	-	56	56.9	-	137	144	-
Thallium	µg/L	0.03 J	0.03 J	-	0.01 J	0.03 J	-	0.04 J	0.04 J	-
pH	SU	4.57	4.01	4.7	6.59	6.59	7.06	6.15	6.04	6.47

Notes:
µg/L: micrograms per liter
mg/L: milligrams per liter
pCi/L: picocuries per liter
SU: standard unit
U: Component was not present in concentrations above method detection limit and is reported as the reporting limit
J: Estimated value. Component was detected in concentrations below the reporting limit
-: Not sampled

Table 2: Groundwater Protection Standards
Big Sandy Plant - Fly Ash Pond

Geosyntec Consultants, Inc.

Constituent Name	MCL	RSL	Background Limit
Antimony, Total (mg/L)	0.006		0.0012
Arsenic, Total (mg/L)	0.01		0.029
Barium, Total (mg/L)	2		0.12
Beryllium, Total (mg/L)	0.004		0.00015
Cadmium, Total (mg/L)	0.005		0.00014
Chromium, Total (mg/L)	0.1		0.0027
Cobalt, Total (mg/L)	n/a	0.006	0.0049
Combined Radium, Total (pCi/L)	5		6.57
Fluoride, Total (mg/L)	4		0.82
Lead, Total (mg/L)	n/a	0.015	0.0013
Lithium, Total (mg/L)	n/a	0.04	0.02
Mercury, Total (mg/L)	0.002		0.000013
Molybdenum, Total (mg/L)	n/a	0.1	0.011
Selenium, Total (mg/L)	0.05		0.0003
Thallium, Total (mg/L)	0.002		0.00023

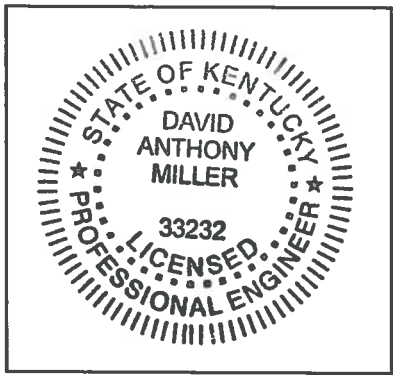
Notes:
Grey cell indicates calculated UTL is higher than MCL.
MCL = Maximum Contaminant Level
RSL = Regional Screening Level
Calculated UTL (Upper Tolerance Limit) represents site-specific background values.
The higher of the calculated UTL or MCL/RSL is used as the GWPS.

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 Big Sandy Fly 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

33232

License Number

KENTUCKY

Licensing State

01.08.19

Date

ATTACHMENT B

Statistical Analysis Output

GROUNDWATER STATS CONSULTING

November 11, 2018

Geosyntec Consultants
Attn: Ms. Allison Kreinberg
150 E. Wilson Bridge Rd., #232
Worthington, OH 43085

Re: Big Sandy Fly Ash Pond
Assessment Monitoring Event – September 2018

Dear Ms. Kreinberg,

Groundwater Stats Consulting (GSC), formerly the statistical consulting division of Sanitas Technologies, is pleased to provide the evaluation of groundwater data for the September 2018 Assessment Monitoring event for American Electric Power Company's Big Sandy 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 USEPA Unified Guidance (2009).

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

- **Upgradient wells:** MW-1011, MW-1012, MW-1203, MW-1604, and MW-1605; and
- **Downgradient wells:** MW-1601, MW-1602, MW-1603, MW-1606, and MW-1607.

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 CCR program consists of the following constituents:

- **Appendix III** (Detection Monitoring) **-** boron, calcium, chloride, fluoride, pH, sulfate, and TDS; and
- **Appendix IV** (Assessment Monitoring) **–** antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, combined radium 226 + 228, fluoride, lead, lithium, mercury, molybdenum, selenium, and thallium.

Time series plots for Appendix III and IV parameters are provided for all wells and constituents; and are used to evaluate concentrations over the entire record. 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.

Evaluation of Appendix III Parameters

Interwell prediction limits combined with a 1-of-2 verification strategy were constructed for boron, calcium, chloride, fluoride, sulfate and TDS; and intrawell prediction limits combined with a 1-of-2 verification strategy were constructed for pH. In the event of an initial exceedance of compliance well data, the 1-of-2 resample plan allows for collection of one additional sample to determine whether the initial exceedance is confirmed. When the resample confirms the initial exceedance, a statistically significant increase (SSI) is identified and further research would be required to identify the cause of the exceedance (i.e. impact from the site, natural variation, or an off-site source). If the resample falls within the statistical limit, the initial exceedance is considered a false positive result and, therefore, no further action is necessary. SSIs were noted for some of the Appendix III parameters and the results of those findings may be found in the Prediction Limit Summary tables following this letter.

When a statistically significant increase is identified, the data are further evaluated using the Sen's Slope/Mann Kendall trend test to determine whether data are statistically increasing, decreasing or stable. A few statistically significant decreasing trends were noted, but no statistically significant increasing trends were found. The Trend Test Summary Table follows this letter.

Evaluation of Appendix IV Parameters

Parametric tolerance limits were used to calculate background limits from pooled upgradient well data for Appendix IV parameters with a target of 95% confidence and 95% coverage to determine the Alternate Contaminant Level (ACL). 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 Regional Screening Levels (RSLs) in the Groundwater Protection Standards (GWPS) table following this letter to determine the highest limit for use as the GWPS in the Confidence Interval comparisons.

Confidence intervals were then constructed on downgradient wells for each of the Appendix IV parameters using the highest limit of either the MCL, RSL, or ACL as discussed above. 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 except for the following well/constituent pairs: beryllium, cobalt, and lithium in well MW-1603. A summary of the confidence interval results follows this letter.

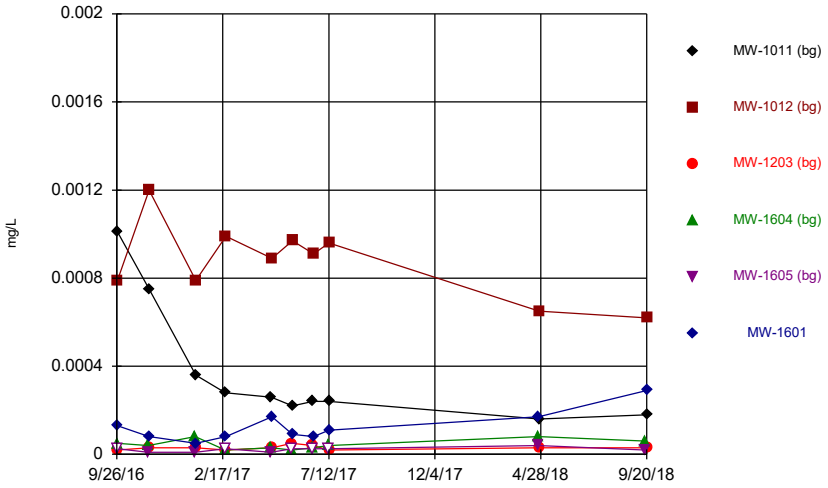
Thank you for the opportunity to assist you in the statistical analysis of groundwater quality for Big Sandy Fly Ash Pond. If you have any questions or comments, please feel free to contact me.

For Groundwater Stats Consulting,

Kristina L. Rayner
Groundwater Statistician

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series



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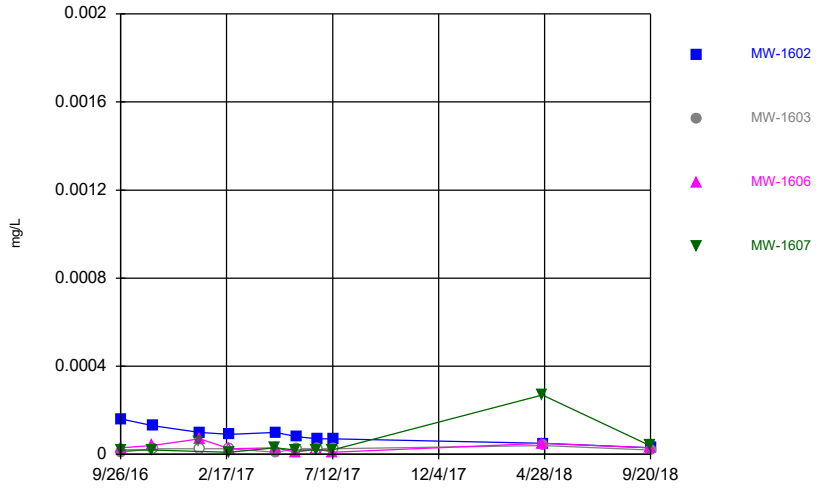
Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series



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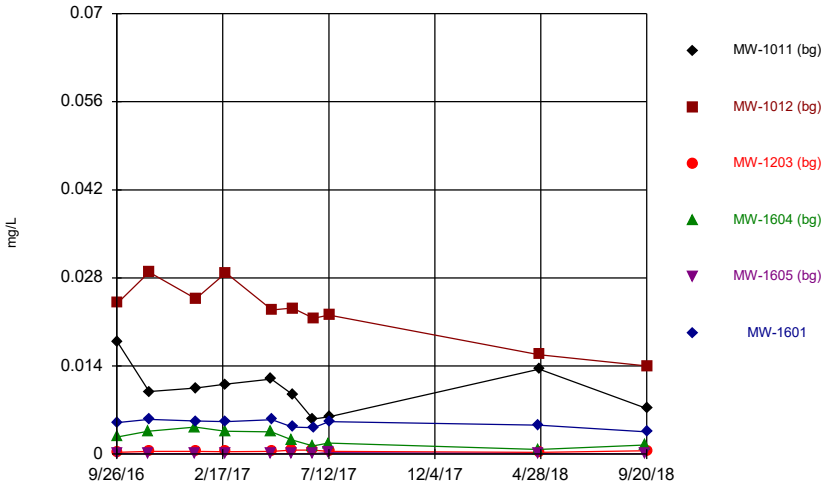
Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Time Series



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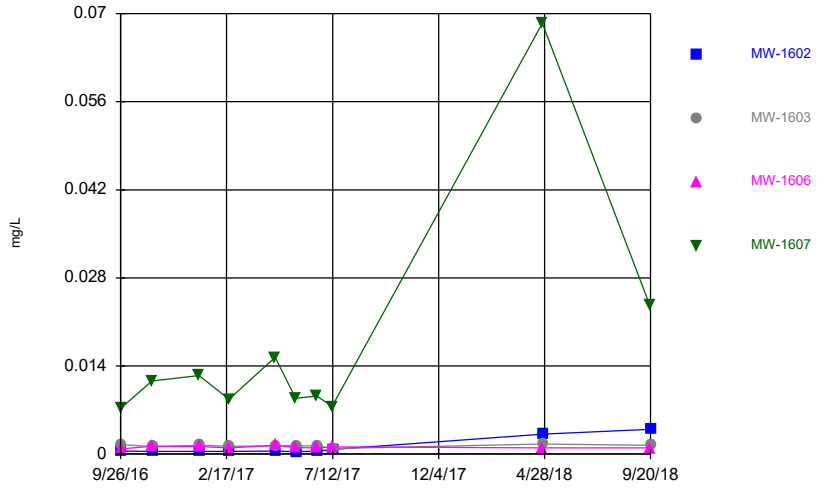
Time Series



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Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

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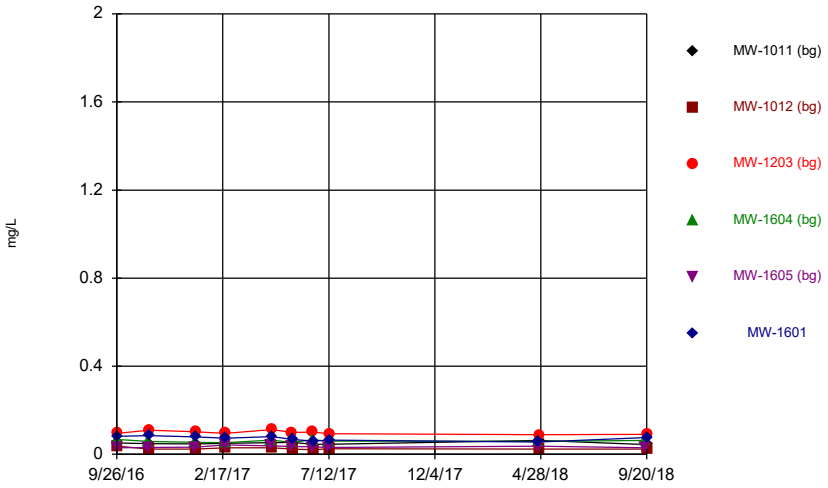

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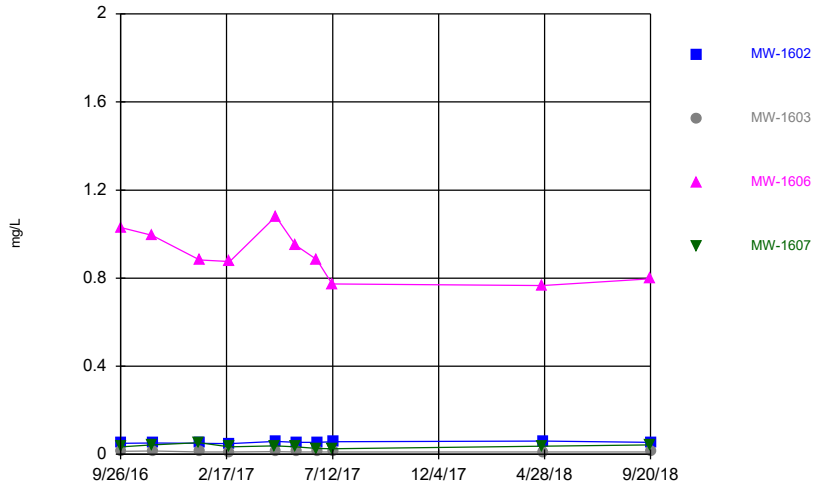
Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Time Series



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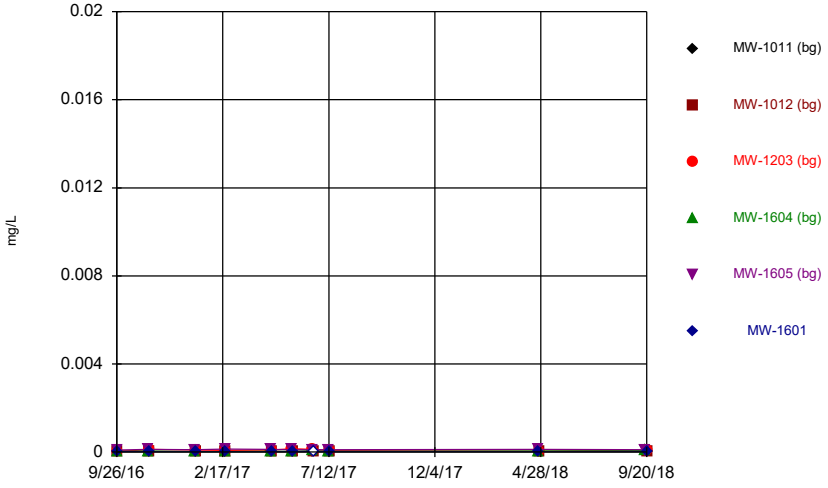
Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series



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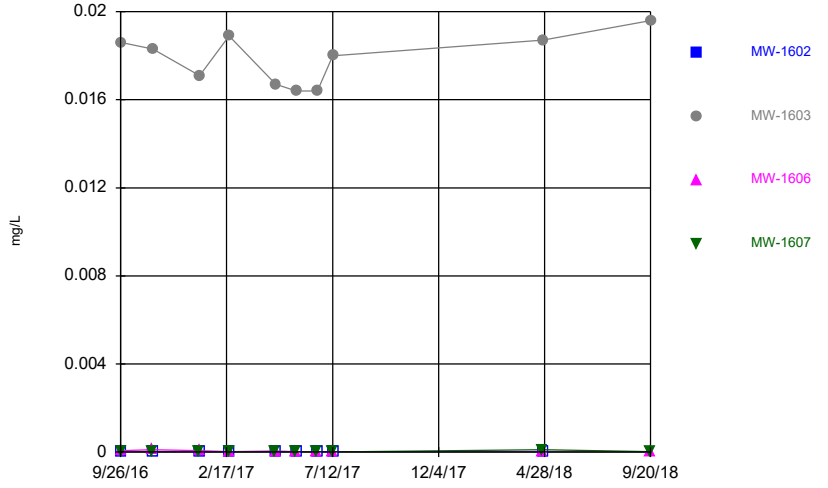
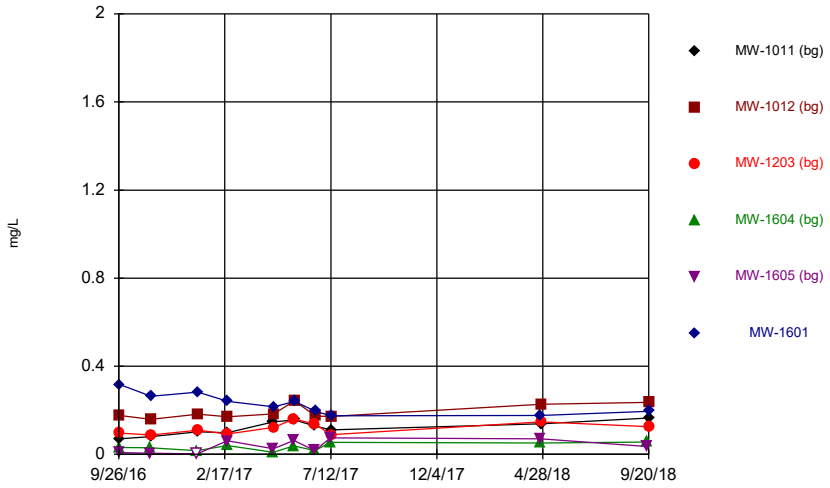
Time Series



Constituent: Beryllium Analysis Run 11/11/2018 12:36 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

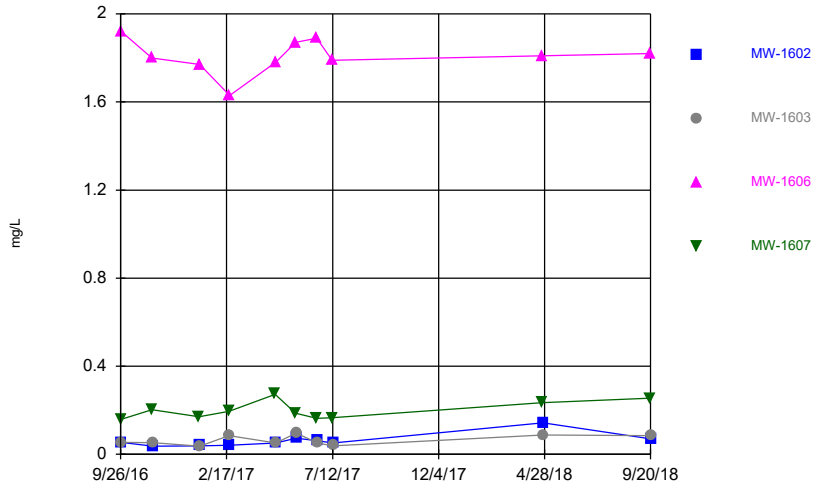
Time Series



Constituent: Boron Analysis Run 11/11/2018 12:36 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

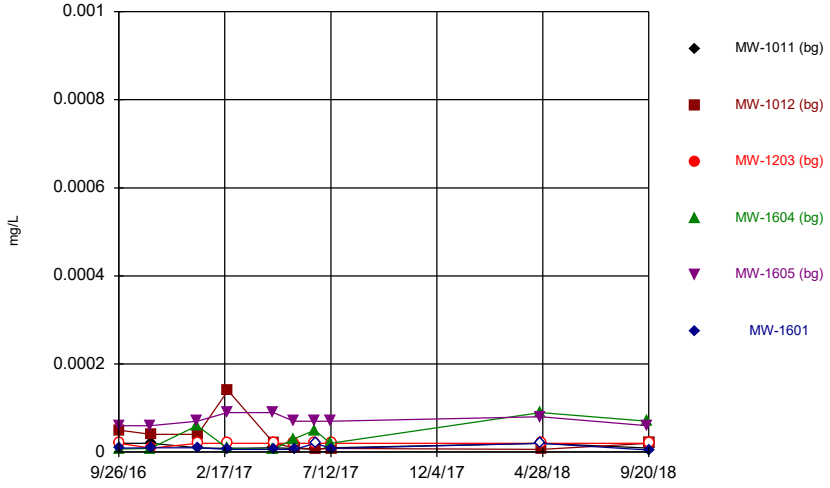
Time Series



Constituent: Boron Analysis Run 11/11/2018 12:36 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

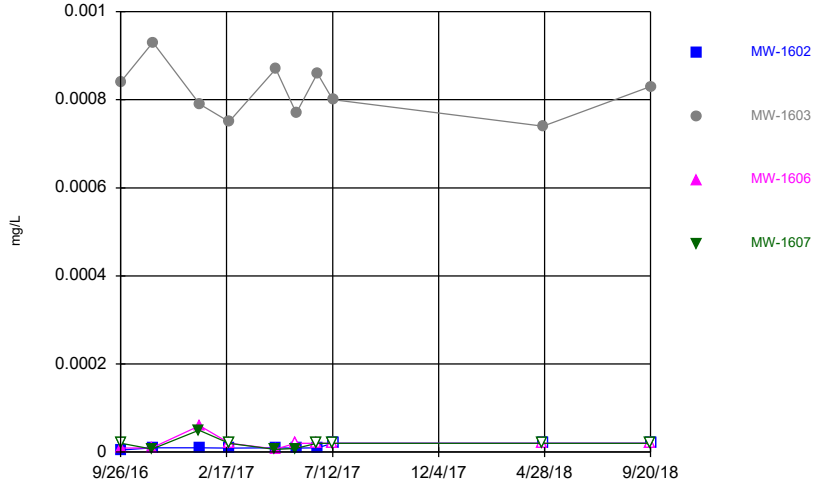
Time Series



Constituent: Cadmium Analysis Run 11/11/2018 12:36 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

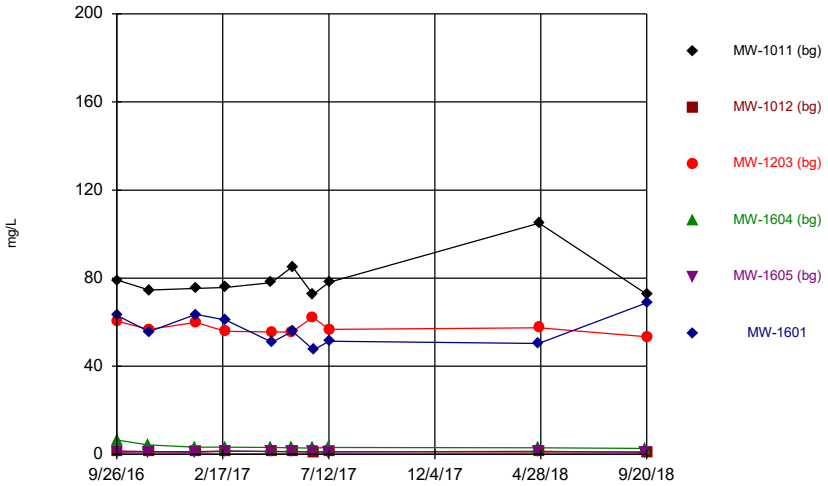
Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series



