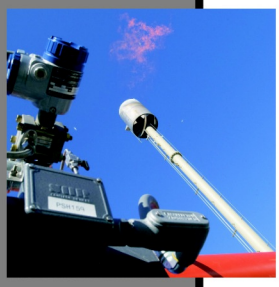

Semiannual Groundwater and Surface Water Quality Monitoring Report

North Manatee Recycling & Disposal Facility, Class III Landfill
Manatee County, Florida
FDEP Permit Nos. 298891-005-SO/T3 and 298891-006-SC/T3
WACS ID SWD-41-98654

Prepared for:

Florida Department of Environmental Protection, Southwest District
13051 N. Telecom Parkway
Temple Terrace, Florida 33637-0926

May 2017

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May 11, 2017

VIA ELECTRONIC MAIL

John Morris, P.G.
Solid Waste Section
Florida Department of Environmental Protection
Southwest District
13051 N. Telecom Parkway
Temple Terrace, Florida 33637-0926

Subject: **Semiannual Groundwater and Surface Water Quality Monitoring Report**
North Manatee Recycling and Disposal Facility, Class III Landfill
14415 C.R. 39, Duette, Manatee County, Florida
FDEP Permit Nos. 298891-005-SO/T3 and 298891-006-SC/T3
WACS ID: SWD-41-98654

Dear Mr. Morris:

On behalf of Waste Management Inc. of Florida (WMIF), HSA Golden is providing for your review this Semiannual Groundwater and Surface Water Quality Monitoring Report, summarizing the February 2017 sampling event at WMIF's North Manatee Recycling and Disposal Facility, Class III Landfill. Monitoring was performed in accordance with the requirements listed in Florida Department of Environmental Protection (FDEP) Permit Nos. 298891-005-SO/T3 and 298891-006-SC/T3 and the Water Quality Monitoring Plan for the facility.

This report discusses the field activities, chemical analytical results, conclusions regarding site conditions, and recommendations for future monitoring. The field activities detailed herein were conducted by Pro-Tech of Cumming, Georgia, and their data indicates that work was performed in accordance with FDEP's *Standard Operating Procedures for Field Activities DEP-SOP-001/01*, dated March 2014. The site location is presented on Figure 1.

1.0 MONITORING WELL NETWORK

Per the FDEP solid waste operating permit for the site, the monitoring well network at the site is comprised of 10 active monitoring wells (BW-1S, BW-2S, BW-3SR, BW-4S, BW-5S, DW-1SR, DW-2SR, DW-3SR, DW-4SR, and DW-5SR), and five inactive wells (BW-1D, BW-2D, BW-3D, BW-4D, and BW-5D) currently classified as piezometers. Monitoring well locations are shown on Figure 2. Well DW-5SR was drilled on October 12, 2016, to replace well DW-5S, which became damaged during the installation of a sulphur treatment system at the facility. Wells with an "S" or "SR" suffix monitor groundwater quality in the upper surficial aquifer, while wells with a "D" suffix monitor groundwater quality in the lower surficial aquifer.

Monitoring wells with a "BW" designation are listed as background monitoring wells in the Water Quality Monitoring Plan, and those wells with a "DW" designation are listed as detection wells.

2.0 GROUNDWATER ELEVATION DATA

Depths to groundwater were recorded at each well location on February 13, 2017, just prior to commencement of semiannual groundwater sampling activities. Water levels within the monitoring wells were measured to the nearest 0.01 foot and recorded (Appendix A). Groundwater elevations, calculated by subtracting depths to groundwater from surveyed top-of-casing elevations, are presented in Table 1. Due to water levels being below the top of dedicated pumps installed within wells DW-1SR, DW-2SR, DW-3SR, and DW-4SR, depth to water could not be measured at these wells.

A water table elevation and potentiometric surface elevation contour map, each generated from Table 1 data, is provided as Figures 3 and 4. As shown on the figures, groundwater flow direction is generally towards the southwest, which is consistent with historic data.

3.0 GROUNDWATER QUALITY TESTING

3.1 Groundwater Sampling and Chemical Analytical Parameters

Following depth-to-groundwater measurements, groundwater samples were collected from each of the 10 active monitoring wells at the site. Purging and sampling were accomplished using the dedicated bladder pumps set at the lowest flow rate (i.e., low flow sampling technique). Groundwater samples were placed on ice, in coolers, and shipped to TestAmerica Denver for chemical analyses. TestAmerica Denver reports their analyses were performed in accordance with Florida Department of Health (FDOH) Certification #E87667 and NELAC standards (June 2003).

Samples collected from the wells were chemically analyzed for the following: ammonia, chloride, nitrate, total dissolved solids (TDS), iron, mercury, sodium, and those parameters listed in 40 CFR Part 258, Appendix I. Field testing, which included the recording of groundwater pH, temperature, specific conductance, dissolved oxygen concentration, turbidity, and oxidation reduction potential (ORP), was performed as a component part of the groundwater sampling process. Groundwater sampling and equipment calibration logs are included within Appendix A.

3.2 Groundwater Quality Results

In accordance with Rule 62-701, Florida Administrative Code (F.A.C.), groundwater chemical analytical results were compared to Primary Drinking Water Standards (PDWS) and Secondary Drinking Water Standards (SDWS) listed in Rule 62-550, F.A.C., and Groundwater Cleanup Target Levels (GCTLs) per Rule 62-777, F.A.C. (see Table 2).

3.2.1 Field Parameters

- Field-measured temperature, specific conductance, dissolved oxygen, and turbidity were within the criteria established in Section 3.3.1, FS 2200, DEP-SOP-001/01, indicating that samples were generally collected under stable conditions.

- pH was recorded at all monitoring well locations outside of the 6.5-8.5 criteria. Readings ranged from 4.30 to 5.57, and these readings are consistent with historic data.

- ORP readings were negative at wells BW-2S, BW-3SR, and DW-5SR. Negative ORP readings are indicative of naturally occurring reducing conditions.

3.2.2 Chemical Analytical Results

Chemical analytical results are summarized on Table 2; these results were compiled from both TestAmerica Denver's analytical report and output from the FDEP's ADaPT data processing software. The laboratory report and ADaPT output are attached in electronic format. Data are interpreted as follows:

- Iron concentrations exceeded the SDWS of 0.3 milligrams/liter (mg/L) at all monitoring well locations, except for DW-4SR. Iron concentrations were within historical concentration ranges for each well. Iron is naturally occurring in shallow aquifer systems in Florida and is further is mobilized under reducing conditions or by acidic groundwater.

- A single exceedence of the sulfate SDWS of 250 mg/L was reported at well DW-3SR (260 mg/L), which is within the historical concentration range at this well.

4.0 SURFACE WATER QUALITY TESTING

Due to prolonged drought conditions at the site, no surface water discharges occurred and therefore, surface water quality testing was not performed.

5.0 QUALITY CONTROL

All groundwater samples were received by TestAmerica Denver in acceptable condition and all analytical holding times were met. Quality Control Summaries for this groundwater and surface water sampling event were provided by TestAmerica Denver in their analytical reports.

1,1,2,2-tetrachloroethane, 1,2,3-trichloropropane, and acrylonitrile were flagged by ADaPT as having elevated method detection limits (MDLs). In instances where MDLs were above regulatory criteria, the FDEP's Practical Quantitation Limits (PQLs) listed in Rule 62-777 were met.

6.0 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Physical and chemical parameters indicate that, in general, the overall groundwater quality at the facility is good, and the network of monitoring wells is operating as intended. Parameters which exceed regulatory limits will continue to be closely monitored during future sampling events. The next semiannual water quality monitoring event is tentatively scheduled for August 2017, and FDEP will be given at least a two-week notice prior to commencement of field activities.

* * * * *

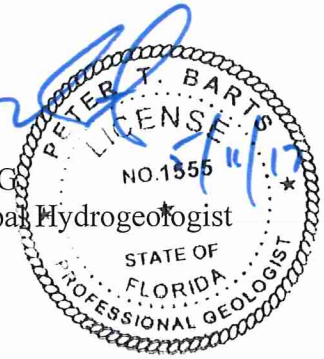
HSA Golden trusts that the contents of this report are sufficient for the FDEP's needs. To facilitate and expedite the review of this report, please contact this office at 407.649.5475 if any of the information provided herein requires clarification.

Sincerely,

HSA GOLDEN

William Jacobs
Senior Project Manager

Peter T. Barts, P.G.
President, Principal Hydrogeologist



Attachments

cc: Mr. Fred Nassar, WMIF
Mr. Seth Ramaley, WMIF
FDEP Southwest District
Mr. Clark Moore, FDEP Tallahassee (EDD only)

Florida Department of Environmental Protection

Bob Martinez Center
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

DEP Form #: 62-701.900(31), F.A.C
Form Title: Water Quality Monitoring Certification
Effective Date: January 6, 2010
Incorporated in Rule 62-701.510(9), F.A.C.

WATER QUALITY MONITORING CERTIFICATION

PART I GENERAL INFORMATION

(1) Facility Name North Manatee Recycling & Disposal Facility, Class III Landfill

Address 14415 CR 39

City Duette Zip 33598 County Manatee

Telephone Number (941) 751-7494

(2) WACS Facility ID SWD-41-98654

(3) DEP Permit Number 298891-005-SO/T3 and 298891-006-SC/T3

(4) Authorized Representative's Name Fred Nassar Title Environmental Protection Mgr.

Address 25515 Old Landfill Road

City Punta Gorda Zip 33980 County Charlotte

Telephone Number (954)557-0581

Email address (if available) fnassar@wm.com

CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submission of false information including the possibility of fine and imprisonment.

April 14, 2017 (Date)

fnassar Digitally signed by fnassar DN: cn=fnassar, email=fnassar@wm.com Date: 2017.04.14 14:06:06 -04'00' (Owner or Authorized Representative's Signature)

PART II QUALITY ASSURANCE REQUIREMENTS

Sampling Organization 920045

Analytical Lab NELAC / HRS Certification # E87667

Lab Name TestAmerica Laboratories, Inc. Denver

Address 4955 Yarrow Street, Arvada, CO 80002-4517

Phone Number (303) 736-0176

Email address (if available)

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Tables

Table 1
Water Table Elevation Data
North Manatee Recycling & Disposal Facility, Class III
February 13, 2017

Monitoring Well No./ Well Type	*Northing/Easting*	*Latitude/Longitude*	*Total Depth (ft-btoc)*	*Top of Casing Elevation (ft-NGVD)*	*Depth to Groundwater (ft-btoc)*	*Potentiometric Surface Elevation (ft-NGVD)*
BW-1S/BG	1201518.19 / 606748.13	27°38'20.647" / -82°09'09.504"	15.2	126.40	6.50	119.90
BW-1D/BG	1201523.70 / 606750.76	27°38'20.702" / -82°09'09.475"	81.92	126.48	6.72	119.76
BW-2S/BG	1202656.06 / 607469.55	27°38'31.924" / -82°09'01.497"	15.3	125.41	5.20	120.21
BW-2D/BG	1202661.57 / 607473.03	27°38'31.978" / -82°09'01.459"	66.2	125.36	5.10	120.26
BW-3SR/BG	1203811.51 / 608625.59	27°38'43.384" / -82°08'48.661"	15	130.40	8.88	121.52
BW-3D/BG	1203811.95 / 608625.30	27°38'43.384" / -82°08'48.661"	61.9	130.21	8.62	121.59
BW-4S/BG	1204043.73 / 606950.20	27°38'45.659" / -82°09'07.291"	15.5	127.46	6.38	121.08
BW-4D/BG	1204044.06 / 606943.98	27°38'45.662" / -82°09'07.361"	51.5	127.40	6.27	121.13
BW-5S/BG	1204046.74 / 605983.73	27°38'45.677" / -82°09'18.039"	15	127.55	7.27	120.28
BW-5D/BG	1204046.50 / 605991.28	27°38'45.675" / -82°09'07.955"	56.8	128.09	7.29	120.80
DW-1SR/DE	1200996.12 / 606032.55	27°38'15.468" / -82°09'17.453"	15.56	130.14	NM	120.94 to 117.19*
DW-2SR/DE	1201000.18 / 605532.63	27°38'15.502" / -82°09'23.012"	14.56	130.37	NM	121.10 to 117.35*
DW-3SR/DE	1201349.96 / 605196.03	27°38'18.962" / -82°09'26.760"	15.10	130.01	NM	120.88 to 117.13*
DW-4SR/DE	1201854.87 / 605174.37	27°38'23.962" /-82°09'27.008"	15.48	130.19	NM	120.21 to 116.46*
DW-5SR/DE	1202261.17 / 605161.32	27°38'27.985" /-82°09'27.159"	15.00	130.69	11.14	119.55

BG: background
btoc: below top of casing
DE: detection
ft: feet
NGVD: National Geodetic Vertical Datum of 1929
NM: Not measured due to water level being below the top of the dedicated pump
* Elevation shown represents the range between the top of the dedicated pump and the pump intake in ft. NGVD.

Table 2
Summary of Semiannual Groundwater Data
North Manatee Recycling & Disposal Facility, Class III
February 13, 2017

Monitoring Well/ Well Designation	*Iron (mg/L)*	*Sulfate (mg/L)*	*pH (SU)*	*ORP (mV)*
BW-1S/BG	**1.2**	9.5	**4.65**	95
BW-2S/BG	**2.1**	2.3 I	**5.21**	-11
BW-3SR/BG	**1.1**	17	**5.57**	-19
BW-4S/BG	**0.87**	120	**4.46**	102
BW-5S/BG	**2.4**	180	**5.09**	20
DW-1SR/DE	**0.5**	25	**5.08**	138
DW-2SR/DE	**0.55**	120	**4.30**	219
DW-3SR/DE	**0.95**	**260**	**4.54**	122
DW-4SR/DE	0.16	61	**5.04**	10
DW-5SR/DE	**1.1**	NA	**5.34**	-46
PDWS/SDWS	*0.3*	*250*	*6.5-8.5*	*None*

Bold = Exceedence of Primary Drinking Water Standard (PDWS) or Secondary Drinking Water Standard (SDWS) of Chapter 62-550, Florida Administrative Code

BG: background
DE: detection
mg/L: milligrams per liter
mV: millivolts
NA: not analyzed
SU: standard units

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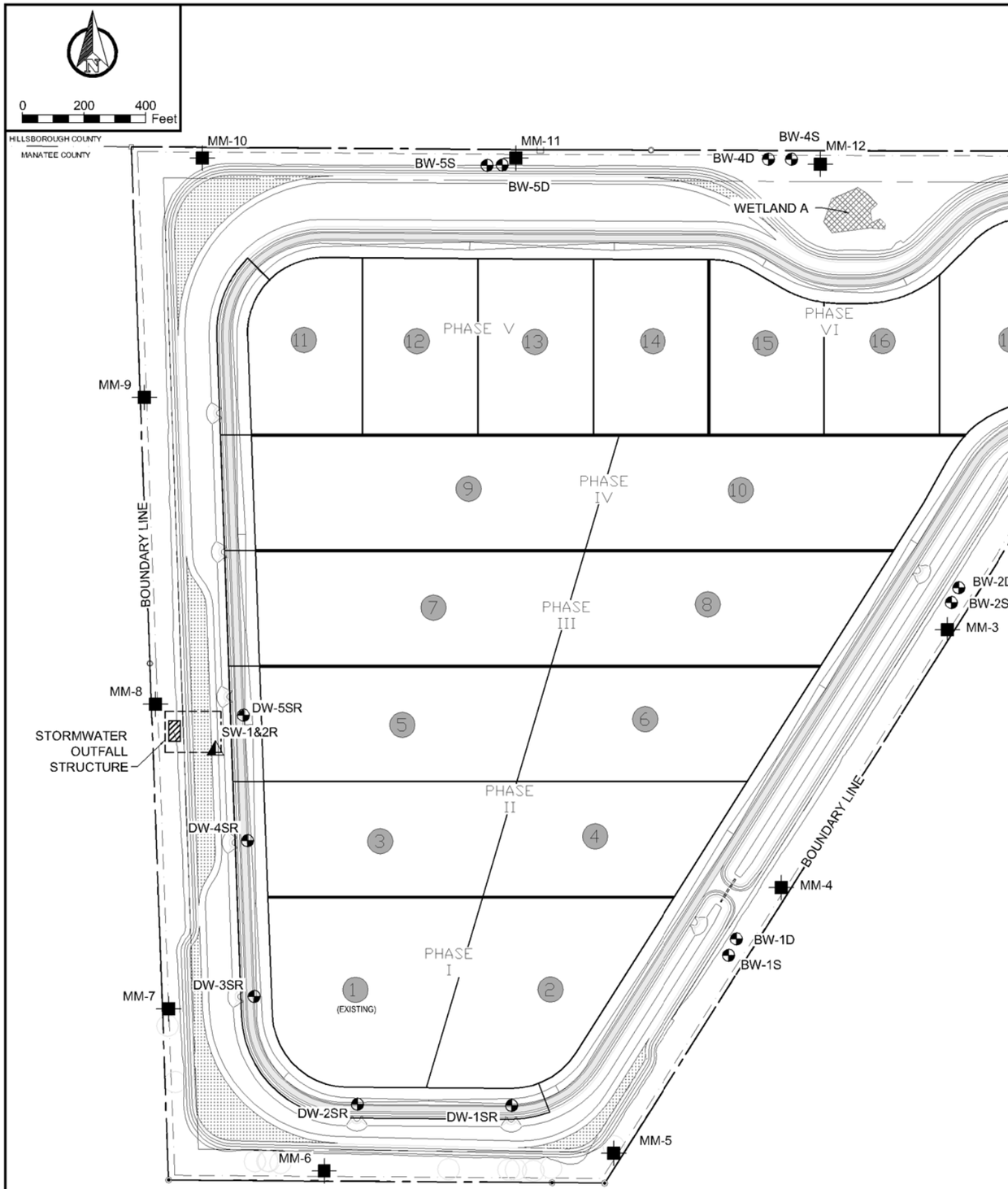
Figures

FIGURE	PROJECT #		NORTH MANATEE RECYCLING & DISPOSAL FACILITY CLASS III LANDFILL 14415 CR 39 DUETTE, MANATEE COUNTY, FLORIDA	hsagolden engineering environmental solutions 11 LAKE GAILIN ROAD ORLANDO, FL 32806 P: 407 649-5475 F: 407 649-6582 HSAGOLDEN.COM
1	09-574.018	SITE LOCATION MAP		MARCH 2017



LEGEND

- BW-2S — UPPER SURFICIAL MONITORING WELL LOCATION
- BW-2D — LOWER SURFICIAL MONITORING WELL LOCATION
- MM-1 — METHANE MONITORING POINT LOCATION
- SW-1&2R — SURFACE WATER SAMPLE LOCATION
- 15 — CELL NUMBERS

WELL ID	NORTHING	EASTING	LATITUDE	LONGITUDE	GROUND ELEV. (FT.) NGVD 29	TOP OF CASING ELEV. (ft.) NGVD 29	2" PVC PIPE ELEV. (ft) NGVD29
BW-1D	1201523.70	606750.76	27°38'20.702"	-82°09'09.475"	124.36	126.91	126.48
BW-1S	1201518.19	606748.13	27°38'20.647"	-82°09'09.504"	124.26	126.74	126.40
BW-2S	1202656.06	607469.55	27°38'31.924"	-82°09'01.497"	123.30	125.84	125.41
BW-2D	1202661.57	607473.03	27°38'31.978"	-82°09'01.459"	123.20	125.83	125.36
BW-3SR	1203811.51	608625.59	27°38'43.384"	-82°08'48.661"	127.85	130.61	130.40
BW-3D	1203806.06	608625.41	27°38'43.325"	-82°08'48.660"	127.53	130.57	130.21
BW-5D	1204046.50	605991.28	27°38'45.675"	-82°09'17.955"	125.20	128.43	128.09
BW-5S	1204046.74	605983.73	27°38'45.677"	-82°09'18.039"	125.30	128.24	127.55
BW-4S	1204043.73	606950.20	27°38'45.659"	-82°09'07.291"	125.10	127.88	127.46
BW-4D	1204044.06	606943.98	27°38'45.662"	-82°09'07.361"	125.00	127.94	127.40
DW-1SR	1200996.12	606032.55	27°38'15.468"	-82°09'17.453"	127.90	130.40	130.14
DW-2SR	1201000.18	605532.63	27°38'15.502"	-82°09'23.012"	128.20	130.56	130.37
DW-3SR	1201349.96	605196.03	27°38'18.962"	-82°09'26.760"	127.20	130.17	130.01
DW-4SR	1201854.87	605174.37	27°38'23.962"	-82°09'27.008"	127.70	130.35	130.19
DW-5SR	1202261.17	605161.32	27°38'27.985"	-82°09'27.159"	127.92	131.05	130.69
MM-1	1203578.23	608671.71	27°38'41.066"	-82°08'48.151"	126.00	129.00	128.48
MM-2	1203069.47	608157.02	27°38'36.026"	-82°08'53.858"	125.70	128.65	128.22
MM-3	1202540.28	607445.52	27°38'30.774"	-82°09'01.762"	124.70	127.69	127.09
MM-4	1201699.94	606909.87	27°38'22.449"	-82°09'07.708"	124.80	127.83	127.34
MM-5	1200840.23	606364.25	27°38'13.927"	-82°09'13.764"	126.80	129.86	129.41
MM-6	1200784.65	605423.54	27°38'13.367"	-82°09'24.222"	126.70	129.82	129.33
MM-7	1201308.42	604919.21	27°38'18.547"	-82°09'29.837"	124.80	128.03	127.43
MM-8	1202299.13	604874.73	27°38'28.357"	-82°09'30.347"	121.10	124.35	123.88
MM-9	1203292.56	604838.36	27°38'38.194"	-82°09'30.764"	125.30	128.17	127.72
MM-10	1204066.96	605027.37	27°38'45.865"	-82°09'28.674"	125.00	128.01	127.53
MM-11	1204059.50	606032.01	27°38'45.804"	-82°09'17.502"	124.60	127.56	127.15
MM-12	1204048.30	607035.19	27°38'45.705"	-82°09'06.346"	124.50	127.78	127.37
MM-13	1204031.68	608024.19	27°38'45.553"	-82°08'55.348"	126.20	129.31	128.82

SOURCE: BASE FILE PROVIDED BY: TERRACON CONSULTING ENGINEERS AND SCIENTISTS, WOODSTOCK GA.