Constituent: Cadmium Analysis Run 11/11/2018 12:36 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

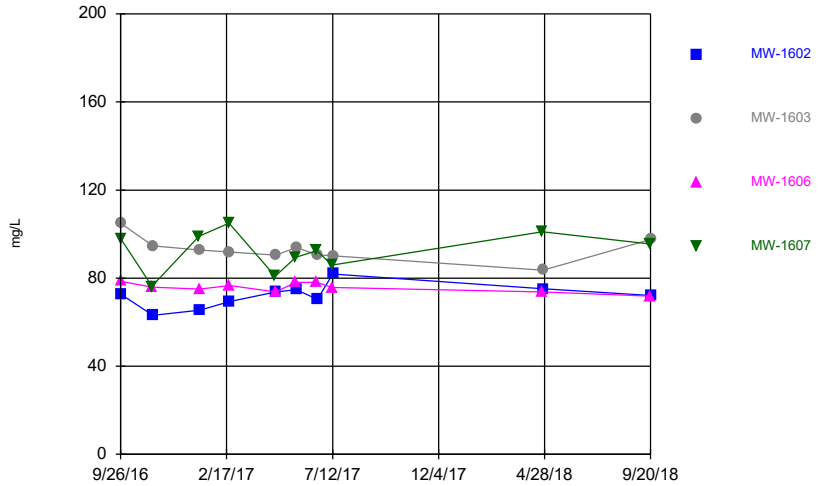
Time Series



Constituent: Calcium Analysis Run 11/11/2018 12:37 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

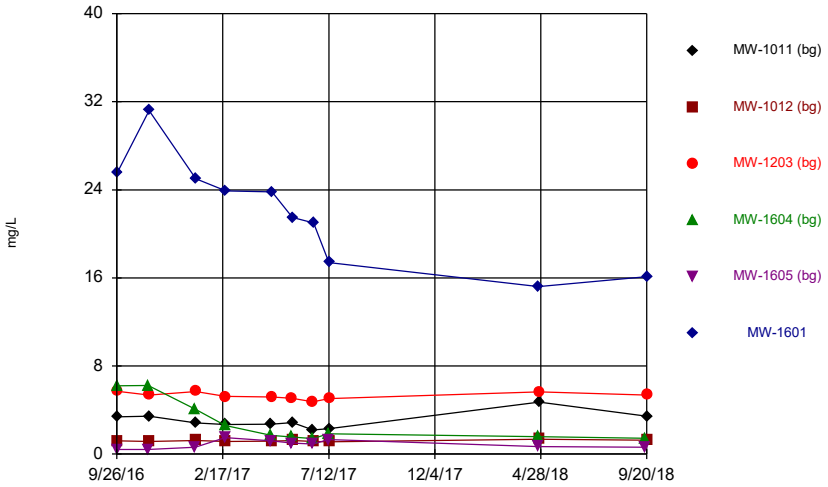
Time Series



Constituent: Calcium Analysis Run 11/11/2018 12:37 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

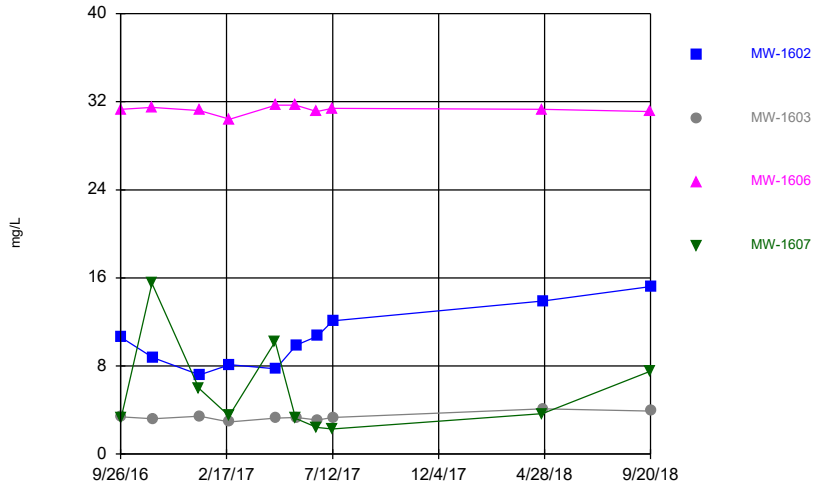
Time Series



Constituent: Chloride Analysis Run 11/11/2018 12:37 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

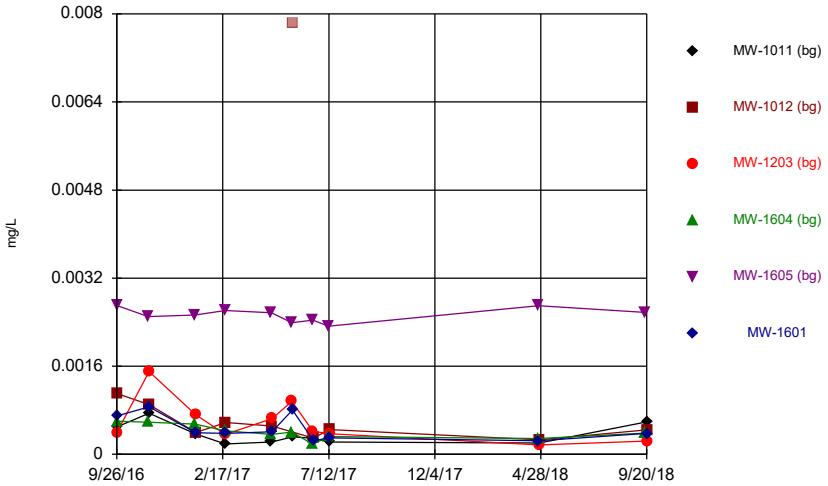
Time Series



Constituent: Chloride Analysis Run 11/11/2018 12:37 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

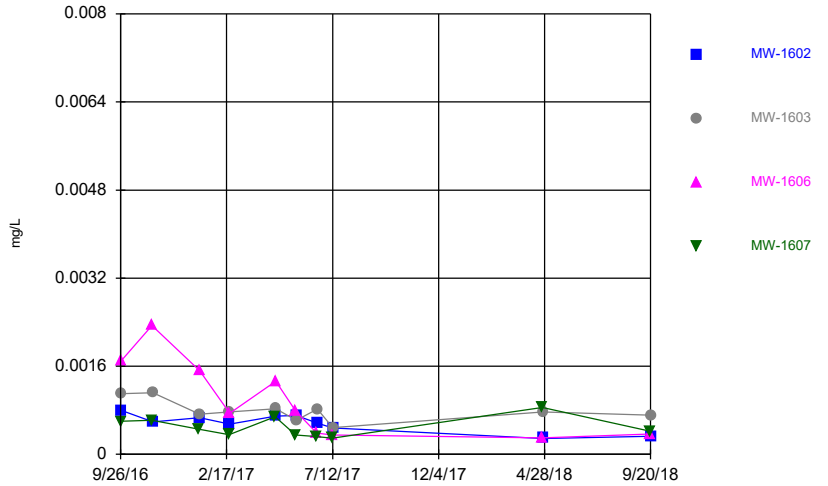
Time Series



Constituent: Chromium Analysis Run 11/11/2018 12:37 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

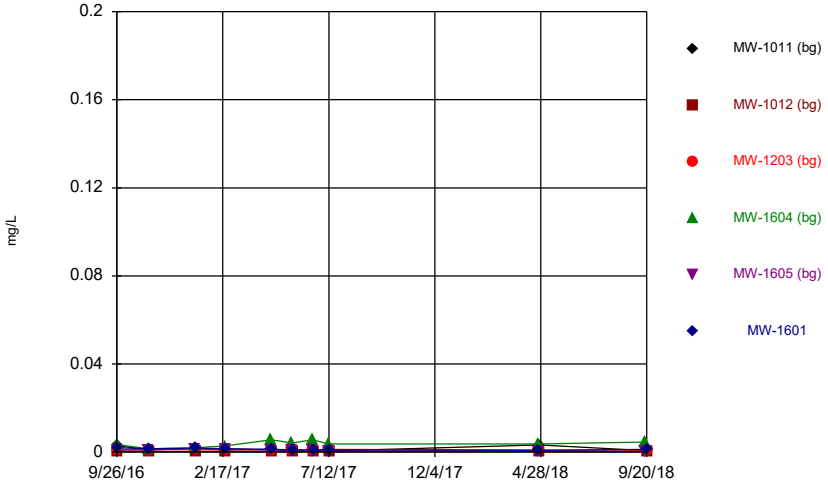
Time Series



Constituent: Chromium Analysis Run 11/11/2018 12:37 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

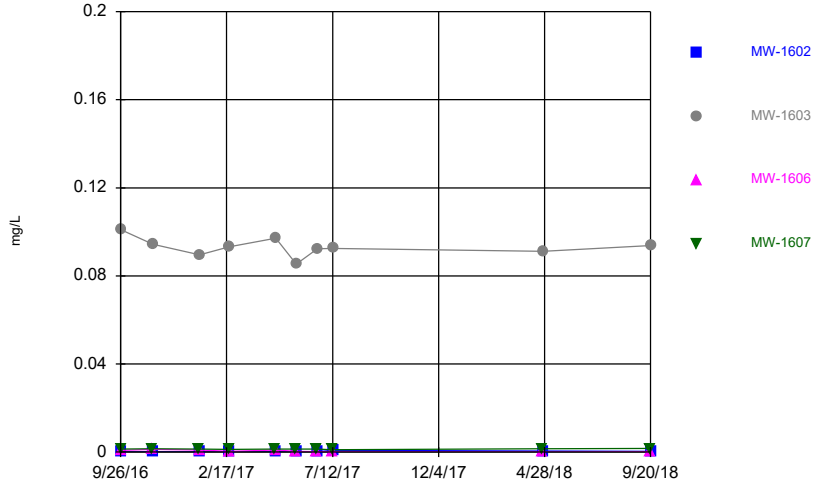
Time Series



Constituent: Cobalt Analysis Run 11/11/2018 12:37 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

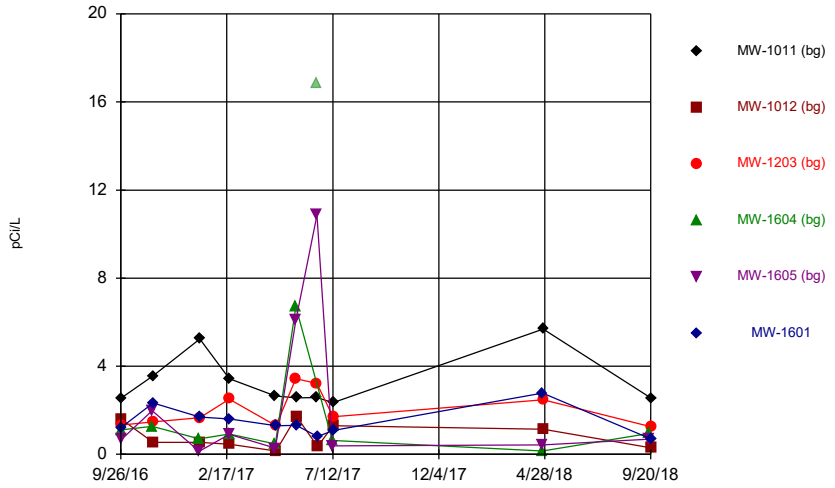
Time Series



Constituent: Cobalt Analysis Run 11/11/2018 12:37 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

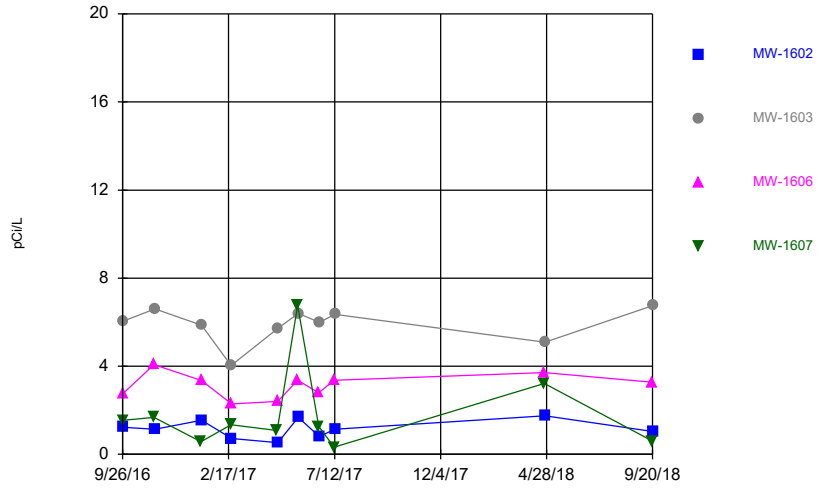
Time Series



Constituent: Combined Radium 226 + 228 Analysis Run 11/11/2018 12:37 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

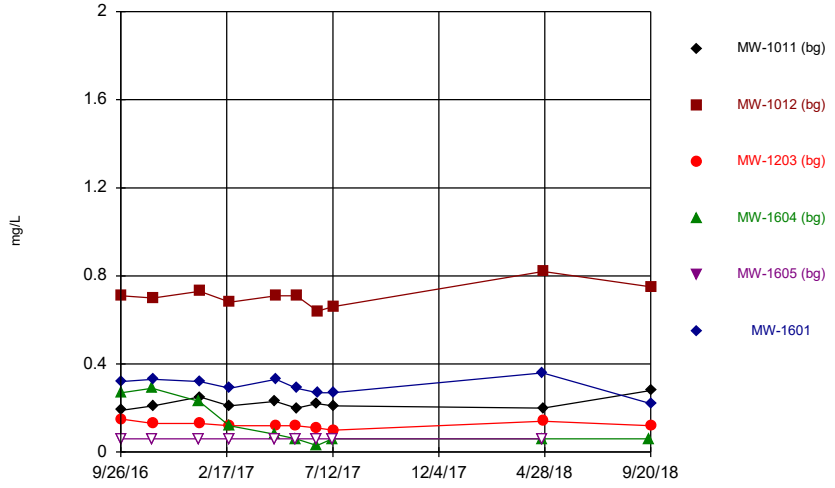
Time Series



Constituent: Combined Radium 226 + 228 Analysis Run 11/11/2018 12:37 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

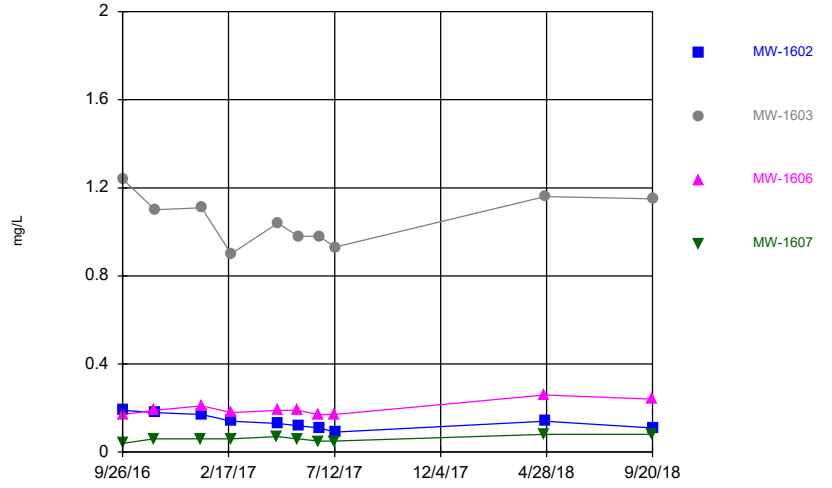
Time Series



Constituent: Fluoride Analysis Run 11/11/2018 12:37 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

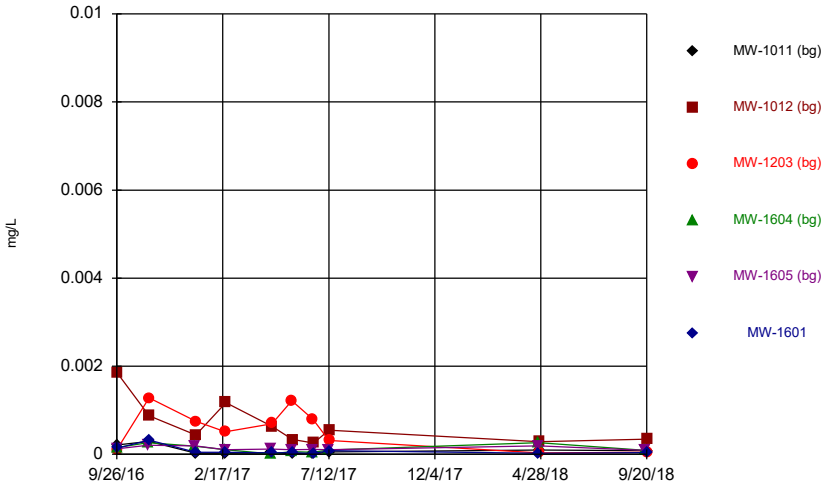
Time Series



Constituent: Fluoride Analysis Run 11/11/2018 12:37 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

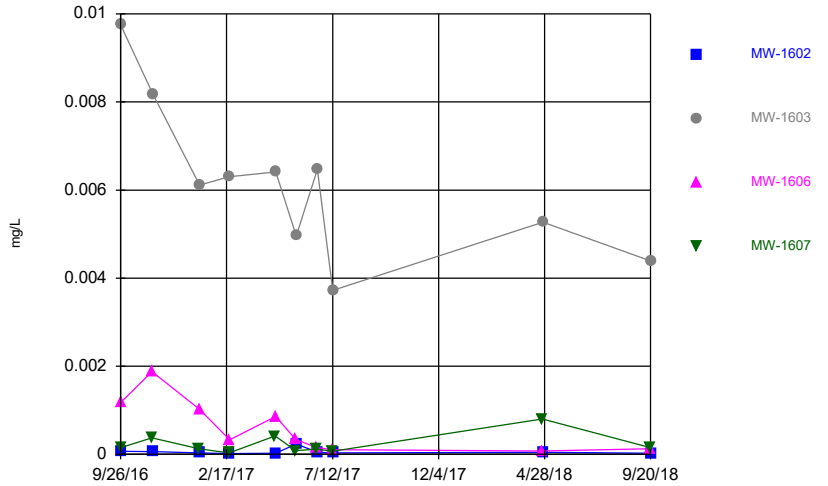
Time Series



Constituent: Lead Analysis Run 11/11/2018 12:37 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

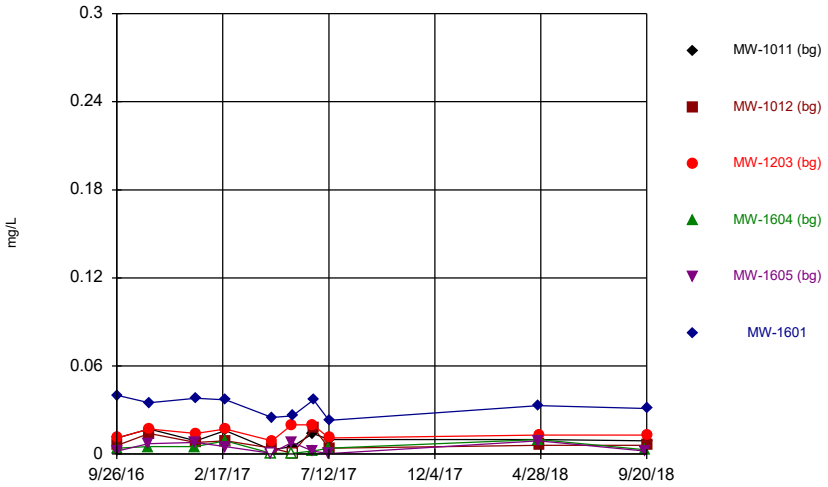
Time Series



Constituent: Lead Analysis Run 11/11/2018 12:37 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

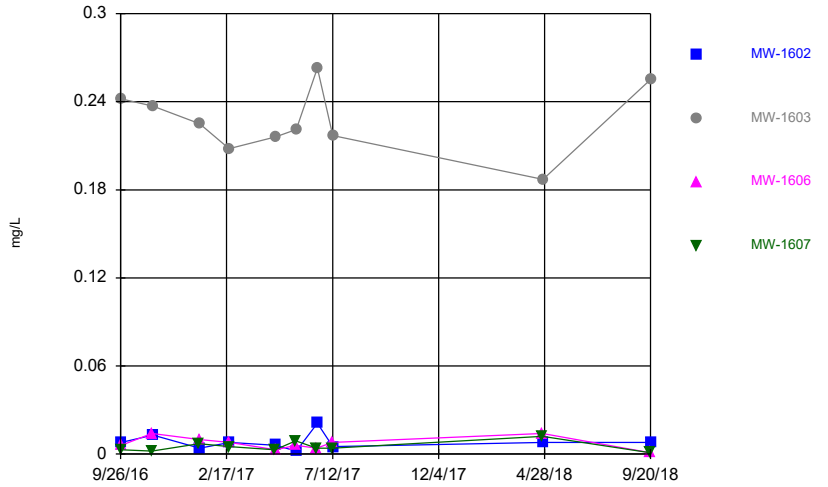
Time Series



Constituent: Lithium Analysis Run 11/11/2018 12:37 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

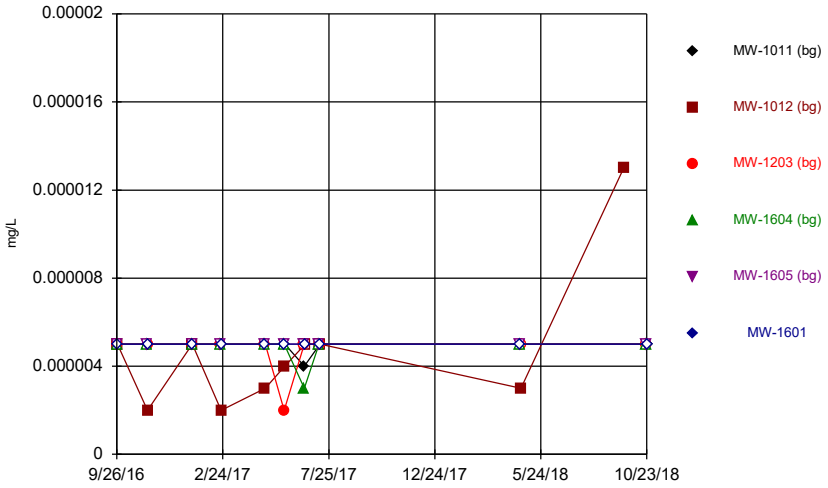
Time Series



Constituent: Lithium Analysis Run 11/11/2018 12:37 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

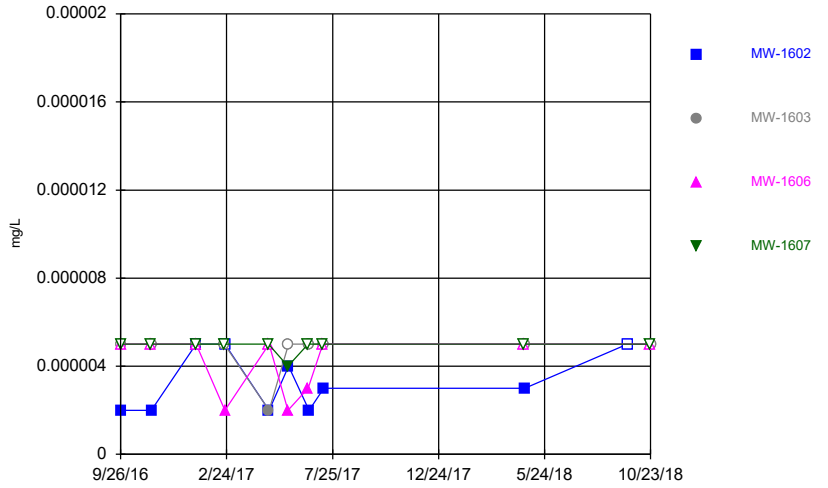
Time Series



Constituent: Mercury Analysis Run 11/11/2018 12:37 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

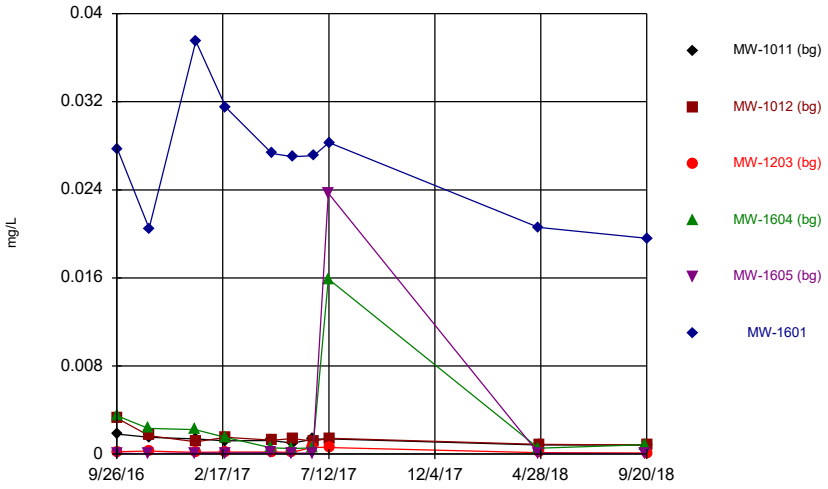
Time Series



Constituent: Mercury Analysis Run 11/11/2018 12:37 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

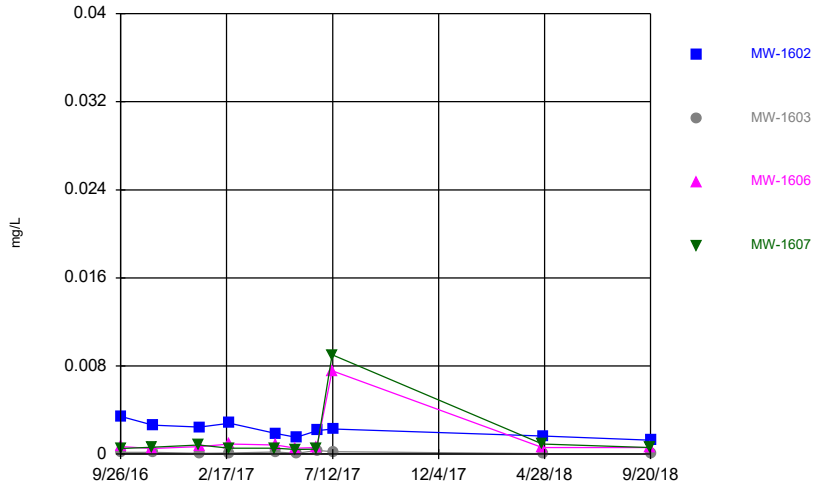
Time Series



Constituent: Molybdenum Analysis Run 11/11/2018 12:37 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

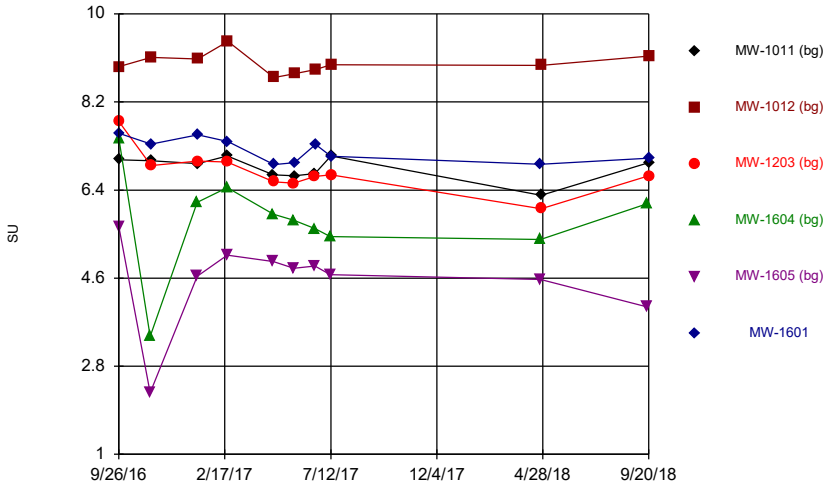
Time Series



Constituent: Molybdenum Analysis Run 11/11/2018 12:37 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

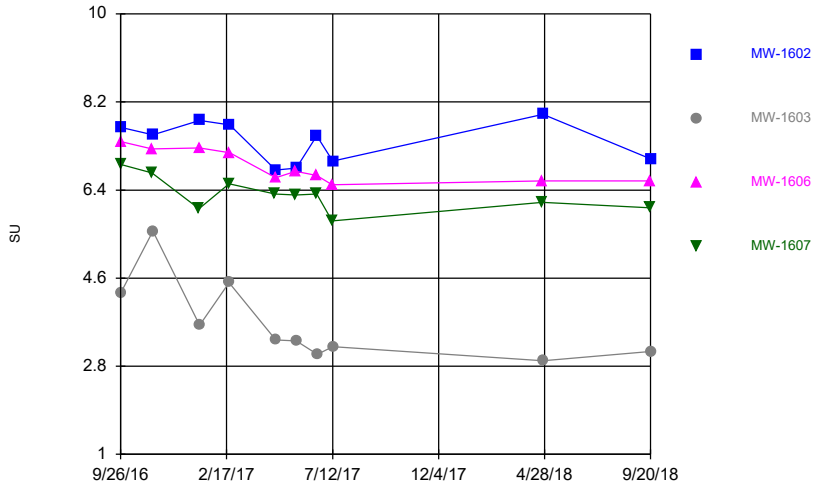
Time Series



Constituent: pH Analysis Run 11/11/2018 12:37 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

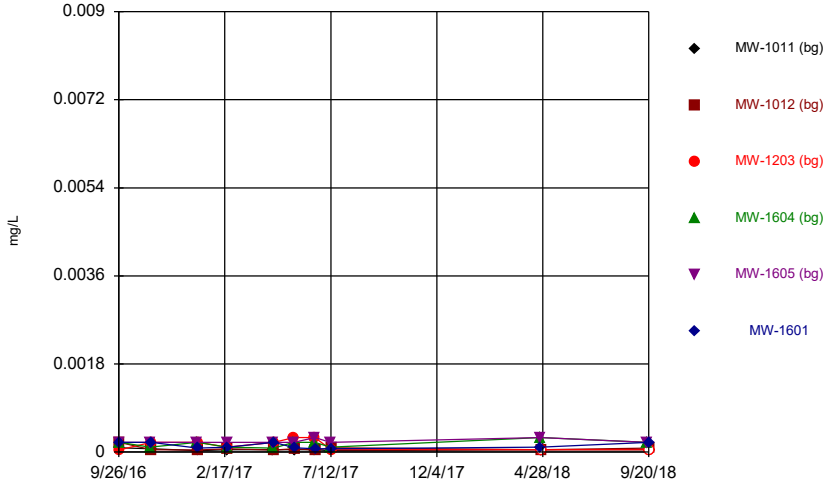
Time Series



Constituent: pH Analysis Run 11/11/2018 12:37 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

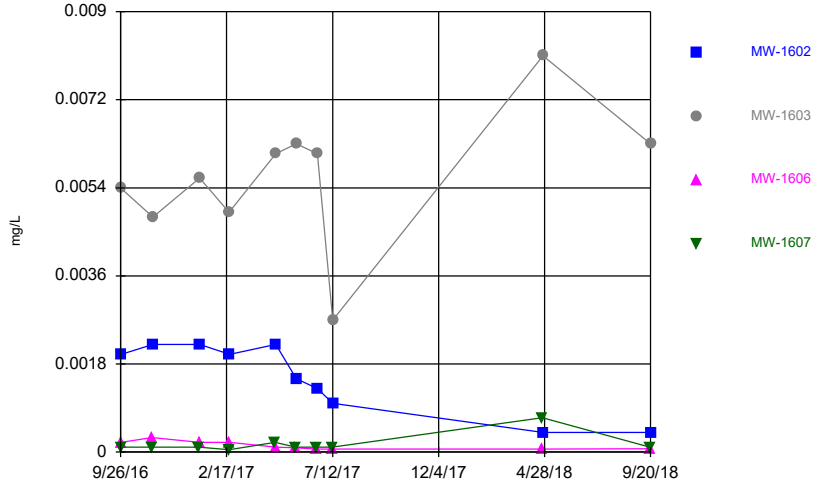
Time Series



Constituent: Selenium Analysis Run 11/11/2018 12:37 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

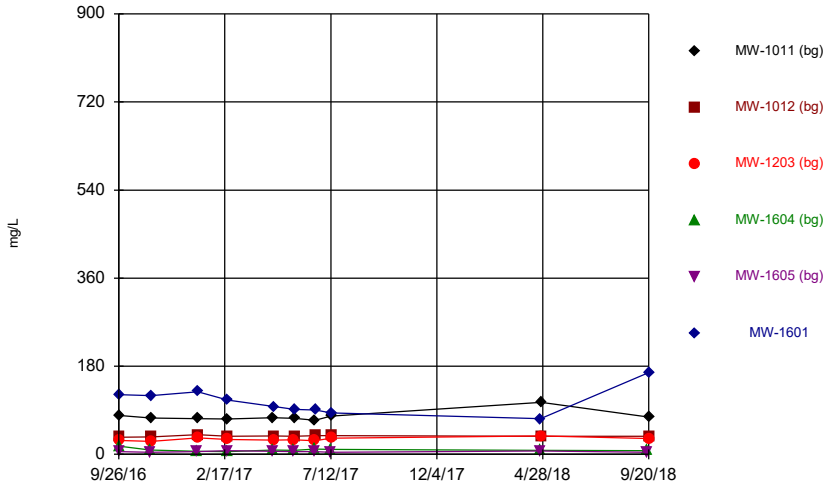
Time Series



Constituent: Selenium Analysis Run 11/11/2018 12:37 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

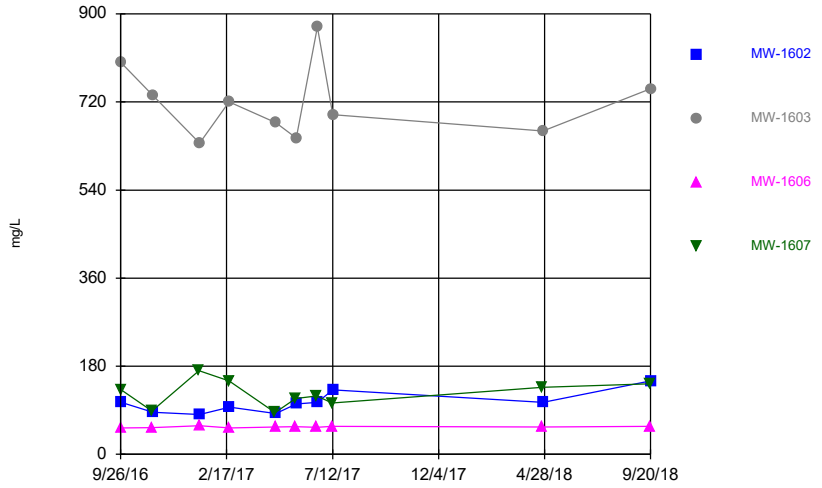
Time Series



Constituent: Sulfate Analysis Run 11/11/2018 12:37 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

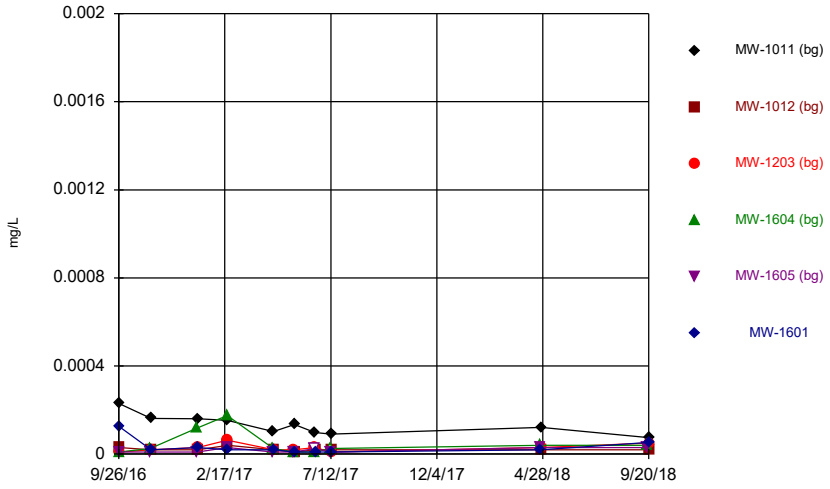
Time Series



Constituent: Sulfate Analysis Run 11/11/2018 12:37 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

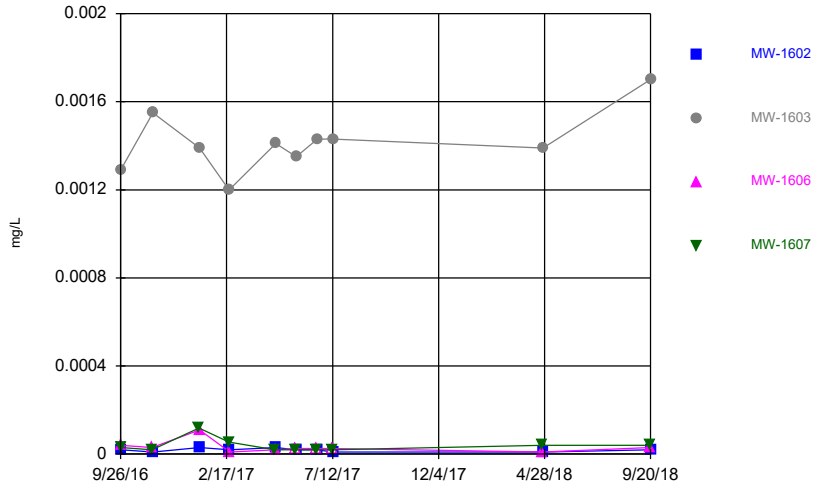
Time Series



Constituent: Thallium Analysis Run 11/11/2018 12:37 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

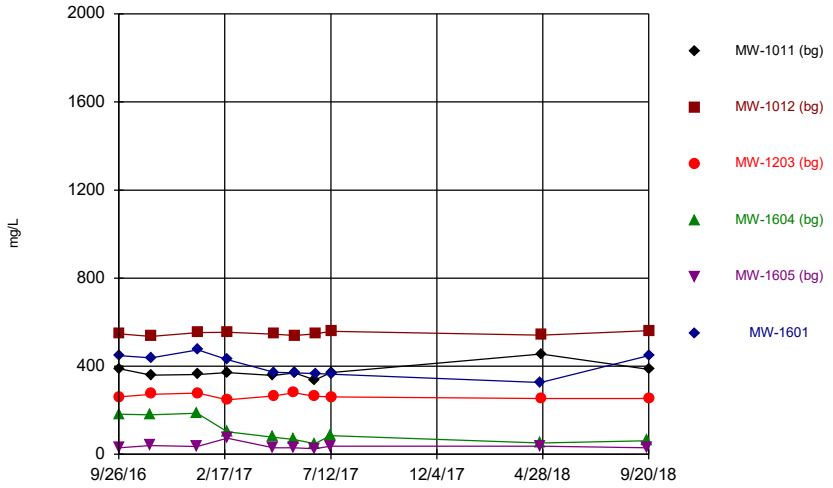
Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Time Series



Constituent: Thallium Analysis Run 11/11/2018 12:37 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

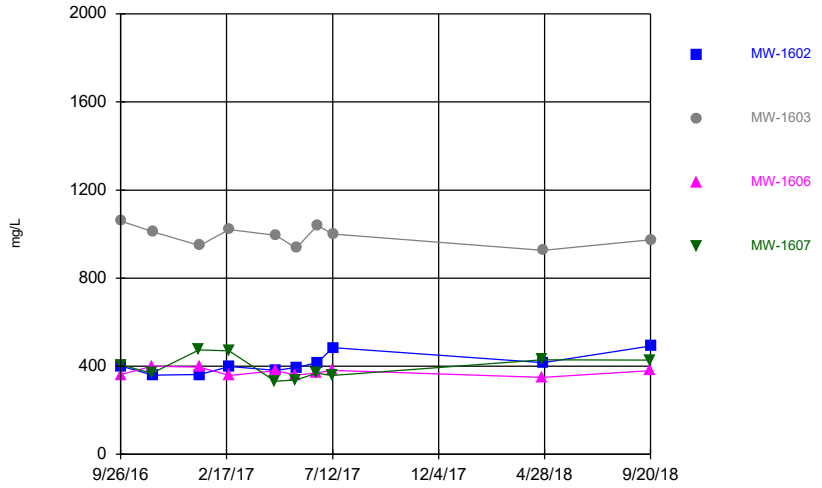
Time Series



Constituent: Total Dissolved Solids Analysis Run 11/11/2018 12:37 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Time Series



Constituent: Total Dissolved Solids Analysis Run 11/11/2018 12:37 PM View: Descriptive
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Interwell Prediction Limit Summary Table - Significant Results

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP Printed 10/30/2018, 10:34 AM

Constituent	Well	Upper Lim.	Date	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron (mg/L)	**MW-1606**	**0.2217**	**9/19/2018**	**1.82**	**Yes**	**50**	**0.09997**	**0.06539**	**2**	**None**	**No**	**0.001504**	**Param Inter 1 of 2**
Boron (mg/L)	**MW-1607**	**0.2217**	**9/19/2018**	**0.255**	**Yes**	**50**	**0.09997**	**0.06539**	**2**	**None**	**No**	**0.001504**	**Param Inter 1 of 2**
Chloride (mg/L)	**MW-1601**	**7**	**9/20/2018**	**16.1**	**Yes**	**50**	**1.31**	**0.3238**	**0**	**None**	**x^(1/3)**	**0.001504**	**Param Inter 1 of 2**
Chloride (mg/L)	**MW-1602**	**7**	**9/20/2018**	**15.2**	**Yes**	**50**	**1.31**	**0.3238**	**0**	**None**	**x^(1/3)**	**0.001504**	**Param Inter 1 of 2**
Chloride (mg/L)	**MW-1606**	**7**	**9/19/2018**	**31.1**	**Yes**	**50**	**1.31**	**0.3238**	**0**	**None**	**x^(1/3)**	**0.001504**	**Param Inter 1 of 2**
Chloride (mg/L)	**MW-1607**	**7**	**9/19/2018**	**7.52**	**Yes**	**50**	**1.31**	**0.3238**	**0**	**None**	**x^(1/3)**	**0.001504**	**Param Inter 1 of 2**
Fluoride (mg/L)	**MW-1603**	**0.82**	**9/20/2018**	**1.15**	**Yes**	**49**	**n/a**	**n/a**	**18.37**	**n/a**	**n/a**	**0.000782**	**NP Inter (normality) ...**
Sulfate (mg/L)	**MW-1601**	**106**	**9/20/2018**	**167**	**Yes**	**50**	**n/a**	**n/a**	**0**	**n/a**	**n/a**	**0.0007428**	**NP Inter (normality) ...**
Sulfate (mg/L)	**MW-1602**	**106**	**9/20/2018**	**150**	**Yes**	**50**	**n/a**	**n/a**	**0**	**n/a**	**n/a**	**0.0007428**	**NP Inter (normality) ...**
Sulfate (mg/L)	**MW-1603**	**106**	**9/20/2018**	**747**	**Yes**	**50**	**n/a**	**n/a**	**0**	**n/a**	**n/a**	**0.0007428**	**NP Inter (normality) ...**
Sulfate (mg/L)	**MW-1607**	**106**	**9/19/2018**	**144**	**Yes**	**50**	**n/a**	**n/a**	**0**	**n/a**	**n/a**	**0.0007428**	**NP Inter (normality) ...**
Total Dissolved Solids (mg/L)	**MW-1603**	**561**	**9/20/2018**	**974**	**Yes**	**50**	**n/a**	**n/a**	**0**	**n/a**	**n/a**	**0.0007428**	**NP Inter (normality) ...**

Interwell Prediction Limit Summary Table - All Results

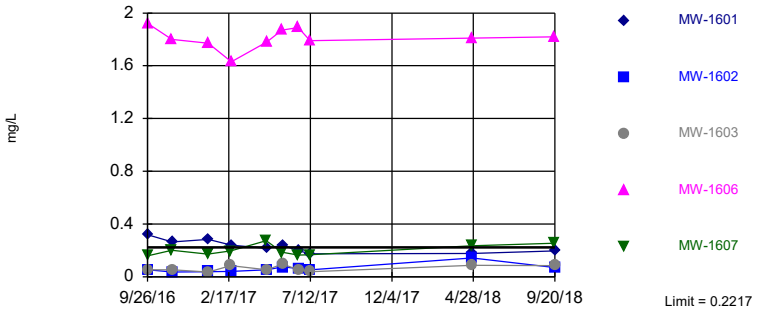
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP Printed 10/30/2018, 10:34 AM