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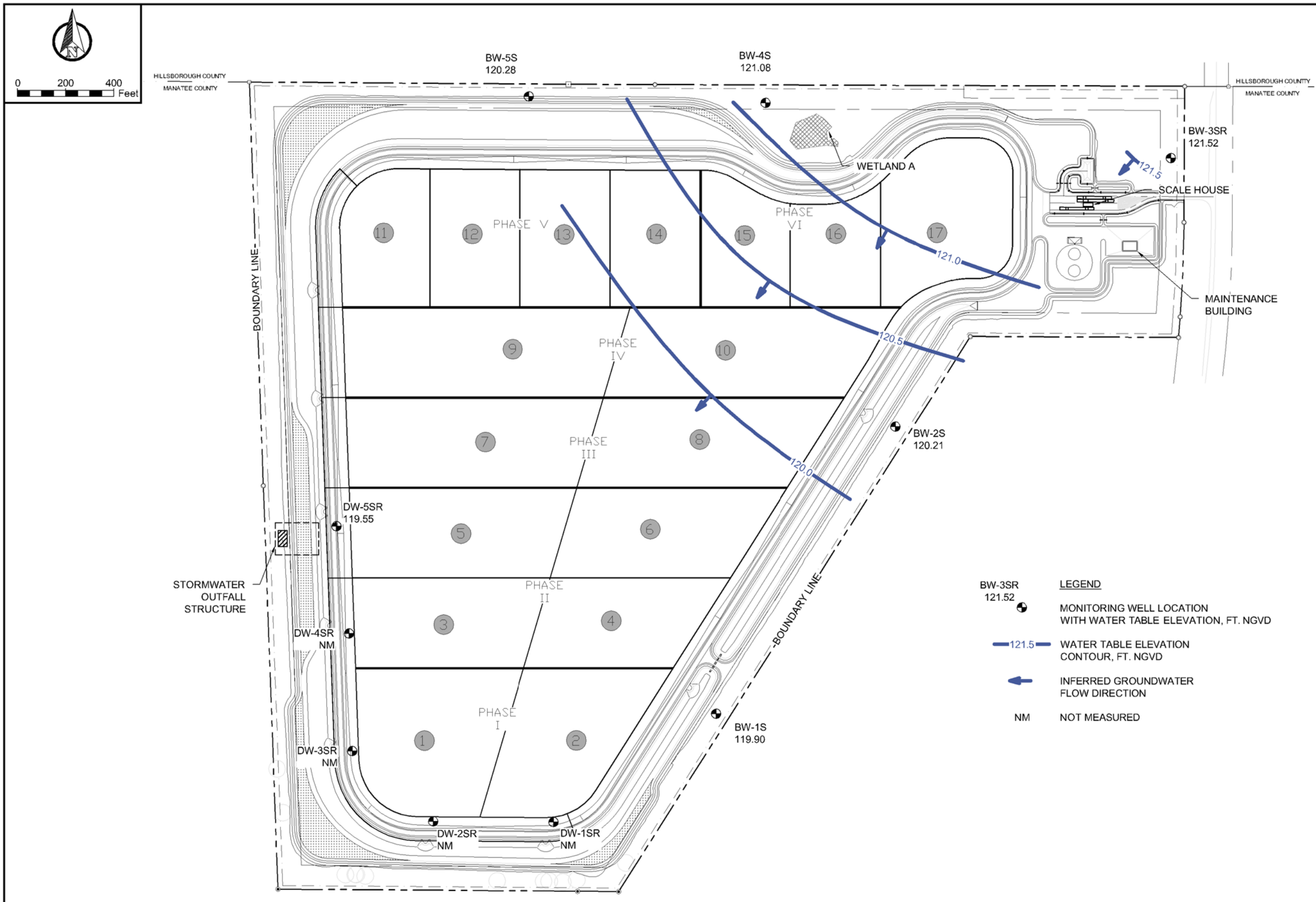
NORTH MANATEE RECYCLING & DISPOSAL FACILITY
CLASS III LANDFILL
14415 CR 39
DUETTE, MANATEE COUNTY, FLORIDA

MONITORING POINT LOCATIONS MAP

PROJECT # 09-574.018

FIGURE 2



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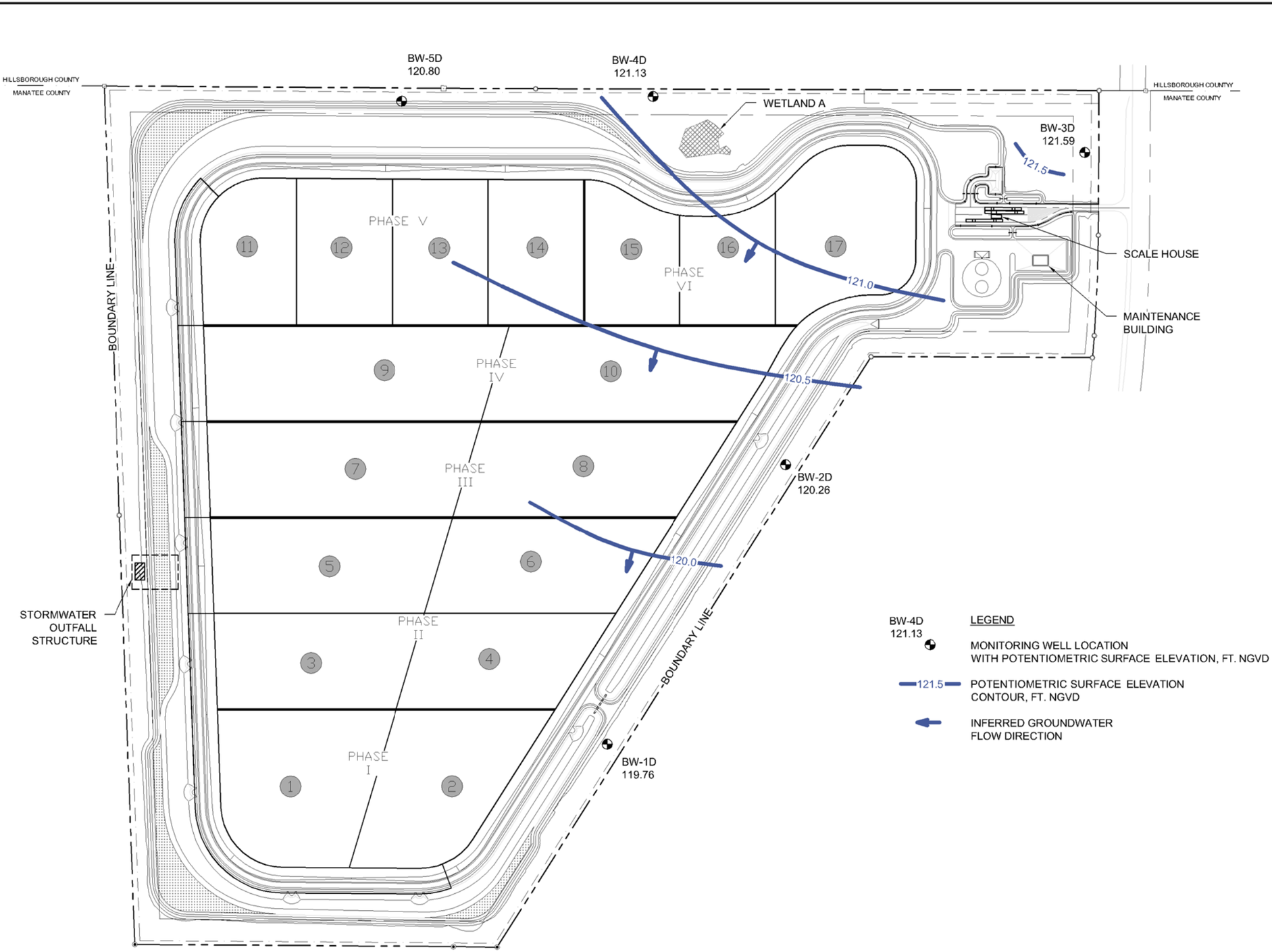
NORTH MANATEE RECYCLING & DISPOSAL FACILITY
CLASS III LANDFILL
14415 CR 39
DUETTE, MANATEE COUNTY, FLORIDA

WATER TABLE ELEVATION CONTOUR MAP:
UPPER SURFICIAL AQUIFER
FEBRUARY 13, 2017

PROJECT #
09-574.018

FIGURE
3



SOURCE: BASE FILE PROVIDED BY: TERRACON CONSULTING ENGINEERS AND SCIENTISTS, WOODSTOCK GA.

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NORTH MANATEE RECYCLING & DISPOSAL FACILITY
CLASS III LANDFILL
14415 CR 39
DUETTE, MANATEE COUNTY, FLORIDA

POTENTIOMETRIC SURFACE
ELEVATION CONTOUR MAP
LOWER SURFICIAL AQUIFER
FEBRUARY 13, 2017

PROJECT #
09-574.018
FIGURE
4

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Appendix A

PROFESSIONAL TECHNICAL SUPPORT SERVICES, INC.
Atlanta (770) 723-9125
Baton Rouge (504) 293-0136
Jacksonville (904) 693-3177
Houston (248) 641-7606
Pittsburgh (412) 746-8821

PTH TO WATER
EASUREMENTS

FACILITY NAME: NORTH MANATEE

DATE: 2-13-17

MONITORING LOCATION	DEPTH TO WATER (ft TOC)
BW-1S	6.50
BW-1D	6.72
BW-2S	5.20
BW-2D	5.10
BW-3SR	8.88
BW-3D	8.62
BW-4S	6.38
BW-4D	6.27
BW-5S	7.27
BW-5D	7.29
DW-1SR	⊗NA
DW-2SR	⊗ NA
DW-3SR	⊗ NA
DW-4SR	⊗ NA
DW-5S	11.14
UG-1	DRY CANAL

MONITORING LOCATION	DEPTH TO WATER (ft TOC)

⊗NA - WATER LEVEL IS BELOW THE TOP OF THE DEDICATED PUMP.

WELL CONDITION INSPECTION FORM

WASTE MANAGEMENT

Site: NORTH MANATEE Personnel: DANNY ARMOUR

Date: 2-13-17 Page 1 of 1

Well ID	Protective Casing	Well Casing	Label	Lock	Sample Equipment Type	General Turbidity	Well Yield	Comments/Observations *
BW-1S	☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	DEDICATED BLADDER PUMP	☒ Clear ☐ Turbid	☒ OK ☐ Inadequate	
BW-2S	☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	"	☒ Clear ☐ Turbid	☒ OK ☐ Inadequate	
BW-3SR	☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	"	☒ Clear ☐ Turbid	☒ OK ☐ Inadequate	
BW-4S	☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	"	☒ Clear ☐ Turbid	☒ OK ☐ Inadequate	
BW-5S	☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	"	☒ Clear ☐ Turbid	☒ OK ☐ Inadequate	
DW-1SR	☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	"	☐ Clear ☒ Turbid	☐ OK ☒ Inadequate	SLIGHTLY TURBID VERY LITTLE WATER IN WELL
DW-2SR	☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	"	☒ Clear ☐ Turbid	☐ OK ☒ Inadequate	VERY LITTLE WATER IN WELL
DW-3SR	☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	"	☒ Clear ☐ Turbid	☐ OK ☒ Inadequate	VERY LITTLE WATER IN WELL
DW-4SR	☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	"	☒ Clear ☐ Turbid	☐ OK ☒ Inadequate	VERY LITTLE WATER IN WELL
DW-5S	☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	PERISTALTIC PUMP	☒ Clear ☐ Turbid	☐ OK ☒ Inadequate	VERY LITTLE WATER IN WELL

* Note ponding water, weep holes, or any other information pertaining to well condition. Provide additional details on listed items.

Return this form to Site Manager - FOR INTERNAL USE ONLY.

Form FD 9000-8: FIELD INSTRUMENT CALIBRATION RECORDS

INSTRUMENT (MAKE/MODEL#) HF SCIENTIFIC MICROTPI INSTRUMENT # 200710329

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL Cl ☐ DO ☐ OTHER _____

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 1000 NTU HF SCIENTIFIC EXP: JAN 2018

Standard B 10.0 NTU HF SCIENTIFIC EXP: JAN 2018

Standard C 0.02 NTU HF SCIENTIFIC EXP: JAN 2018

DATE (y/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
17/02/13	0730	A	1000	AUTO CAL	-	YES	INIT	DSA
"	"	B	10.0	"	-	YES	INIT	DSA
"	"	C	0.02	"	-	YES	INIT	DSA

Form FD 9000-8: FIELD INSTRUMENT CALIBRATION RECORDS

INSTRUMENT (MAKE/MODEL#) YSI PRO SERIES INSTRUMENT # 15D100782

PARAMETER: *[check only one]*

☐ TEMPERATURE ☒ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL Cl ☐ DO ☐ OTHER _____

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 1.413 mS/cm PINE ENVIRONMENTAL LOT# 6GD211 EXP: 04/30/2013

Standard B _____

Standard C _____

DATE (yy/mm/dd)	TIME (hr:mn)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV.	CALIBRATED (YES, NO)	TYPE (INIT. COND)	SAMPLER INITIALS
13/02/13	0730	A	1.413	AUTO CAL	-	YES	INIT	DK

Form FD 9000-8: FIELD INSTRUMENT CALIBRATION RECORDS

INSTRUMENT (MAKE/MODEL#) YSI Pro Series INSTRUMENT # 15D100783

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☒ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL Cl ☐ DO ☐ OTHER _____

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 7.00 (std) Ricca Chem Lot# 2607D40 Exp: 07/2018

Standard B 4.00 (std) Ricca Chem Lot# 2511B04 Exp: 11/2017

Standard C 10.00 (std) Ricca Chem Lot# 2608E32 Exp: 02/2018

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
17/02/13	0730	A	7.00	Auto Cal	-	Yes	INIT	DA
"	"	B	4.00	"	-	Yes	INIT	DA
"	"	C	10.00	"	-	Yes	INIT	DA

Form FD 9000-8: FIELD INSTRUMENT CALIBRATION RECORDS

INSTRUMENT (MAKE/MODEL#) YSI Pro Series INSTRUMENT # 15D100782

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL Cl ☒ DO ☐ OTHER _____

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A SATURATED AIR

Standard B _____

Standard C _____

DATE (y/m/d)	TIME (h:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED? (YES / NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
17/02/13	0730	A	100% SAT	100%	-	Yes	INIT	DA

Table FS 2200-2
Dissolved Oxygen Saturation

TEMP	D.O.	mg/L	TEMP	D.O.	mg/L	TEMP	D.O.	mg/L	TEMP	D.O.	mg/L
deg C	SAT.	20%	deg C	SAT.	20%	deg C	SAT.	20%	deg C	SAT.	20%
15.0	10.084	2.017	19.0	9.276	1.855	23.0	8.578	1.716	27.0	7.968	1.594
15.1	10.062	2.012	19.1	9.258	1.852	23.1	8.562	1.712	27.1	7.954	1.591
15.2	10.040	2.008	19.2	9.239	1.848	23.2	8.546	1.709	27.2	7.940	1.588
15.3	10.019	2.004	19.3	9.220	1.844	23.3	8.530	1.706	27.3	7.926	1.585
15.4	9.997	1.999	19.4	9.202	1.840	23.4	8.514	1.703	27.4	7.912	1.582
15.5	9.976	1.995	19.5	9.184	1.837	23.5	8.498	1.700	27.5	7.898	1.580
15.6	9.955	1.991	19.6	9.165	1.833	23.6	8.482	1.696	27.6	7.884	1.577
15.7	9.934	1.987	19.7	9.147	1.829	23.7	8.466	1.693	27.7	7.870	1.574
15.8	9.912	1.982	19.8	9.129	1.826	23.8	8.450	1.690	27.8	7.856	1.571
15.9	9.891	1.978	19.9	9.111	1.822	23.9	8.434	1.687	27.9	7.842	1.568
16.0	9.870	1.974	20.0	9.092	1.818	24.0	8.418	1.684	28.0	7.828	1.566
16.1	9.849	1.970	20.1	9.074	1.815	24.1	8.403	1.681	28.1	7.814	1.563
16.2	9.829	1.966	20.2	9.056	1.811	24.2	8.387	1.677	28.2	7.800	1.560
16.3	9.808	1.962	20.3	9.039	1.808	24.3	8.371	1.674	28.3	7.786	1.557
16.4	9.787	1.957	20.4	9.021	1.804	24.4	8.356	1.671	28.4	7.773	1.555
16.5	9.767	1.953	20.5	9.003	1.801	24.5	8.340	1.668	28.5	7.759	1.552
16.6	9.746	1.949	20.6	8.985	1.797	24.6	8.325	1.665	28.6	7.745	1.549
16.7	9.726	1.945	20.7	8.968	1.794	24.7	8.309	1.662	28.7	7.732	1.546
16.8	9.705	1.941	20.8	8.950	1.790	24.8	8.294	1.659	28.8	7.718	1.544
16.9	9.685	1.937	20.9	8.932	1.786	24.9	8.279	1.656	28.9	7.705	1.541
17.0	9.665	1.933	21.0	8.915	1.783	25.0	8.263	1.653	29.0	7.691	1.538
17.1	9.645	1.929	21.1	8.898	1.780	25.1	8.248	1.650	29.1	7.678	1.536
17.2	9.625	1.925	21.2	8.880	1.776	25.2	8.233	1.647	29.2	7.664	1.533
17.3	9.605	1.921	21.3	8.863	1.773	25.3	8.218	1.644	29.3	7.651	1.530
17.4	9.585	1.917	21.4	8.846	1.769	25.4	8.203	1.641	29.4	7.638	1.528
17.5	9.565	1.913	21.5	8.829	1.766	25.5	8.188	1.638	29.5	7.625	1.525
17.6	9.545	1.909	21.6	8.812	1.762	25.6	8.173	1.635	29.6	7.611	1.522
17.7	9.526	1.905	21.7	8.794	1.759	25.7	8.158	1.632	29.7	7.598	1.520
17.8	9.506	1.901	21.8	8.777	1.755	25.8	8.143	1.629	29.8	7.585	1.517
17.9	9.486	1.897	21.9	8.761	1.752	25.9	8.128	1.626	29.9	7.572	1.514
18.0	9.467	1.893	22.0	8.744	1.749	26.0	8.114	1.623	30.0	7.559	1.512
18.1	9.448	1.890	22.1	8.727	1.745	26.1	8.099	1.620	30.1	7.546	1.509
18.2	9.428	1.886	22.2	8.710	1.742	26.2	8.084	1.617	30.2	7.533	1.507
18.3	9.409	1.882	22.3	8.693	1.739	26.3	8.070	1.614	30.3	7.520	1.504
18.4	9.390	1.878	22.4	8.677	1.735	26.4	8.055	1.611	30.4	7.507	1.501
18.5	9.371	1.874	22.5	8.660	1.732	26.5	8.040	1.608	30.5	7.494	1.499
18.6	9.352	1.870	22.6	8.644	1.729	26.6	8.026	1.605	30.6	7.481	1.496
18.7	9.333	1.867	22.7	8.627	1.725	26.7	8.012	1.602	30.7	7.468	1.494
18.8	9.314	1.863	22.8	8.611	1.722	26.8	7.997	1.599	30.8	7.456	1.491
18.9	9.295	1.859	22.9	8.595	1.719	26.9	7.983	1.597	30.9	7.443	1.489

Derived using the formula in Standard Methods for the Examination of Water and Wastewater, Page 4-101, 18th Edition, 1992

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: DAN ARMOUR	Lab PM: Harrington, Danielle M	Carrier Tracking No(s):	COC No: 280-18310-8475.1
Client Contact: Fred Nassar	Phone: 225.907-4060	E-Mail: danielle.harrington@testamericainc.com		Page: Page 1 of 1
Company: Waste Management				Job #:

Address:	Due Date Requested:
City:	TAT Requested (days):
State, Zip:	
Phone:	PO #: Purchase Order Requested
Email: fnassar@wm.com	WO #:
Project Name: Event Desc: Semiannual Groundwater FEB AUG	Project #: 28004939
Site: FL50|North Manatee (NMRDF)/FL50 Florida	SSOW#:

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	300.0 CL, FL, SO4, NO3, pH Total Dissolved Solids(1Liter-PE)	Total Metals 6010B, 6020, 7470A (500mL-PE)	350.1 - Ammonia as N (500 mL-AG)	8260B - (MOD) Appendix I (with Short list spike)(40mL VOA-CG)	8011 - Local Method(40mL VOA-CG)	RAD-226 903.0 (1Liter - PE)	RAD-228 904.0 (1Liter-PE)	Total Number of containers
			Preservation Code:											
DW-45R	2-13	1343	G	W	N		1	1	1	3	3	1	1	Short Hold 300.0 NO3 andpH
DW-35R	2-13	1257	G	W	N		1	1	1	3	3	1	1	
DW-25R	2-13	1157	G	W	N		1	1	1	3	3	1	1	
DW-15R	2-13	1114	G	W	N		1	1	1	3	3	1	1	
BW-1S	2-13	1048	G	W	N		1	1	1	3	3	1	1	
BW-2S	2-13	1011	G	W	N		1	1	1	3	3	1	1	
BW-3SR	2-13	0934	G	W	N		1	1	1	3	3	1	1	
BW-5S	2-13	0900	G	W	N		1	1	1	3	3	1	1	
BW-4S	2-13	0824	G	W	N		1	1	1	3	3	1	1	
TRIP	2-13	—	G	W	N					✓	✓			

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Material Codes: AG=Amber Glass; CG=Clear Glass; PE=Polyethylene; PP=Polypropylene; S=Silicone; T=Teflon; O= Other Special Instructions/Note:

280-93877 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time: 2-13-17 1800	Company: PRO-TECH	Received by:	Date/Time: 2/14/17 0955	Company: TAD
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 2.5, 0.5, 0.6 +0.0 IR#7 DW 2/14/17

3/15/2017

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: NORTH MANATEE		SITE LOCATION: DUETTE, FL	
WELL NO: DW-45R	SAMPLE ID:		DATE: 2-13-17

PURGING DATA

WELL DIAMETER (inches): 2	TUBING DIAMETER (inches): 1/8	WELL SCREEN INTERVAL DEPTH: 5.48 (feet) to 15.48 (feet)	STATIC DEPTH TO WATER (feet): NA		PURGE PUMP TYPE OR BAILER: BP
WELL ELEVATION TOC (ft NGVD): 28.04			GROUNDWATER ELEVATION (ft NGVD): NA		

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

= ( ) (feet) - (feet) X gallons/foot = gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

= 0.3 gallons + (0.006 gallons/foot X 15.48 (feet)) + 0.05 gallons = 0.44 gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 10.48	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 10.48	PURGING INITIATED AT: 1320	PURGING ENDED AT: 1343		TOTAL VOLUME PURGED (gallons): 2.40

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	ORP (mV)	COLOR	ODOR
1328	0.80	0.80	0.10	NA	5.08	27.7	227	0.5	12.73	9		
1333	0.50	1.30	0.10	"	5.06	27.7	227	0.5	13.88	9		
1338	0.50	1.80	0.10	"	5.05	27.7	227	0.5	14.03	9		
1342	0.50	2.30	0.10	"	5.04	27.7	226	0.6	12.66	10	SLT. YELLOW TINT	
	NA - WATER LEVEL IS BELOW THE TOP OF THE DEDICATED PUMP.											

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.66
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: DAN ARMOUR / PROTEAM	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT: 1343		SAMPLING ENDED AT: NR
PUMP OR TUBING DEPTH IN WELL (feet): 10.48	TUBING MATERIAL CODE: T	FIELD-FILTERED: Y (N) µm Filtration Equipment Type:		FILTER SIZE:
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y (N) (replaced)		DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLE PUMP FLOW RATE (mL per minute)	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
	1	PP	1 L	—	—	—	G-CHEM	0.10	BP
	1	PE	500 ml	HNO3	—	—	METALS	"	"
	1	AG	500 ml	H2SO4	—	—	NH3	"	"
	3	CG	40 ml	HCl	—	—	8260B	"	"
	3	CG	40 ml	NaThio	—	—	8011	"	"
	2	PE	1L	HNO3	—	—	RAD 226/228	"	"

REMARKS:
Sheen Present: YES (NO) VERY LITTLE WATER IN WELL - COULD NOT REDDLE TURBIDITY

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; FFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)
pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2), optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

FORM D 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: NORTH MANATEE		SITE LOCATION: DUETTE, FL	
WELL NO: DW-33R	SAMPLE ID:		DATE: 2-13-17

PURGING DATA

WELL DIAMETER (inches): 2	TUBING DIAMETER (inches): 3/8	WELL SCREEN INTERVAL DEPTH: 5.1 (feet) to 15.1 (feet)	STATIC DEPTH TO WATER (feet): NA	PURGE PUMP TYPE OR BAILER: BP
WELL ELEVATION TOC (ft NGVD): 127.65			GROUNDWATER ELEVATION (ft NGVD): NA	

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (feet) - feet) X gallons/foot = gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= 0.3 gallons + (0.006 gallons/foot X 15.10 feet) + 0.05 gallons = 0.44 gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 12.00	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 12.00	PURGING INITIATED AT: 1230	PURGING ENDED AT: 1251		TOTAL VOLUME PURGED (gallons): 2.16

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	ORP (mV)	COLOR	ODOR
1238	0.96	0.96	0.12	NA	4.58	26.9	656	0.4	4.13	124		
1242	0.36	1.32	0.12		4.55	26.8	659	0.4	4.91	123		
1246	0.36	1.68	0.12		4.53	26.7	661	0.4	4.07	123		
1250	0.36	2.04	0.12		4.54	26.9	661	0.4	4.31	122	VERY	
											SLT.	
											YELLOW	
											TINT	
	NA- WATER LEVEL IS BELOW THE TOP OF THE DEDICATED WELL.											