Constituent	Well	Upper Lim.	Date	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron (mg/L)	MW-1601	0.2217	9/20/2018	0.196	No	50	0.09997	0.06539	2	None	No	0.001504	Param Inter 1 of 2
Boron (mg/L)	MW-1602	0.2217	9/20/2018	0.07	No	50	0.09997	0.06539	2	None	No	0.001504	Param Inter 1 of 2
Boron (mg/L)	MW-1603	0.2217	9/20/2018	0.085	No	50	0.09997	0.06539	2	None	No	0.001504	Param Inter 1 of 2
Boron (mg/L)	**MW-1606**	**0.2217**	**9/19/2018**	**1.82**	**Yes**	**50**	**0.09997**	**0.06539**	**2**	**None**	**No**	**0.001504**	**Param Inter 1 of 2**
Boron (mg/L)	**MW-1607**	**0.2217**	**9/19/2018**	**0.255**	**Yes**	**50**	**0.09997**	**0.06539**	**2**	**None**	**No**	**0.001504**	**Param Inter 1 of 2**
Calcium (mg/L)	MW-1601	105	9/20/2018	68.8	No	50	n/a	n/a	0	n/a	n/a	0.0007428	NP Inter (normality) ...
Calcium (mg/L)	MW-1602	105	9/20/2018	72.1	No	50	n/a	n/a	0	n/a	n/a	0.0007428	NP Inter (normality) ...
Calcium (mg/L)	MW-1603	105	9/20/2018	97.5	No	50	n/a	n/a	0	n/a	n/a	0.0007428	NP Inter (normality) ...
Calcium (mg/L)	MW-1606	105	9/19/2018	71.8	No	50	n/a	n/a	0	n/a	n/a	0.0007428	NP Inter (normality) ...
Calcium (mg/L)	MW-1607	105	9/19/2018	95.6	No	50	n/a	n/a	0	n/a	n/a	0.0007428	NP Inter (normality) ...
Chloride (mg/L)	**MW-1601**	**7**	**9/20/2018**	**16.1**	**Yes**	**50**	**1.31**	**0.3238**	**0**	**None**	**x^(1/3)**	**0.001504**	**Param Inter 1 of 2**
Chloride (mg/L)	**MW-1602**	**7**	**9/20/2018**	**15.2**	**Yes**	**50**	**1.31**	**0.3238**	**0**	**None**	**x^(1/3)**	**0.001504**	**Param Inter 1 of 2**
Chloride (mg/L)	MW-1603	7	9/20/2018	3.92	No	50	1.31	0.3238	0	None	x^(1/3)	0.001504	Param Inter 1 of 2
Chloride (mg/L)	**MW-1606**	**7**	**9/19/2018**	**31.1**	**Yes**	**50**	**1.31**	**0.3238**	**0**	**None**	**x^(1/3)**	**0.001504**	**Param Inter 1 of 2**
Chloride (mg/L)	**MW-1607**	**7**	**9/19/2018**	**7.52**	**Yes**	**50**	**1.31**	**0.3238**	**0**	**None**	**x^(1/3)**	**0.001504**	**Param Inter 1 of 2**
Fluoride (mg/L)	MW-1601	0.82	9/20/2018	0.22	No	49	n/a	n/a	18.37	n/a	n/a	0.000782	NP Inter (normality) ...
Fluoride (mg/L)	MW-1602	0.82	9/20/2018	0.11	No	49	n/a	n/a	18.37	n/a	n/a	0.000782	NP Inter (normality) ...
Fluoride (mg/L)	**MW-1603**	**0.82**	**9/20/2018**	**1.15**	**Yes**	**49**	**n/a**	**n/a**	**18.37**	**n/a**	**n/a**	**0.000782**	**NP Inter (normality) ...**
Fluoride (mg/L)	MW-1606	0.82	9/19/2018	0.24	No	49	n/a	n/a	18.37	n/a	n/a	0.000782	NP Inter (normality) ...
Fluoride (mg/L)	MW-1607	0.82	9/19/2018	0.08	No	49	n/a	n/a	18.37	n/a	n/a	0.000782	NP Inter (normality) ...
Sulfate (mg/L)	**MW-1601**	**106**	**9/20/2018**	**167**	**Yes**	**50**	**n/a**	**n/a**	**0**	**n/a**	**n/a**	**0.0007428**	**NP Inter (normality) ...**
Sulfate (mg/L)	**MW-1602**	**106**	**9/20/2018**	**150**	**Yes**	**50**	**n/a**	**n/a**	**0**	**n/a**	**n/a**	**0.0007428**	**NP Inter (normality) ...**
Sulfate (mg/L)	**MW-1603**	**106**	**9/20/2018**	**747**	**Yes**	**50**	**n/a**	**n/a**	**0**	**n/a**	**n/a**	**0.0007428**	**NP Inter (normality) ...**
Sulfate (mg/L)	MW-1606	106	9/19/2018	56.9	No	50	n/a	n/a	0	n/a	n/a	0.0007428	NP Inter (normality) ...
Sulfate (mg/L)	**MW-1607**	**106**	**9/19/2018**	**144**	**Yes**	**50**	**n/a**	**n/a**	**0**	**n/a**	**n/a**	**0.0007428**	**NP Inter (normality) ...**
Total Dissolved Solids (mg/L)	MW-1601	561	9/20/2018	448	No	50	n/a	n/a	0	n/a	n/a	0.0007428	NP Inter (normality) ...
Total Dissolved Solids (mg/L)	MW-1602	561	9/20/2018	492	No	50	n/a	n/a	0	n/a	n/a	0.0007428	NP Inter (normality) ...
Total Dissolved Solids (mg/L)	**MW-1603**	**561**	**9/20/2018**	**974**	**Yes**	**50**	**n/a**	**n/a**	**0**	**n/a**	**n/a**	**0.0007428**	**NP Inter (normality) ...**
Total Dissolved Solids (mg/L)	MW-1606	561	9/19/2018	380	No	50	n/a	n/a	0	n/a	n/a	0.0007428	NP Inter (normality) ...
Total Dissolved Solids (mg/L)	MW-1607	561	9/19/2018	428	No	50	n/a	n/a	0	n/a	n/a	0.0007428	NP Inter (normality) ...

Exceeds Limit: MW-1606, MW-1607

Prediction Limit

Interwell Parametric



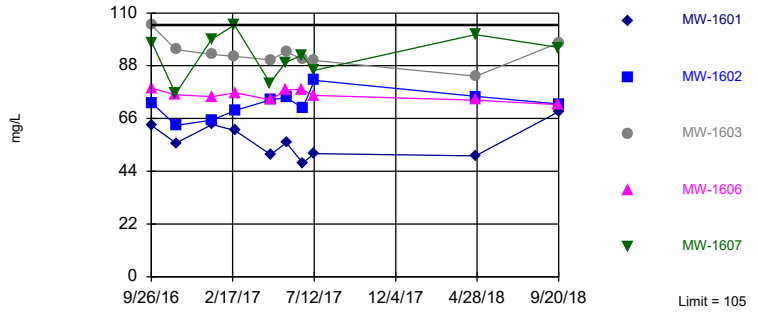
Background Data Summary: Mean=0.09997, Std. Dev.=0.06539, n=50, 2% NDs. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9708, critical = 0.935. Kappa = 1.862 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.001504. Comparing 5 points to limit.

Constituent: Boron Analysis Run 10/30/2018 10:30 AM View: PL's - Interwell
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Within Limit

Prediction Limit

Interwell Non-parametric



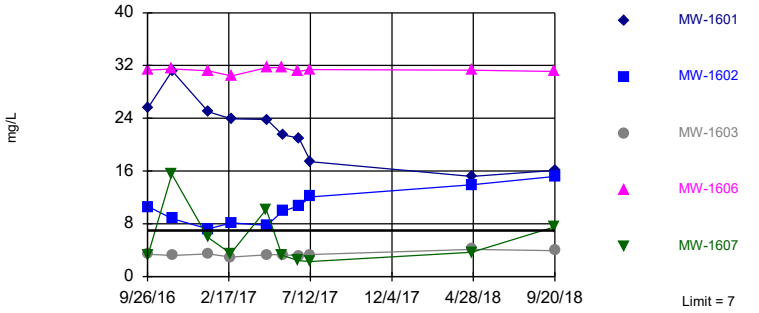
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 50 background values. Annual per-constituent alpha = 0.007403. Individual comparison alpha = 0.0007428 (1 of 2). Comparing 5 points to limit.

Constituent: Calcium Analysis Run 10/30/2018 10:30 AM View: PL's - Interwell
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Exceeds Limit: MW-1601, MW-1602, MW-1606, MW-1607

Prediction Limit

Interwell Parametric



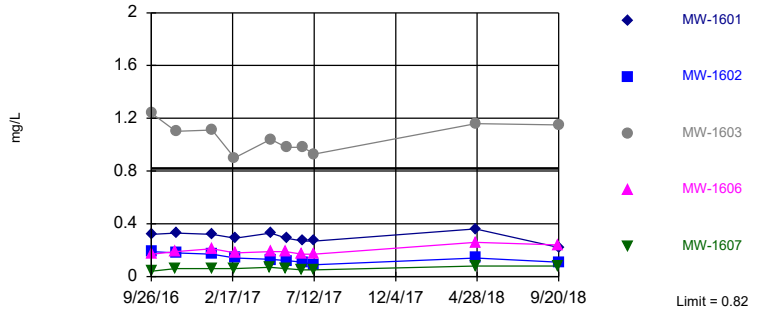
Background Data Summary (based on cube root transformation): Mean=1.31, Std. Dev.=0.3238, n=50. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9417, critical = 0.935. Kappa = 1.862 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.001504. Comparing 5 points to limit.

Constituent: Chloride Analysis Run 10/30/2018 10:30 AM View: PL's - Interwell
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Exceeds Limit: MW-1603

Prediction Limit

Interwell Non-parametric



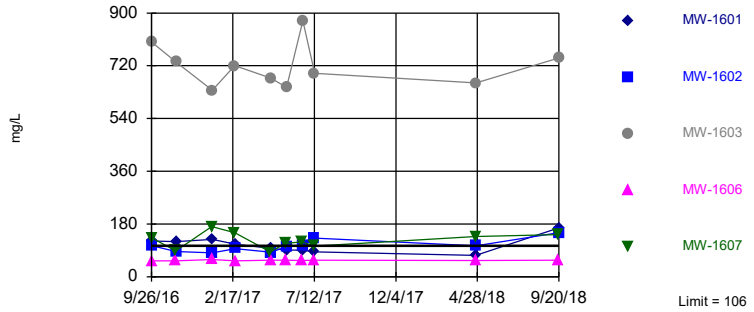
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 49 background values. 18.37% NDs. Annual per-constituent alpha = 0.007793. Individual comparison alpha = 0.000782 (1 of 2). Comparing 5 points to limit.

Constituent: Fluoride Analysis Run 10/30/2018 10:30 AM View: PL's - Interwell
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Exceeds Limit: MW-1601, MW-1602, MW-1603, MW-1607

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 50 background values. Annual per-constituent alpha = 0.007403. Individual comparison alpha = 0.0007428 (1 of 2). Comparing 5 points to limit.

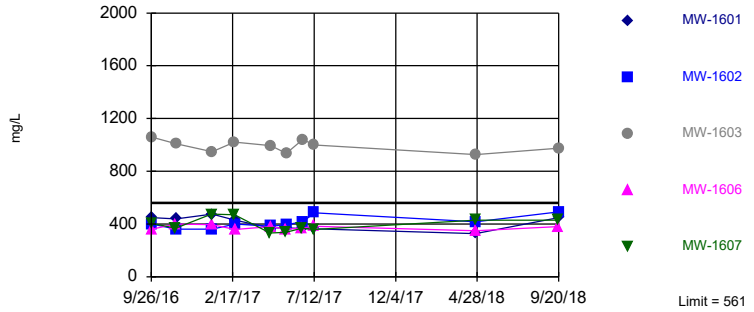
Constituent: Sulfate Analysis Run 10/30/2018 10:30 AM View: PL's - Interwell
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Exceeds Limit: MW-1603

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 50 background values. Annual per-constituent alpha = 0.007403. Individual comparison alpha = 0.0007428 (1 of 2). Comparing 5 points to limit.

Constituent: Total Dissolved Solids Analysis Run 10/30/2018 10:30 AM View: PL's - Interwell
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Intrawell Prediction Limit Summary Table - All Results (No Significant Results)

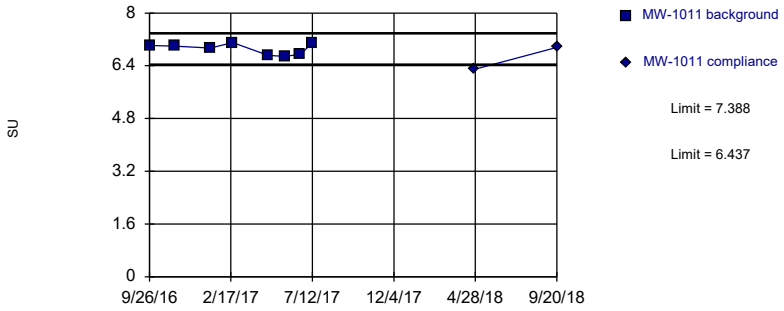
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP Printed 10/30/2018, 10:41 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
pH (SU)	MW-1011	7.388	6.437	9/20/2018	6.96	No	8	6.913	0.1734	0	None	No	0.000752	Param 1 of 2
pH (SU)	MW-1012	9.616	8.347	9/20/2018	9.14	No	8	8.981	0.2315	0	None	No	0.000752	Param 1 of 2
pH (SU)	MW-1203	8.004	5.786	9/20/2018	6.69	No	8	6.895	0.4046	0	None	No	0.000752	Param 1 of 2
pH (SU)	MW-1604	8.915	2.64	9/18/2018	6.12	No	8	5.778	1.145	0	None	No	0.000752	Param 1 of 2
pH (SU)	MW-1605	6.564	1.095	9/18/2018	4.01	No	8	22.14	7.644	0	None	x^2	0.000752	Param 1 of 2
pH (SU)	MW-1601	7.94	6.59	9/20/2018	7.05	No	8	7.265	0.2465	0	None	No	0.000752	Param 1 of 2
pH (SU)	MW-1602	8.5	6.23	9/20/2018	7.04	No	8	7.365	0.4143	0	None	No	0.000752	Param 1 of 2
pH (SU)	MW-1603	6.228	1.497	9/20/2018	3.1	No	8	3.863	0.8632	0	None	No	0.000752	Param 1 of 2
pH (SU)	MW-1606	7.883	6.04	9/19/2018	6.59	No	8	6.961	0.3363	0	None	No	0.000752	Param 1 of 2
pH (SU)	MW-1607	7.383	5.349	9/19/2018	6.04	No	8	6.366	0.3713	0	None	No	0.000752	Param 1 of 2

Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=6.913, Std. Dev.=0.1734, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8526, critical = 0.749. Kappa = 2.74 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

Constituent: pH Analysis Run 10/30/2018 10:39 AM View: PL's - Intrawell

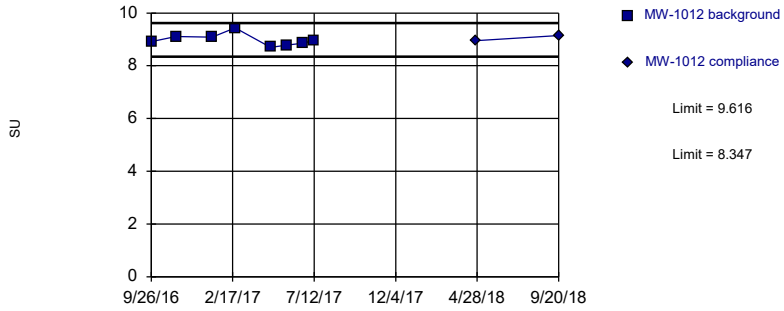
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=8.981, Std. Dev.=0.2315, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9365, critical = 0.749. Kappa = 2.74 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

Constituent: pH Analysis Run 10/30/2018 10:39 AM View: PL's - Intrawell

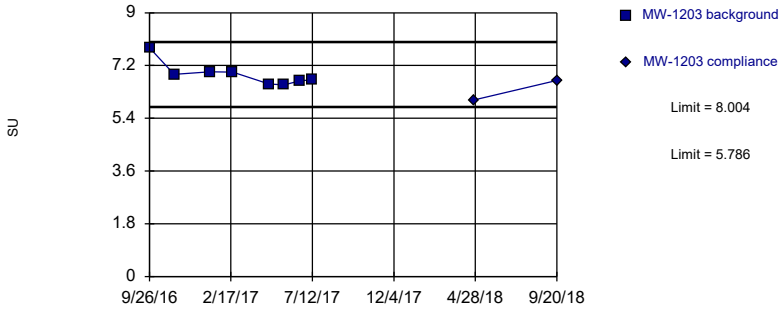
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=6.895, Std. Dev.=0.4046, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.7987, critical = 0.749. Kappa = 2.74 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

Constituent: pH Analysis Run 10/30/2018 10:39 AM View: PL's - Intrawell

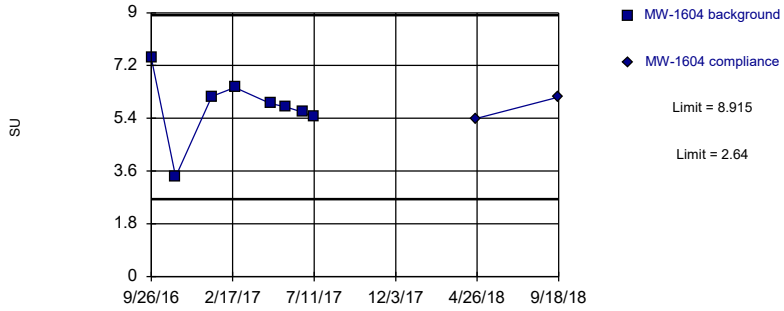
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=5.778, Std. Dev.=1.145, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8966, critical = 0.749. Kappa = 2.74 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

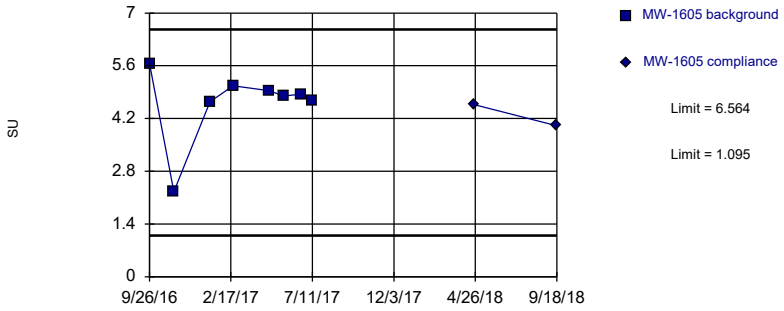
Constituent: pH Analysis Run 10/30/2018 10:39 AM View: PL's - Intrawell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary (based on square transformation): Mean=22.14, Std. Dev.=7.644, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8006, critical = 0.749. Kappa = 2.74 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

Constituent: pH Analysis Run 10/30/2018 10:39 AM View: PL's - Intrawell

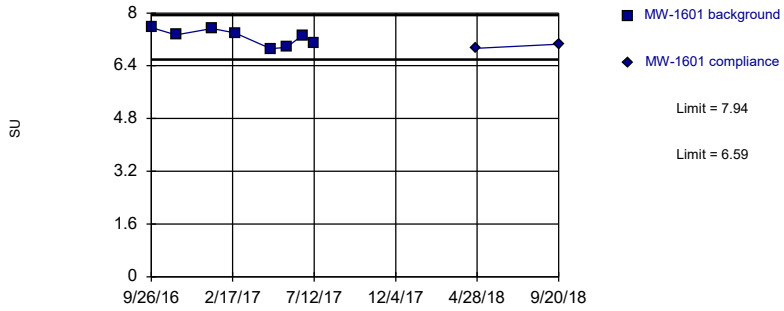
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=7.265, Std. Dev.=0.2465, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9052, critical = 0.749. Kappa = 2.74 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

Constituent: pH Analysis Run 10/30/2018 10:39 AM View: PL's - Intrawell

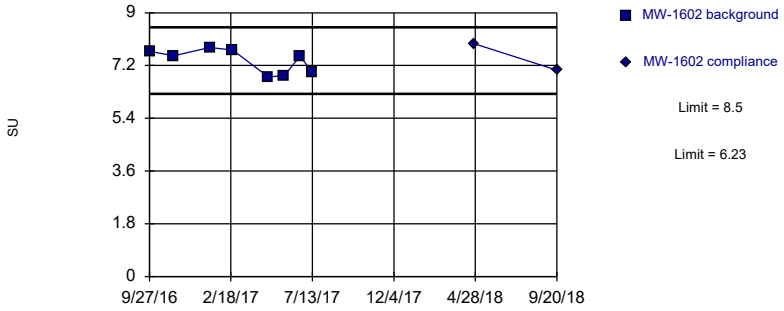
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=7.365, Std. Dev.=0.4143, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8508, critical = 0.749. Kappa = 2.74 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

Constituent: pH Analysis Run 10/30/2018 10:39 AM View: PL's - Intrawell

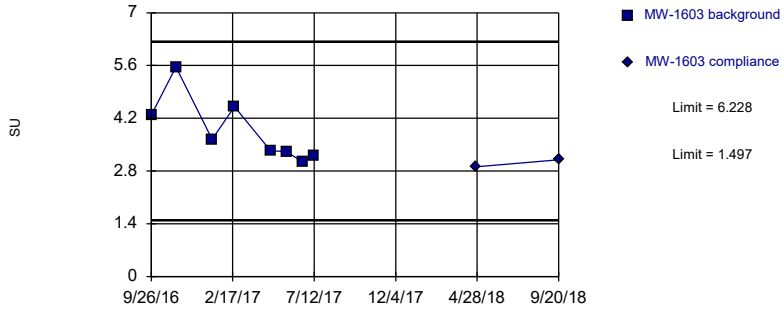
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=3.863, Std. Dev.=0.8632, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8662, critical = 0.749. Kappa = 2.74 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

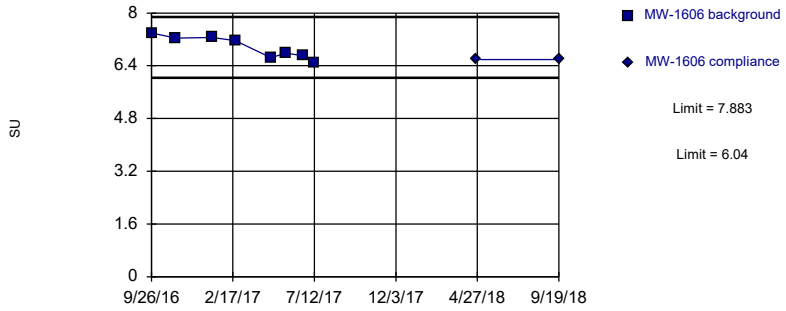
Constituent: pH Analysis Run 10/30/2018 10:39 AM View: PL's - Intrawell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=6.961, Std. Dev.=0.3363, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8932, critical = 0.749. Kappa = 2.74 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

Constituent: pH Analysis Run 10/30/2018 10:39 AM View: PL's - Intrawell

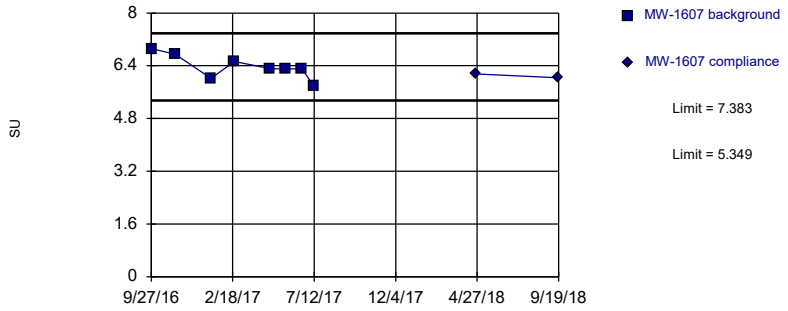
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=6.366, Std. Dev.=0.3713, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9693, critical = 0.749. Kappa = 2.74 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.001504.

Constituent: pH Analysis Run 10/30/2018 10:39 AM View: PL's - Intrawell

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Trend Test Summary Table - Significant Results

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP Printed 10/30/2018, 11:46 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Chloride (mg/L)	**MW-1604 (bg)**	**-2.575**	**-31**	**-30**	**Yes**	**10**	**0**	**n/a**	**n/a**	**0.01**	**NP**
Chloride (mg/L)	**MW-1601**	**-7.643**	**-41**	**-30**	**Yes**	**10**	**0**	**n/a**	**n/a**	**0.01**	**NP**
Fluoride (mg/L)	**MW-1604 (bg)**	**-0.1575**	**-31**	**-30**	**Yes**	**10**	**0**	**n/a**	**n/a**	**0.01**	**NP**

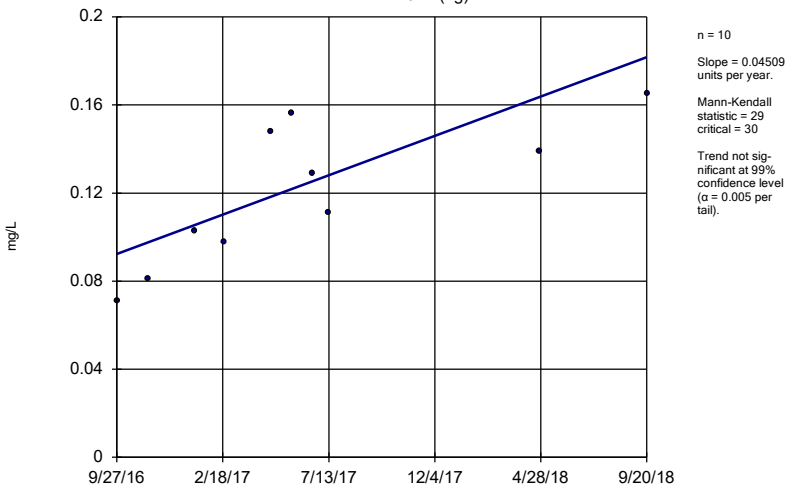
Trend Test Summary Table - All Results

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP Printed 10/30/2018, 11:46 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Boron (mg/L)	MW-1011 (bg)	0.04509	29	30	No	10	0	n/a	n/a	0.01	NP
Boron (mg/L)	MW-1012 (bg)	0.03029	17	30	No	10	0	n/a	n/a	0.01	NP
Boron (mg/L)	MW-1203 (bg)	0.025	17	30	No	10	0	n/a	n/a	0.01	NP
Boron (mg/L)	MW-1604 (bg)	0.01398	19	30	No	10	0	n/a	n/a	0.01	NP
Boron (mg/L)	MW-1605 (bg)	0.02955	21	30	No	10	10	n/a	n/a	0.01	NP
Boron (mg/L)	MW-1606	0.02483	5	30	No	10	0	n/a	n/a	0.01	NP
Boron (mg/L)	MW-1607	0.03809	11	30	No	10	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-1011 (bg)	-0.4252	-2	-30	No	10	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-1012 (bg)	0.02262	5	30	No	10	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-1203 (bg)	-0.4212	-17	-30	No	10	0	n/a	n/a	0.01	NP
Chloride (mg/L)	**MW-1604 (bg)**	**-2.575**	**-31**	**-30**	**Yes**	**10**	**0**	**n/a**	**n/a**	**0.01**	**NP**
Chloride (mg/L)	MW-1605 (bg)	0.1021	7	30	No	10	0	n/a	n/a	0.01	NP
Chloride (mg/L)	**MW-1601**	**-7.643**	**-41**	**-30**	**Yes**	**10**	**0**	**n/a**	**n/a**	**0.01**	**NP**
Chloride (mg/L)	MW-1602	3.792	27	30	No	10	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-1606	-0.1011	-6	-30	No	10	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-1607	-1.79	-9	-30	No	10	0	n/a	n/a	0.01	NP
Fluoride (mg/L)	MW-1011 (bg)	0.01527	7	30	No	10	0	n/a	n/a	0.01	NP
Fluoride (mg/L)	MW-1012 (bg)	0.01185	4	30	No	10	0	n/a	n/a	0.01	NP
Fluoride (mg/L)	MW-1203 (bg)	-0.02786	-20	-30	No	10	0	n/a	n/a	0.01	NP
Fluoride (mg/L)	**MW-1604 (bg)**	**-0.1575**	**-31**	**-30**	**Yes**	**10**	**0**	**n/a**	**n/a**	**0.01**	**NP**
Fluoride (mg/L)	MW-1605 (bg)	0	0	25	No	9	100	n/a	n/a	0.01	NP
Fluoride (mg/L)	MW-1603	-0.05061	-6	-30	No	10	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-1011 (bg)	1.138	5	30	No	10	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-1012 (bg)	0.6848	5	30	No	10	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-1203 (bg)	3.113	15	30	No	10	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-1604 (bg)	-0.5714	-7	-30	No	10	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-1605 (bg)	0.05376	1	30	No	10	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-1601	-42.55	-23	-30	No	10	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-1602	31.47	24	30	No	10	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-1603	-27.22	-3	-30	No	10	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-1607	6.066	3	30	No	10	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-1011 (bg)	12.62	8	30	No	10	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-1012 (bg)	6.404	12	30	No	10	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-1203 (bg)	-8.805	-13	-30	No	10	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-1604 (bg)	-87.65	-29	-30	No	10	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-1605 (bg)	-0.7557	-9	-30	No	10	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-1603	-33.18	-17	-30	No	10	0	n/a	n/a	0.01	NP

Sen's Slope Estimator

MW-1011 (bg)



n = 10

Slope = 0.04509 units per year.

Mann-Kendall statistic = 29 critical = 30

Trend not significant at 99% confidence level (α = 0.005 per tail).

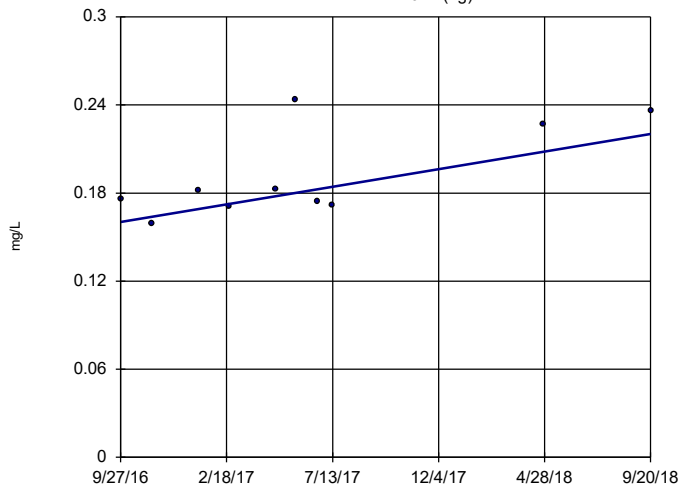
Constituent: Boron Analysis Run 10/30/2018 11:44 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Sen's Slope Estimator

MW-1012 (bg)



n = 10

Slope = 0.03029 units per year.

Mann-Kendall statistic = 17 critical = 30

Trend not significant at 99% confidence level (α = 0.005 per tail).

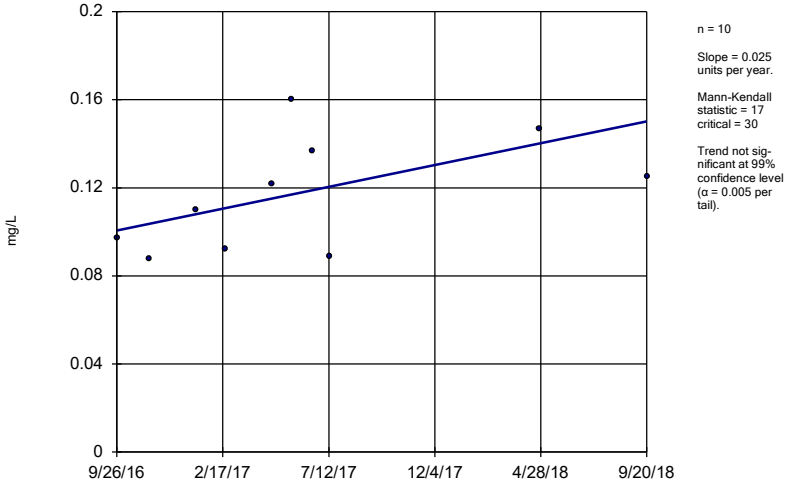
Constituent: Boron Analysis Run 10/30/2018 11:44 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Sen's Slope Estimator

MW-1203 (bg)



n = 10

Slope = 0.025 units per year.

Mann-Kendall statistic = 17 critical = 30

Trend not significant at 99% confidence level (α = 0.005 per tail).

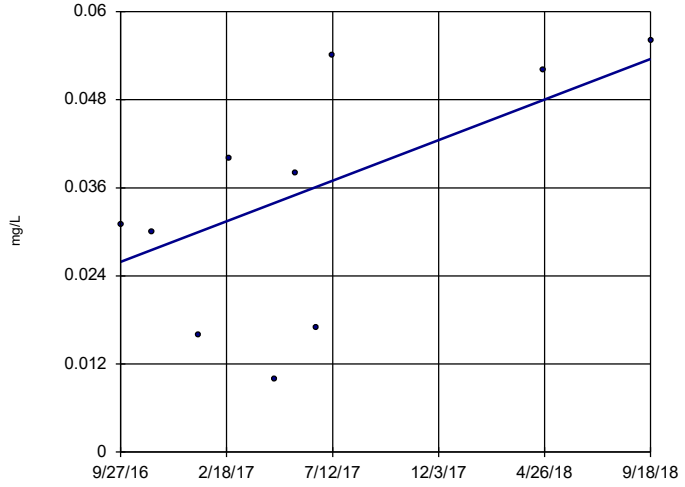
Constituent: Boron Analysis Run 10/30/2018 11:44 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Sen's Slope Estimator

MW-1604 (bg)



n = 10

Slope = 0.01398 units per year.

Mann-Kendall statistic = 19 critical = 30

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Boron Analysis Run 10/30/2018 11:44 AM View: Trend Tests

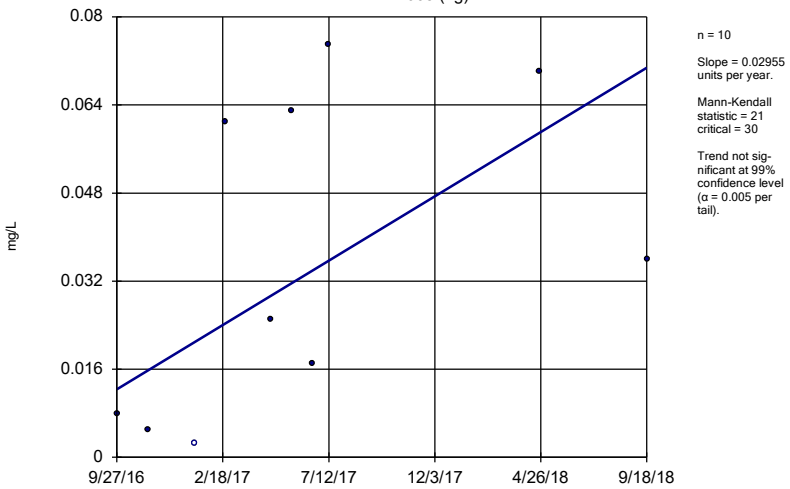
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-1605 (bg)



n = 10

Slope = 0.02955 units per year.

Mann-Kendall statistic = 21
critical = 30

Trend not significant at 99% confidence level (α = 0.005 per tail).

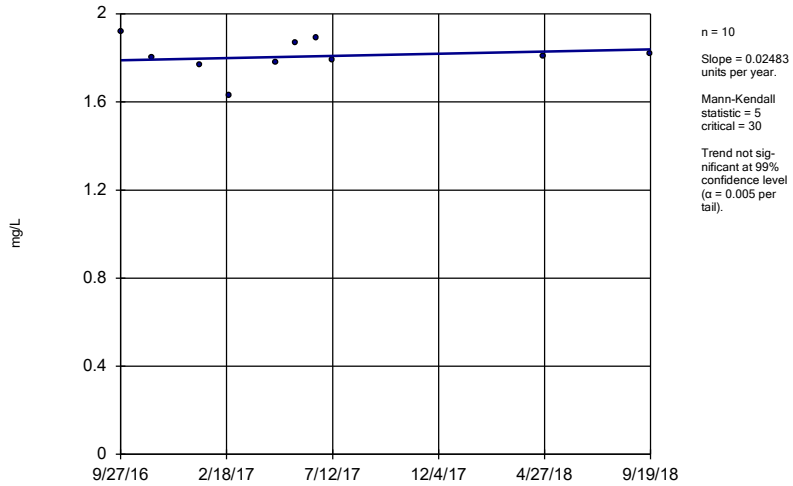
Constituent: Boron Analysis Run 10/30/2018 11:44 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Sen's Slope Estimator

MW-1606



n = 10

Slope = 0.02483 units per year.

Mann-Kendall statistic = 5
critical = 30

Trend not significant at 99% confidence level (α = 0.005 per tail).

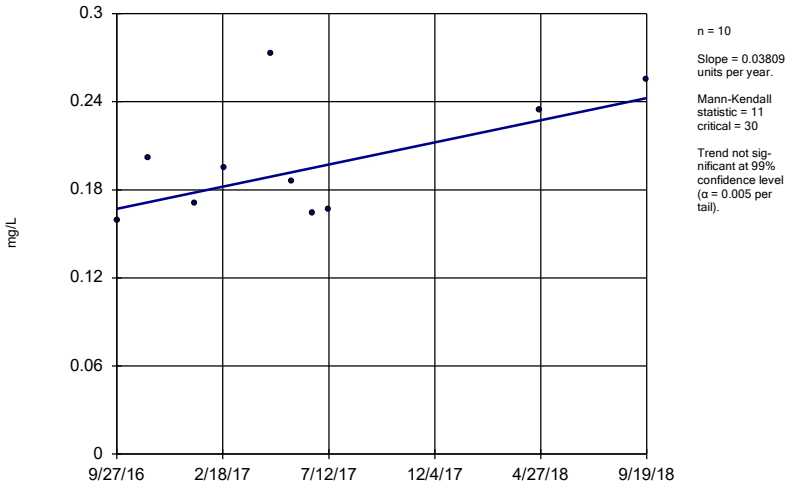
Constituent: Boron Analysis Run 10/30/2018 11:44 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Sen's Slope Estimator

MW-1607



n = 10

Slope = 0.03809 units per year.

Mann-Kendall statistic = 11
critical = 30

Trend not significant at 99% confidence level (α = 0.005 per tail).

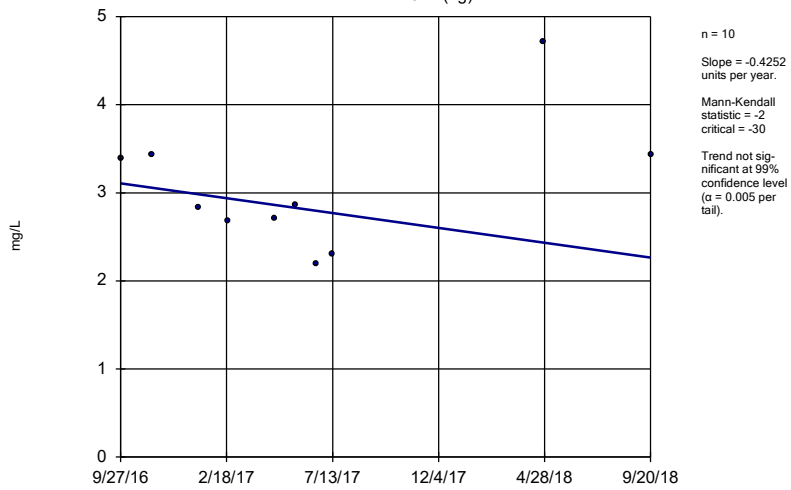
Constituent: Boron Analysis Run 10/30/2018 11:44 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Sen's Slope Estimator

MW-1011 (bg)



n = 10

Slope = -0.4252 units per year.

Mann-Kendall statistic = -2
critical = -30

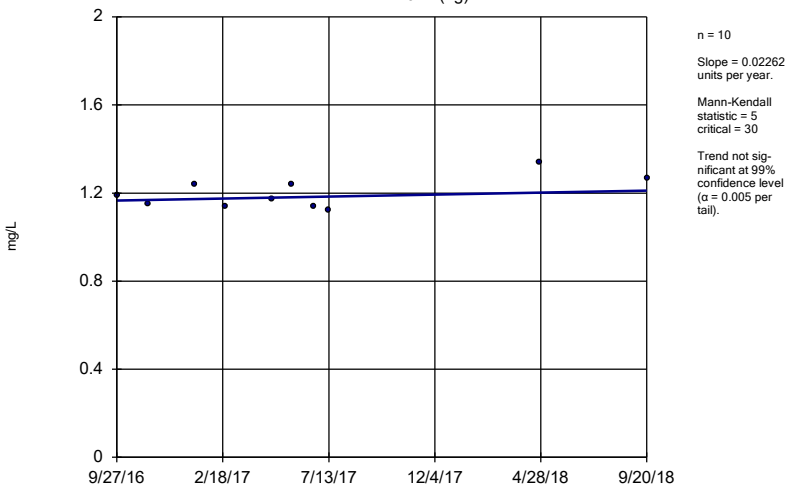
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride Analysis Run 10/30/2018 11:44 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sen's Slope Estimator

MW-1012 (bg)



n = 10

Slope = 0.02262 units per year.

Mann-Kendall statistic = 5
critical = 30

Trend not significant at 99% confidence level (α = 0.005 per tail).

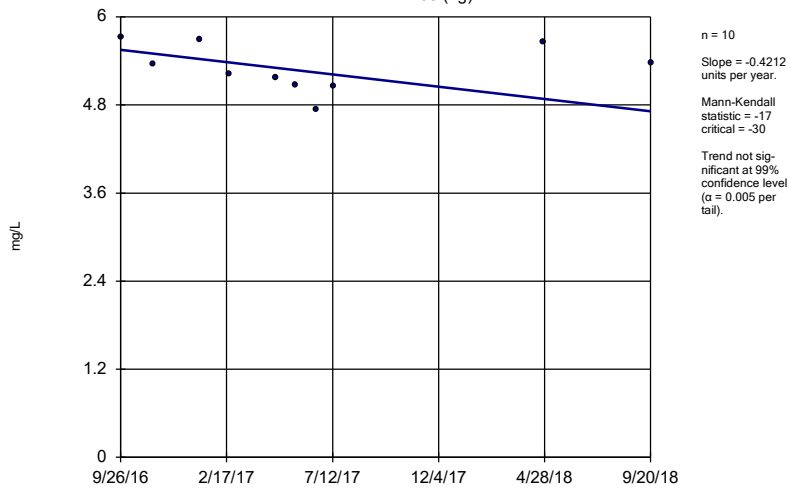
Constituent: Chloride Analysis Run 10/30/2018 11:44 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Sen's Slope Estimator

MW-1203 (bg)



n = 10

Slope = -0.4212 units per year.

Mann-Kendall statistic = -17
critical = -30

Trend not significant at 99% confidence level (α = 0.005 per tail).

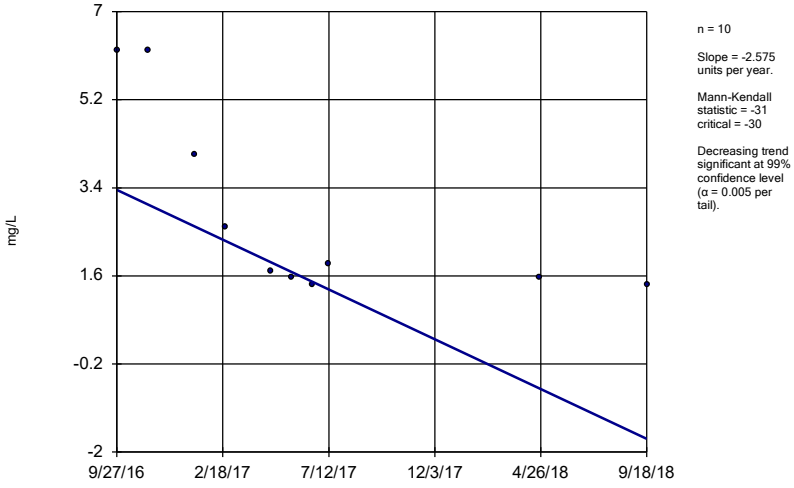
Constituent: Chloride Analysis Run 10/30/2018 11:44 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Sen's Slope Estimator

MW-1604 (bg)



n = 10

Slope = -2.575 units per year.

Mann-Kendall statistic = -31
critical = -30

Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

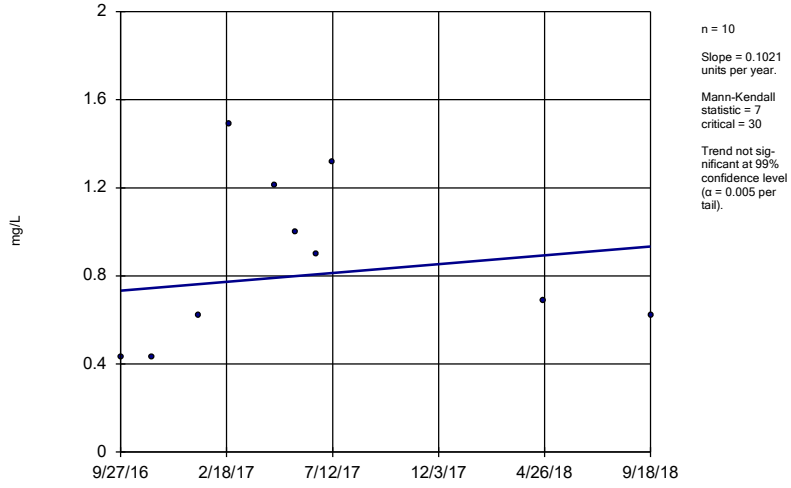
Constituent: Chloride Analysis Run 10/30/2018 11:44 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Sen's Slope Estimator

MW-1605 (bg)



n = 10

Slope = 0.1021 units per year.