WELL CAPACITY (Gallons Per Foot): 0.16" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: DAN ARMOUR / PRO-TECH	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT: 1251		SAMPLING ENDED AT: NR
PUMP OR TUBING DEPTH IN WELL (feet): 12.00	TUBING MATERIAL CODE: T	FIELD-FILTERED: Y (N) µm Filtration Equipment Type:		FILTER SIZE:
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y (N replaces)		DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLE PUMP FLOW RATE (ml per minute)	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (ml)	FINAL pH			
	1	PE	1 L	—	—	—	G-CHEM	0.12	BP
	1	PE	500 ml	HNO3	—	—	METALS		
	1	AG	500 ml	H2SO4	—	—	NH3		
	3	CG	40 ml	HCl	—	—	8260B		
	3	CG	40 ml	Na2S2O3	—	—	8011		
	2	PE	1L	HNO3	—	—	RAD 226/228		

REMARKS:
Sheen Present: YES (NO) VERY LITTLE WATER TO WORK WITH

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)
pH: ± 0.2 units Temperature: ± 0.2°C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2), optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: NORTH MANATEE		SITE LOCATION: DUETTE, FL	
WELL NO: DW-7SR	SAMPLE ID:		DATE: 2-13-17

PURGING DATA

WELL DIAMETER (inches): 2	TUBING DIAMETER (inches): 3/8	WELL SCREEN INTERVAL DEPTH: 9.56 feet to 14.56 feet	STATIC DEPTH TO WATER (feet): NA	PURGE PUMP TYPE OR BAILER: BP
WELL ELEVATION TOC (ft NGVD): 128.10			GROUNDWATER ELEVATION (ft NGVD): NA	

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (feet - feet) X gallons/foot = gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= 0.3 gallons + (0.006 gallons/foot X 14.56 feet) + 0.05 gallons = 0.44 gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 9.56	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 9.56	PURGING INITIATED AT: 1134	PURGING ENDED AT: 1157	TOTAL VOLUME PURGED (gallons): 2.30

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	ORP (mV)	COLOR	ODOR
1141	0.70	0.90	0.10	NA	4.32	26.7	346	0.4	8.56	215		
1146	0.50	1.20	0.10		4.16	26.8	345	0.4	8.07	219		
1151	0.50	1.70	0.10		4.11	26.8	345	0.4	7.33	218	SLT	
1156	0.50	2.20	0.10		4.30	26.8	344	0.4	6.50	219	YELLOW	
											TINT	
	NA- DEPTH TO WATER IS BELOW THE TOP OF THE DEDICATED PUMP											

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 1/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: DAN ARMOUR / PRO-TECH	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT: 1157	SAMPLING ENDED AT: NR
PUMP OR TUBING DEPTH IN WELL (feet): 9.56	TUBING MATERIAL CODE: T	FIELD-FILTERED: Y (N) FILTER SIZE: µm Filtration Equipment Type:	
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y (N replaced)	DUPLICATE: Y (N)	

SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH	INTENDED ANALYSIS AND/OR METHOD	SAMPLE PUMP FLOW RATE (mL per minute)	SAMPLING EQUIPMENT CODE
	1	PE	1 L	—	—	—	G-CHEM	0.10	BP
	1	PE	500 ml	HNO3	—	—	METALS		
	1	AG	500 ml	H2SO4	—	—	NH3		
	3	GG	40 ml	HCl	—	—	8260B		
	3	GG	40 ml	NaThio	—	—	8011		
	2	PE	1L	HNO3	—	—	RAD 226/228		

REMARKS:
Sheen Present YES (NO) VERY LITTLE WATER IN WELL TO WORK WITH

MATERIAL CODES: AG = Amber Glass; GG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)
pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2), optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

(Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: NORTH MANATEE		SITE LOCATION: DUETTE, FL	
WELL NO: DW-1SR	SAMPLE ID:		DATE: 2-13-19

PURGING DATA

WELL DIAMETER (inches): 2	TUBING DIAMETER (inches): 3/8	WELL SCREEN INTERVAL DEPTH: 5.56 feet to 15.56 feet	STATIC DEPTH TO WATER (feet): NA	PURGE PUMP TYPE OR BAILER: BP

WELL ELEVATION TOC (ft NGVD): 128.19 | GROUNDWATER ELEVATION (ft NGVD): NA

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (feet - feet) X gallons/foot = gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= 0.3 gallons + (0.006 gallons/foot X 15.56 feet) + 0.05 gallons = 0.44 gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 10.56	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 10.56	PURGING INITIATED AT: 1101	PURGING ENDED AT: 1114		TOTAL VOLUME PURGED (gallons): 2.30

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	ORP (mV)	COLOR	ODOR
1108	0.70	0.70	0.10	NA	5.07	26.3	126	0.6	96.24	139		
1103	0.50	1.20	0.10		5.07	26.2	126	0.7	94.39	133		
1108	0.50	1.70	0.10		5.08	26.2	127	0.6	97.31	139		
1113	0.50	2.20	0.10		5.08	26.2	127	0.7	96.44	138	BROWN	
	NA- WATER LEVEL IS BELOW THE TOP OF THE DEDICATED PUMP											

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 6" = 1.02; 8" = 1.47; 12" = 5.66
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: DAN ARMOUR / PRO-TECH	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT: 1114		SAMPLING ENDED AT: NR
PUMP OR TUBING DEPTH IN WELL (feet): 10.56	TUBING MATERIAL CODE: T	FIELD-FILTERED: Y (N) µm Filtration Equipment Type:		FILTER SIZE:
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y (N) (replaced)		DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLE PUMP FLOW RATE (ml per minute)	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
	1	PE	1 L	—	—	—	G-CHEM	0.10	BP
	1	PE	500 ml	HNO3	—	—	METALS		
	1	AG	500 ml	H2SO4	—	—	NH3		
	3	CG	40 ml	HCl	—	—	8260B		
	3	CG	40 ml	NaThio	—	—	8011		
	2	PE	1L	HNO3	—	—	RAD 226 / 228		

REMARKS:
Sheen Present: YES (NO) VERY LITTLE WATER IN WELL - COULD NOT REDUCE TURBIDITY

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)
pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2), optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: NORTH MANATEE		SITE LOCATION: DUETTE, FL	
WELL NO: BW-1S	SAMPLE ID:		DATE: 2-13-17

PURGING DATA

WELL DIAMETER (inches): 2	TUBING DIAMETER (inches): 3/8	WELL SCREEN INTERVAL DEPTH: 5 feet to 15 feet	STATIC DEPTH TO WATER (feet): 6.50	PURGE PUMP TYPE OR BAILER: BP

WELL ELEVATION TOC (ft NGVD): 126.40 GROUNDWATER ELEVATION (ft NGVD): 119.90

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

= 15.00 feet - 6.50 feet X 0.163 gallons/foot = 1.39 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

= 0.3 gallons + (0.006 gallons/foot X 15.00 feet) + 0.05 gallons = 0.44 gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 11.00	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 11.00	PURGING INITIATED AT: 1038	PURGING ENDED AT: 1048		TOTAL VOLUME PURGED (gallons): 3.60

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	ORP (mV)	COLOR	ODOR
1038	1.50	1.50	0.15	7.68	4.64	23.4	77	0.3	7.90	101		
1041	0.45	1.95	0.15	7.68	4.65	23.5	78	0.3	7.36	98		
1044	0.45	2.40	0.15	7.68	4.65	23.5	78	0.3	8.08	96		
1047	0.45	2.85	0.15	7.68	4.65	23.5	78	0.3	7.36	95	YELLOW TINT	

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 6" = 1.02; 8" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT: 1048		SAMPLING ENDED AT: NR
DAN ARMOUR / PRO-TECH				

PUMP OR TUBING DEPTH IN WELL (feet): 11.00	TUBING MATERIAL CODE: T	FIELD-FILTERED: Y (N) FILTER SIZE: µm Filtration Equipment Type:

FIELD DECONTAMINATION: PUMP Y (N) TUBING Y (R replaced) DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLE PUMP FLOW RATE (mL per minute)	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
	1	PE	1 L	—	—	—	G-CHEM	0.15	BP
	1	PE	500 ml	HNO_3	—	—	METALS		
	1	AG	500 ml	H_2SO_4	—	—	NH3		
	3	CG	40 ml	HCl	—	—	8260B		
	3	CG	40 ml	$Na_2S_2O_3$	—	—	8011		
	2	PE	1L	HNO_3	—	—	RAD226/228		

REMARKS:

Sheen Present: YES (NO)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2), optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME:	NORTH MANATEE	SITE LOCATION:	DUETTE, FL	
WELL NO:	BW-23	SAMPLE ID:		DATE: 2-13-17

PURGING DATA

WELL DIAMETER (inches):	TUBING DIAMETER (inches):	WELL SCREEN INTERVAL DEPTH:	STATIC DEPTH TO WATER (feet):	PURGE PUMP TYPE OR BAILER:
2	3/8	5 feet to 15 feet	5.20	BP

WELL ELEVATION TOC (ft NGVD): 125.41 GROUNDWATER ELEVATION (ft NGVD): 120.21

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable)

= (15.00 feet - 5.20 feet) X 0.163 gallons/foot = 1.60 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME (only fill out if applicable)

= 0.3 gallons + (0.006 gallons/foot X 15.00 feet) + 0.05 gallons = 0.44 gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED (gallons):
11.00	11.00	0950	1011	3.36

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	ORP (mV)	COLOR	ODOR
1001	1.76	1.76	0.16	5.52	5.23	23.8	83	0.2	4.35	-10		
1004	0.48	2.24	0.16	5.52	5.23	23.8	83	0.2	3.93	-11		
1007	0.48	2.72	0.16	5.52	5.22	23.9	83	0.2	4.13	-11		
1010	0.48	3.20	0.16	5.52	5.21	23.9	82	0.2	3.92	-11	NONE	

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0008; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT:	SAMPLING ENDED AT:
DAN ARMOUR / PRO-TECH		1011	NR

PUMP OR TUBING DEPTH IN WELL (feet):	TUBING MATERIAL CODE:	FIELD-FILTERED: Y (N) µm Filtration Equipment Type:	FILTER SIZE:
11.00	T		

FIELD DECONTAMINATION: PUMP Y (N) TUBING Y (N) (replaced) DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLE PUMP FLOW RATE (mL per minute)	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
	1	PE	1 L	—	—	—	G-CHEM	0.16	BP
	1	PE	500 ml	HNO3	—	—	METALS		
	1	AG	500 ml	H2SO4	—	—	NH3		
	3	CG	40 ml	HCl	—	—	82608		
	3	CG	40 ml	NaThio	—	—	8011		
	2	PE	1L	HNO3	—	—	Rad 226/228		

REMARKS:

Sheen Present: YES (NO)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = Amer Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RPPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2), optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

FORM FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: NORTH MANATEE		SITE LOCATION: DUETTE, FL	
WELL NO: BW-35R	SAMPLE ID:		DATE: 2-13-19

PURGING DATA

WELL DIAMETER (inches): 2	TUBING DIAMETER (inches): 3/8	WELL SCREEN INTERVAL DEPTH: 5 feet to 15 feet	STATIC DEPTH TO WATER (feet): 8.88		PURGE PUMP TYPE OR BAILER: BP
WELL ELEVATION TOC (ft NGVD): 130.40			GROUNDWATER ELEVATION (ft NGVD): 121.52		

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable)

= (15.00 feet - 8.88 feet) X 0.163 gallons/foot = 1.00 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME (only fill out if applicable)

= 0.3 gallons + (0.006 gallons/foot X 15.00 feet) + 0.05 gallons = 0.449 gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 11.00	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 11.00	PURGING INITIATED AT: 0914	PURGING ENDED AT: 0934		TOTAL VOLUME PURGED (gallons): 3.00

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) umhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	ORP (mV)	COLOR	ODOR
0924	1.50	1.50	0.15	9.06	5.59	23.5	239	0.3	3.32	-17		
0927	0.45	1.95	0.15	9.06	5.57	23.5	237	0.3	3.64	-17		
0930	0.45	2.40	0.15	9.07	5.59	23.5	237	0.3	3.69	-19		
0933	0.45	2.85	0.15	9.07	5.57	23.5	237	0.3	3.04	-19	NONE	

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

TUBING INSIDE DIA. CAPACITY (Gal./FT): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electro Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: DAN ARMOUR / PROTECH	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT: 0934		SAMPLING ENDED AT: NR
PUMP OR TUBING DEPTH IN WELL (feet): 11.00	TUBING MATERIAL CODE: T	FIELD-FILTERED: Y (N) µm Filtration Equipment Type:		FILTER SIZE:
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y (N) replaced		DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLE PUMP FLOW RATE (mL per minute)	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
	1	PE	1 L	—	—	—	G-CHEM	0.15	BP
	1	PE	500 ml	HNO_3	—	—	METALS		
	1	AG	500 ml	H_2SO_4	—	—	NH3		
	3	CG	40 ml	HCl	—	—	8260B		
	3	CG	40 ml	$Na_2S_2O_3$	—	—	8011		
	2	PE	1 L	HNO_3	—	—	RAD 226 / 228		

REMARKS:

Sheen Present: YES (NO)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; FFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2), optionally ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

GROUNDWATER SAMPLING LOG

SITE NAME: NORTH MANATEE		SITE LOCATION: DUETTE, FL	
WELL NO: BW-5S	SAMPLE ID:		DATE: 2/3/17

PURGING DATA

WELL DIAMETER (inches): 2	TUBING DIAMETER (inches): 3/8	WELL SCREEN INTERVAL DEPTH: 5 (feet) to 15 (feet)	STATIC DEPTH TO WATER (feet): 7.27		PURGE PUMP TYPE OR BAILER: BP
WELL ELEVATION TOC (ft NGVD): 127.55			GROUNDWATER ELEVATION (ft NGVD): 120.28		

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable)

= (15.00 (feet) − 7.27 (feet) X 0.163 gallons/foot = 1.26 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME (only fill out if applicable)

= 0.3 gallons + (0.006 gallons/foot X 15.00 feet) + 0.05 gallons = 0.44 gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 11.00	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 11.00	PURGING INITIATED AT: 0840	PURGING ENDED AT: 0900		TOTAL VOLUME PURGED (gallons): 3.00

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	ORP (mV)	COLOR	ODOR
0850	1.50	1.50	0.15	7.50	5.10	22.7	511	0.3	2.15	22		
0853	0.45	1.95	0.15	7.50	5.10	22.8	511	0.2	2.58	21		
0856	0.45	2.40	0.15	7.50	5.09	22.9	511	0.3	2.33	21		
0859	0.45	2.85	0.15	7.50	5.09	22.9	512	0.2	1.89	20	NONE	

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.86
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0008; 3/16" = 0.0014; 1/4" = 0.0028; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: DAN ARMOUR / PRO-TECH	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT: 0900	SAMPLING ENDED AT: NR
PUMP OR TUBING DEPTH IN WELL (feet): 11.00	TUBING MATERIAL CODE: T	FIELD-FILTERED: Y (N) µm Filtration Equipment Type:	FILTER SIZE:
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y (N) replaced	DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLE PUMP FLOW RATE (mL per minute)	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
	1	PE	1 L	—	—	—	G-CHEM	0.15	BP
	1	PE	500 ml	HNO3	—	—	METALS		
	1	AG	500 ml	H2SO4	—	—	NH3		
	3	CG	40 ml	HCl	—	—	82608		
	3	CG	40 ml	Na2S2O3	—	—	8011		
	2	PE	1L	HNO3	—	—	RAD 226/228		

REMARKS:

Sheen Present YES (NO)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2), optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

FORM FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME:	NORTH MANATEE		SITE LOCATION:	DUETTE, FL	
WELL NO:	BW-4S	SAMPLE ID:			DATE: 2-13-17

PURGING DATA

WELL DIAMETER (inches):	2	TUBING DIAMETER (inches):	3/8	WELL SCREEN INTERVAL DEPTH:	5 (feet) to 15 (feet)	STATIC DEPTH TO WATER (feet):	6.38	PURGE PUMP TYPE OR BAILER:	BP

WELL ELEVATION TOC (ft NGVD): 127.46 GROUNDWATER ELEVATION (ft NGVD): 121.08

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

= (15.00 (feet) - 6.38 (feet)) X 0.163 (gallons/foot) = 1.41 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

= 0.3 gallons + (0.006 gallons/foot X 15.00 (feet)) + 0.05 gallons = 0.44 gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	11.00	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	11.00	PURGING INITIATED AT:	0804	PURGING ENDED AT:	0824	TOTAL VOLUME PURGED (gallons):	3.00

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	ORP (mV)	COLOR	ODOR
0814	1.50	1.50	0.15	6.51	4.43	22.2	344	0.2	3.73	105		
0819	0.45	1.95	0.15	6.51	4.45	22.2	344	0.2	3.70	104		
0820	0.45	2.40	0.15	6.51	4.44	22.2	344	0.2	3.99	104		
0823	0.45	2.85	0.15	6.51	4.46	22.1	346	0.2	3.99	103	None	

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0003; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	DAN ARMOUR / PRO-TECH	SAMPLER(S) SIGNATURE(S):		SAMPLING INITIATED AT:	0824	SAMPLING ENDED AT:	NR

PUMP OR TUBING DEPTH IN WELL (feet):	11.00	TUBING MATERIAL CODE:	T	FIELD-FILTERED: Y (N)	FILTER SIZE: µm

Filtration Equipment Type:

FIELD DECONTAMINATION: PUMP Y (N) TUBING Y (N) (replaced) DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLE PUMP FLOW RATE (mL per minute)	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
	1	PE	1 L	—	—	—	G-CHEM	0.15	BP
	1	PE	500 ml	HNO3	—	—	METALS		
	1	AG	500 ml	H2SO4	—	—	NH3		
	3	CG	40 ml	HCl	—	—	82608		
	3	CG	40 ml	NaThio	—	—	8011		
	2	PE	1L	HNO3	—	—	RAD 226 / 228		

REMARKS:

Sheen Present: YES (NO)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2), optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

3/15/2017

Client Information	Sampler: DAN ARMOUR	Lab PM: Harrington, Danielle M	Carrier Tracking No(s):	COC No: 280-18310-8475.1
Client Contact: Fred Nassar	Phone: 225-907-4060	E-Mail: danielle.harrington@testamericainc.com		Page: Page 1 of 1
Company: Waste Management				Job #:

Address:	Due Date Requested:
City:	TAT Requested (days):
State, Zip:	
Phone:	PO #: Purchase Order Requested
Email: fnassar@wm.com	WO #:
Project Name: Event Desc: Semiannual Background DW-5S FEB AUG	Project #: 28004939
Site:FL50|North Manatee (NMRDF)/FL50 Florida	SSOW#:

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	300.0 CL, NO3, Total Dissolved Solids(1Liter-PE)	Total Metals 6010B, 6020, 7470A (600mL-PE)	350.1 - Ammonia as N (500 mL-AG)	8260B - (MOD) Appendix I (with Short list spike)(40mL VOA-CG)	8011 - Local Method(40mL VOA-CG)	Total Number of containers
			Preservation Code:		N	N	D	S	A	R		
DW-5S	2-13	1424	G	W	N		1	1	1	3	3	
TRIP	2-13	—	G	W	N					✓		

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Material Codes: AG=Amber Glass; CG=Clear Glass; PE=Polyethylene; PP=Polypropylene; S=Silicone; T=Teflon; O= Other Special Instructions/Note:

Short Hold 300.0 NO3

280-93875 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time: 2-13-17 1800	Company PRO-TECH	Received by:	Date/Time: 2/14/17 0955	Company TAD
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 1.4 +0.0 IR#7 2/14/17

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: North Manatee		SITE LOCATION: Duette, FL	
WELL NO: DW-SS	SAMPLE ID:		DATE: 2-13-17

PURGING DATA

WELL DIAMETER (inches): 2	TUBING DIAMETER (inches): 1/4	WELL SCREEN INTERVAL DEPTH: 5.4 feet to 15.4 feet	STATIC DEPTH TO WATER (feet): 11.14		PURGE PUMP TYPE OR BAILER: PP
WELL ELEVATION TOC (ft NGVD): NA			GROUNDWATER ELEVATION (ft NGVD): NA		

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (15.40 feet - 11.14 feet) X 0.163 gallons/foot = 0.69 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= 0.0 gallons + (0.0026 gallons/foot X 15.40 feet) + 0.05 gallons = 0.09 gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 14.00	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 14.00	PURGING INITIATED AT: 1400	PURGING ENDED AT: 1424		TOTAL VOLUME PURGED (gallons): 2.88

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	ORP (mV)	COLOR	ODOR
1414	1.68	1.68	0.12	11.30	5.31	26.2	93	0.5	7.48	-46		
1417	0.36	2.04	0.12	11.30	5.32	26.2	92	0.6	7.23	-46		
1420	0.36	2.40	0.12	11.31	5.34	26.1	92	0.5	7.49	-46		
1423	0.36	2.76	0.12	11.31	5.34	26.1	92	0.5	7.71	-46	NONE	

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./FL): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: DAN ARMOUR / PBS-TECH	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT: 1424		SAMPLING ENDED AT: NR
PUMP OR TUBING DEPTH IN WELL (feet): 14.00	TUBING MATERIAL CODE: PE	FIELD-FILTERED: Y (N) µm Filtration Equipment Type:		FILTER SIZE:
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y (N) (replaced)		DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLE PUMP FLOW RATE (mL per minute)	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
	1	PE	1L	-	-	-	6-CHEM	0.12	PP
	1	PE	500ml	HNO3	-	-	METALS		PP
	1	AG	500 ml	H2SO4	-	-	NH3		PP
	3	CG	40ml	HCl	-	-	8260B		RFPP
	3	CG	40ml	Na2S2O3	-	-	8011		RFPP

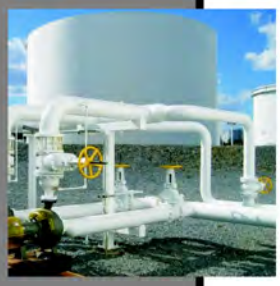
REMARKS:
SHEEN: NO

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)
pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009



Semiannual Groundwater and Surface Water Quality Monitoring Report

North Manatee Recycling & Disposal Facility, Class III Landfill
Manatee County, Florida
FDEP Permit Nos. 298891-005-SO/T3 and 298891-006-SC/T3
WACS ID SWD-41-98654

***Prepared for*:**

Florida Department of Environmental Protection, Southwest District
13051 N. Telecom Parkway
Temple Terrace, Florida 33637-0926

November 2017

hsagolden engineering environmental solutions

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Fax: 407.649.6582
www.hsagolden.com

November 6, 2017

VIA ELECTRONIC MAIL

Mr. Steve Morgan
Environmental Manager
Florida Department of Environmental Protection
Southwest District
13051 N. Telecom Parkway
Temple Terrace, Florida 33637-0926

Subject: **Semiannual Groundwater and Surface Water Quality Monitoring Report**
North Manatee Recycling and Disposal Facility, Class III Landfill
14415 C.R. 39, Duette, Manatee County, Florida
FDEP Permit Nos. 298891-005-SO/T3 and 298891-006-SC/T3
WACS ID: SWD-41-98654

Dear Mr. Morgan:

On behalf of Waste Management Inc. of Florida (WMIF), HSA Golden is providing for your review this Semiannual Groundwater and Surface Water Quality Monitoring Report, summarizing the August 2017 sampling event at WMIF's North Manatee Recycling and Disposal Facility, Class III Landfill. Monitoring was performed in accordance with the requirements listed in Florida Department of Environmental Protection (FDEP) Permit Nos. 298891-005-SO/T3 and 298891-006-SC/T3 and the Water Quality Monitoring Plan for the facility.

This report discusses the field activities, chemical analytical results, conclusions regarding site conditions, and recommendations for future monitoring. The field activities detailed herein were conducted by Pro-Tech of Cumming, Georgia, and their data indicates that work was performed in accordance with FDEP's *Standard Operating Procedures for Field Activities DEP-SOP-001/01,* dated March 2014. The site location is presented on Figure 1.

1.0 MONITORING WELL NETWORK

Per the FDEP solid waste operating permit for the site, the monitoring well network at the site is comprised of 10 active monitoring wells (BW-1S, BW-2S, BW-3SR, BW-4S, BW-5S, DW-1SR, DW-2SR, DW-3SR, DW-4SR, and DW-5SR), and five inactive wells (BW-1D, BW-2D, BW-3D, BW-4D, and BW-5D) currently classified as piezometers. Monitoring well locations are shown on Figure 2. Well DW-5SR was drilled on October 12, 2016, to replace well DW-5S, which became damaged during the installation of a sulphur treatment system at the facility. Wells with an "S" or "SR" suffix monitor groundwater quality in the upper surficial aquifer, while wells with a "D" suffix monitor groundwater quality in the lower surficial aquifer.

Monitoring wells with a "BW" designation are listed as background monitoring wells in the Water Quality Monitoring Plan, and those wells with a "DW" designation are listed as detection wells.

2.0 GROUNDWATER ELEVATION DATA

Depths to groundwater were recorded at each well location on August 16, 2017, just prior to commencement of semiannual groundwater sampling activities. Water levels within the monitoring wells were measured to the nearest 0.01 foot and recorded (Appendix A). Groundwater elevations, calculated by subtracting depths to groundwater from surveyed top-of-casing elevations, are presented in Table 1.

Water table elevation and potentiometric surface elevation contour maps, each generated from Table 1 data, are provided as Figures 3 and 4. As shown on the figures, groundwater flow direction is generally towards the southwest, which is consistent with historic data.

3.0 GROUNDWATER QUALITY TESTING

3.1 Groundwater Sampling and Chemical Analytical Parameters

Following depth-to-groundwater measurements, groundwater samples were collected from each of the 10 active monitoring wells at the site. Purging and sampling were accomplished using the dedicated bladder pumps set at the lowest flow rate (i.e., low flow sampling technique). Groundwater samples were placed on ice, in coolers, and shipped to TestAmerica Denver for chemical analyses. TestAmerica Denver reports their analyses were performed in accordance with Florida Department of Health (FDOH) Certification #E87667 and NELAC standards (June 2003).

Samples collected from the wells were chemically analyzed for the following: ammonia, chloride, nitrate, total dissolved solids (TDS), iron, mercury, sodium, and those parameters listed in 40 CFR Part 258, Appendix I. Field testing, which included the recording of groundwater pH, temperature, specific conductance, dissolved oxygen concentration, turbidity, and oxidation reduction potential (ORP), was performed as a component part of the groundwater sampling process. Groundwater sampling and equipment calibration logs are included within Appendix A.

3.2 Groundwater Quality Results

In accordance with Rule 62-701, Florida Administrative Code (F.A.C.), groundwater chemical analytical results were compared to Primary Drinking Water Standards (PDWS) and Secondary Drinking Water Standards (SDWS) listed in Rule 62-550, F.A.C., and Groundwater Cleanup Target Levels (GCTLs) per Rule 62-777, F.A.C. (see Table 2).

3.2.1 Field Parameters

- Field-measured temperature, specific conductance, dissolved oxygen, and turbidity were within the criteria established in Section 3.3.1, FS 2200, DEP-SOP-001/01, indicating that samples were generally collected under stable conditions.

- pH was recorded at all monitoring well locations outside of the 6.5-8.5 criteria. Readings ranged from 4.00 to 5.35, and these readings are consistent with historic data.

- ORP readings were negative at wells BW-2S and BW-3SR. Negative ORP readings are indicative of naturally occurring reducing conditions.

3.2.2 Chemical Analytical Results

Chemical analytical results are summarized on Table 2; these results were compiled from both TestAmerica Denver's analytical report and output from the FDEP's ADaPT data processing software. The laboratory report and ADaPT output are attached in electronic format. Data are interpreted as follows:

- Iron concentrations exceeded the SDWS of 0.3 milligrams/liter (mg/L) at all monitoring well locations, except for DW-1SR and DW-2SR. Iron concentrations were within historical concentration ranges for each well. Iron is naturally occurring in shallow aquifer systems in Florida and is further is mobilized under reducing conditions or by acidic groundwater.