Mann-Kendall statistic = 7
critical = 30

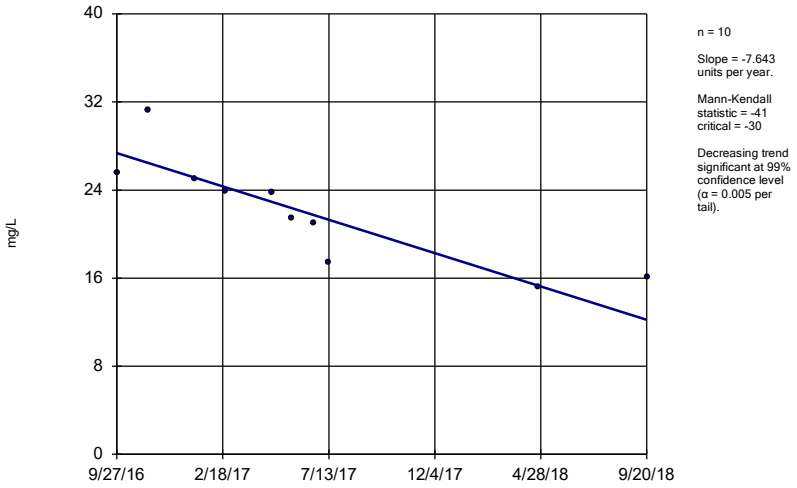
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride Analysis Run 10/30/2018 11:44 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sen's Slope Estimator

MW-1601



n = 10

Slope = -7.643 units per year.

Mann-Kendall statistic = -41 critical = -30

Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

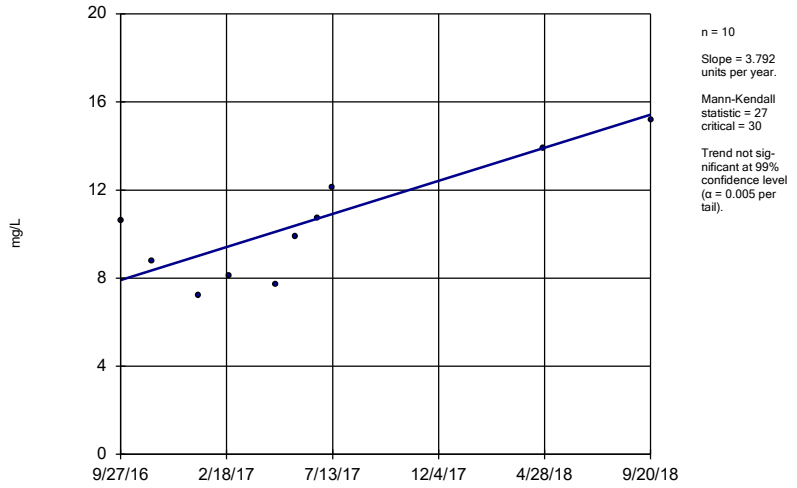
Constituent: Chloride Analysis Run 10/30/2018 11:44 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Sen's Slope Estimator

MW-1602



n = 10

Slope = 3.792 units per year.

Mann-Kendall statistic = 27 critical = 30

Trend not significant at 99% confidence level (α = 0.005 per tail).

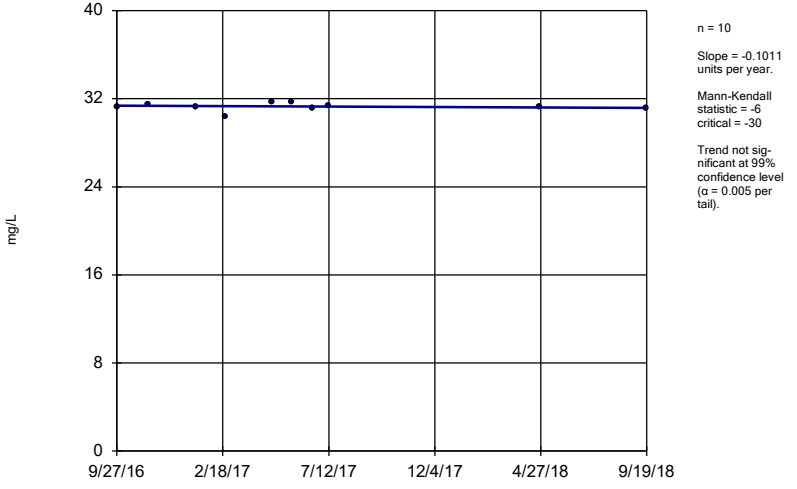
Constituent: Chloride Analysis Run 10/30/2018 11:44 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Sen's Slope Estimator

MW-1606



n = 10

Slope = -0.1011 units per year.

Mann-Kendall statistic = -6 critical = -30

Trend not significant at 99% confidence level (α = 0.005 per tail).

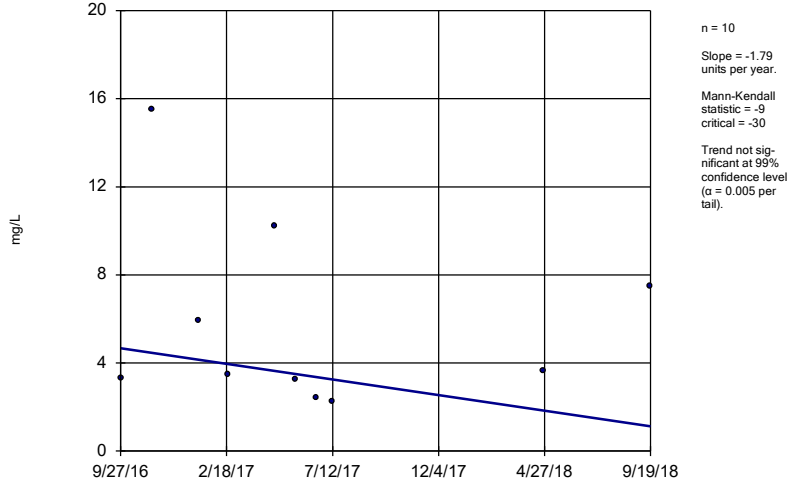
Constituent: Chloride Analysis Run 10/30/2018 11:44 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Sen's Slope Estimator

MW-1607



n = 10

Slope = -1.79 units per year.

Mann-Kendall statistic = -9 critical = -30

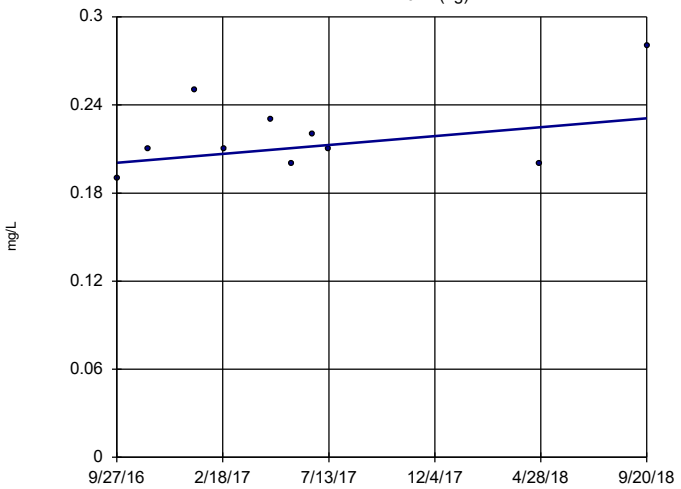
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride Analysis Run 10/30/2018 11:44 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sen's Slope Estimator

MW-1011 (bg)



n = 10

Slope = 0.01527 units per year.

Mann-Kendall statistic = 7 critical = 30

Trend not significant at 99% confidence level (α = 0.005 per tail).

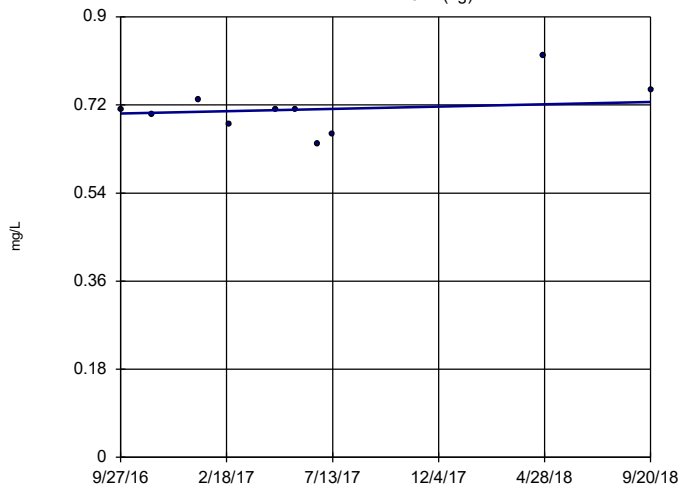
Constituent: Fluoride Analysis Run 10/30/2018 11:44 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Sen's Slope Estimator

MW-1012 (bg)



n = 10

Slope = 0.01185 units per year.

Mann-Kendall statistic = 4 critical = 30

Trend not significant at 99% confidence level (α = 0.005 per tail).

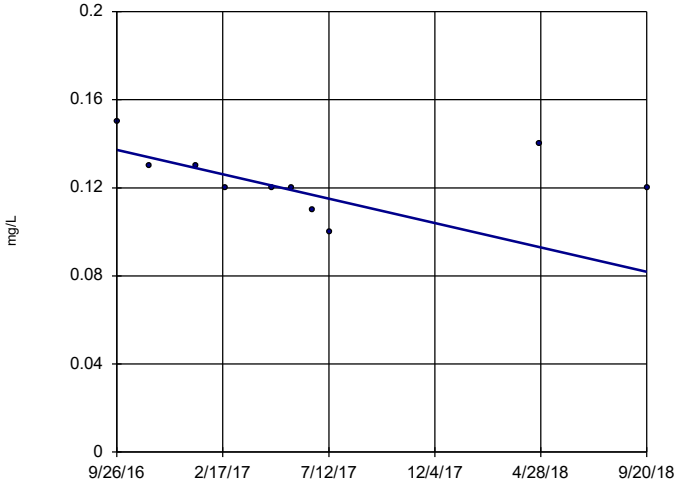
Constituent: Fluoride Analysis Run 10/30/2018 11:44 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Sen's Slope Estimator

MW-1203 (bg)



n = 10

Slope = -0.02786 units per year.

Mann-Kendall statistic = -20 critical = -30

Trend not significant at 99% confidence level (α = 0.005 per tail).

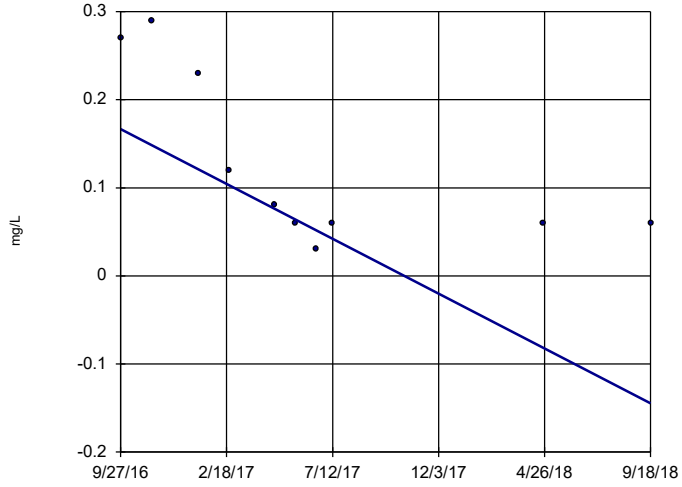
Constituent: Fluoride Analysis Run 10/30/2018 11:44 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Sen's Slope Estimator

MW-1604 (bg)



n = 10

Slope = -0.1575 units per year.

Mann-Kendall statistic = -31 critical = -30

Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

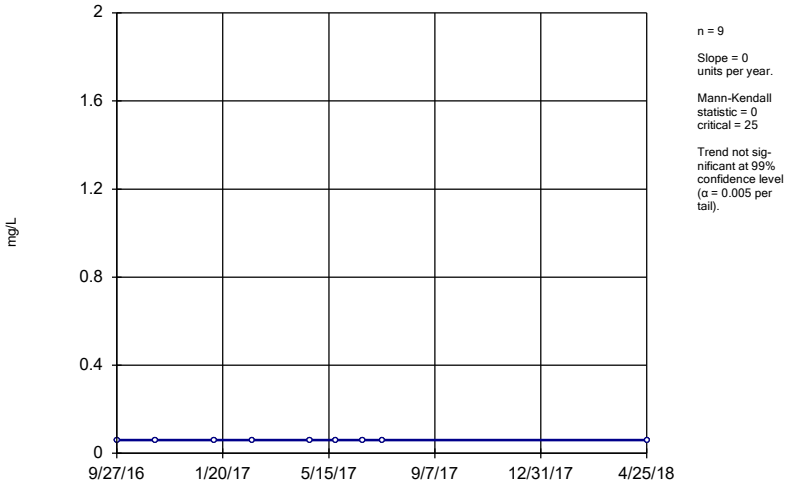
Constituent: Fluoride Analysis Run 10/30/2018 11:44 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-1605 (bg)



n = 9

Slope = 0 units per year.

Mann-Kendall statistic = 0 critical = 25

Trend not significant at 99% confidence level (α = 0.005 per tail).

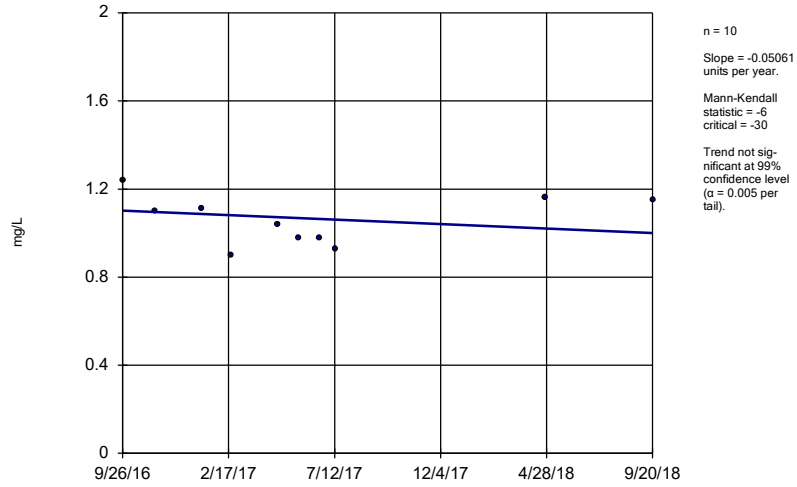
Constituent: Fluoride Analysis Run 10/30/2018 11:44 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Sen's Slope Estimator

MW-1603



n = 10

Slope = -0.05061 units per year.

Mann-Kendall statistic = -6 critical = -30

Trend not significant at 99% confidence level (α = 0.005 per tail).

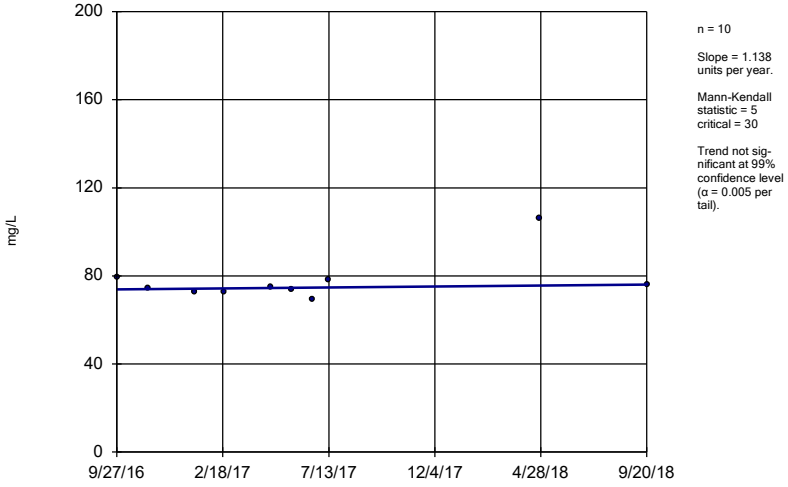
Constituent: Fluoride Analysis Run 10/30/2018 11:44 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Sen's Slope Estimator

MW-1011 (bg)



n = 10

Slope = 1.138 units per year.

Mann-Kendall statistic = 5 critical = 30

Trend not significant at 99% confidence level (α = 0.005 per tail).

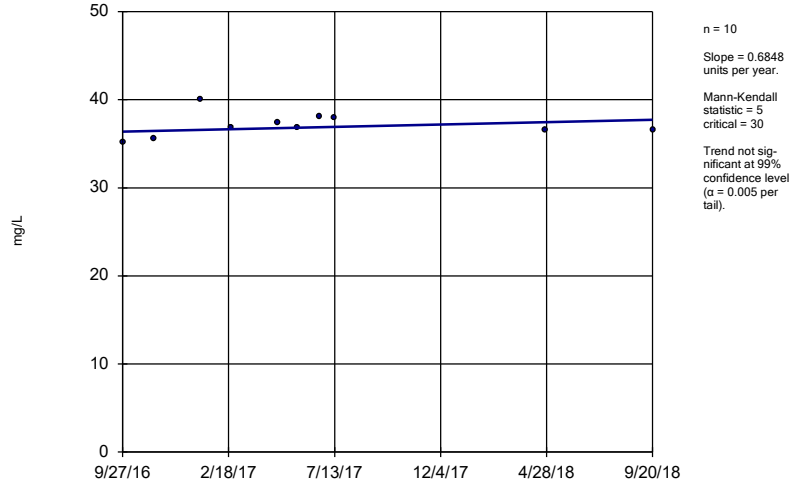
Constituent: Sulfate Analysis Run 10/30/2018 11:44 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Sen's Slope Estimator

MW-1012 (bg)



n = 10

Slope = 0.6848 units per year.

Mann-Kendall statistic = 5 critical = 30

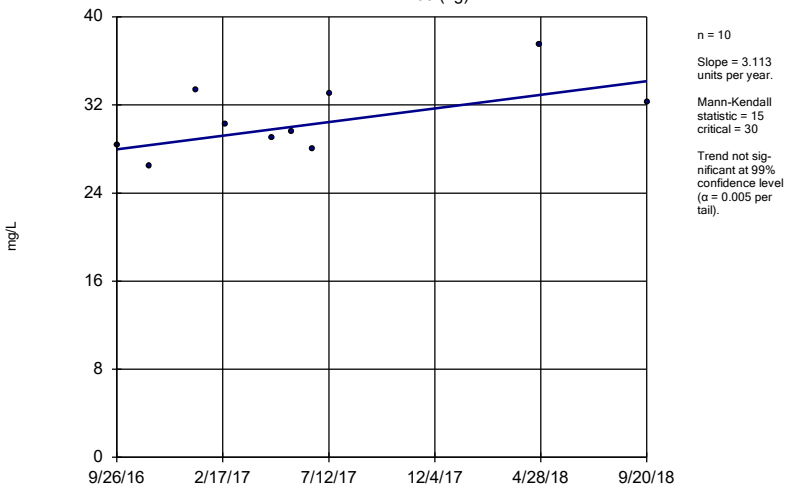
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Sulfate Analysis Run 10/30/2018 11:44 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sen's Slope Estimator

MW-1203 (bg)



n = 10

Slope = 3.113 units per year.

Mann-Kendall statistic = 15 critical = 30

Trend not significant at 99% confidence level (α = 0.005 per tail).

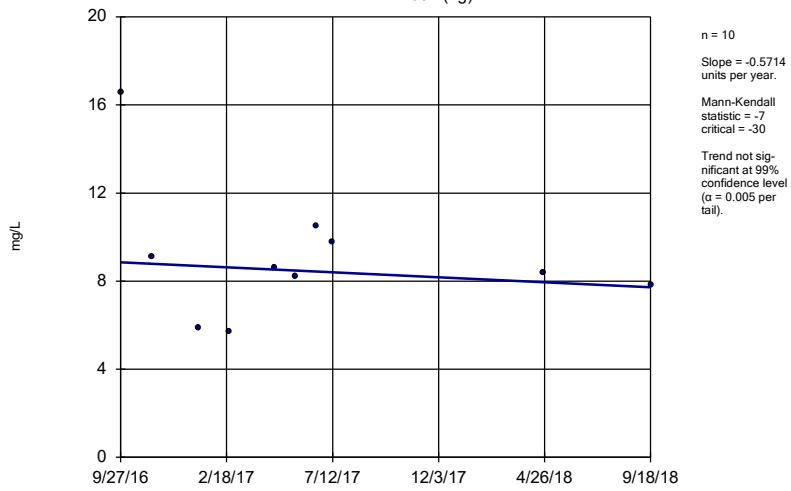
Constituent: Sulfate Analysis Run 10/30/2018 11:44 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Sen's Slope Estimator

MW-1604 (bg)



n = 10

Slope = -0.5714 units per year.

Mann-Kendall statistic = -7 critical = -30

Trend not significant at 99% confidence level (α = 0.005 per tail).

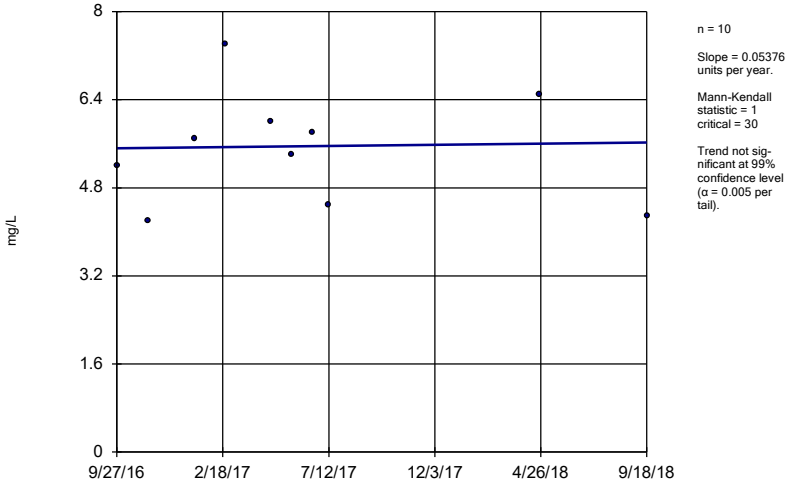
Constituent: Sulfate Analysis Run 10/30/2018 11:44 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Sen's Slope Estimator

MW-1605 (bg)



n = 10

Slope = 0.05376 units per year.