4.0 SURFACE WATER QUALITY TESTING

On July 17, 2017, WMIF personnel collected a surface water discharge sample from the SW-1 and -2R outfall. The surface water sample was analyzed for those parameters listed in Appendix 3, Item 8.b of the facility permit. Surface water sampling results were compared against the Class III Fresh Surface Water Standards listed in Rule 62-302.530, F.A.C. and none of the compounds detected exceeded regulatory criteria.

5.0 QUALITY CONTROL

All groundwater samples were received by TestAmerica Denver in acceptable condition and all analytical holding times were met. Quality Control Summaries for this groundwater and surface water sampling event were provided by TestAmerica Denver in their analytical reports.

1,1,2,2-tetrachloroethane, 1,2,3-trichloropropane, and acrylonitrile were flagged by ADaPT as having elevated method detection limits (MDLs). In instances where MDLs were above regulatory criteria, the FDEP's Practical Quantitation Limits (PQLs) listed in Rule 62-777 were met.

6.0 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Physical and chemical parameters indicate that, in general, the overall groundwater quality at the facility is good, and the network of monitoring wells is operating as intended. Parameters which exceed regulatory limits will continue to be closely monitored during future sampling events. The next semiannual water quality monitoring event is tentatively scheduled for February 2018, and FDEP will be given at least a two-week notice prior to commencement of field activities.

* * * * *

HSA Golden trusts that the contents of this report are sufficient for the FDEP's needs. To facilitate and expedite the review of this report, please contact this office at 407.649.5475 if any of the information provided herein requires clarification.

Sincerely,

HSA GOLDEN

William Jacobs
Senior Project Manager

JOHN P. SMITH LICENSE No. 63423 11/6/2017 STATE OF FLORIDA PROFESSIONAL ENGINEER

John P. Smith, P.E.
Vice President, Principal Engineer

Attachments

cc: Mr. Fred Nassar, WMIF
Mr. Seth Ramaley, WMIF
FDEP Southwest District
Mr. Clark Moore, FDEP Tallahassee (EDD only)

Florida Department of Environmental Protection

Bob Martinez Center
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

DEP Form #: 62-701.900(31), F.A.C
Form Title: Water Quality Monitoring Certification
Effective Date: January 6, 2010
Incorporated in Rule 62-701.510(9), F.A.C.

WATER QUALITY MONITORING CERTIFICATION

PART I GENERAL INFORMATION

(1) Facility Name North Manatee Recycling & Disposal Facility, Class III Landfill

Address 14415 CR 39

City Duette Zip 33598 County Manatee

Telephone Number (941) 751-7494

(2) WACS Facility ID SWD-41-98654

(3) DEP Permit Number 298891-005-SO/T3 and 298891-006-SC/T3

(4) Authorized Representative's Name Fred Nassar Title Environmental Protection Mgr.

Address 25515 Old Landfill Road

City Punta Gorda Zip 33980 County Charlotte

Telephone Number (954)557-0581

Email address (if available) fnassar@wm.com

CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submission of false information including the possibility of fine and imprisonment.

October 16, 2017
(Date)

fnassar@wm.com
Digitally signed by fnassar@wm.com
DN: cn=fnassar@wm.com
Date: 2017.10.16 14:45:10 -04'00'
(Owner or Authorized Representative's Signature)

PART II QUALITY ASSURANCE REQUIREMENTS

Sampling Organization 920045

Analytical Lab NELAC / HRS Certification # E87667

Lab Name TestAmerica Laboratories, Inc. Denver

Address 4955 Yarrow Street, Arvada, CO 80002-4517

Phone Number (303) 736-0176

Email address (if available)

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Tables

Table 1
Water Table Elevation Data
North Manatee Recycling & Disposal Facility, Class III
August 16, 2017

Monitoring Well No./ Well Type	*Northing/Easting*	*Latitude/Longitude*	*Total Depth (ft-btoc)*	*Top of Casing Elevation (ft-NGVD)*	*Depth to Groundwater (ft-btoc)*	*Potentiometric Surface Elevation (ft-NGVD)*
BW-1S/BG	1201518.19 / 606748.13	27°38'20.647" / -82°09'09.504"	15.2	126.40	3.58	122.82
BW-1D/BG	1201523.70 / 606750.76	27°38'20.702" / -82°09'09.475"	81.92	126.48	3.95	122.53
BW-2S/BG	1202656.06 / 607469.55	27°38'31.924" / -82°09'01.497"	15.3	125.41	2.78	122.63
BW-2D/BG	1202661.57 / 607473.03	27°38'31.978" / -82°09'01.459"	66.2	125.36	2.44	122.92
BW-3SR/BG	1203811.51 / 608625.59	27°38'43.384" / -82°08'48.661"	15	130.40	6.40	124.00
BW-3D/BG	1203811.95 / 608625.30	27°38'43.384" / -82°08'48.661"	61.9	130.21	6.40	123.81
BW-4S/BG	1204043.73 / 606950.20	27°38'45.659" / -82°09'07.291"	15.5	127.46	3.97	123.49
BW-4D/BG	1204044.06 / 606943.98	27°38'45.662" / -82°09'07.361"	51.5	127.40	3.86	123.54
BW-5S/BG	1204046.74 / 605983.73	27°38'45.677" / -82°09'18.039"	15	127.55	5.02	122.53
BW-5D/BG	1204046.50 / 605991.28	27°38'45.675" / -82°09'07.955"	56.8	128.09	4.71	123.38
DW-1SR/DE	1200996.12 / 606032.55	27°38'15.468" / -82°09'17.453"	15.56	130.14	7.28	122.86
DW-2SR/DE	1201000.18 / 605532.63	27°38'15.502" / -82°09'23.012"	14.56	130.37	7.74	122.63
DW-3SR/DE	1201349.96 / 605196.03	27°38'18.962" / -82°09'26.760"	15.10	130.01	7.49	122.52
DW-4SR/DE	1201854.87 / 605174.37	27°38'23.962" /-82°09'27.008"	15.48	130.19	7.32	122.87
DW-5SR/DE	1202261.17 / 605161.32	27°38'27.985" /-82°09'27.159"	15.00	130.69	8.65	122.04

BG = background
DE = detection
ft-btoc = feet below top of casing
ft-NGVD = feet National Geodetic Vertical Datum of 1929

Table 2
Summary of Semiannual Groundwater Data
North Manatee Recycling & Disposal Facility, Class III
August 16, 2017

Monitoring Well/ Well Designation	*Iron (mg/L)*	*pH (SU)*	*ORP (mV)*
BW-1S/BG	**1.5**	**4.03**	137
BW-2S/BG	**11**	**5.35**	-68
BW-3SR/BG	**0.89 V**	**5.33**	-71
BW-4S/BG	**3.1**	**4.00**	121
BW-5S/BG	**0.49 V**	**5.07**	130
DW-1SR/DE	0.14 V	**4.55**	149
DW-2SR/DE	0.11 V	**4.14**	242
DW-3SR/DE	**0.36 V**	**4.44**	192
DW-4SR/DE	**3.0**	**4.20**	8
DW-5SR/DE	**0.57 V**	**4.50**	77.6
PDWS/SDWS	*0.3*	*6.5-8.5*	*None*

Bold = Exceedence of Primary Drinking Water Standard (PDWS) or Secondary Drinking Water Standard (SDWS) of Chapter 62-550, Florida Administrative Code

BG = background

DE = detection

mg/L = milligrams per liter

mV = millivolts

SU = standard units

V = compound detected in laboratory blank

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Figures

01-FIG.dwg

OCTOBER 2017

AERIAL SOURCE: GOOGLE EARTH, 2017

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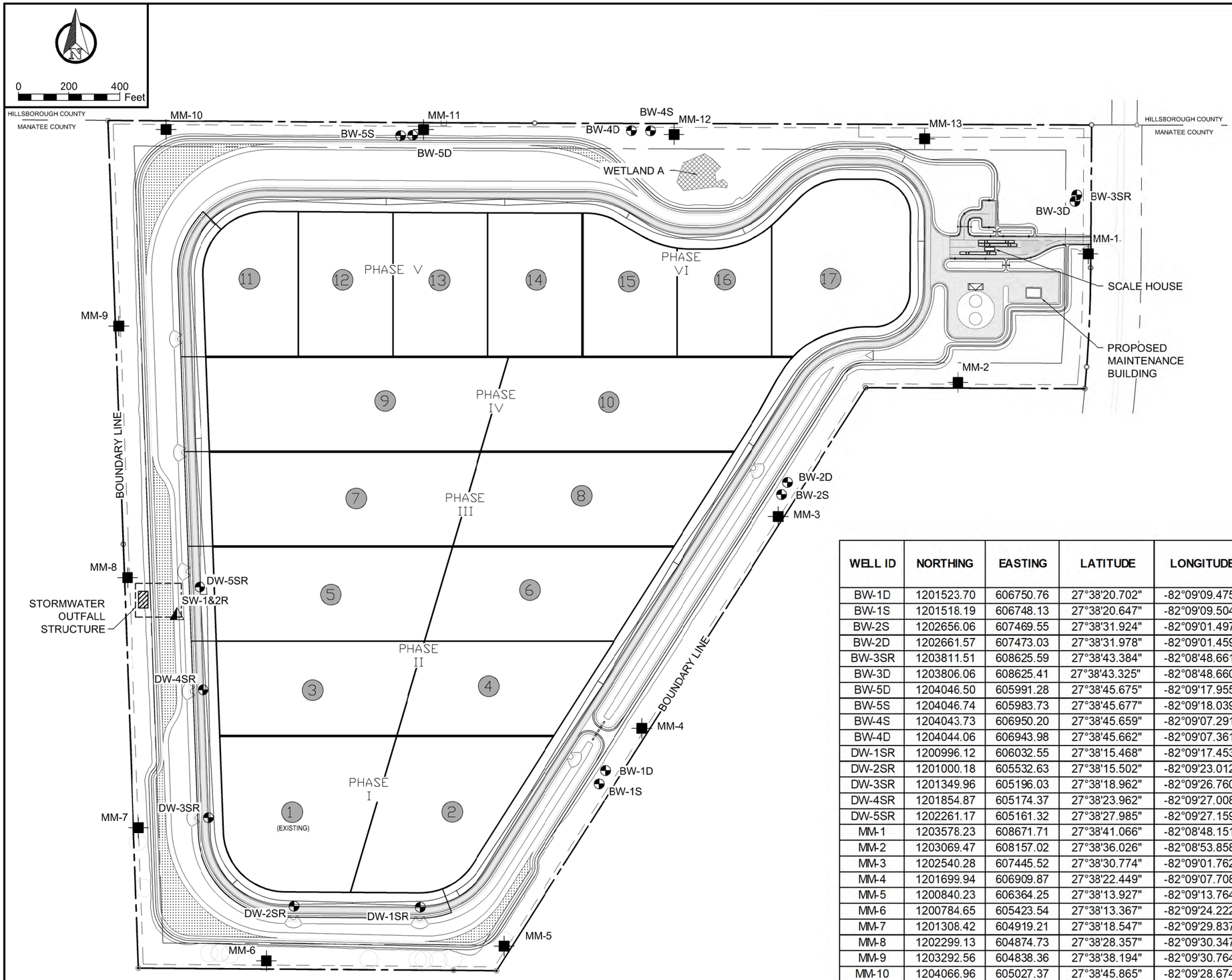
NORTH MANATEE RECYCLING & DISPOSAL FACILITY
CLASS III LANDFILL
14415 CR 39
DUETTE, MANATEE COUNTY, FLORIDA

SITE LOCATION MAP

PROJECT #
09-574.018
FIGURE
1

P:\09-574.018 WM - North Manatee Class III Water Quality Reporting\CAD\Figures\GROUNDWATER\20172017-10-04 - Semiannual Groundwater Report\01-FIG.dwg , SHEET SIZE: LETTER, PEN STYLE: HSAG - MONO - HALF PEN.CTB , LAYOUT NAME: SITE LOCATION MAP , LAST SAVE BY: TSINGH 10/4/2017 8:49:46 PM



LEGEND

- BW-2S — UPPER SURFICIAL MONITORING WELL LOCATION
- BW-2D — LOWER SURFICIAL MONITORING WELL LOCATION
- MM-1 — METHANE MONITORING POINT LOCATION
- SW-1&2R — SURFACE WATER SAMPLE LOCATION
- 15 — CELL NUMBERS

WELL ID	NORTHING	EASTING	LATITUDE	LONGITUDE	GROUND ELEV. (FT.) NGVD 29	TOP OF CASING ELEV. (ft.) NGVD 29	2" PVC PIPE ELEV. (ft) NGVD29
BW-1D	1201523.70	606750.76	27°38'20.702"	-82°09'09.475"	124.36	126.91	126.48
BW-1S	1201518.19	606748.13	27°38'20.647"	-82°09'09.504"	124.26	126.74	126.40
BW-2S	1202656.06	607469.55	27°38'31.924"	-82°09'01.497"	123.30	125.84	125.41
BW-2D	1202661.57	607473.03	27°38'31.978"	-82°09'01.459"	123.20	125.83	125.36
BW-3SR	1203811.51	608625.59	27°38'43.384"	-82°08'48.661"	127.85	130.61	130.40
BW-3D	1203806.06	608625.41	27°38'43.325"	-82°08'48.660"	127.53	130.57	130.21
BW-5D	1204046.50	605991.28	27°38'45.675"	-82°09'17.955"	125.20	128.43	128.09
BW-5S	1204046.74	605983.73	27°38'45.677"	-82°09'18.039"	125.30	128.24	127.55
BW-4S	1204043.73	606950.20	27°38'45.659"	-82°09'07.291"	125.10	127.88	127.46
BW-4D	1204044.06	606943.98	27°38'45.662"	-82°09'07.361"	125.00	127.94	127.40
DW-1SR	1200996.12	606032.55	27°38'15.468"	-82°09'17.453"	127.90	130.40	130.14
DW-2SR	1201000.18	605532.63	27°38'15.502"	-82°09'23.012"	128.20	130.56	130.37
DW-3SR	1201349.96	605196.03	27°38'18.962"	-82°09'26.760"	127.20	130.17	130.01
DW-4SR	1201854.87	605174.37	27°38'23.962"	-82°09'27.008"	127.70	130.35	130.19
DW-5SR	1202261.17	605161.32	27°38'27.985"	-82°09'27.159"	127.92	131.05	130.69
MM-1	1203578.23	608671.71	27°38'41.066"	-82°08'48.151"	126.00	129.00	128.48
MM-2	1203069.47	608157.02	27°38'36.026"	-82°08'53.858"	125.70	128.65	128.22
MM-3	1202540.28	607445.52	27°38'30.774"	-82°09'01.762"	124.70	127.69	127.09
MM-4	1201699.94	606909.87	27°38'22.449"	-82°09'07.708"	124.80	127.83	127.34
MM-5	1200840.23	606364.25	27°38'13.927"	-82°09'13.764"	126.80	129.86	129.41
MM-6	1200784.65	605423.54	27°38'13.367"	-82°09'24.222"	126.70	129.82	129.33
MM-7	1201308.42	604919.21	27°38'18.547"	-82°09'29.837"	124.80	128.03	127.43
MM-8	1202299.13	604874.73	27°38'28.357"	-82°09'30.347"	121.10	124.35	123.88
MM-9	1203292.56	604838.36	27°38'38.194"	-82°09'30.764"	125.30	128.17	127.72
MM-10	1204066.96	605027.37	27°38'45.865"	-82°09'28.674"	125.00	128.01	127.53
MM-11	1204059.50	606032.01	27°38'45.804"	-82°09'17.502"	124.60	127.56	127.15
MM-12	1204048.30	607035.19	27°38'45.705"	-82°09'06.346"	124.50	127.78	127.37
MM-13	1204031.68	608024.19	27°38'45.553"	-82°08'55.348"	126.20	129.31	128.82

SOURCE: BASE FILE PROVIDED BY: TERRACON CONSULTING ENGINEERS AND SCIENTISTS, WOODSTOCK GA.

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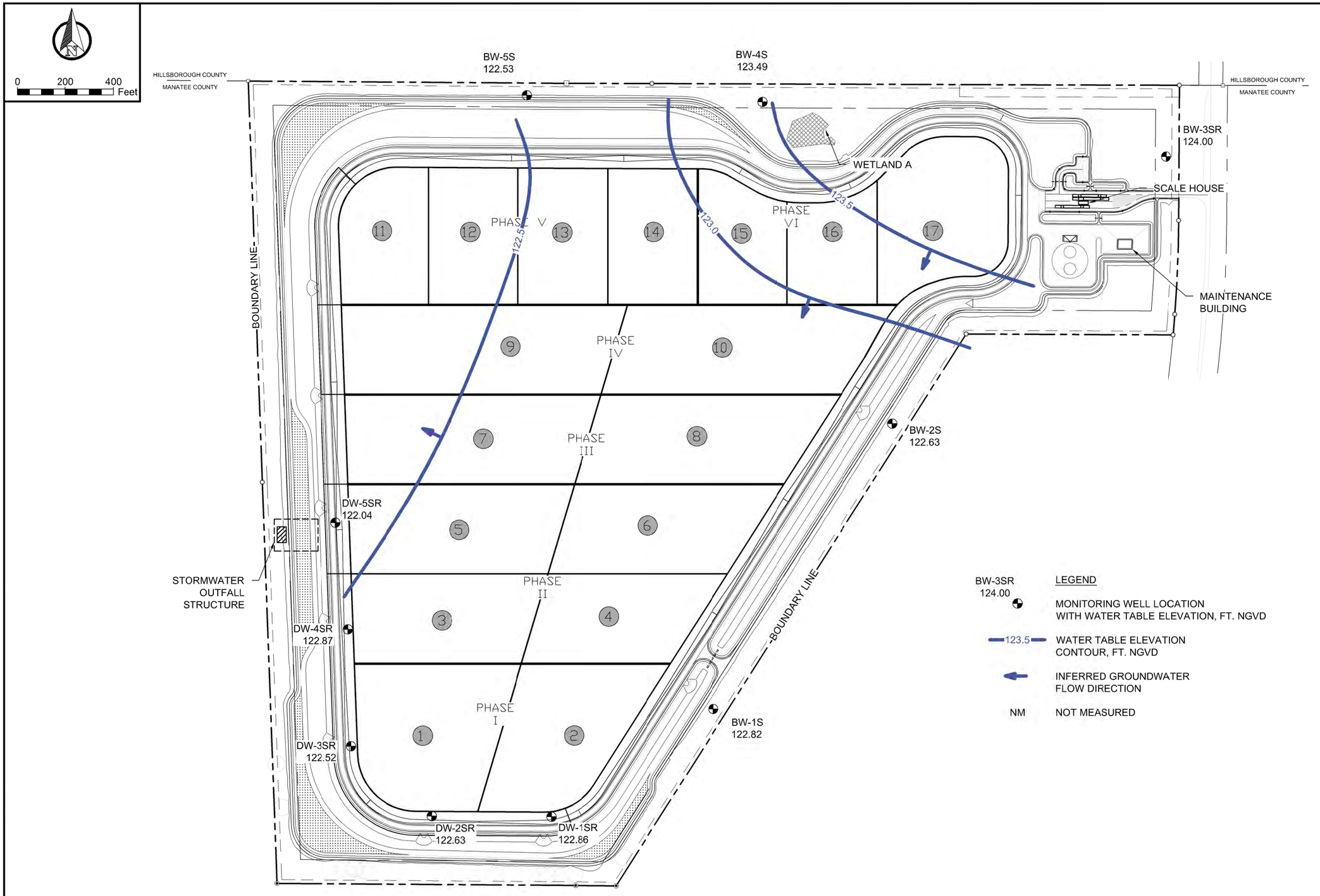
CLASS III LANDFILL
14415 CR 39
DUETTE, MANATEE COUNTY, FLORIDA

MONITORING POINT LOCATIONS MAP

PROJECT # 09-574.018

FIGURE 2



SOURCE: BASE FILE PROVIDED BY: TERRACON CONSULTING ENGINEERS AND SCIENTISTS, WOODSTOCK GA.

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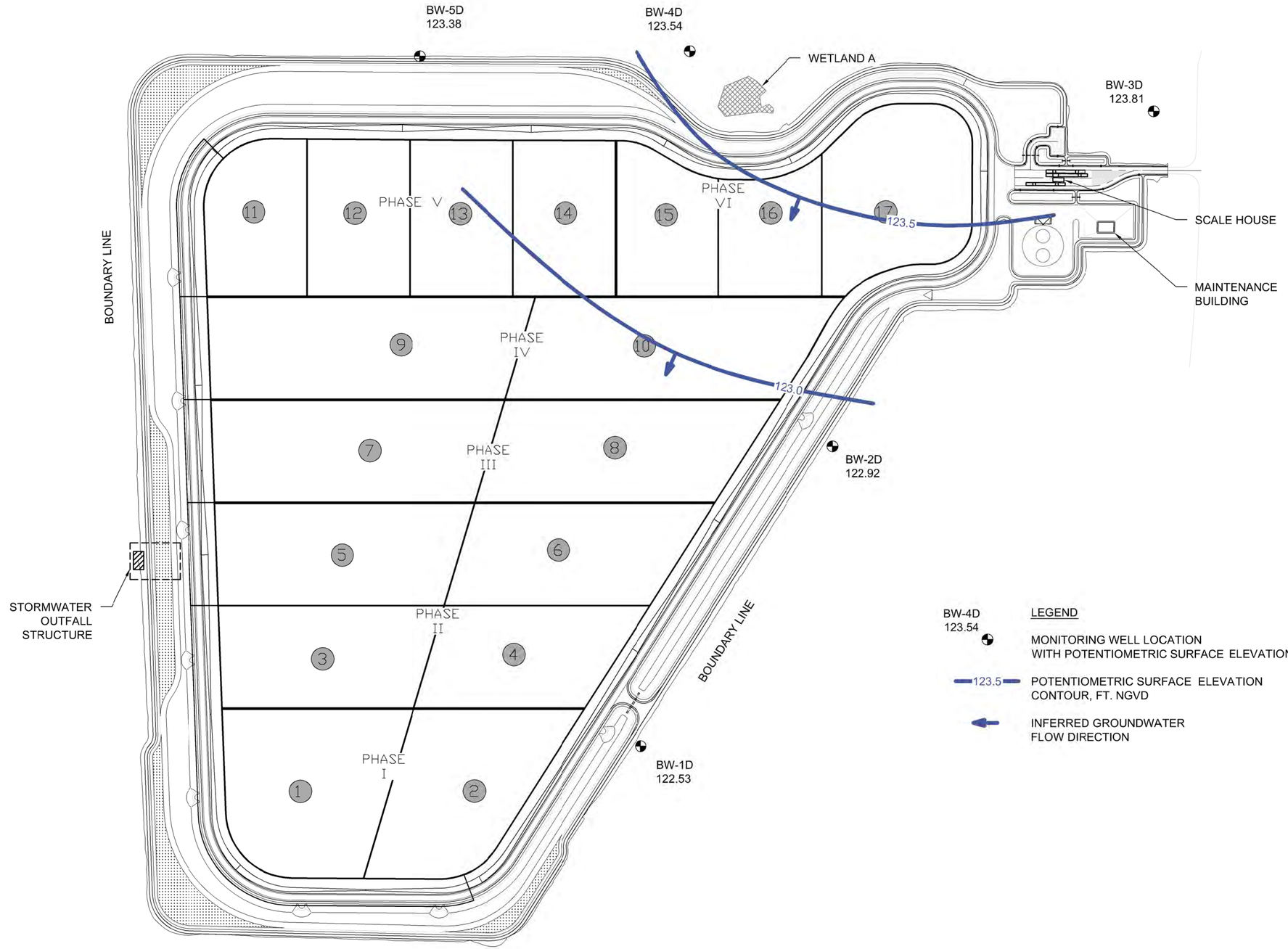
CLASS III LANDFILL
14415 CR 39
DUETTE, MANATEE COUNTY, FLORIDA

WATER TABLE ELEVATION CONTOUR MAP:
UPPER SURFICIAL AQUIFER
AUGUST 16, 2017

PROJECT #
09-574.018

FIGURE
3



BW-4D
123.54

LEGEND

MONITORING WELL LOCATION
WITH POTENTIOMETRIC SURFACE ELEVATION, FT. NGVD

123.5 POTENTIOMETRIC SURFACE ELEVATION
CONTOUR, FT. NGVD

INFERRED GROUNDWATER
FLOW DIRECTION

SOURCE: BASE FILE PROVIDED BY: TERRACON CONSULTING ENGINEERS AND SCIENTISTS, WOODSTOCK GA.

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NORTH MANATEE RECYCLING & DISPOSAL FACILITY
CLASS III LANDFILL
14415 CR 39
DUETTE, MANATEE COUNTY, FLORIDA

POTENTIOMETRIC SURFACE
ELEVATION CONTOUR MAP
LOWER SURFICIAL AQUIFER
AUGUST 16, 2017

PROJECT #
09-574.018

FIGURE
4

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Appendix A

PROFESSIONAL TECHNICAL SUPPORT SERVICES, INC.
Atlanta (770) 723-9339
Baton Rouge (504) 293-0136
Jacksonville (904) 695-3177
Houston (208) 441-7600
Pittsburgh (412) 746-8823

FACILITY NAME: NORTH MANATEE

?TH TO WATER
:ASUREMENTS

DATE: 8-16-17

MONITORING LOCATION	DEPTH TO WATER (ft TOC)
BW-1S	3.58
BW-1D	3.95
BW-2S	2.78
BW-2D	2.44
BW-3SR	6.40
BW-3D	6.40
BW-4S	3.97
BW-4D	3.86
BW-5S	5.02
BW-5D	4.71
DW-1SR	7.28
DW-2SR	7.74
DW-3SR	7.49
DW-4SR	7.32
DW-5S	8.65
UG-1	2.68

MONITORING LOCATION	DEPTH TO WATER (ft TOC)

WELL CONDITION INSPECTION FORM

WASTE MANAGEMENT

Site: NORTH MANATEE Personnel: DAN ARMOUR

Date: 8-16-17 Page 1 of 1

Well ID	Protective Casing	Well Casing	Label	Lock	Sample Equipment Type	General Turbidity	Well Yield	Comments/Observations *
BW-1S	[X] OK [ ] Damaged	[X] OK [ ] Damaged	[X] OK [ ] Inadequate	[X] Yes [ ] No	DEDICATED BLADDER PUMP	[X] Clear [ ] Turbid	[X] OK [ ] Inadequate	
BW-2S	[X] OK [ ] Damaged	[X] OK [ ] Damaged	[X] OK [ ] Inadequate	[X] Yes [ ] No	"	[X] Clear [ ] Turbid	[X] OK [ ] Inadequate	
BW-3SR	[X] OK [ ] Damaged	[X] OK [ ] Damaged	[X] OK [ ] Inadequate	[X] Yes [ ] No	"	[X] Clear [ ] Turbid	[X] OK [ ] Inadequate	
BW-4S	[X] OK [ ] Damaged	[X] OK [ ] Damaged	[X] OK [ ] Inadequate	[X] Yes [ ] No	"	[X] Clear [ ] Turbid	[X] OK [ ] Inadequate	
BW-5S	[X] OK [ ] Damaged	[X] OK [ ] Damaged	[X] OK [ ] Inadequate	[X] Yes [ ] No	"	[X] Clear [ ] Turbid	[X] OK [ ] Inadequate	
DW-1SR	[X] OK [ ] Damaged	[X] OK [ ] Damaged	[X] OK [ ] Inadequate	[X] Yes [ ] No	"	[ ] Clear [X] Turbid	[X] OK [ ] Inadequate	TURBID
DW-2SR	[X] OK [ ] Damaged	[X] OK [ ] Damaged	[X] OK [ ] Inadequate	[X] Yes [ ] No	"	[X] Clear [X] Turbid	[X] OK [ ] Inadequate	SLT. TURBID
DW-3SR	[X] OK [ ] Damaged	[X] OK [ ] Damaged	[X] OK [ ] Inadequate	[X] Yes [ ] No	"	[X] Clear [X] Turbid	[X] OK [ ] Inadequate	SLT. TURBID
DW-4SR	[X] OK [ ] Damaged	[X] OK [ ] Damaged	[X] OK [ ] Inadequate	[X] Yes [ ] No	"	[X] Clear [X] Turbid	[X] OK [ ] Inadequate	SLT. TURBID
DW-5S	[X] OK [ ] Damaged	[X] OK [ ] Damaged	[X] OK [ ] Inadequate	[X] Yes [ ] No	PERISTALTIC PUMP	[ ] Clear [ ] Turbid	[ ] OK [ ] Inadequate	

* Note ponding water, weep holes, or any other information pertaining to well condition. Provide additional details on listed items.
Return this form to Site Manager - FOR INTERNAL USE ONLY.

Form FD 9000-8: FIELD INSTRUMENT CALIBRATION RECORDS

INSTRUMENT (MAKE/MODEL#) YSI PRO SERIES INSTRUMENT # 15D100782

PARAMETER: *[check only one]*

☐ TEMPERATURE ☒ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL Cl ☐ DO ☐ OTHER _____

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 1.413 mS/cm PINE ENVIRONMENTAL EXP: 02/2018

Standard B _____

Standard C _____

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
17/08/14	0600	A	1.413	AUTO CAL	-	YES	INIT	DSA
17/08/15	0620	A	1.413	AUTO CAL	-	YES	CONT	DSA
17/08/16	0730	A	1.413	AUTO CAL	-	YES	CONT	DSA

Form FD 9000-8: FIELD INSTRUMENT CALIBRATION RECORDS

INSTRUMENT (MAKE/MODEL#) YSI PRO SERIES INSTRUMENT # 15D100782

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL Cl ☒ DO ☐ OTHER _____

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A SATURATED AIR

Standard B _____

Standard C _____

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
17/05/14	0600	A	100% SAT	100%	-	YES	INIT	DSA
17/08/15	0630	A	100% SAT	100%	-	YES	CONT	DSA
17/08/16	0730	A	100% SAT	100%	-	YES	CONT	DSA

Table FS 2200-2
Dissolved Oxygen Saturation

TEMP	D.O,	mg/L	TEMP	D.O.	mg/L	TEMP	D.O.	mg/L	TEMP	D.O.	mg/L
deg C	SAT.	20%	deg C	SAT.	20%	deg C	SAT.	20%	deg C	SAT.	20%
15.0	10.084	2.017	19.0	9.276	1.855	23.0	8.578	1.716	27.0	7.968	1.594
15.1	10.062	2.012	19.1	9.258	1.852	23.1	8.562	1.712	27.1	7.954	1.591
15.2	10.040	2.008	19.2	9.239	1.848	23.2	8.546	1.709	27.2	7.940	1.588
15.3	10.019	2.004	19.3	9.220	1.844	23.3	8.530	1.706	27.3	7.926	1.585
15.4	9.997	1.999	19.4	9.202	1.840	23.4	8.514	1.703	27.4	7.912	1.582
15.5	9.976	1.995	19.5	9.184	1.837	23.5	8.498	1.700	27.5	7.898	1.580
15.6	9.955	1.991	19.6	9.165	1.833	23.6	8.482	1.696	27.6	7.884	1.577
15.7	9.934	1.987	19.7	9.147	1.829	23.7	8.466	1.693	27.7	7.870	1.574
15.8	9.912	1.982	19.8	9.129	1.826	23.8	8.450	1.690	27.8	7.856	1.571
15.9	9.891	1.978	19.9	9.111	1.822	23.9	8.434	1.687	27.9	7.842	1.568
16.0	9.870	1.974	20.0	9.092	1.818	24.0	8.418	1.684	28.0	7.828	1.566
16.1	9.849	1.970	20.1	9.074	1.815	24.1	8.403	1.681	28.1	7.814	1.563
16.2	9.829	1.966	20.2	9.056	1.811	24.2	8.387	1.677	28.2	7.800	1.560
16.3	9.808	1.962	20.3	9.039	1.808	24.3	8.371	1.674	28.3	7.786	1.557
16.4	9.787	1.957	20.4	9.021	1.804	24.4	8.356	1.671	28.4	7.773	1.555
16.5	9.767	1.953	20.5	9.003	1.801	24.5	8.340	1.668	28.5	7.759	1.552
16.6	9.746	1.949	20.6	8.985	1.797	24.6	8.325	1.665	28.6	7.745	1.549
16.7	9.726	1.945	20.7	8.968	1.794	24.7	8.309	1.662	28.7	7.732	1.546
16.8	9.705	1.941	20.8	8.950	1.790	24.8	8.294	1.659	28.8	7.718	1.544
16.9	9.685	1.937	20.9	8.932	1.786	24.9	8.279	1.656	28.9	7.705	1.541
17.0	9.665	1.933	21.0	8.915	1.783	25.0	8.263	1.653	29.0	7.691	1.538
17.1	9.645	1.929	21.1	8.898	1.780	25.1	8.248	1.650	29.1	7.678	1.536
17.2	9.625	1.925	21.2	8.880	1.776	25.2	8.233	1.647	29.2	7.664	1.533
17.3	9.605	1.921	21.3	8.863	1.773	25.3	8.218	1.644	29.3	7.651	1.530
17.4	9.585	1.917	21.4	8.846	1.769	25.4	8.203	1.641	29.4	7.638	1.528
17.5	9.565	1.913	21.5	8.829	1.766	25.5	8.188	1.638	29.5	7.625	1.525
17.6	9.545	1.909	21.6	8.812	1.762	25.6	8.173	1.635	29.6	7.611	1.522
17.7	9.526	1.905	21.7	8.794	1.759	25.7	8.158	1.632	29.7	7.598	1.520
17.8	9.506	1.901	21.8	8.777	1.755	25.8	8.143	1.629	29.8	7.585	1.517
17.9	9.486	1.897	21.9	8.761	1.752	25.9	8.128	1.626	29.9	7.572	1.514
18.0	9.467	1.893	22.0	8.744	1.749	26.0	8.114	1.623	30.0	7.559	1.512
18.1	9.448	1.890	22.1	8.727	1.745	26.1	8.099	1.620	30.1	7.546	1.509
18.2	9.428	1.886	22.2	8.710	1.742	26.2	8.084	1.617	30.2	7.533	1.507
18.3	9.409	1.882	22.3	8.693	1.739	26.3	8.070	1.614	30.3	7.520	1.504
18.4	9.390	1.878	22.4	8.677	1.735	26.4	8.055	1.611	30.4	7.507	1.501
18.5	9.371	1.874	22.5	8.660	1.732	26.5	8.040	1.608	30.5	7.494	1.499
18.6	9.352	1.870	22.6	8.644	1.729	26.6	8.026	1.605	30.6	7.481	1.496
18.7	9.333	1.867	22.7	8.627	1.725	26.7	8.012	1.602	30.7	7.468	1.494
18.8	9.314	1.863	22.8	8.611	1.722	26.8	7.997	1.599	30.8	7.456	1.491
18.9	9.295	1.859	22.9	8.595	1.719	26.9	7.983	1.597	30.9	7.443	1.489

Derived using the formula in Standard Methods for the Examination of Water and Wastewater, Page 4-101, 18th Edition, 1992

Form FD 9000-8: FIELD INSTRUMENT CALIBRATION RECORDS

INSTRUMENT (MAKE/MODEL#) HF SCIENTIFIC MICRO TPI INSTRUMENT # 200710329

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL Cl ☐ DO ☐ OTHER _____

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 1000 NTU HF SCIENTIFIC EXP: JAN 2018
Standard B 10.0 NTU HF SCIENTIFIC EXP: JAN 2018
Standard C 0.02 NTU HF SCIENTIFIC EXP: JAN 2018

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
17/08/14	0600	A	1000	AUTO CAL	-	YES	INIT	DSA
"	"	B	10.0	"	-	YES	INIT	DSA
"	"	C	0.02	"	-	YES	INIT	DSA
17/08/15	0630	A	1000	AUTO CAL	-	YES	CONT	DSA
"	"	B	10.0	"	-	YES	CONT	DSA
		C	0.02	"	-	YES	CONT	DSA
17/08/16	0730	A	1000	AUTO CAL	-	YES	CONT	DSA
"	"	B	10.0	"	-	YES	CONT	DSA
		C	0.02	"	-	YES	CONT	DSA

Form FD 9000-8: FIELD INSTRUMENT CALIBRATION RECORDS

INSTRUMENT (MAKE/MODEL#) YSI Pro Series INSTRUMENT # 15D100783

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☒ pH ☐ ORP
☐ TURBIDITY ☐ RESIDUAL Cl ☐ DO ☐ OTHER _____

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 7.00 (std) Ricca Chem Lot# 2607D40 Exp: 07/2018

Standard B 4.00 (std) Ricca Chem Lot# 2511B04 Exp: 11/2017

Standard C 10.00 (std) Ricca Chem Lot# 2608E32 Exp: 02/2018

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
17/08/14	0600	A	7.00	Auto Cal	-	Yes	INIT	DSA
"	"	B	4.00	"	-	Yes	INIT	DSA
		C	10.00		-	Yes	INIT	DSA
17/08/15	0630	A	7.00	Auto Cal	-	Yes	CONT	DSA
"	"	B	4.00	"	-	Yes	CONT	DSA
		C	10.00		-	Yes	CONT	DSA
17/08/16	0730	A	7.00	Auto Cal	-	Yes	CONT	DSA
"	"	B	4.00	"	-	Yes	CONT	DSA
		C	10.00		-	Yes	CONT	DSA

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: DAN ARMOUR	Lab PM: Harrington, Danielle M	Carrier Tracking No(s):	COC No: 280-18310-8475.1
Client Contact: Fred Nassar	Phone: 225-907-4060	E-Mail: danielle.harrington@testamericainc.com		Page: Page 1 of 1
Company: Waste Management				Job #:

Address:	Due Date Requested:
City:	TAT Requested (days):
State, Zip:	
Phone:	PO #: Purchase Order Requested
Email: fnassar@wm.com	WO #:
Project Name: Event Desc: Semiannual Background DW-5S FEB AUG	Project #: 28004939
Site:FL50\North Manatee (NMRDF)/FL50 Florida	SSOW#:

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	300.0 Cl., NO3, Total Dissolved Solids(1Liter-PE)	Total Metals 6010B, 6020, 7470A (500mL-PE)	350.1 - Ammonia as N (500 mL-AG)	8260B - (MOD) Appendix I (with Short list spike)(40mL VOA-CG)	8011 - Local Method(40mL VOA-CG)	Total Number of containers	Preservation Codes:
			Preservation Code:										
DW-5S	8-16	1240	G	W	N		1	1	1	3	3		Short Hold 300.0 NO3
TRIP	8-16	-	G	W	N					✓	✓		

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

Material Codes: AG=Amber Glass; CG=Clear Glass; PE=Polyethylene; PP=Polypropylene; S=Silicone; T=Teflon; O= Other Special Instructions/Note:

280-100323 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	8-16-17 / 1630	PRO-TECH		8-17-17 0845	TAD
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No :	Cooler Temperature(s) °C and Other Remarks: 2.9, 3.1 IR#7 +0.1 RP 8-17-17

8/30/2017

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: NORTH MANATEE		SITE LOCATION: DUETTE, FL	
WELL NO: DW - 55	SAMPLE ID:		DATE: 08/16/2017

PURGING DATA

WELL DIAMETER (inches): 2	TUBING DIAMETER (inches): 1/4	WELL SCREEN INTERVAL DEPTH: 5 - 4 feet to 15 - 4 feet	STATIC DEPTH TO WATER (feet): 8.65	PURGE PUMP TYPE OR BAILER: PP
WELL ELEVATION TOC (ft NGVD): NA			GROUNDWATER ELEVATION (ft NGVD): NA	

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable)

= (15.40 feet - 8.65 feet) X 0.163 gallons/foot = 1.10 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME (only fill out if applicable)

= 0.0 gallons + (0.026 gallons/foot X 15.40 feet) + 0.05 gallons = 0.89 gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 14.00	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 14.00	PURGING INITIATED AT: 1215	PURGING ENDED AT: 1239	TOTAL VOLUME PURGED (gallons): 2.88

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	ORP (mV)	COLOR	ODOR
1230	1.80	1.80	0.12	9.15	4.48	30.5	112	0.26	7.64	88.3		
1233	0.36	2.16	0.12	9.15	4.47	30.6	111	0.24	7.60	83.1		
1236	0.36	2.52	0.12	9.15	4.50	30.6	110	0.22	7.51	75.8		
1239	0.36	2.88	0.12	9.15	4.50	30.7	111	0.20	7.33	77.6	NONE	

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 6" = 1.02; 8" = 1.47; 12" = 5.68

TUBING INSIDE DIA. CAPACITY (Gal./FL): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: BEN RAMSEYER / PRO-TECH	SAMPLER(S) SIGNATURE(S): Ben Ramseyer	SAMPLING INITIATED AT: 1240	SAMPLING ENDED AT: NR
PUMP OR TUBING DEPTH IN WELL (feet): 14.00	TUBING MATERIAL CODE: PE	FIELD-FILTERED: Y (N) Filtration Equipment Type:	FILTER SIZE: µm
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y N (replaced)	DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLE PUMP FLOW RATE (mL per minute)	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
	1	PE	1L	—	—	—	GEN CHEM	0.12	BP
	1	PE	500 ML	HNO_3	—	—	METALS		
	1	AG	500 ML	H_2SO_4	—	—	NH_3		
	3	CG	40 ML	HCl	—	—	8260B		
	3	CG	40 ML	Na Thio	—	—	8011		
	2	PE	1L	HNO_3	—	—	RAD 228 & 226		

REMARKS:

Shaen Present: YES (NO)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2), optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

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Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

9/15/2017

Client Information	Sampler: DAN ARMOUR	Lab PM: Harrington, Danielle M	Carrier Tracking No(s):
Client Contact: Fred Nassar	Phone: 225-907-4060	E-Mail: danielle.harrington@testamericainc.com	COC No: 280-18310-8475.1
Company: Waste Management			Page: Page 1 of 1
Address:	Due Date Requested:		Job #:
City:	TAT Requested (days):		
State, Zip:			
Phone:	PO #: Purchase Order Requested		
Email: fnassar@wm.com	WO #:		
Project Name: Event Desc: Semiannual Groundwater FEB AUG	Project #: 28004939		
Site: FL50|North Manatee (NMRDF)/FL50 Florida	SSOW#:		

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	300.0 Cl-, Fl-, SO4, NO3, pH Total Dissolved Solids(1 Liter-PE)	Total Metals 6010B, 6020, 7470A (500mL-PE)	350.1 - Ammonia as N (500 mL-AG)	8260B - (MOD) Appendix I (with Short list spike)(40mL VOA-CG)	8011 - Local Method(40mL VOA-CG)	RAD-228 903.0 (1Liter - PE)	RAD-228 904.0 (1Liter-PE)	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	T	S	A	R	D	D		
BW-1S	8-16	0855	G	W	N		1	1	1	3	3	1	1		Short Hold 300.0 NO3 andpH
BW-2S	8-16	0820	G	W	N		1	1	1	3	3	1	1		
BW-3SR	8-16	1135	G	W	N		1	1	1	3	3	1	1		
BW-4S	8-16	0910	G	W	N		1	1	1	3	3	1	1		
BW-5S	8-16	1012	G	W	N		1	1	1	3	3	1	1		
[redacted]-1SR	8-16	1110	G	W	N		1	1	1	3	3	1	1		
[redacted]-2SR	8-16	1150	G	W	N		1	1	1	3	3	1	1		
DW-3SR	8-16	1225	G	W	N		1	1	1	3	3	1	1		
[redacted]-4SR	8-16	1305	G	W	N		1	1	1	3	3	1	1		
[redacted]TRIP	8-16	—	G	W	N					✓	✓				

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Material Codes: AG=Amber Glass; CG=Clear Glass; PE=Polyethylene; PP=Polypropylene; S=Silicone; T=Teflon; O= Other Special Instructions/Note:

280-100322 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by:	Date/Time: 8-16-17 / 1630	Company: PRO-TECH	Received by:	Date/Time: 8-17-17 0845	Company: TAD
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time	Company

Custody Seals Intact: △ Yes △ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: #07, 1.1, 1.8, 1.4 RP #7 +0.1 RP 8-17-17

GROUNDWATER SAMPLING LOG

SITE NAME: NORTH MANATEE | SITE LOCATION: DUETTE, FL

WELL NO: BW-1S | SAMPLE ID: | DATE: 8-16-17

PURGING DATA

WELL DIAMETER (inches): 2 | TUBING DIAMETER (inches): 3/8 | WELL SCREEN INTERVAL DEPTH: 5 feet to 15 feet | STATIC DEPTH TO WATER (feet): 3.58 | PURGE PUMP TYPE OR BAILER: BP

WELL ELEVATION TOC (ft NGVD): 126.40 | GROUNDWATER ELEVATION (ft NGVD): 122.82

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (feet - feet) X gallons/foot = gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= 0.3 gallons + (0.006 gallons/foot X 15.00 feet) + 0.05 gallons = 0.44 gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 11.00 | FINAL PUMP OR TUBING DEPTH IN WELL (feet): 11.00 | PURGING INITIATED AT: 0835 | PURGING ENDED AT: 0855 | TOTAL VOLUME PURGED (gallons): 3.80

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	ORP (mV)	COLOR	ODOR
0845	1.90	1.90	0.19	4.89	4.05	26.6	111	1.2	8.58	144		
0848	0.57	2.47	0.19	4.89	4.04	26.6	111	1.2	7.91	143		
0851	0.57	3.04	0.19	4.89	4.04	26.6	111	1.2	7.59	141		
0854	0.57	3.61	0.19	4.89	4.03	26.6	112	1.2	7.40	137	YELLOW TINT	

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 6" = 1.02; 8" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: BLAKE GRISSOM / DAN ARMOUR / PRO-TECH | SAMPLER(S) SIGNATURE(S): | SAMPLING INITIATED AT: 0855 | SAMPLING ENDED AT: NR

PUMP OR TUBING DEPTH IN WELL (feet): 11.00 | TUBING MATERIAL CODE: T | FIELD-FILTERED: Y (N) µm | FILTER SIZE: | Filtration Equipment Type:

FIELD DECONTAMINATION: PUMP Y (N) | TUBING Y (N) replaced | DUPLICATE: Y (N)

SAMPLE ID CODE	SAMPLE CONTAINER SPECIFICATION: # CONTAINERS	MATERIAL CODE	VOLUME	SAMPLE PRESERVATION: PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH	INTENDED ANALYSIS AND/OR METHOD	SAMPLE PUMP FLOW RATE Top (mL per minute)	SAMPLING EQUIPMENT CODE
	1	PE	1 L	—	—	—	G-CHEM	0.19	BP
	1	PE	500 ml	HNO_3	—	—	METALS		
	1	AG	500 ml	H_2SO_4	—	—	NH3		
	3	CG	40 ml	HCl	—	—	8260B		
	3	CG	40 ml	$NaThio$	—	—	8011		
	2	PE	1 L	HNO_3	—	—	RAD 226/228		

REMARKS:

Sheen Present: YES (NO)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2), optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

FORM D 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: NORTH MANATEE		SITE LOCATION: DUETTE, FL	
WELL NO: BW-2S	SAMPLE ID:		DATE: 8-16-17

PURGING DATA

WELL DIAMETER (inches): 2	TUBING DIAMETER (inches): 3/8	WELL SCREEN INTERVAL DEPTH: 5 feet to 15 feet	STATIC DEPTH TO WATER (feet): 2.78	PURGE PUMP TYPE OR BAILER: BP
WELL ELEVATION TOC (ft NGVD): 125.41			GROUNDWATER ELEVATION (ft NGVD): 122.63	

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (feet - feet) X gallons/foot = gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= 0.3 gallons + (0.006 gallons/foot) X 15.00 feet) + 0.05 gallons = 0.44 gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED (gallons):
11.00	11.00	0800	0820	4.00

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) mmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	ORP (mV)	COLOR	ODOR
0810	2.00	2.00	0.20	3.18	5.36	25.7	218	0.6	5.35	-66		
0813	0.60	2.60	0.20	3.18	5.36	25.7	213	0.6	4.54	-67		
0816	0.60	3.20	0.20	3.18	5.35	25.7	210	0.6	4.47	-67		
0819	0.60	3.80	0.20	3.18	5.35	25.7	209	0.6	4.16	-68	VERY LIGHT TAN	

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 6" = 1.02; 8" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT:		SAMPLING ENDED AT:
BLAINE GRISSOM DAN ARMOUR / PRO-TECH		0820		NR

PUMP OR TUBING DEPTH IN WELL (feet):	TUBING MATERIAL CODE:		FIELD-FILTERED: Y (N) µm Filtration Equipment Type:	FILTER SIZE:
11.00	T			

FIELD DECONTAMINATION: PUMP Y (N) TUBING Y (N) (replaced) DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLE PUMP FLOW RATE (mL per minute)	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
	1	PE	1 L	—	—	—	G-CHEM	0.20	BP
	1	PE	500 ml	HNO_3	—	—	METALS		
	1	AG	500 ml	H_2SO_4	—	—	NH3		
	3	CG	40 ml	HCl	—	—	82608		
	3	CG	40 ml	$Na_2S_2O_3$	—	—	8011		
	2	PE	1L	HNO_3	—	—	RAD 226/228		

REMARKS:

Sheen Present: YES (NO)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)
pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2), optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

GROUNDWATER SAMPLING LOG

SITE NAME: NORTH MANATEE		SITE LOCATION: DUETTE, FL	
WELL NO: BW-35R	SAMPLE ID:		DATE: 8/16/2017

PURGING DATA

WELL DIAMETER (inches): 2	TUBING DIAMETER (inches): 3/8	WELL SCREEN INTERVAL DEPTH: 5 feet to 15 feet	STATIC DEPTH TO WATER (feet): 6.40		PURGE PUMP TYPE OR BAILER: BP
WELL ELEVATION TOC (ft NGVD): 130.40			GROUNDWATER ELEVATION (ft NGVD): 124.00		

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= 115.00 (feet) - 6.40 (feet) X 0.163 gallons/foot = 1.40 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= 0.3 gallons + (0.006 gallons/foot X 15.00 (feet)) + 0.05 gallons = 0.44 gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 11.00	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 11.00	PURGING INITIATED AT: 1115	PURGING ENDED AT: 1134		TOTAL VOLUME PURGED (gallons): 3.04