Mann-Kendall statistic = 1 critical = 30

Trend not significant at 99% confidence level (α = 0.005 per tail).

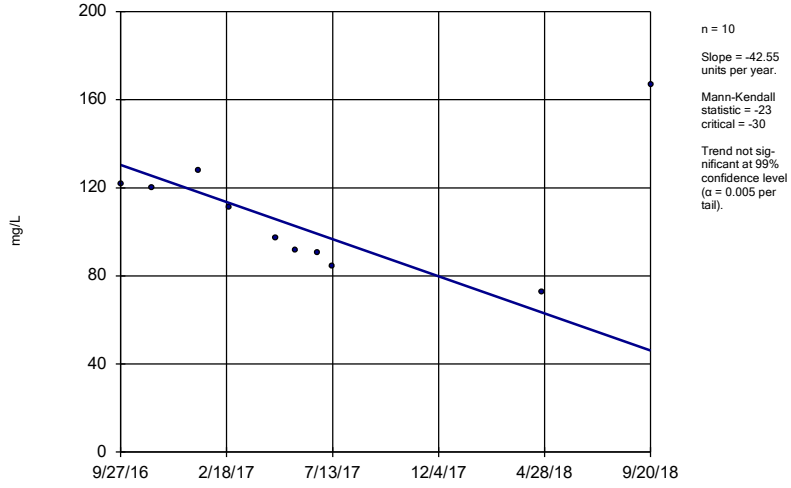
Constituent: Sulfate Analysis Run 10/30/2018 11:44 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Sen's Slope Estimator

MW-1601



n = 10

Slope = -42.55 units per year.

Mann-Kendall statistic = -23 critical = -30

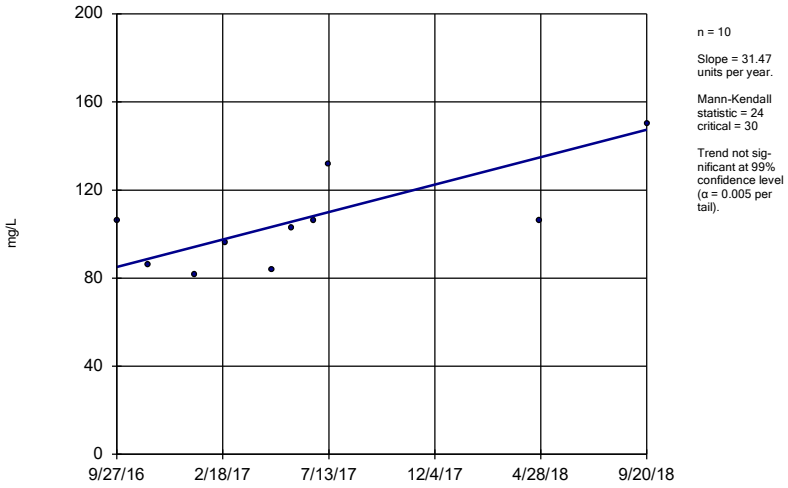
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Sulfate Analysis Run 10/30/2018 11:44 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sen's Slope Estimator

MW-1602



n = 10

Slope = 31.47 units per year.

Mann-Kendall statistic = 24 critical = 30

Trend not significant at 99% confidence level (α = 0.005 per tail).

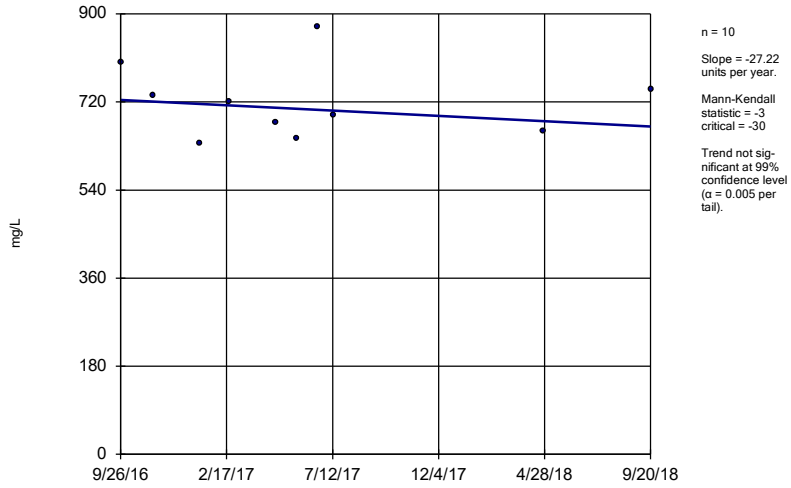
Constituent: Sulfate Analysis Run 10/30/2018 11:44 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Sen's Slope Estimator

MW-1603



n = 10

Slope = -27.22 units per year.

Mann-Kendall statistic = -3 critical = -30

Trend not significant at 99% confidence level (α = 0.005 per tail).

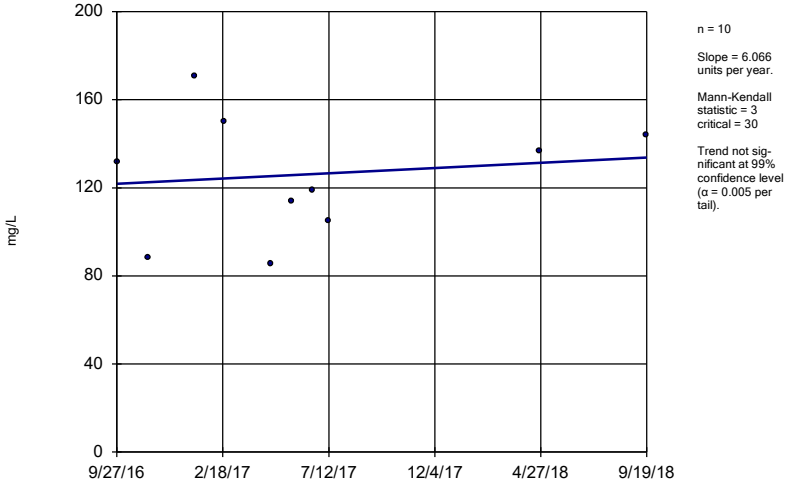
Constituent: Sulfate Analysis Run 10/30/2018 11:44 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Sen's Slope Estimator

MW-1607



n = 10

Slope = 6.066 units per year.

Mann-Kendall statistic = 3 critical = 30

Trend not significant at 99% confidence level (α = 0.005 per tail).

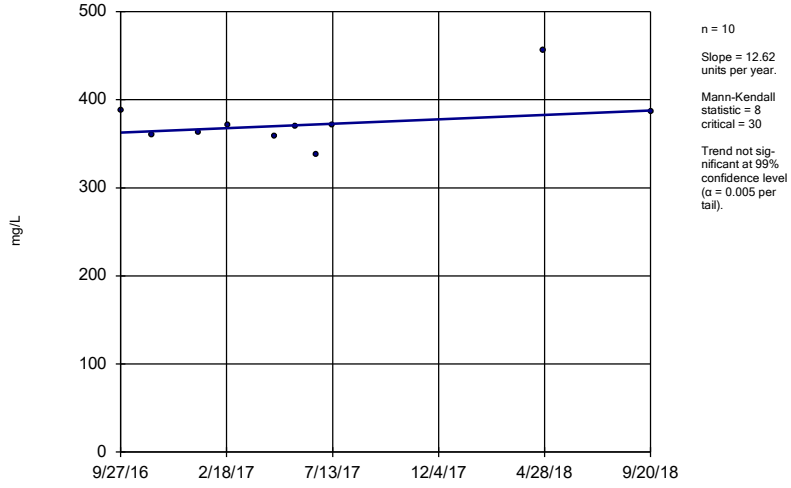
Constituent: Sulfate Analysis Run 10/30/2018 11:44 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Sen's Slope Estimator

MW-1011 (bg)



n = 10

Slope = 12.62 units per year.

Mann-Kendall statistic = 8 critical = 30

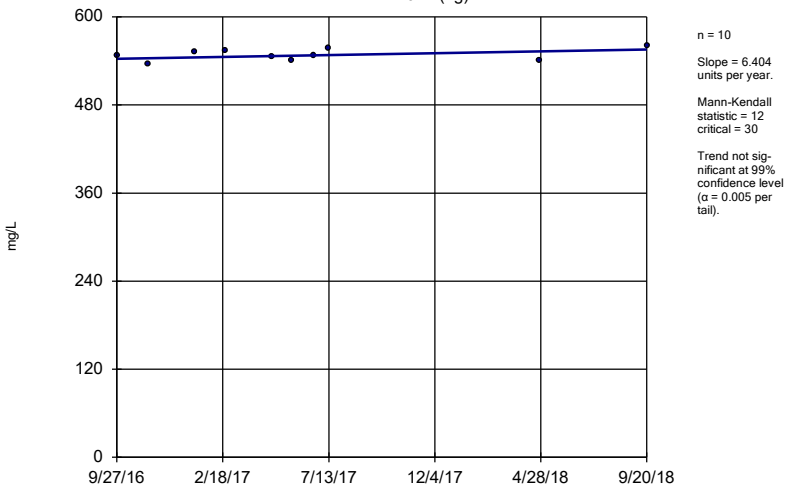
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Total Dissolved Solids Analysis Run 10/30/2018 11:44 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sen's Slope Estimator

MW-1012 (bg)



n = 10

Slope = 6.404 units per year.

Mann-Kendall statistic = 12 critical = 30

Trend not significant at 99% confidence level (α = 0.005 per tail).

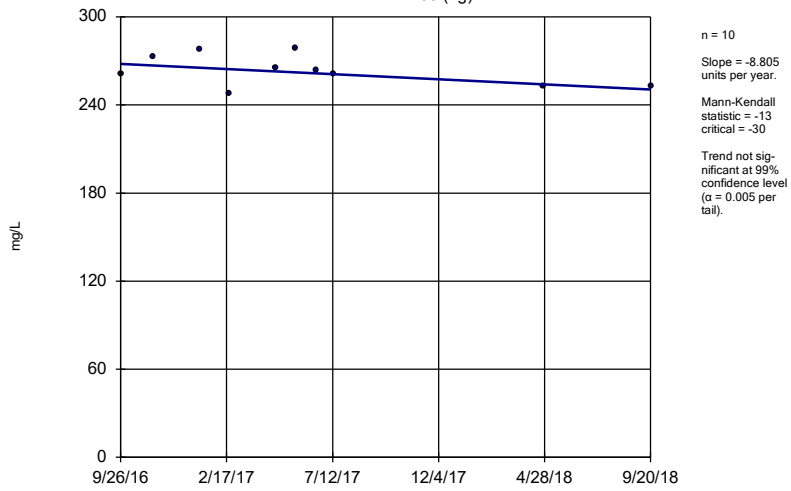
Constituent: Total Dissolved Solids Analysis Run 10/30/2018 11:44 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Sen's Slope Estimator

MW-1203 (bg)



n = 10

Slope = -8.805 units per year.

Mann-Kendall statistic = -13 critical = -30

Trend not significant at 99% confidence level (α = 0.005 per tail).

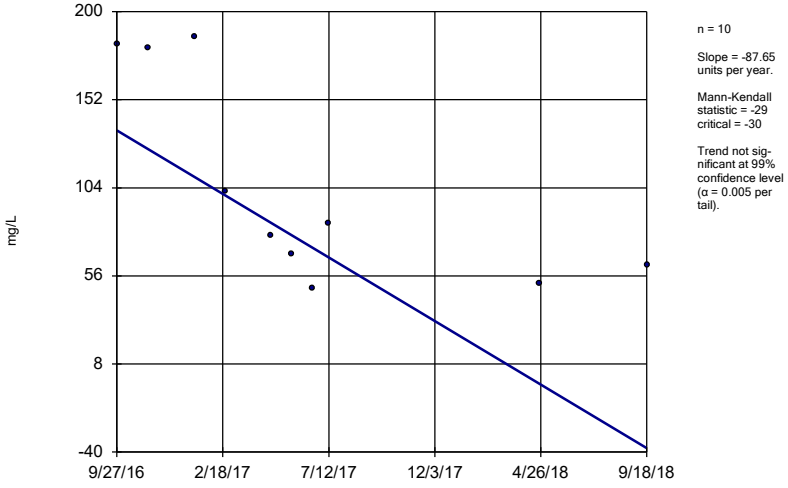
Constituent: Total Dissolved Solids Analysis Run 10/30/2018 11:44 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Sen's Slope Estimator

MW-1604 (bg)



n = 10

Slope = -87.65 units per year.

Mann-Kendall statistic = -29 critical = -30

Trend not significant at 99% confidence level (α = 0.005 per tail).

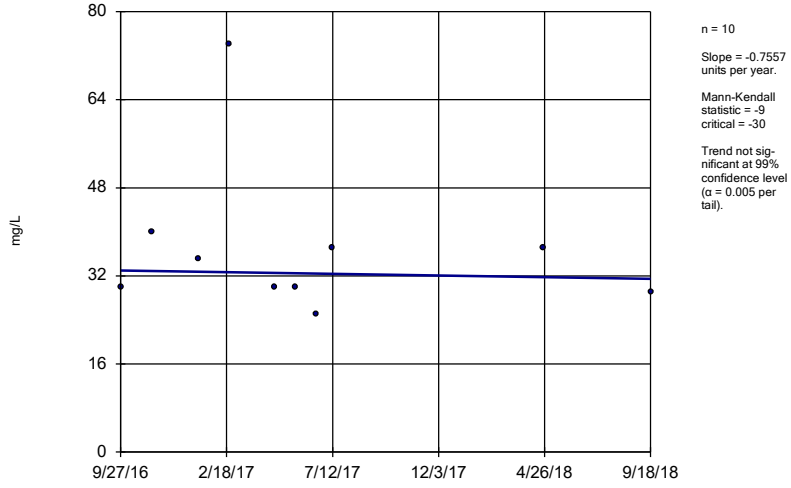
Constituent: Total Dissolved Solids Analysis Run 10/30/2018 11:45 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Sen's Slope Estimator

MW-1605 (bg)



n = 10

Slope = -0.7557 units per year.

Mann-Kendall statistic = -9 critical = -30

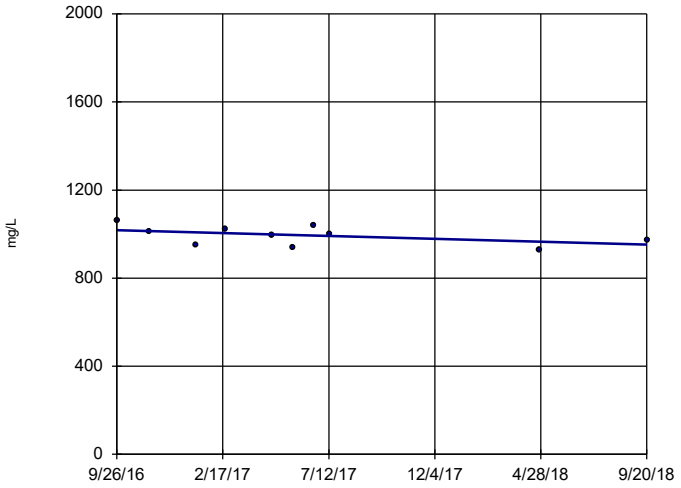
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Total Dissolved Solids Analysis Run 10/30/2018 11:45 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sen's Slope Estimator

MW-1603



n = 10

Slope = -33.18 units per year.

Mann-Kendall statistic = -17 critical = -30

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Total Dissolved Solids Analysis Run 10/30/2018 11:45 AM View: Trend Tests

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Upper Tolerance Limits

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP Printed 11/11/2018, 12:22 PM

Constituent	Well	Upper Lim.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony (mg/L)	n/a	0.0012	50	n/a	n/a	10	n/a	n/a	0.07694	NP Inter(normality)
Arsenic (mg/L)	n/a	0.0289	50	n/a	n/a	0	n/a	n/a	0.07694	NP Inter
Barium (mg/L)	n/a	0.1149	50	0.226	0.05467	0	None	sqrt(x)	0.05	Inter
Beryllium (mg/L)	n/a	0.000149	50	n/a	n/a	20	n/a	n/a	0.07694	NP Inter(Cohens/xform)
Cadmium (mg/L)	n/a	0.00014	50	n/a	n/a	22	n/a	n/a	0.07694	NP Inter(normality)
Chromium (mg/L)	n/a	0.0027	49	n/a	n/a	0	n/a	n/a	0.08099	NP Inter(normality)
Cobalt (mg/L)	n/a	0.004934	50	0.03313	0.01797	0	None	sqrt(x)	0.05	Inter
Combined Radium 226 + 228 (pCi/L)	n/a	6.573	49	1.262	0.6288	0	None	sqrt(x)	0.05	Inter
Fluoride (mg/L)	n/a	0.82	49	n/a	n/a	18.37	n/a	n/a	0.08099	NP Inter(normality)
Lead (mg/L)	n/a	0.001301	50	0.0593	0.02414	0	None	x^(1/3)	0.05	Inter
Lithium (mg/L)	n/a	0.0196	50	0.008226	0.005508	8	None	No	0.05	Inter
Mercury (mg/L)	n/a	0.000013	50	n/a	n/a	82	n/a	n/a	0.07694	NP Inter(NDs)
Molybdenum (mg/L)	n/a	0.01087	50	-7.441	1.414	0	None	ln(x)	0.05	Inter
Selenium (mg/L)	n/a	0.0003	50	n/a	n/a	14	n/a	n/a	0.07694	NP Inter(normality)
Thallium (mg/L)	n/a	0.000229	50	n/a	n/a	8	n/a	n/a	0.07694	NP Inter(normality)

Confidence Interval - Significant Results

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP Printed 11/11/2018, 12:33 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Beryllium (mg/L)	**MW-1603**	**0.01889**	**0.01685**	**0.004**	**Yes**	**10**	**0**	**No**	**0.01**	**Param.**
Cobalt (mg/L)	**MW-1603**	**0.09678**	**0.0893**	**0.006**	**Yes**	**10**	**0**	**No**	**0.01**	**Param.**
Lithium (mg/L)	**MW-1603**	**0.2473**	**0.2069**	**0.04**	**Yes**	**10**	**0**	**No**	**0.01**	**Param.**

Confidence Interval - All Results

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP Printed 11/11/2018, 12:33 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Antimony (mg/L)	MW-1601	0.0001877	0.0000623	0.006	No	10	0	No	0.01	Param.
Antimony (mg/L)	MW-1602	0.0001216	0.0000544	0.006	No	10	0	No	0.01	Param.
Antimony (mg/L)	MW-1603	0.000025	0.00001	0.006	No	10	60	No	0.011	NP (normality)
Antimony (mg/L)	MW-1606	0.00005984	0.00002	0.006	No	10	20	No	0.01	Param.
Antimony (mg/L)	MW-1607	0.00027	0.00001	0.006	No	9	0	No	0.002	NP (normality)
Arsenic (mg/L)	MW-1601	0.005391	0.004245	0.029	No	10	0	No	0.01	Param.
Arsenic (mg/L)	MW-1602	0.00315	0.00037	0.029	No	10	0	No	0.011	NP (normality)
Arsenic (mg/L)	MW-1603	0.00149	0.001146	0.029	No	10	0	No	0.01	Param.
Arsenic (mg/L)	MW-1606	0.001221	0.0009268	0.029	No	10	0	No	0.01	Param.
Arsenic (mg/L)	MW-1607	0.0236	0.00736	0.029	No	10	0	No	0.011	NP (normality)
Barium (mg/L)	MW-1601	0.08132	0.0638	2	No	10	0	No	0.01	Param.
Barium (mg/L)	MW-1602	0.05799	0.05053	2	No	10	0	No	0.01	Param.
Barium (mg/L)	MW-1603	0.0132	0.01059	2	No	10	0	sqrt(x)	0.01	Param.
Barium (mg/L)	MW-1606	1	0.8064	2	No	10	0	No	0.01	Param.
Barium (mg/L)	MW-1607	0.0441	0.02964	2	No	10	0	No	0.01	Param.
Beryllium (mg/L)	MW-1601	0.00001	0.000005	0.004	No	10	10	No	0.011	NP (normality)
Beryllium (mg/L)	MW-1602	0.00001	0.00001	0.004	No	9	100	No	0.002	NP (NDs)
Beryllium (mg/L)	**MW-1603**	**0.01889**	**0.01685**	**0.004**	**Yes**	**10**	**0**	**No**	**0.01**	**Param.**
Beryllium (mg/L)	MW-1606	0.00006344	0.00001006	0.004	No	10	0	sqrt(x)	0.01	Param.
Beryllium (mg/L)	MW-1607	0.000028	0.00001	0.004	No	10	0	No	0.011	NP (normality)
Cadmium (mg/L)	MW-1601	0.00001	0.000005	0.005	No	10	20	No	0.011	NP (normality)
Cadmium (mg/L)	MW-1602	0.00001	0.000005	0.005	No	10	30	No	0.011	NP (normality)
Cadmium (mg/L)	MW-1603	0.000871	0.000765	0.005	No	10	0	No	0.01	Param.
Cadmium (mg/L)	MW-1606	0.00001	0.000007	0.005	No	10	60	No	0.011	NP (normality)
Cadmium (mg/L)	MW-1607	0.00001	0.000006	0.005	No	10	60	No	0.011	NP (normality)
Chromium (mg/L)	MW-1601	0.0006611	0.0002777	0.1	No	10	0	sqrt(x)	0.01	Param.
Chromium (mg/L)	MW-1602	0.0007122	0.0004206	0.1	No	10	0	No	0.01	Param.
Chromium (mg/L)	MW-1603	0.0009693	0.0006229	0.1	No	10	0	No	0.01	Param.
Chromium (mg/L)	MW-1606	0.001611	0.0003553	0.1	No	10	0	No	0.01	Param.
Chromium (mg/L)	MW-1607	0.0006598	0.0003316	0.1	No	10	0	No	0.01	Param.
Cobalt (mg/L)	MW-1601	0.001633	0.0009388	0.006	No	10	0	No	0.01	Param.
Cobalt (mg/L)	MW-1602	0.0003909	0.00001283	0.006	No	10	0	sqrt(x)	0.01	Param.
Cobalt (mg/L)	**MW-1603**	**0.09678**	**0.0893**	**0.006**	**Yes**	**10**	**0**	**No**	**0.01**	**Param.**
Cobalt (mg/L)	MW-1606	0.0009054	0.0001654	0.006	No	10	0	No	0.01	Param.
Cobalt (mg/L)	MW-1607	0.001499	0.001247	0.006	No	10	0	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1601	2.066	0.8997	6.57	No	10	0	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1602	1.523	0.7943	6.57	No	10	0	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1603	6.607	5.163	6.57	No	10	0	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1606	3.648	2.631	6.57	No	10	0	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-1607	3.104	0.5096	6.57	No	10	0	sqrt(x)	0.01	Param.
Fluoride (mg/L)	MW-1601	0.3359	0.2641	4	No	10	0	No	0.01	Param.
Fluoride (mg/L)	MW-1602	0.1674	0.1086	4	No	10	0	No	0.01	Param.
Fluoride (mg/L)	MW-1603	1.158	0.9602	4	No	10	0	No	0.01	Param.
Fluoride (mg/L)	MW-1606	0.2232	0.1705	4	No	10	0	x^(1/3)	0.01	Param.
Fluoride (mg/L)	MW-1607	0.07248	0.04952	4	No	10	0	No	0.01	Param.
Lead (mg/L)	MW-1601	0.0001142	0.00002532	0.015	No	10	0	ln(x)	0.01	Param.
Lead (mg/L)	MW-1602	0.00008316	0.00002313	0.015	No	10	0	ln(x)	0.01	Param.
Lead (mg/L)	MW-1603	0.007743	0.004569	0.015	No	10	0	No	0.01	Param.
Lead (mg/L)	MW-1606	0.00115	0.00006768	0.015	No	10	0	No	0.01	Param.
Lead (mg/L)	MW-1607	0.0003982	0.0000598	0.015	No	10	0	sqrt(x)	0.01	Param.
Lithium (mg/L)	MW-1601	0.03786	0.02714	0.04	No	10	0	No	0.01	Param.
Lithium (mg/L)	MW-1602	0.01308	0.003522	0.04	No	10	0	No	0.01	Param.
Lithium (mg/L)	**MW-1603**	**0.2473**	**0.2069**	**0.04**	**Yes**	**10**	**0**	**No**	**0.01**	**Param.**
Lithium (mg/L)	MW-1606	0.01128	0.003518	0.04	No	10	0	No	0.01	Param.
Lithium (mg/L)	MW-1607	0.008033	0.001967	0.04	No	10	0	No	0.01	Param.