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	ORP (mV)	COLOR	ODOR
1125	1.60	1.60	0.16	7.20	5.33	27.1	239	0.19	2.80	-57.6		
1128	0.96	2.08	0.16	7.20	5.31	27.1	247	0.19	1.24	-62.3		
1131	0.96	2.56	0.16	7.20	5.33	27.1	254	0.17	0.96	-69.2		
1134	0.48	3.04	0.16	7.20	5.33	27.1	255	0.16	0.89	-71.0	NOND	

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.86
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: BEN KAMYGROWSKI / DAN ARMOUR, PRO-TECH	SAMPLER(S) SIGNATURE(S): Ben Kamygrowski	SAMPLING INITIATED AT: 1135		SAMPLING ENDED AT: NR
PUMP OR TUBING DEPTH IN WELL (feet): 11.00	TUBING MATERIAL CODE: T	FIELD-FILTERED: Y (N) µm Filtration Equipment Type:		FILTER SIZE:
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y (N) (replaced)		DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLE PUMP FLOW RATE (mL per minute)	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
	1	PE	1 L	—	—	—	G-CHEM	0.16	BP
	1	PE	500 ml	HNO3	—	—	METALS		
	1	AG	500 ml	H2SO4	—	—	NH3		
	3	CG	40 ml	HCl	—	—	8260B		
	3	CG	40 ml	NaThio	—	—	8011		
	2	PE	1L	HNO3	—	—	RAD226+RAD228		

REMARKS:

Sheen Present: YES (NO)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2), optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: NORTH MANATEE		SITE LOCATION: DUETTE, FL	
WELL NO: BW-4S	SAMPLE ID:		DATE: 08/16/2017

PURGING DATA

WELL DIAMETER (inches): 2	TUBING DIAMETER (inches): 3/8	WELL SCREEN INTERVAL DEPTH: 5 feet to 15 feet	STATIC DEPTH TO WATER (feet): 3.97		PURGE PUMP TYPE OR BAILER: BP
WELL ELEVATION TOC (ft NGVD): 129.46			GROUNDWATER ELEVATION (ft NGVD): 125.49		

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (feet – feet) X gallons/foot = gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= 0.3 gallons + (0.006 gallons/foot X 15.00 feet) + 0.05 gallons = 0.44 gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 11.00	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 11.00	PURGING INITIATED AT: 0848	PURGING ENDED AT: 0909		TOTAL VOLUME PURGED (gallons): 2.95

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	ORP (mV)	COLOR	ODOR
0900	1.60	1.60	0.16	4.20	3.98	26.4	446	0.16	8.19	145		
0903	0.48	2.05	0.16	4.20	3.96	26.5	421	0.12	7.84	126		
0906	0.48	2.50	0.16	4.20	4.00	26.6	421	0.13	7.63	126		
0909	0.48	2.95	0.16	4.20	4.00	26.7	427	0.13	7.58	121	NONE	

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 1/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: BEN RAMSEAUR / DAN ARMOUR / PRO-TECH	SAMPLER(S) SIGNATURE(S): Ben Ramseaur	SAMPLING INITIATED AT: 0910	SAMPLING ENDED AT: NR
PUMP OR TUBING DEPTH IN WELL (feet): 11.00	TUBING MATERIAL CODE: T	FIELD-FILTERED: Y (N) µm Filtration Equipment Type:	FILTER SIZE:
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y (N) (replaced)	DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION					
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH	INTENDED ANALYSIS AND/OR METHOD	SAMPLE PUMP FLOW RATE (mL per minute)	SAMPLING EQUIPMENT CODE
	1	PE	1 L	—	—	—	G-CHEM	0.16	BP
	1	PE	500 ml	HNO3	—	—	METALS	"	"
	1	AG	500 ml	H2SO4	—	—	NH3	"	"
	3	CG	40 ml	HCl	—	—	82608	"	"
	3	CG	40 ml	NaThio	—	—	8011	"	"
	2	PE	1L	HNO3	—	—	RAD 226 + RAD 228	"	"

REMARKS:
Sheen Present: YES (NO)
MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RPPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)
pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2). optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: NORTH MANATEE		SITE LOCATION: DUETTE, FL	
WELL NO: BW-5S	SAMPLE ID:		DATE: 08/16/2017

PURGING DATA

WELL DIAMETER (inches): 2	TUBING DIAMETER (inches): 3/8	WELL SCREEN INTERVAL DEPTH: 5 feet to 15 feet	STATIC DEPTH TO WATER (feet): 5.02		PURGE PUMP TYPE OR BAILER: BP
WELL ELEVATION TOC (ft NGVD): 127.55			GROUNDWATER ELEVATION (ft NGVD): 122.53		

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

= (15.00 feet - 5.02 feet) X 0.163 gallons/foot = 1.62 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

= 0.3 gallons + (0.006 gallons/foot X 15.00 feet) + 0.05 gallons = 0.44 gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 11.00	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 11.00	PURGING INITIATED AT: 0950	PURGING ENDED AT: 1011		TOTAL VOLUME PURGED (gallons): 3.33

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	ORP (mV)	COLOR	ODOR
1002	1.92	1.92	0.16	5.36	5.32	27.5	135	0.12	12.1	128		
1005	0.48	2.40	0.16	5.36	5.08	27.6	135	0.12	12.4	125		
1008	0.48	2.88	0.16	5.36	5.07	27.6	133	0.09	12.5	129		
1011	0.98	3.33	0.16	5.36	5.07	27.5	134	0.10	12.7	130	YELLOWISH TINT	

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 6" = 1.02; 8" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: BEN RAMSEMAN / DAN ARMOUR / PRO-TECH	SAMPLER(S) SIGNATURE(S): Ben Ramseman	SAMPLING INITIATED AT: 1012	SAMPLING ENDED AT: NR
PUMP OR TUBING DEPTH IN WELL (feet): 11.00	TUBING MATERIAL CODE: T	FIELD-FILTERED: Y (N) µm Filtration Equipment Type:	FILTER SIZE:
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y (N) replaced	DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLE PUMP FLOW RATE (mL per minute)	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
	1	PE	1 L	—	—	—	G-CHEM	0.16	BP
	1	PE	500ml	HNO3	—	—	METALS		
	1	AG	500 ml	H2SO4	—	—	NH3		
	3	CG	40 ml	HCl	—	—	8260B		
	3	CG	40 ml	NaThio	—	—	8011		
	2	PE	1 L	HNO3	—	—	RAD 226+RAD 228		

REMARKS:

Sheen Present: YES (NO)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2), optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: NORTH MANATEE | SITE LOCATION: DUETTE, FL

WELL NO: DW-15R | SAMPLE ID: | DATE: 8-16-17

PURGING DATA

WELL DIAMETER (inches): 2 | TUBING DIAMETER (inches): 3/8 | WELL SCREEN INTERVAL DEPTH 5.56 feet to 15.56 feet | STATIC DEPTH TO WATER (feet): 7.28 | PURGE PUMP TYPE OR BAILER: BP

WELL ELEVATION TOC (ft NGVD): 128.17 | GROUNDWATER ELEVATION (ft NGVD): 120.89

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable)

= (15.56 feet - 7.28 (feet) X 0.163 gallons/foot = 1.35 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME (only fill out if applicable)

= 0.3 gallons + (0.006 gallons/foot X 15.56 (feet) + 0.05 gallons = 0.44 gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 12.95 | FINAL PUMP OR TUBING DEPTH IN WELL (feet): 12.95 | PURGING INITIATED AT: 0910 | PURGING ENDED AT: 1110 | TOTAL VOLUME PURGED (gallons): 18.00

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	ORP (mV)	COLOR	ODOR
1103	0.45	16.95	0.15	8.03	4.58	31.3	91	1.0	69.65	147		
1106	0.45	17.40	0.15	8.03	4.56	31.3	92	1.0	64.92	148		
1109	0.45	17.85	0.15	8.03	4.55	31.3	92	1.0	66.41	149	LIGHT	
											BROWN	
											TINT	

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

TUBING INSIDE DIA. CAPACITY (Gal./FT.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: BLAINE GRUSSOM / PRO-TECH | SAMPLER(S) SIGNATURE(S): | SAMPLING INITIATED AT: 1110 | SAMPLING ENDED AT: NR

PUMP OR TUBING DEPTH IN WELL (feet): 12.95 | TUBING MATERIAL CODE: T | FIELD-FILTERED: Y (N) | FILTER SIZE: µm | Filtration Equipment Type:

FIELD DECONTAMINATION: PUMP Y (N) | TUBING Y (N) (replaced) | DUPLICATE: Y (N)

SAMPLE ID CODE	CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH	INTENDED ANALYSIS AND/OR METHOD	SAMPLE PUMP FLOW RATE gal (liter per minute)	SAMPLING EQUIPMENT CODE
	1	PE	1L	—	—	—	G-CHEM	0.15	BP
	1	PE	500mL	HNO_3	—	—	METALS		
	1	AG	500mL	H_2SO_4	—	—	NH_3		
	3	CG	40mL	HCl	—	—	8260B		
	3	CG	40mL	NaThio	—	—	8011		
	2	PE	1L	HNO_3	—	—	RAD226/228		

REMARKS:

Sheen Present YES (NO)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2), optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 6 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

FORM FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: NORTH MANATEE | SITE LOCATION: DUETTE, FL

WELL NO: DW-1SR | SAMPLE ID: | DATE: 8-10-17

PURGING DATA

WELL DIAMETER (inches): 2 | TUBING DIAMETER (inches): 3/8 | WELL SCREEN INTERVAL DEPTH: 5.56 feet to 15.56 feet | STATIC DEPTH TO WATER (feet): 7.28 | PURGE PUMP TYPE OR BAILER: BP

WELL ELEVATION TOC (ft NGVD): 128.17 | GROUNDWATER ELEVATION (ft NGVD): 120.89

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable)

= (15.56 (feet) - 7.28 (feet) X 0.163 gallons/foot = 1.35 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME (only fill out if applicable)

= 0.3 gallons + (0.006 gallons/foot X 15.56 feet) + 0.05 gallons = 0.44 gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 12.95 | FINAL PUMP OR TUBING DEPTH IN WELL (feet): 12.95 | PURGING INITIATED AT: 0910 | PURGING ENDED AT: 1110 | TOTAL VOLUME PURGED (gallons): 18.00

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or mS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	ORP (mV)	COLOR	ODOR
0920	1.50	1.50	0.15	7.88					62.56			
0930	1.50	3.00	0.15	8.00					87.58			
0940	1.50	4.50	0.15	8.00					95.95			
0950	1.50	6.00	0.15	8.03					121.60			
1000	1.50	7.50	0.15	8.03					103.20			
1010	1.50	9.00	0.15	8.03					97.12			
1020	1.50	10.50	0.15	8.03					80.50			
1030	1.50	12.00	0.15	8.03					75.09			
1040	1.50	13.50	0.15	8.03					80.04			
1050	1.50	15.00	0.15	8.03					72.11			
1100	1.50	16.50	0.15	8.03	4.60	31.3	91	1.0	68.19	144		

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 6" = 1.02; 8" = 1.47; 12" = 5.88

TUBING INSIDE DIA. CAPACITY (Gal/Ft): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: BLAINE GRISSOM / DAN ARMOUR / PROTECH

SAMPLER(S) SIGNATURE(S):

SAMPLING INITIATED AT: 1110 | SAMPLING ENDED AT: NR

PUMP OR TUBING DEPTH IN WELL (feet): 12.95 | TUBING MATERIAL CODE: T | FIELD-FILTERED: Y (N) | FILTER SIZE: µm | Filtration Equipment Type:

FIELD DECONTAMINATION: PUMP Y (N) | TUBING Y (N) replaced | DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLE PUMP FLOW RATE (mL/min)	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
	1	PE	1 L	—	—	—	G-CHEM	0.15	BP
	1	PE	500 ml	HNO_3	—	—	METALS		
	1	AG	500 ml	H_2SO_4	—	—	NH_3		
	3	CG	40 ml	HCl	—	—	82608		
	3	CG	40 ml	$NaThio$	—	—	8011		
	2	PE	1L	HNO_3	—	—	RAD 226/228		

REMARKS:

Sheen Present: YES (NO)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2), optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: NORTH MANATEE		SITE LOCATION: DUETTE, FL	
WELL NO: DW-25R	SAMPLE ID:		DATE: 8-16-17

PURGING DATA

WELL DIAMETER (inches): 2	TUBING DIAMETER (inches): 1 1/4	WELL SCREEN INTERVAL DEPTH: 4.56 (feet) to 14.56 (feet)	STATIC DEPTH TO WATER (feet): 7.74		PURGE PUMP TYPE OR BAILER: BP
WELL ELEVATION TOC (ft NGVD): 128.10			GROUNDWATER ELEVATION (ft NGVD): 120.36		

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

= (14.56 (feet) − 7.74 (feet)) X 0.163 gallons/foot = 1.11 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

= 0.3 gallons + (0.006 gallons/foot X 14.56 (feet)) + 0.05 gallons = 0.44 gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 13.02	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 13.02	PURGING INITIATED AT: 1130	PURGING ENDED AT: 1150		TOTAL VOLUME PURGED (gallons): 3.00

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	ORP (mV)	COLOR	ODOR
1140	1.50	1.50	0.15	8.09	4.20	29.5	347	0.8	12.10	238		
1143	0.45	1.95	0.15	8.09	4.17	29.5	350	0.8	13.25	239		
1146	0.45	2.40	0.15	8.09	4.16	29.5	353	0.8	15.49	240		
1149	0.45	2.85	0.15	8.09	4.14	29.5	352	0.8	14.88	242	LIGHT TAN	

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./FT.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: BLAINE GRISSOM / DAN ARMOUR / PRO-TECH	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT: 1150		SAMPLING ENDED AT: NR
PUMP OR TUBING DEPTH IN WELL (feet): 13.02	TUBING MATERIAL CODE: T	FIELD-FILTERED: Y (N) µm Filtration Equipment Type:		FILTER SIZE:
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y (N) (replaced)		DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLE-PUMP FLOW RATE (ml per minute)	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
	1	PE	1 L	—	—	—	G-CHEM	0.15	BP
	1	PE	500 ml	HNO3	—	—	METALS		
	1	AG	500 ml	H2SO4	—	—	NH3		
	3	CG	40 ml	HCl	—	—	82608		
	3	CG	40 ml	NaThio	—	—	8011		
	2	PE	1L	HNO3	—	—	RAD 226/228		

REMARKS:

Sheen Present YES (NO)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2), optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

FORM D 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: NORTH MANATEE		SITE LOCATION: DUETTE, FL	
WELL NO: DW-35R	SAMPLE ID:		DATE: 8-16-17

PURGING DATA

WELL DIAMETER (inches): 2	TUBING DIAMETER (inches): 3/8	WELL SCREEN INTERVAL DEPTH: 5.1 (feet) to 15 (feet)	STATIC DEPTH TO WATER (feet): 7.49		PURGE PUMP TYPE OR BAILER: BP
WELL ELEVATION TOC (ft NGVD): 127.65			GROUNDWATER ELEVATION (ft NGVD): 120.16		

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable)

= (15.10 (feet) − 7.49 (feet)) X 0.163 gallons/foot = 1.24 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME (only fill out if applicable)

= 0.3 gallons + (0.006 gallons/foot X 15.10 (feet)) + 0.05 gallons = 0.44 gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 12.88	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 12.88	PURGING INITIATED AT: 1205	PURGING ENDED AT: 1225		TOTAL VOLUME PURGED (gallons): 3.00

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	ORP (mV)	COLOR	ODOR
1215	1.50	1.50	0.15	7.84	4.54	29.8	184	0.5	15.01	191		
1218	0.45	1.95	0.15	7.84	4.50	29.8	187	0.5	15.64	194		
1221	0.45	2.40	0.15	7.84	4.48	29.8	189	0.5	16.08	194		
1224	0.45	2.85	0.15	7.84	4.44	29.8	192	0.5	17.22	192	YELLOW TINT	

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: BLAINE GRIBSOM DAN ARMOUR / PRO-TECH	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT: 1225		SAMPLING ENDED AT: NR
PUMP OR TUBING DEPTH IN WELL (feet): 12.88	TUBING MATERIAL CODE: T	FIELD-FILTERED: Y (N) µm Filtration Equipment Type:		FILTER SIZE:
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y (N replaced)		DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLE PUMP FLOW RATE (mL per minute)	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED (IN FIELD mL)	FINAL pH			
	1	PE	1 L	—	—	—	G-CHEM	0.15	BP
	1	PE	500 ml	HNO_3	—	—	METALS		
	1	AG	500 ml	H_2SO_4	—	—	NH3		
	3	CG	40 ml	HCl	—	—	82608		
	3	CG	40 ml	$NaThio$	—	—	8011		
	2	PE	1L	HNO_3	—	—	RAD226/228		

REMARKS:

Sheen Present: YES (NO)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; FPPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES:
1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2), optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

FORM FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: NORTH MANATEE | SITE LOCATION: DUETTE, FL

WELL NO: DW-45R | SAMPLE ID:

DATE: 8-16-17

PURGING DATA

WELL DIAMETER (inches): 2 | TUBING DIAMETER (inches): 3/8 | WELL SCREEN INTERVAL DEPTH: 5.48 feet to 15.48 feet | STATIC DEPTH TO WATER (feet): 7.32 | PURGE PUMP TYPE OR BAILER: BP

WELL ELEVATION TOC (ft NGVD): 128.04 | GROUNDWATER ELEVATION (ft NGVD): 120.72

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable)

= (15.48 (feet) - 7.32 (feet)) X 0.163 gallons/foot = 1.33 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME (only fill out if applicable)

= 0.3 gallons + (0.006 gallons/foot X 15.48 feet) + 0.05 gallons = 0.44 gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 13.73 | FINAL PUMP OR TUBING DEPTH IN WELL (feet): 13.73 | PURGING INITIATED AT: 1245 | PURGING ENDED AT: 1305 | TOTAL VOLUME PURGED (gallons): 3.00

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	ORP (mV)	COLOR	ODOR
1255	1.50	1.50	0.15	8.24	4.51	30.6	244	0.3	15.98	27		
1258	0.45	1.95	0.15	8.24	4.63	30.6	248	0.3	16.21	18		
1301	0.45	2.40	0.15	8.24	4.69	30.6	252	0.3	15.85	12		
1304	0.45	2.85	0.15	8.24	4.70	30.6	254	0.3	16.93	8	YELLOW TINT	

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 6" = 1.02; 8" = 1.47; 12" = 5.88

TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 1/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: BLAINE BRISTOM DAN ARMOUR / PRO-TECH | SAMPLER(S) SIGNATURE(S):

PUMP OR TUBING DEPTH IN WELL (feet): 13.73 | TUBING MATERIAL CODE: T | SAMPLING INITIATED AT: 1305 | SAMPLING ENDED AT: NR

FIELD DECONTAMINATION: PUMP Y (N) | TUBING Y (N) (replaced) | FIELD-FILTERED: Y (N) µm | FILTER SIZE: | Filtration Equipment Type: | DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATION / SAMPLE PRESERVATION

SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH	INTENDED ANALYSIS AND/OR METHOD	SAMPLE PUMP FLOW RATE (mL per minute)	SAMPLING EQUIPMENT CODE
	1	PE	1 L	—	—	—	G-CHEM	0.15	BP
	1	AG	500 ml	HNO_3	—	—	METALS		
	3	CG	40 ml	H_2SO_4	—	—	NH3		
	3	CG	40 ml	HCl	—	—	82603		
	2	PE	1L	$NaThio_3$	—	—	8011		
				HNO_3	—	—	RAD 226/228		

REMARKS: Sheen Present: YES (NO)

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2), optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

Pace Laboratories
8 East Tower Circle
Ormond Beach, FL 321174
Phone (813) 885-7427

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: FRED NASSAR	Lab PM: Harrington, Danielle M	Carrier Tracking No(s):	COC No: 280-14976-7062.1
Client Contact: Ms.Danielle Harrington	Phone: 954-557-0581	E-Mail: danielle.harrington@testamericainc.com		Page: Page 1 of 1
Company: TestAmerica Denver				Job #:

Address: 4955 Yarrow Street	Due Date Requested:
City: Arvada, CO 80002	TAT Requested (days):
State, Zip: FL, 34205	
Phone: 813-786-6807(Tel)	PO #:
Email: mlersch@wm.com fnassar@wm.com	WO #:
Project Name: FL50|North Manatee (NMRDF)	Project #: 28004939 - Semiannual Surfacewater Feb Aug
Site: Florida	SSOW#:

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Material Codes: AG=Amber Glass; CG=Clear Glass; PE=Polyethylene; PP=Polypropylene; S=Silicone; T=Teflo ; O=OtherSpecial Instructions/Note:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Chlorophyll A(1Liter - AG)	Total Number of containers	
			Preservation Code:						
SW-102R	7/17/17	1105	G	W			2		pH 7.15 Temp 30.6 °C SpecCond 5704 µS/cm

WO# : 35324403
35324403

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time: 7/17/17 1336	Company	Received by:	Date/Time: 7-17-17 1336	Company TAT
Relinquished by:	Date/Time: 7/17/17 1700	Company TA TPA	Received by: Miller Perry/Pace	Date/Time: 7/18/17 1100	Company PACE
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ∆ Yes ∆ No
Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 1.4 T286

8/7/2017

Pace Analytical Florida Laboratory	Document Name: Sample Condition Upon Receipt Form	Document Revised: February 6, 2017
	Document No.: F-FL-C-007 rev. 11	Issuing Authority: Pace Florida Quality Office

Sample Condition Upon Receipt Form (SCUR)

Project # WO#: 35324403

Project Manager: PM: CTR **Due Date:** 07/27/17

Client: CLIENT: 36-TA

Date and Initials of person:
Examining contents:_____
Label:_____
Deliver:_____
pH:_____

Thermometer Used: T186 Date: 7/18/17 Time: 1100 Initials: _____

Cooler #1 Temp.°C	1.3 (Visual)	+0.1 (Correction Factor)	1.4 (Actual)	☐ Samples on ice, cooling process has begun
Cooler #2 Temp.°C	_____ (Visual)	_____ (Correction Factor)	_____ (Actual)	☐ Samples on ice, cooling process has begun
Cooler #3 Temp.°C	_____ (Visual)	_____ (Correction Factor)	_____ (Actual)	☐ Samples on ice, cooling process has begun
Cooler #4 Temp.°C	_____ (Visual)	_____ (Correction Factor)	_____ (Actual)	☐ Samples on ice, cooling process has begun
Cooler #5 Temp.°C	_____ (Visual)	_____ (Correction Factor)	_____ (Actual)	☐ Samples on ice, cooling process has begun
Cooler #6 Temp.°C	_____ (Visual)	_____ (Correction Factor)	_____ (Actual)	☐ Samples on ice, cooling process has begun

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ Other_____

Shipping Method: ☐ First Overnight ☑ Priority Overnight ☐ Standard Overnight ☐ Ground ☐ Other_____

Billing: ☐ Recipient ☐ Sender ☐ Third Party ☐ Unknown

Tracking # 7167 3773 4686

Custody Seal on Cooler/Box Present: ☐ Yes ☑ No **Seals intact:** ☐ Yes ☐ No **Ice:** (Wet) Blue None

Packing Material: ☑ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other_____

Samples shorted to lab (If Yes, complete) Shorted Date:_____ Shorted Time:_____ Qty:_____

		Comments:
Chain of Custody Present	☑Yes ☐ No ☐N/A	
Chain of Custody Filled Out	☑Yes ☐ No ☐N/A	
Relinquished Signature & Sampler Name COC	☑Yes ☐ No ☐N/A	
Samples Arrived within Hold Time	☑Yes ☐ No ☐N/A	
Rush TAT requested on COC	☐Yes ☑ No ☐N/A	
Sufficient Volume	☑Yes ☐ No ☐N/A	
Correct Containers Used	☑Yes ☐ No ☐N/A	
Containers Intact	☑Yes ☐ No ☐N/A	
Sample Labels match COC (sample IDs & date/time of collection)	☑Yes ☐ No ☐N/A	
All containers needing acid/base preservation have been checked. All Containers needing preservation are found to be in compliance with EPA recommendation: Exceptions: VOA, Coliform, TOC, O&G, Carbamates	☐Yes ☐ No ☑N/A ☐Yes ☐ No ☑N/A	Preservation Information: Preservative:_____ Lot #/Trace #:_____ Date:_____ Time:_____ Initials:_____
Headspace in VOA Vials? (>6mm):	☐Yes ☐ No ☑N/A	
Trip Blank Present:	☐Yes ☑ No ☐N/A	

Client Notification/ Resolution:
Person Contacted:_____ Date/Time:_____

Comments/ Resolution (use back for additional comments):_____

Project Manager Review:_____ Date:_____

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

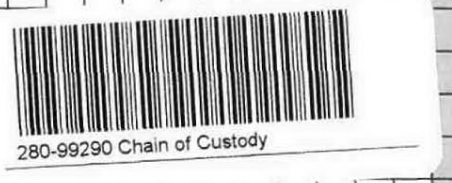
Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Fred Nassar	Lab PM: Harrington, Danielle M	Carrier Tracking No(s):	COC No: 280-14976-7062.1
Client Contact: Fred Nassar	Phone: 954-557-0531	E-Mail: danielle.harrington@testamericainc.com		Page: Page 1 of 1
Company: Waste Management				Job #:
Address: 25515 Old Landfill	Due Date Requested:			
City: Punta Gorda	TAT Requested (days):			
State, Zip: FL, 33980				
Phone:	PO #:			
Email: fnassar@wm.com	WO #:			
Project Name: FL50|North Manatee (NMRDF)	Project #: 28004939 - Semiannual Surfacewater Feb Aug			
Site: Florida	SSOW#:			

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Hardness/Total metals/Mercury(500mL-PE) Failure **	Total Nitrogen/Unionized Ammonia(1Liter-PE)	COD/TOC/T Phos(500 mL-AG)	8260B (40 mL VOA-CG)	TSS(1 Liter-PE)	BOD (1 Liter-PE)	TDS / 300.0 - NO3(IC) (1 Liter-PE)	8011(40 mL VOA-CG)	Fecal Coliform *(Steril w/thio 100 ml-O)	Chlorophyll-a**(1Liter-AG)	Trip Blank HCl	Trip Blank Thio	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	S	S	A	N	N	N	R	R	N				
SW-192R	7/17/17	1105	G	W			1	1	1	2	1	1	1	3	*	**	2	2		Shorthold: NO3 by IC, BOD
																				*Fecal Coliform samples
Please Run																				subbed to TA Tampa
DO, Spec Cond, & Turbidity In Lab																				**Chlorophyll-a sample
																				Subbed to PACE
(1) 8260B Vials Broken When Kit was opened																				pH 7.13
																				Temp 30.6 °C
																				Spec Cond 5704 µs/cm
																				Sample Clear with Slight Yellow Tint



Preservation Codes:

A - HCl	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Material Codes: AG=Amber Glass; CG=Clear Glass; PE=Polyethylene; PP=Polypropylene; S=Silicone; T=Teflon; O=OtherSpecial Instructions/Note:

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Date/Time	Company		Date/Time	Company
Relinquished by:	7/17/17 1330	WM	Received by:	7-17-17 e 1336	TA TMA
Relinquished by:	7/17/17 1700	TA TMA	Received by:	7-18-17 0900	TAD
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Pace Laboratories
8 East Tower Circle
Ormond Beach, FL 321174
Phone (813) 885-7427

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: FRED NASSAR	Lab PM: Harrington, Danielle M	Carrier Tracking No(s):	COC No: 280-14976-7062.1
Client Contact: Ms.Danielle Harrington	Phone: 954-557-0581	E-Mail: danielle.harrington@testamericainc.com		Page: Page 1 of 1
Company: TestAmerica Denver				Job #:

Address: 4955 Yarrow Street	Due Date Requested:	Analysis Requested	Preservation Codes:
City: Arvada, CO 80002	TAT Requested (days):		A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
State, Zip: FL, 34205			
Phone: 813-786-6807(Tel)	PO #:		Other:
Email: mlerschi@wm.com FnassarQWm.com	WO #:		
Project Name: FL50|North Manatee (NMRDF)	Project #: 28004939 - Semiannual Surfacewater Feb Aug		
Site: Florida	SSOW#:		

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Chlorophyll A(1Liter - AG)	Total Number of containers	Material Codes: AG=Amber Glass; CG=Clear Glass; PE=Polyethylene; PP=Polypropylene; S=Silicone; T=Teflo ; O=OtherSpecial Instructions/Note:
			Preservation Code:						
SW-142R	7/17/17	1105	G	W			2		pH 7.13 Temp 30.6 °C Spec Cond 5104 s/cm

2 chloro-A Bottles direct to Pace

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify)	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	7/17/17 1336	WM		7-17-17e 1336	TA TPA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
				7-18-17 0900	TAD
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

TestAmerica Tampa
6712 Benjamin Road #100
Tampa FL, 33634
Phone (813) 885-7427

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: FRED NASSAR	Lab PM: Harrington, Danielle M	Carrier Tracking No(s):	COC No: 280-14976-7062.1
Client Contact: Ms.Danielle Harrington	Phone: 754-557-0581	E-Mail: danielle.harrington@testamericainc.com		Page: Page 1 of 1
Company: TestAmerica Denver				Job #:

Address: 4955 Yarrow Street	Due Date Requested:	
City: Arvada, CO 80002	TAT Requested (days):	
State, Zip: FL, 34205		
Phone: 813-786-6807(Tel)	PO #:	
Email: mlersch@wm.com fnassar@wm.com	WO #:	
Project Name: FL50|North Manatee (NMRDF)	Project #: 28004939 - Semiannual Surfacewater Feb Aug	
Site: Florida	SSOW#:	

Analysis Requested

Preservation Codes:

A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2SO3
S - H2SO4
T - TSP Dodecahydrate
Acetone
MCAA
- ph 4-5
- other (specify)

1 Bacti Bottle Stayed in Tampa

AG=Amber Glass; ; PE=Polyethylene; ylene; S=Silicone; O=OtherSpecial ctions/Note:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Fecal Coliform(Sterile w/thio 100 ml-O)
			Preservation Code:				R
SW-142R	7/17/17	1105	G	W			i

Login: Contact DENVER for job # number

Do NOT log in!

pH 7.13
Temp 30.6 °C

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Date/Time	Company		Date/Time	Company
Relinquished by:	7/17/17 1536	WM	Received by:	7-17-17 1336	TA TBA
Relinquished by: KG 7/17/17	Date/Time:	Company	Received by:	7-18-17 0900	TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 4.8/5.0 CU-09

Results of the Ground Water Statistics

for North Manatee Recycling & Disposal Facility

Second Semi-Annual Monitoring Event in 2017

Prepared for:
North Manatee Recycling & Disposal Facility
14155 County Road 39
Duette, FL 34219

Prepared by:
Jeffrey A. Holmgren
Otter Creek Environmental Services, L.L.C.
40W565 Foxwick Court
Elgin, IL 60124
(847) 464-1355

January 2018

Introduction

This report contains the results of the statistical analyses used to evaluate the ground water data obtained during the second semi-annual monitoring event in 2017 at North Manatee Recycling and Disposal Facility. The ground water at North Manatee RDF is monitored by background wells BW-1S, BW-2S, BW-3SR, BW-4S, and BW-5S and compliance wells DW-1SR, DW-2SR, DW-3SR, DW-4SR, and DW-5S. Monitoring wells BW-1S, BW-2S, BW-3SR, BW-4S, BW-5S, DW-1SR, DW-2SR, DW-3SR, and DW-4SR were sampled on November 7, 2017 and analyzed for the parameters required by permit.

The statistical plan is designed to detect a release from the facility at the earliest indication so that it is protective of human health and the environment. Both interwell and intrawell methodologies are described and then applied to the North Manatee RDF data. The statistical plan prepared by Dr. Robert Gibbons conforms with the Coal Combustion Residual (CCR) rule (40 CFR 257), USEPA Guidance document ("*Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Unified Guidance"*, March 2009), and the American Society for Testing and Materials (ASTM) standard D6312-98, *Developing Appropriate Statistical Approaches for Ground-Water Detection Monitoring Programs.*

Ground Water Monitoring Program

The groundwater monitoring network for North Manatee RDF includes upgradient wells BW-1S, BW-2S, BW-3SR, BW-4S, and BW-5S and compliance wells DW-1SR, DW-2SR, DW-3SR, DW-4SR, and DW-5S. Each of the groundwater monitoring wells is to be sampled at least semiannually and analyzed for the detection monitoring parameters listed in Appendix III and Appendix IV of 40 CFR Part 257.

Appendix III to Part 257 – Constituents for Detection Monitoring

Boron
Calcium
Chloride
Fluoride
pH
Sulfate
Total Dissolved Solids

Appendix IV to Part 257 – Constituents for Assessment Monitoring

Antimony	Lead
Arsenic	Lithium
Barium	Mercury
Beryllium	Molybdenum
Cadmium	Selenium
Chromium	Thallium
Cobalt	Radium 226
Fluoride	Radium 228

The ground water data obtained during the second semi-annual monitoring event in 2017 are summarized in Attachment A.

STATISTICAL METHODOLOGIES FOR DETECTION MONITORING

The CCR rule for statistical analysis provides several options for evaluating the ground water data. The preferred methods for comparing ground water data are using either prediction limits or using control charts. Both of these methods were applied to the North Manatee RDF data using the DUMPStat® statistical program. DUMPStat® is a program for the statistical analysis of groundwater monitoring data using methods described in "Statistical Methods for Groundwater Monitoring" by Dr. Robert D. Gibbons. Ground water statistics are to be done on the trace metals and inorganic constituents listed above.

Interwell Statistics: Upgradient versus Downgradient Comparisons

Interwell statistics are appropriate when the upgradient and downgradient wells monitor the same ground water formation and there is similar variability in the upgradient and downgradient zones. Site prediction limits are determined by pooling the historical ground water data from hydraulically upgradient wells. This statistical method compares the current downgradient determinations to site prediction limits and checks for exceedances. The type of prediction limit utilized (e.g., parametric or nonparametric) is based on the detection frequency and the data distribution of each parameter in the background data. The distribution of the background data is tested for normality using the Shapiro-Wilk test (Gibbons, 1994 and USEPA 1992). If the constituent is normally distributed, a normal prediction limit is used. If normality is rejected by the Shapiro-Wilk test, the background data is transformed by taking the natural logarithm. The Shapiro-Wilk test is then reapplied on the transformed data. If it is not rejected, lognormal prediction limits are used. If after transforming the data, normality is still rejected, nonparametric prediction limits are used for that analyte. The nonparametric prediction limit is the largest determination in the background measurements. For constituents where the background detection frequency is greater than 0% but less than 50%, nonparametric prediction limits will be used. If the detection frequency is 0% after thirteen samples have been collected, the practical quantitation limit (PQL) becomes the nonparametric prediction limit.

Results of the Interwell Statistics

The background data used in this statistical analysis includes the ground water data collected from ground water wells BW-1S, BW-2S, BW-3SR, BW-4S, and BW-5S during the period from 2011 through the current data. A summary of the background data from monitoring wells BW-1S, BW-2S, BW-3SR, BW-4S, and BW-5S is listed in Attachment B, Table 1 "Upgradient Data". This statistical method compares the current downgradient determinations to site prediction limits and checks for exceedances.

Table 2 "Most Current Downgradient Monitoring Data", summarizes the current data from downgradient wells DW-1SR, DW-2SR, DW-3SR, and DW-4SR, compared to the site prediction limits. Prediction limit exceedances are flagged with asterisks. For the most current data, the site prediction limit exceedances detected are summarized in the table below.

Prediction Limit Exceedances at North Manatee RDF during the Second Semi-Annual Monitoring Event in 2017

Well	Parameter	Result	Prediction Limit	Prediction Limit Type	Verified/ Awaiting verification
DW-2SR	Calcium, mg/L	72.0	50.6760	Normal	Awaiting verification
	Chloride, mg/L	300	24.0765	Normal	Awaiting verification
	Total Dissolved Solids, mg/L	810	510.2459	Lognormal	Awaiting verification
DW-3SR	Calcium, mg/L	140	50.6760	Normal	Awaiting verification
	Chloride, mg/L	330	24.0765	Normal	Awaiting verification
	Total Dissolved Solids, mg/L	950	510.2459	Lognormal	Awaiting verification

The detection frequencies of the parameters in the up and down gradient monitoring wells are summarized in Table 3. Table 4 summarizes the results of the Shapiro-Wilk test. Table 5 is a summary of the statistics and prediction limits determined for the metals. Table 6 is a historical summary of the data at those wells that have indicated an exceedance. Time series graphs of each of the parameters at each well with the corresponding prediction limits are attached.

A statistical power curve indicates the expected false assessments for the site as a whole. The false positive rate for interwell analyses is the percentage of failures when the upgradient versus downgradient true mean difference equals zero. False negative rate indicates the chance of missing contamination at a single well for a single constituent. The statistical power is a function of the number of wells included, the number of constituents compared, the detection frequencies, and the data distributions involved. For interwell analysis, the site-wide false positive rate is <1% and the test becomes sensitive to 4.5 standard deviation unit increases over background.

Intrawell statistics

Intrawell statistics are appropriate for facilities where the upgradient wells do not accurately characterize the natural ground water conditions downgradient from the facility. This may be due to different hydrogeological conditions where the wells are screened, having too few upgradient wells to account for the spatial variability, or the site exhibiting no definable hydraulic gradient. Intrawell statistics compare new measurements to the historical data at each ground water monitoring well independently. It is recommended that at least eight background samples be obtained prior to performing the statistics.

The most useful technique for intrawell comparisons is the combined Shewhart-CUSUM control chart. This control chart procedure is useful because it will detect releases both in terms of the constituent concentration and cumulative increases. This method is also extremely sensitive to sudden and gradual releases. A requirement for constructing these control charts is that the parameter is detected at a frequency greater than or equal to 25%, otherwise the data variance is not properly defined.

The combined Shewhart-CUSUM control chart assumes that the data are independent and normally distributed with a fixed mean and a constant variance. Independent data is much more critical than the normality assumption. To achieve independence, it is recommended that data are collected no more frequently than quarterly to account for seasonal variation. The combined Shewhart-CUSUM control chart is extremely robust to deviations from normality. Because the control charts do not use a specific multiplier based on a normal distribution, it is more conservative to assume normality.

It is recommended that at least eight rounds of data be available to provide a reliable estimate of the mean and standard deviation of the parameter concentration, although the control charts will be generated with as few as four data points. Having only four data points may produce greater uncertainty in the mean and standard deviation of the background data, leading to higher control limits, thus having a potentially high false negative rate.

Many groundwater monitoring parameters are not detected at a frequency great enough to generate the combined Shewhart-CUSUM control charts. For constituents that are detected less than 25% of the time at a particular well, the data should be plotted as a time series until a sufficient number of data points are available to provide a 99% confidence nonparametric prediction limit. Thirteen independent measurements (with 1 resample) are necessary to achieve a 99% confidence (1% false positive rate) nonparametric prediction limit. Eight independent measurements (for pass 1 of 2 resamples) are necessary to achieve a 99% confidence nonparametric prediction limit. The nonparametric prediction limit is the largest determination out of the data set collected for that well and parameter. If the detection frequency is 0% after thirteen samples have been collected, the practical quantitation limit (PQL) becomes the nonparametric prediction limit.

In developing the statistical background, the historical data must be thoroughly screened for anomalous data due to sampling error, analytical error, or simply by chance alone. An erroneous data point, if not removed prior to the mean and variance computations, would yield a larger control limit thus increasing the false negative rate. The DUMPStat® program screens for outliers using the Dixon test. If the Dixon test indicates an outlier, the value is compared to three times the median value for intrawell analyses. If the value fails both criteria of the two-stage screening, the value is considered a statistical outlier and will not be used in the mean and variance determinations. Anomalous data will still be plotted on the graphs (with a unique symbol) but will not be included in the calculations.

The verification resample plan is an integral function of the statistical plan to reduce the probability that anomalous data obtained after the background has been established, is indicative of a landfill release.

The background data for each well and constituent is tested for existing trends using Sen's nonparametric estimate of trend. If contamination exists prior to completing the background, the control limits could be potentially high and this control chart method would not be able to detect an increasing trend unless the increase is severe.

Results of the Intrawell Statistics

The Appendix III and Appendix IV parameter data from wells DW-1SR, DW-2SR, DW-3SR, and DW-4SR were evaluated using the combined Shewhart-CUSUM control chart method. The background includes historical data obtained from 2011 through 2016 for all wells.

A summary of the intrawell statistics is included in Attachment C, Table 1 "Summary Statistics and Intermediate Computations for Combined Shewhart-CUSUM Control Charts." The control charts or time series graphs follow the summary table. For the parameters evaluated, the control limit exceedances detected are summarized in the table below.

Control Limit Exceedances During the Second Semi-Annual Monitoring Event in 2017

Well	Parameter	Result	CUSUM value	Control Limit	Control Limit Type	Verified/ Awaiting Verification
DW-1SR	Radium 226, pCi/L	0.27	0.3183	0.2002	Normal	Awaiting Verification
DW-2SR	Chloride, mg/L	300	289.7731	119.6042	Normal	Awaiting Verification
DW-3SR	Calcium, mg/L	140	124.0469	136.7888	Normal	Awaiting Verification
	Chloride, mg/L	330	326.5549	32.3804	Normal	Awaiting Verification
	Total Dissolved Solids, mg/L	950	854.6904	802.6434	Normal	Awaiting Verification

No increasing trends were detected in the background data.

A control chart factor was selected to provide a balance of the site-wide false positive and false negative rates. A statistical power curve indicates the expected false assessments for the site as a whole. The site-wide false positive rate is 26% and the test becomes sensitive to 3 standard deviation units over background.

There is insufficient data to perform intrawell comparisons on several constituents.

CONCLUSIONS

This document describes a comprehensive statistical plan designated for the North Manatee RDF. The groundwater monitoring network for North Manatee RDF includes upgradient wells BW-1S, BW-2S, BW-3SR, BW-4S, and BW-5S and compliance wells DW-1SR, DW-2SR, DW-3SR, DW-4SR, and DW-5S. Each of the groundwater monitoring wells is to be sampled and analyzed for the detection monitoring parameters listed in Appendix III and Appendix IV of 40 CFR Part 257.

The ground water data was compared to background using prediction limits (interwell) and using control charts (intrawell). For the most current data, there are site prediction limit exceedances for calcium, chloride, and TDS at DW-2SR and calcium, chloride, and TDS at DW-3SR awaiting verification.

Using intrawell comparisons, there were control limit exceedances detected for radium 226 at DW-1SR, chloride at DW-2SR, and calcium, chloride, and TDS at DW-3SR awaiting verification.

Attachment A

Ground Water Data obtained during the Second Semi-Annual Monitoring Event in 2017

Table 1

Analytical Data Summary for 11/07/2017

Constituents	Units	BW-1S	BW-2S	BW-3SR	BW-4S	BW-5S	DW-1SR	DW-2SR	DW-3SR	DW-4SR
Antimony	ug/L	<2.0000	<2.0000	<2.0000	<2.0000	<2.0000	<2.0000	<2.0000	<2.0000	<2.0000
Arsenic	ug/L	<5.0000	<5.0000	<5.0000	<5.0000	<5.0000	<5.0000	<5.0000	<5.0000	<5.0000
Barium	ug/L	<10.0000	<10.0000	<10.0000	53.0000	17.0000	<10.0000	37.0000	34.0000	19.0000
Beryllium	ug/L	<1.0000	<1.0000	<1.0000	<1.0000	<1.0000	<1.0000	<1.0000	<1.0000	<1.0000
Boron	ug/L	<100.0000	<100.0000	<100.0000	<100.0000	<100.0000	<100.0000	140.0000	130.0000	<100.0000
Cadmium	ug/L	<5.0000	<5.0000	<5.0000	<5.0000	<5.0000	<5.0000	<5.0000	<5.0000	<5.0000
Calcium	mg/L	7.1000	5.3000	28.0000	8.8000	31.0000	8.9000	72.0000	140.0000	21.0000
Chloride	mg/L	8.2000	16.0000	24.0000	13.0000	12.0000	<3.0000	300.0000	330.0000	3.6000
Chromium	ug/L	<10.0000	<10.0000	<10.0000	<10.0000	<10.0000	<10.0000	<10.0000	<10.0000	<10.0000
Cobalt	ug/L	<10.0000	<10.0000	<10.0000	<10.0000	<10.0000	<10.0000	<10.0000	<10.0000	<10.0000
Fluoride	mg/L	<.5000	<.5000	<.5000	<.5000	<.5000	<.5000	.5300	<.5000	<.5000
Groundwater elevation	ft/msl	121.3200	121.8000	122.1900	124.2900	121.6100	119.4400	119.0600	119.0100	118.9300
Lead	ug/L	<9.0000	<9.0000	<9.0000	<9.0000	<9.0000	<9.0000	<9.0000	<9.0000	<9.0000
Lithium	ug/L	<20.0000	<20.0000	<20.0000	<20.0000	<20.0000	<20.0000	<20.0000	<20.0000	<20.0000
Mercury	ug/L	<.2000	<.2000	<.2000	<.2000	<.2000	<.2000	<.2000	<.2000	<.2000
Molybdenum	ug/L	<20.0000	<20.0000	<20.0000	<20.0000	<20.0000	<20.0000	<20.0000	<20.0000	<20.0000
pH (Field)	S.U.	4.1300	5.4100	5.2300	3.8900	5.1500	4.4100	4.0700	4.4400	4.6400
pH (Lab)	S.U.	4.6000	5.9000	6.6000	4.7000	6.4000	5.7000	4.2000	5.1000	5.9000
Radium-226	pCi/L	.3720	.2940	.3020	20.1000	1.6100	.2700	1.6600	2.0700	1.5400
Radium-228	pCi/L	.5760	.3800	.4310	9.3900	1.7700	1.0100	4.7800	3.3300	2.5400
Residue, filterable (tds)	mg/L	120.0000	59.0000	190.0000	320.0000	350.0000	150.0000	810.0000	950.0000	200.0000
Selenium	ug/L	<20.0000	<20.0000	<20.0000	<20.0000	<20.0000	<20.0000	<20.0000	<20.0000	<20.0000
Specific conductance (field)	umhos/cm	103.0000	92.0000	257.0000	508.0000	546.0000	82.0000	873.0000	964.0000	231.0000
Sulfate	mg/L	18.0000	<5.0000	22.0000	210.0000	180.0000	10.0000	160.0000	240.0000	87.0000
Thallium	ug/L	<1.0000	<1.0000	<1.0000	<1.0000	<1.0000	<1.0000	<1.0000	<1.0000	<1.0000
Turbidity (field)	NTU	7.0400	5.1500	1.6000	5.2600	3.9800	44.5100	6.3600	6.4200	12.1100
Water temperature (field)	degrees C	24.9000	23.5000	26.6000	25.4000	26.3000	26.6000	28.3000	28.7000	28.6000

* - The displayed value is the arithmetic mean of multiple database matches.

Attachment B

Summary Tables and Graphs for the Interwell Comparisons

Table 1

Upgradient Data

Constituent	Units	Well	Date		Result	
Antimony	ug/L	BW-1S	10/05/2011	ND	2.0000	
Antimony	ug/L	BW-1S	02/14/2012	ND	2.0000	
Antimony	ug/L	BW-1S	08/15/2012	ND	2.0000	
Antimony	ug/L	BW-1S	02/14/2013	ND	2.0000	
Antimony	ug/L	BW-1S	08/21/2013	ND	2.0000	
Antimony	ug/L	BW-1S	08/27/2014	ND	2.0000	
Antimony	ug/L	BW-1S	02/13/2015	ND	2.0000	
Antimony	ug/L	BW-1S	08/17/2015	ND	2.0000	
Antimony	ug/L	BW-1S	12/17/2015	ND	2.0000	
Antimony	ug/L	BW-1S	02/15/2016	ND	2.0000	
Antimony	ug/L	BW-1S	05/05/2016	ND	2.0000	
Antimony	ug/L	BW-1S	08/04/2016	ND	2.0000	
Antimony	ug/L	BW-1S	11/02/2016	ND	2.0000	
Antimony	ug/L	BW-1S	02/13/2017	ND	2.0000	
Antimony	ug/L	BW-1S	05/03/2017	ND	2.0000	
Antimony	ug/L	BW-1S	08/16/2017	ND	2.0000	
Antimony	ug/L	BW-1S	11/07/2017	ND	2.0000	
Arsenic	ug/L	BW-1S	10/05/2011	ND	5.0000	
Arsenic	ug/L	BW-1S	02/14/2012	ND	5.0000	
Arsenic	ug/L	BW-1S	08/15/2012	ND	5.0000	
Arsenic	ug/L	BW-1S	02/14/2013	ND	5.0000	
Arsenic	ug/L	BW-1S	08/21/2013	ND	5.0000	
Arsenic	ug/L	BW-1S	08/27/2014	ND	5.0000	
Arsenic	ug/L	BW-1S	02/13/2015	ND	5.0000	
Arsenic	ug/L	BW-1S	08/17/2015	ND	5.0000	
Arsenic	ug/L	BW-1S	12/17/2015	ND	5.0000	
Arsenic	ug/L	BW-1S	02/15/2016	ND	5.0000	
Arsenic	ug/L	BW-1S	05/05/2016	ND	5.0000	
Arsenic	ug/L	BW-1S	08/04/2016	ND	5.0000	
Arsenic	ug/L	BW-1S	11/02/2016	ND	5.0000	
Arsenic	ug/L	BW-1S	02/13/2017	ND	5.0000	
Arsenic	ug/L	BW-1S	05/03/2017	ND	5.0000	
Arsenic	ug/L	BW-1S	08/16/2017	ND	5.0000	
Arsenic	ug/L	BW-1S	11/07/2017	ND	5.0000	
Barium	ug/L	BW-1S	10/05/2011		11.0000	
Barium	ug/L	BW-1S	02/14/2012		13.0000	
Barium	ug/L	BW-1S	08/15/2012	ND	10.0000	
Barium	ug/L	BW-1S	02/14/2013	ND	10.0000	
Barium	ug/L	BW-1S	08/21/2013	ND	10.0000	
Barium	ug/L	BW-1S	08/27/2014	ND	10.0000	
Barium	ug/L	BW-1S	02/13/2015	ND	10.0000	
Barium	ug/L	BW-1S	08/17/2015	ND	10.0000	
Barium	ug/L	BW-1S	12/17/2015	ND	10.0000	
Barium	ug/L	BW-1S	02/15/2016	ND	10.0000	
Barium	ug/L	BW-1S	05/05/2016	ND	10.0000	
Barium	ug/L	BW-1S	08/04/2016	ND	10.0000	
Barium	ug/L	BW-1S	11/02/2016	ND	10.0000	
Barium	ug/L	BW-1S	02/13/2017	ND	10.0000	
Barium	ug/L	BW-1S	05/03/2017	ND	10.0000	
Barium	ug/L	BW-1S	08/16/2017	ND	10.0000	
Barium	ug/L	BW-1S	11/07/2017	ND	10.0000	
Beryllium	ug/L	BW-1S	10/05/2011	ND	1.0000	
Beryllium	ug/L	BW-1S	02/14/2012	ND	1.0000	
Beryllium	ug/L	BW-1S	08/15/2012	ND	1.0000	
Beryllium	ug/L	BW-1S	02/14/2013	ND	1.0000	
Beryllium	ug/L	BW-1S	08/21/2013	ND	1.0000	
Beryllium	ug/L	BW-1S	08/27/2014	ND	1.0000	
Beryllium	ug/L	BW-1S	02/13/2015	ND	1.0000	
Beryllium	ug/L	BW-1S	08/17/2015	ND	1.0000	
Beryllium	ug/L	BW-1S	12/17/2015	ND	1.0000	
Beryllium	ug/L	BW-1S	02/15/2016	ND	1.0000	
Beryllium	ug/L	BW-1S	05/05/2016	ND	1.0000	
Beryllium	ug/L	BW-1S	08/04/2016	ND	1.0000	
Beryllium	ug/L	BW-1S	11/02/2016	ND	1.0000	
Beryllium	ug/L	BW-1S	02/13/2017	ND	1.0000	
Beryllium	ug/L	BW-1S	05/03/2017	ND	1.0000	
Beryllium	ug/L	BW-1S	08/16/2017	ND	1.0000	
Beryllium	ug/L	BW-1S	11/07/2017	ND	1.0000	
Boron	ug/L	BW-1S	12/17/2015	ND	100.0000	
Boron	ug/L	BW-1S	02/15/2016	ND	100.0000	
Boron	ug/L	BW-1S	05/05/2016	ND	100.0000	
Boron	ug/L	BW-1S	08/04/2016	ND	100.0000	
Boron	ug/L	BW-1S	11/02/2016	ND	100.0000	
Boron	ug/L	BW-1S	02/13/2017	ND	100.0000	
Boron	ug/L	BW-1S	05/03/2017	ND	100.0000	
Boron	ug/L	BW-1S	08/16/2017	ND	100.0000	

* - Outlier for that well and constituent.
ND = Not detected, result = detection limit.