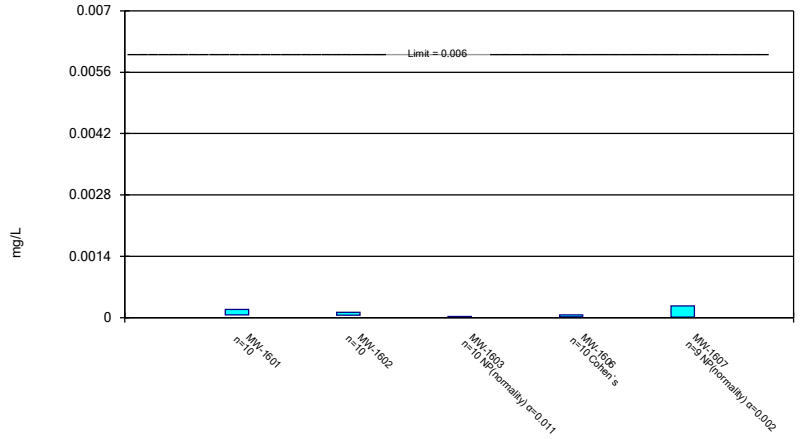
Confidence Interval - All Results

Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP Printed 11/11/2018, 12:33 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Mercury (mg/L)	MW-1601	0.0000025	0.0000025	0.002	No	10	100	No	0.011	NP (NDs)
Mercury (mg/L)	MW-1602	0.000003	0.000002	0.002	No	10	30	No	0.011	NP (Cohens/xfrm)
Mercury (mg/L)	MW-1603	0.0000025	0.000002	0.002	No	10	90	No	0.011	NP (NDs)
Mercury (mg/L)	MW-1606	0.0000025	0.000002	0.002	No	10	70	No	0.011	NP (normality)
Mercury (mg/L)	MW-1607	0.0000025	0.0000025	0.002	No	10	90	No	0.011	NP (NDs)
Molybdenum (mg/L)	MW-1601	0.0316	0.02182	0.1	No	10	0	No	0.01	Param.
Molybdenum (mg/L)	MW-1602	0.00278	0.001616	0.1	No	10	0	No	0.01	Param.
Molybdenum (mg/L)	MW-1603	0.0002167	0.00005331	0.1	No	10	0	No	0.01	Param.
Molybdenum (mg/L)	MW-1606	0.00091	0.00051	0.1	No	10	0	No	0.011	NP (normality)
Molybdenum (mg/L)	MW-1607	0.0009	0.00042	0.1	No	10	0	No	0.011	NP (normality)
Selenium (mg/L)	MW-1601	0.0002	0.00007	0.05	No	10	0	No	0.011	NP (normality)
Selenium (mg/L)	MW-1602	0.002163	0.0008769	0.05	No	10	0	No	0.01	Param.
Selenium (mg/L)	MW-1603	0.006867	0.004393	0.05	No	10	0	No	0.01	Param.
Selenium (mg/L)	MW-1606	0.0002023	0.0000631	0.05	No	10	0	sqrt(x)	0.01	Param.
Selenium (mg/L)	MW-1607	0.0002	0.00005	0.05	No	10	0	No	0.011	NP (normality)
Thallium (mg/L)	MW-1601	0.00004569	0.00001096	0.002	No	10	0	ln(x)	0.01	Param.
Thallium (mg/L)	MW-1602	0.00003	0.00001	0.002	No	10	0	No	0.011	NP (normality)
Thallium (mg/L)	MW-1603	0.001536	0.001292	0.002	No	10	0	No	0.01	Param.
Thallium (mg/L)	MW-1606	0.00004	0.00001	0.002	No	10	30	No	0.011	NP (Cohens/xfrm)
Thallium (mg/L)	MW-1607	0.000055	0.00002	0.002	No	10	0	No	0.011	NP (normality)

Parametric and Non-Parametric (NP) Confidence Interval

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

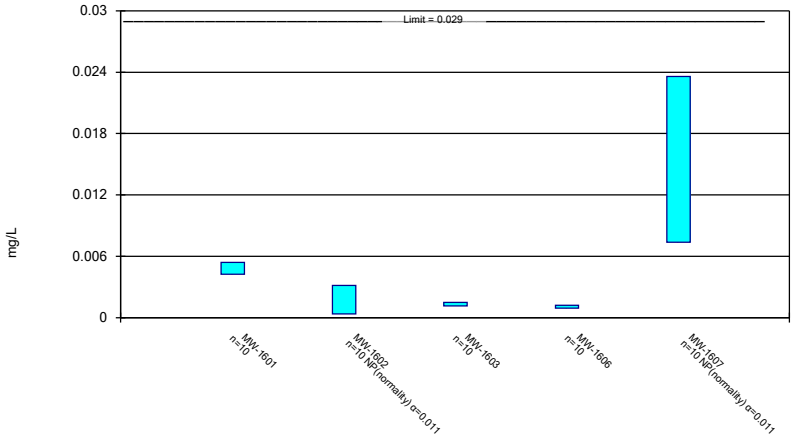


Constituent: Antimony Analysis Run 11/11/2018 12:31 PM View: Confidence Intervals - App IV
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Parametric and Non-Parametric (NP) Confidence Interval

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

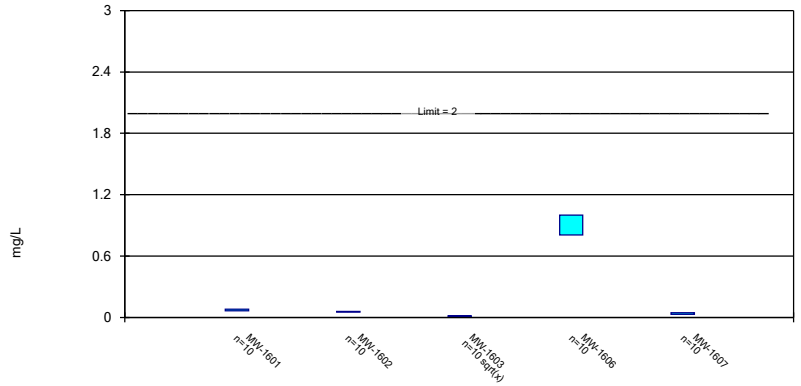


Constituent: Arsenic Analysis Run 11/11/2018 12:31 PM View: Confidence Intervals - App IV
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Parametric Confidence Interval

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

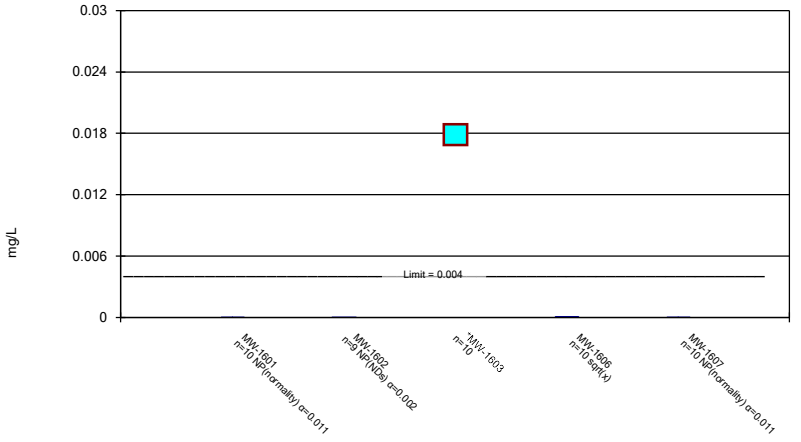


Constituent: Barium Analysis Run 11/11/2018 12:31 PM View: Confidence Intervals - App IV
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Parametric and Non-Parametric (NP) Confidence Interval

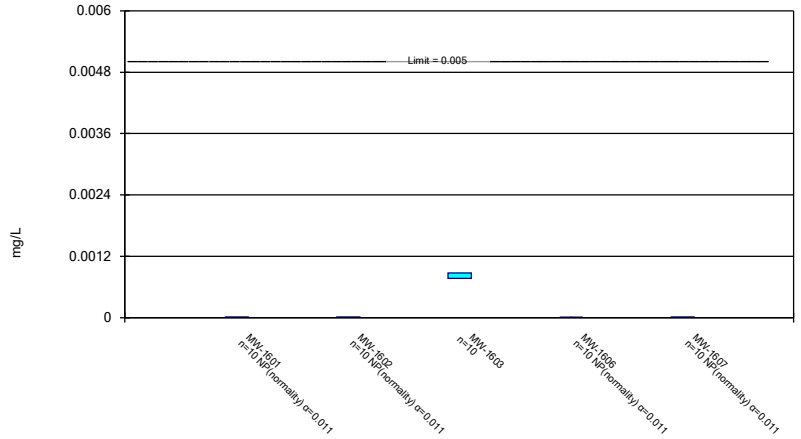
Compliance limit is exceeded.* Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Beryllium Analysis Run 11/11/2018 12:31 PM View: Confidence Intervals - App IV
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Parametric and Non-Parametric (NP) Confidence Interval

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

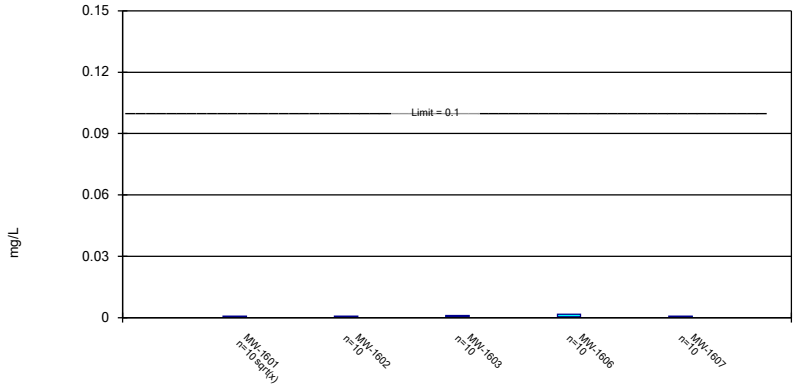


Constituent: Cadmium Analysis Run 11/11/2018 12:31 PM View: Confidence Intervals - App IV
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Parametric Confidence Interval

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

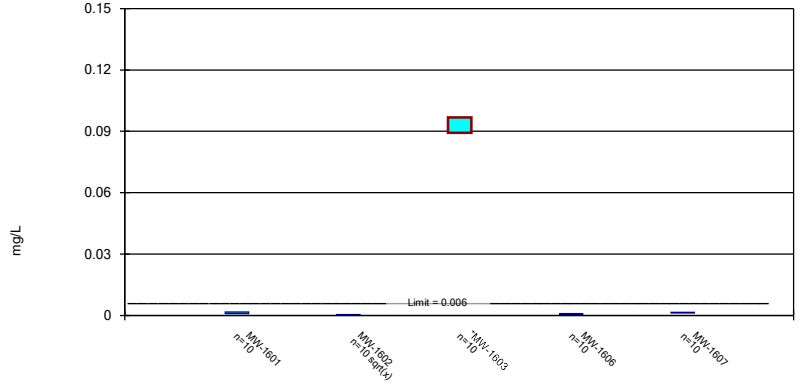


Constituent: Chromium Analysis Run 11/11/2018 12:31 PM View: Confidence Intervals - App IV
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Parametric Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

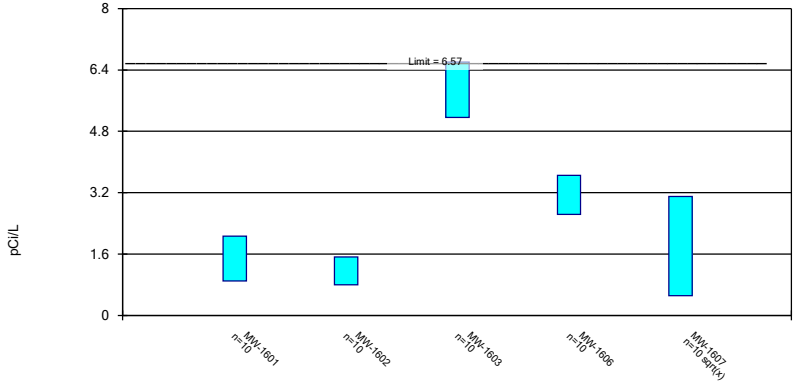


Constituent: Cobalt Analysis Run 11/11/2018 12:31 PM View: Confidence Intervals - App IV
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Parametric Confidence Interval

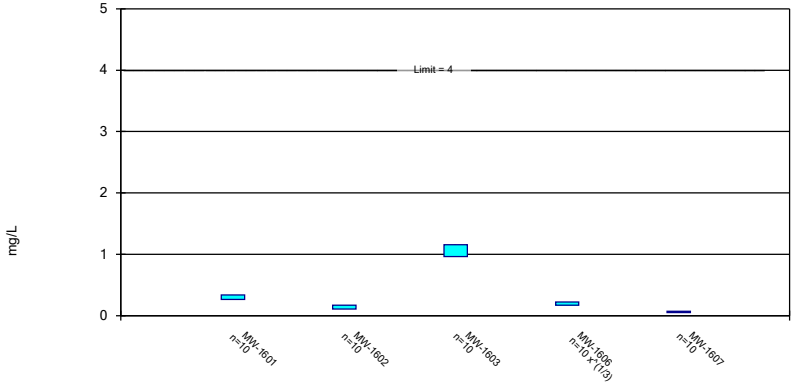
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 + 228 Analysis Run 11/11/2018 12:31 PM View: Confidence Intervals
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Parametric Confidence Interval

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

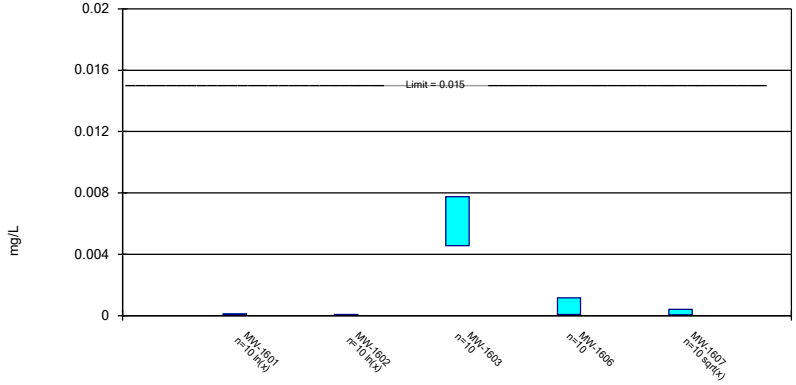


Constituent: Fluoride Analysis Run 11/11/2018 12:31 PM View: Confidence Intervals - App IV
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Parametric Confidence Interval

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

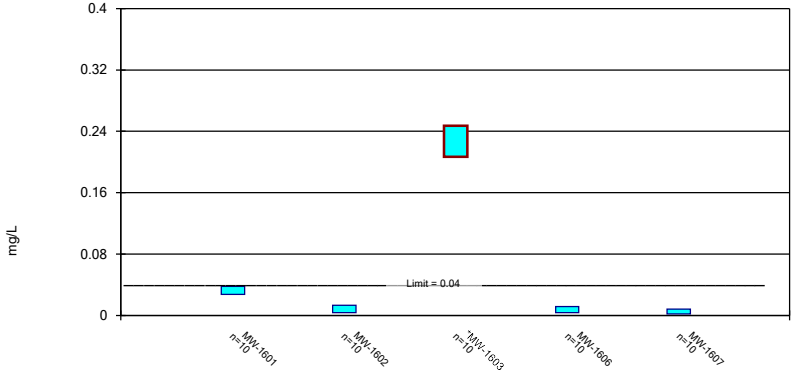


Constituent: Lead Analysis Run 11/11/2018 12:31 PM View: Confidence Intervals - App IV
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Parametric Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

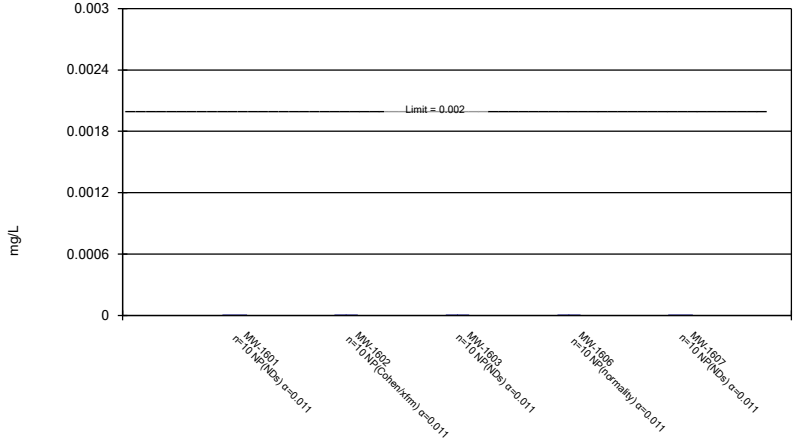


Constituent: Lithium Analysis Run 11/11/2018 12:31 PM View: Confidence Intervals - App IV
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Non-Parametric Confidence Interval

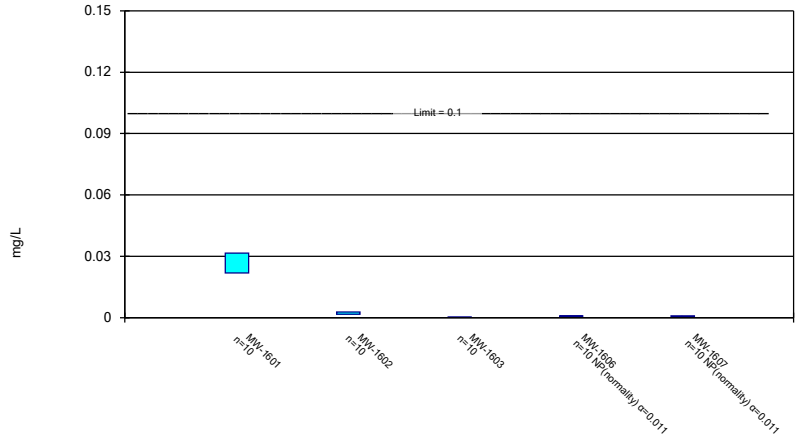
Compliance Limit is not exceeded.



Constituent: Mercury Analysis Run 11/11/2018 12:31 PM View: Confidence Intervals - App IV
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Parametric and Non-Parametric (NP) Confidence Interval

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

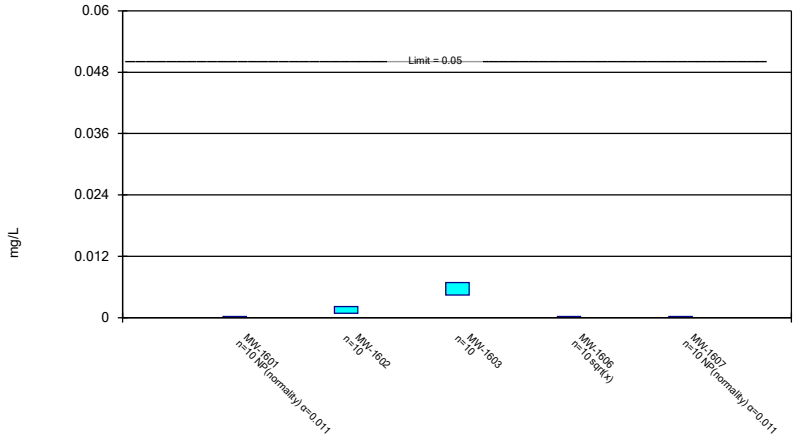


Constituent: Molybdenum Analysis Run 11/11/2018 12:31 PM View: Confidence Intervals - App IV
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Parametric and Non-Parametric (NP) Confidence Interval

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

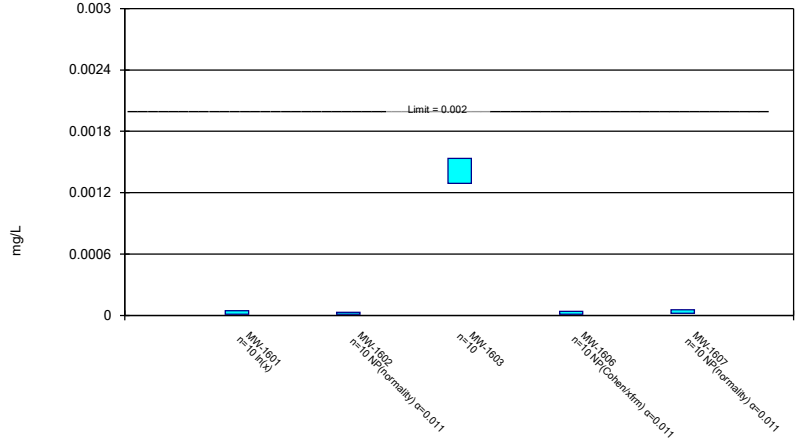


Constituent: Selenium Analysis Run 11/11/2018 12:31 PM View: Confidence Intervals - App IV
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP

Sanitas™ v.9.6.11e Sanitas software utilized by Groundwater Stats Consulting. UG

Parametric and Non-Parametric (NP) Confidence Interval

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



Constituent: Thallium Analysis Run 11/11/2018 12:32 PM View: Confidence Intervals - App IV
Big Sandy FAP Client: Geosyntec Data: Big Sandy FAP