Table 1

Upgradient Data

Constituent	Units	Well	Date		Result	
Boron	ug/L	BW-1S	11/07/2017	ND	100.0000	
Cadmium	ug/L	BW-1S	10/05/2011	ND	5.0000	
Cadmium	ug/L	BW-1S	02/14/2012	ND	5.0000	
Cadmium	ug/L	BW-1S	08/15/2012	ND	5.0000	
Cadmium	ug/L	BW-1S	02/14/2013	ND	5.0000	
Cadmium	ug/L	BW-1S	08/21/2013	ND	5.0000	
Cadmium	ug/L	BW-1S	08/27/2014	ND	5.0000	
Cadmium	ug/L	BW-1S	02/13/2015	ND	5.0000	
Cadmium	ug/L	BW-1S	08/17/2015	ND	5.0000	
Cadmium	ug/L	BW-1S	12/17/2015	ND	5.0000	
Cadmium	ug/L	BW-1S	02/15/2016	ND	5.0000	
Cadmium	ug/L	BW-1S	05/05/2016	ND	5.0000	
Cadmium	ug/L	BW-1S	08/04/2016	ND	5.0000	
Cadmium	ug/L	BW-1S	11/02/2016	ND	5.0000	
Cadmium	ug/L	BW-1S	02/13/2017	ND	5.0000	
Cadmium	ug/L	BW-1S	05/03/2017	ND	5.0000	
Cadmium	ug/L	BW-1S	08/16/2017	ND	5.0000	
Cadmium	ug/L	BW-1S	11/07/2017	ND	5.0000	
Calcium	mg/L	BW-1S	12/17/2015		7.4000	
Calcium	mg/L	BW-1S	02/15/2016		6.5000	
Calcium	mg/L	BW-1S	05/05/2016		6.0000	
Calcium	mg/L	BW-1S	08/04/2016		5.0000	
Calcium	mg/L	BW-1S	11/02/2016		5.5000	
Calcium	mg/L	BW-1S	02/13/2017		5.2000	
Calcium	mg/L	BW-1S	05/03/2017		4.0000	
Calcium	mg/L	BW-1S	08/16/2017		8.9000	
Calcium	mg/L	BW-1S	11/07/2017		7.1000	
Chloride	mg/L	BW-1S	10/05/2011		13.0000	
Chloride	mg/L	BW-1S	02/14/2012		8.7000	
Chloride	mg/L	BW-1S	08/15/2012		9.1000	
Chloride	mg/L	BW-1S	02/14/2013		7.3000	
Chloride	mg/L	BW-1S	08/21/2013		6.4000	
Chloride	mg/L	BW-1S	08/27/2014		13.0000	
Chloride	mg/L	BW-1S	02/13/2015		5.0000	
Chloride	mg/L	BW-1S	08/17/2015		6.1000	
Chloride	mg/L	BW-1S	12/17/2015		4.7000	
Chloride	mg/L	BW-1S	02/15/2016	ND	15.0000	
Chloride	mg/L	BW-1S	05/05/2016		4.9000	
Chloride	mg/L	BW-1S	08/04/2016		5.1000	
Chloride	mg/L	BW-1S	11/02/2016		4.8000	
Chloride	mg/L	BW-1S	02/13/2017		6.8000	
Chloride	mg/L	BW-1S	05/03/2017		4.7000	
Chloride	mg/L	BW-1S	08/16/2017		8.7000	
Chloride	mg/L	BW-1S	11/07/2017		8.2000	
Chromium	ug/L	BW-1S	10/05/2011	ND	10.0000	
Chromium	ug/L	BW-1S	02/14/2012	ND	10.0000	
Chromium	ug/L	BW-1S	08/15/2012	ND	10.0000	
Chromium	ug/L	BW-1S	02/14/2013	ND	10.0000	
Chromium	ug/L	BW-1S	08/21/2013	ND	10.0000	
Chromium	ug/L	BW-1S	08/27/2014	ND	10.0000	
Chromium	ug/L	BW-1S	02/13/2015	ND	10.0000	
Chromium	ug/L	BW-1S	08/17/2015	ND	10.0000	
Chromium	ug/L	BW-1S	12/17/2015	ND	10.0000	
Chromium	ug/L	BW-1S	02/15/2016	ND	10.0000	
Chromium	ug/L	BW-1S	05/05/2016	ND	10.0000	
Chromium	ug/L	BW-1S	08/04/2016	ND	10.0000	
Chromium	ug/L	BW-1S	11/02/2016	ND	10.0000	
Chromium	ug/L	BW-1S	02/13/2017	ND	10.0000	
Chromium	ug/L	BW-1S	05/03/2017	ND	10.0000	
Chromium	ug/L	BW-1S	08/16/2017	ND	10.0000	
Chromium	ug/L	BW-1S	11/07/2017	ND	10.0000	
Cobalt	ug/L	BW-1S	10/05/2011	ND	10.0000	
Cobalt	ug/L	BW-1S	02/14/2012	ND	10.0000	
Cobalt	ug/L	BW-1S	08/15/2012	ND	10.0000	
Cobalt	ug/L	BW-1S	02/14/2013	ND	10.0000	
Cobalt	ug/L	BW-1S	08/21/2013	ND	10.0000	
Cobalt	ug/L	BW-1S	08/27/2014	ND	10.0000	
Cobalt	ug/L	BW-1S	02/13/2015	ND	10.0000	
Cobalt	ug/L	BW-1S	08/17/2015	ND	10.0000	
Cobalt	ug/L	BW-1S	12/17/2015	ND	10.0000	
Cobalt	ug/L	BW-1S	02/15/2016	ND	10.0000	
Cobalt	ug/L	BW-1S	05/05/2016	ND	10.0000	
Cobalt	ug/L	BW-1S	08/04/2016	ND	10.0000	
Cobalt	ug/L	BW-1S	11/02/2016	ND	10.0000	
Cobalt	ug/L	BW-1S	02/13/2017	ND	10.0000	
Cobalt	ug/L	BW-1S	05/03/2017	ND	10.0000	

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Table 1

Upgradient Data

Constituent	Units	Well	Date		Result	
Cobalt	ug/L	BW-1S	08/16/2017	ND	10.0000	
Cobalt	ug/L	BW-1S	11/07/2017	ND	10.0000	
Fluoride	mg/L	BW-1S	12/17/2015	ND	0.5000	
Fluoride	mg/L	BW-1S	02/15/2016	ND	2.5000	
Fluoride	mg/L	BW-1S	05/05/2016	ND	0.5000	
Fluoride	mg/L	BW-1S	08/04/2016	ND	0.5000	
Fluoride	mg/L	BW-1S	11/02/2016	ND	0.5000	
Fluoride	mg/L	BW-1S	02/13/2017	ND	0.5000	
Fluoride	mg/L	BW-1S	05/03/2017	ND	0.5000	
Fluoride	mg/L	BW-1S	08/16/2017	ND	0.5000	
Fluoride	mg/L	BW-1S	11/07/2017	ND	0.5000	
Lead	ug/L	BW-1S	10/05/2011	ND	9.0000	
Lead	ug/L	BW-1S	02/14/2012	ND	9.0000	
Lead	ug/L	BW-1S	08/15/2012	ND	9.0000	
Lead	ug/L	BW-1S	02/14/2013	ND	9.0000	
Lead	ug/L	BW-1S	08/21/2013	ND	9.0000	
Lead	ug/L	BW-1S	08/27/2014	ND	9.0000	
Lead	ug/L	BW-1S	02/13/2015	ND	9.0000	
Lead	ug/L	BW-1S	08/17/2015	ND	9.0000	
Lead	ug/L	BW-1S	12/17/2015	ND	9.0000	
Lead	ug/L	BW-1S	02/15/2016	ND	9.0000	
Lead	ug/L	BW-1S	05/05/2016	ND	9.0000	
Lead	ug/L	BW-1S	08/04/2016	ND	9.0000	
Lead	ug/L	BW-1S	11/02/2016	ND	9.0000	
Lead	ug/L	BW-1S	02/13/2017	ND	9.0000	
Lead	ug/L	BW-1S	05/03/2017	ND	9.0000	
Lead	ug/L	BW-1S	08/16/2017	ND	9.0000	
Lead	ug/L	BW-1S	11/07/2017	ND	9.0000	
Lithium	ug/L	BW-1S	12/17/2015	ND	10.0000	
Lithium	ug/L	BW-1S	02/15/2016	ND	20.0000	
Lithium	ug/L	BW-1S	05/05/2016	ND	20.0000	
Lithium	ug/L	BW-1S	08/04/2016	ND	20.0000	
Lithium	ug/L	BW-1S	11/02/2016	ND	20.0000	
Lithium	ug/L	BW-1S	02/13/2017	ND	20.0000	
Lithium	ug/L	BW-1S	05/03/2017	ND	20.0000	
Lithium	ug/L	BW-1S	08/16/2017	ND	20.0000	
Lithium	ug/L	BW-1S	11/07/2017	ND	20.0000	
Mercury	ug/L	BW-1S	10/05/2011	ND	0.2000	
Mercury	ug/L	BW-1S	02/14/2012	ND	0.2000	
Mercury	ug/L	BW-1S	08/15/2012	ND	0.2000	
Mercury	ug/L	BW-1S	02/14/2013	ND	0.2000	
Mercury	ug/L	BW-1S	08/21/2013	ND	0.2000	
Mercury	ug/L	BW-1S	08/27/2014	ND	0.2000	
Mercury	ug/L	BW-1S	02/13/2015	ND	0.2000	
Mercury	ug/L	BW-1S	08/17/2015	ND	0.2000	
Mercury	ug/L	BW-1S	12/17/2015	ND	0.2000	
Mercury	ug/L	BW-1S	02/15/2016	ND	0.2000	
Mercury	ug/L	BW-1S	05/05/2016	ND	0.2000	
Mercury	ug/L	BW-1S	08/04/2016	ND	0.2000	
Mercury	ug/L	BW-1S	11/02/2016	ND	0.2000	
Mercury	ug/L	BW-1S	02/13/2017	ND	0.2000	
Mercury	ug/L	BW-1S	05/03/2017	ND	0.2000	
Mercury	ug/L	BW-1S	08/16/2017	ND	0.2000	
Mercury	ug/L	BW-1S	11/07/2017	ND	0.2000	
Molybdenum	ug/L	BW-1S	12/17/2015	ND	20.0000	
Molybdenum	ug/L	BW-1S	02/15/2016	ND	20.0000	
Molybdenum	ug/L	BW-1S	05/05/2016	ND	20.0000	
Molybdenum	ug/L	BW-1S	08/04/2016	ND	20.0000	
Molybdenum	ug/L	BW-1S	11/02/2016	ND	20.0000	
Molybdenum	ug/L	BW-1S	02/13/2017	ND	20.0000	
Molybdenum	ug/L	BW-1S	05/03/2017	ND	20.0000	
Molybdenum	ug/L	BW-1S	08/16/2017	ND	20.0000	
Molybdenum	ug/L	BW-1S	11/07/2017	ND	20.0000	
pH (Field)	S.U.	BW-1S	10/05/2011		4.6300	
pH (Field)	S.U.	BW-1S	02/14/2012		4.0100	
pH (Field)	S.U.	BW-1S	08/15/2012		4.5400	
pH (Field)	S.U.	BW-1S	02/14/2013		4.1600	
pH (Field)	S.U.	BW-1S	08/21/2013		4.2400	
pH (Field)	S.U.	BW-1S	08/27/2014		4.6600	
pH (Field)	S.U.	BW-1S	02/13/2015		4.6100	
pH (Field)	S.U.	BW-1S	08/17/2015		4.7200	
pH (Field)	S.U.	BW-1S	12/17/2015		4.6700	
pH (Field)	S.U.	BW-1S	02/15/2016		4.8000	
pH (Field)	S.U.	BW-1S	02/25/2016		4.7300	
pH (Field)	S.U.	BW-1S	05/05/2016		4.3200	
pH (Field)	S.U.	BW-1S	08/04/2016		5.1100	

* - Outlier for that well and constituent.
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Table 1

Upgradient Data

Constituent	Units	Well	Date		Result	
pH (Field)	S.U.	BW-1S	11/02/2016		4.6000	
pH (Field)	S.U.	BW-1S	02/13/2017		4.6500	
pH (Field)	S.U.	BW-1S	05/03/2017		4.4400	
pH (Field)	S.U.	BW-1S	08/16/2017		4.0300	
pH (Field)	S.U.	BW-1S	11/07/2017		4.1300	
Radium-226	pCi/L	BW-1S	12/17/2015	ND	0.0613	
Radium-226	pCi/L	BW-1S	02/25/2016	ND	0.1850	
Radium-226	pCi/L	BW-1S	05/05/2016	ND	0.0613	
Radium-226	pCi/L	BW-1S	08/04/2016	ND	0.0673	
Radium-226	pCi/L	BW-1S	11/02/2016	ND	0.2680	
Radium-226	pCi/L	BW-1S	02/13/2017	ND	0.1290	
Radium-226	pCi/L	BW-1S	05/03/2017	ND	0.1660	
Radium-226	pCi/L	BW-1S	08/16/2017		0.3270	
Radium-226	pCi/L	BW-1S	11/07/2017		0.3720	
Radium-228	pCi/L	BW-1S	12/17/2015		0.1510	
Radium-228	pCi/L	BW-1S	02/25/2016		0.4510	
Radium-228	pCi/L	BW-1S	05/05/2016	ND	0.3790	
Radium-228	pCi/L	BW-1S	08/04/2016	ND	0.4000	
Radium-228	pCi/L	BW-1S	11/02/2016	ND	0.4900	
Radium-228	pCi/L	BW-1S	02/13/2017	ND	0.4830	
Radium-228	pCi/L	BW-1S	05/03/2017	ND	0.4270	
Radium-228	pCi/L	BW-1S	08/16/2017		0.6960	
Radium-228	pCi/L	BW-1S	11/07/2017		0.5760	
Residue, filterable (tds)	mg/L	BW-1S	10/05/2011		78.0000	
Residue, filterable (tds)	mg/L	BW-1S	02/14/2012		110.0000	
Residue, filterable (tds)	mg/L	BW-1S	08/15/2012		120.0000	
Residue, filterable (tds)	mg/L	BW-1S	02/14/2013		110.0000	
Residue, filterable (tds)	mg/L	BW-1S	08/21/2013		96.0000	
Residue, filterable (tds)	mg/L	BW-1S	08/27/2014		140.0000	
Residue, filterable (tds)	mg/L	BW-1S	02/13/2015		120.0000	
Residue, filterable (tds)	mg/L	BW-1S	08/17/2015		100.0000	
Residue, filterable (tds)	mg/L	BW-1S	12/17/2015		100.0000	
Residue, filterable (tds)	mg/L	BW-1S	02/15/2016		110.0000	
Residue, filterable (tds)	mg/L	BW-1S	05/05/2016		130.0000	
Residue, filterable (tds)	mg/L	BW-1S	08/04/2016		120.0000	
Residue, filterable (tds)	mg/L	BW-1S	11/02/2016		120.0000	
Residue, filterable (tds)	mg/L	BW-1S	02/13/2017		110.0000	
Residue, filterable (tds)	mg/L	BW-1S	05/03/2017		130.0000	
Residue, filterable (tds)	mg/L	BW-1S	08/16/2017		130.0000	
Residue, filterable (tds)	mg/L	BW-1S	11/07/2017		120.0000	
Selenium	ug/L	BW-1S	10/05/2011	ND	15.0000	
Selenium	ug/L	BW-1S	02/14/2012	ND	15.0000	
Selenium	ug/L	BW-1S	08/15/2012	ND	15.0000	
Selenium	ug/L	BW-1S	02/14/2013	ND	15.0000	
Selenium	ug/L	BW-1S	08/21/2013	ND	15.0000	
Selenium	ug/L	BW-1S	08/27/2014	ND	15.0000	
Selenium	ug/L	BW-1S	02/13/2015	ND	15.0000	
Selenium	ug/L	BW-1S	08/17/2015	ND	15.0000	
Selenium	ug/L	BW-1S	12/17/2015	ND	15.0000	
Selenium	ug/L	BW-1S	02/15/2016	ND	15.0000	
Selenium	ug/L	BW-1S	05/05/2016	ND	15.0000	
Selenium	ug/L	BW-1S	08/04/2016	ND	15.0000	
Selenium	ug/L	BW-1S	11/02/2016	ND	15.0000	
Selenium	ug/L	BW-1S	02/13/2017	ND	15.0000	
Selenium	ug/L	BW-1S	05/03/2017	ND	20.0000	
Selenium	ug/L	BW-1S	08/16/2017	ND	20.0000	
Selenium	ug/L	BW-1S	11/07/2017	ND	20.0000	
Sulfate	mg/L	BW-1S	12/17/2015		9.6000	
Sulfate	mg/L	BW-1S	02/15/2016	ND	25.0000	
Sulfate	mg/L	BW-1S	05/05/2016		11.0000	
Sulfate	mg/L	BW-1S	08/04/2016		9.0000	
Sulfate	mg/L	BW-1S	11/02/2016		9.0000	
Sulfate	mg/L	BW-1S	02/13/2017		9.5000	
Sulfate	mg/L	BW-1S	05/03/2017		13.0000	
Sulfate	mg/L	BW-1S	08/16/2017		21.0000	
Sulfate	mg/L	BW-1S	11/07/2017		18.0000	
Thallium	ug/L	BW-1S	10/05/2011	ND	1.0000	
Thallium	ug/L	BW-1S	02/14/2012	ND	1.0000	
Thallium	ug/L	BW-1S	08/15/2012	ND	1.0000	
Thallium	ug/L	BW-1S	02/14/2013	ND	1.0000	
Thallium	ug/L	BW-1S	08/21/2013	ND	1.0000	
Thallium	ug/L	BW-1S	08/27/2014	ND	1.0000	
Thallium	ug/L	BW-1S	02/13/2015	ND	1.0000	
Thallium	ug/L	BW-1S	08/17/2015	ND	1.0000	
Thallium	ug/L	BW-1S	12/17/2015	ND	1.0000	
Thallium	ug/L	BW-1S	02/15/2016	ND	1.0000	

* - Outlier for that well and constituent.
ND = Not detected, result = detection limit.

Table 1

Upgradient Data

Constituent	Units	Well	Date		Result	
Thallium	ug/L	BW-1S	05/05/2016	ND	1.0000	
Thallium	ug/L	BW-1S	08/04/2016	ND	1.0000	
Thallium	ug/L	BW-1S	11/02/2016	ND	1.0000	
Thallium	ug/L	BW-1S	02/13/2017	ND	1.0000	
Thallium	ug/L	BW-1S	05/03/2017	ND	1.0000	
Thallium	ug/L	BW-1S	08/16/2017	ND	1.0000	
Thallium	ug/L	BW-1S	11/07/2017	ND	1.0000	
Antimony	ug/L	BW-2S	10/05/2011	ND	2.0000	
Antimony	ug/L	BW-2S	02/14/2012	ND	2.0000	
Antimony	ug/L	BW-2S	08/15/2012	ND	2.0000	
Antimony	ug/L	BW-2S	02/14/2013	ND	2.0000	
Antimony	ug/L	BW-2S	08/21/2013	ND	2.0000	
Antimony	ug/L	BW-2S	08/27/2014	ND	2.0000	
Antimony	ug/L	BW-2S	02/13/2015	ND	2.0000	
Antimony	ug/L	BW-2S	08/17/2015	ND	2.0000	
Antimony	ug/L	BW-2S	12/17/2015	ND	2.0000	
Antimony	ug/L	BW-2S	02/15/2016	ND	2.0000	
Antimony	ug/L	BW-2S	05/05/2016	ND	2.0000	
Antimony	ug/L	BW-2S	08/04/2016	ND	2.0000	
Antimony	ug/L	BW-2S	11/02/2016	ND	2.0000	
Antimony	ug/L	BW-2S	02/13/2017	ND	2.0000	
Antimony	ug/L	BW-2S	05/03/2017	ND	2.0000	
Antimony	ug/L	BW-2S	08/16/2017	ND	2.0000	
Antimony	ug/L	BW-2S	11/07/2017	ND	2.0000	
Arsenic	ug/L	BW-2S	10/05/2011	ND	5.0000	
Arsenic	ug/L	BW-2S	02/14/2012	ND	5.0000	
Arsenic	ug/L	BW-2S	08/15/2012	ND	5.0000	
Arsenic	ug/L	BW-2S	02/14/2013	ND	5.0000	
Arsenic	ug/L	BW-2S	08/21/2013	ND	5.0000	
Arsenic	ug/L	BW-2S	08/27/2014	ND	5.0000	
Arsenic	ug/L	BW-2S	02/13/2015	ND	5.0000	
Arsenic	ug/L	BW-2S	08/17/2015	ND	5.0000	
Arsenic	ug/L	BW-2S	12/17/2015	ND	5.0000	
Arsenic	ug/L	BW-2S	02/15/2016		5.3000	
Arsenic	ug/L	BW-2S	05/05/2016		7.6000	
Arsenic	ug/L	BW-2S	08/04/2016		7.8000	
Arsenic	ug/L	BW-2S	11/02/2016	ND	5.0000	
Arsenic	ug/L	BW-2S	02/13/2017	ND	5.0000	
Arsenic	ug/L	BW-2S	05/03/2017	ND	5.0000	
Arsenic	ug/L	BW-2S	08/16/2017	ND	5.0000	
Arsenic	ug/L	BW-2S	11/07/2017	ND	5.0000	
Barium	ug/L	BW-2S	10/05/2011		14.0000	
Barium	ug/L	BW-2S	02/14/2012		13.0000	
Barium	ug/L	BW-2S	08/15/2012		21.0000	
Barium	ug/L	BW-2S	02/14/2013		15.0000	
Barium	ug/L	BW-2S	08/21/2013		12.0000	
Barium	ug/L	BW-2S	08/27/2014	ND	10.0000	
Barium	ug/L	BW-2S	02/13/2015	ND	10.0000	
Barium	ug/L	BW-2S	08/17/2015		12.0000	
Barium	ug/L	BW-2S	12/17/2015	ND	10.0000	
Barium	ug/L	BW-2S	02/15/2016	ND	10.0000	
Barium	ug/L	BW-2S	05/05/2016	ND	10.0000	
Barium	ug/L	BW-2S	08/04/2016	ND	10.0000	
Barium	ug/L	BW-2S	11/02/2016	ND	10.0000	
Barium	ug/L	BW-2S	02/13/2017	ND	10.0000	
Barium	ug/L	BW-2S	05/03/2017	ND	10.0000	
Barium	ug/L	BW-2S	08/16/2017		11.0000	
Barium	ug/L	BW-2S	11/07/2017	ND	10.0000	
Beryllium	ug/L	BW-2S	10/05/2011	ND	1.0000	
Beryllium	ug/L	BW-2S	02/14/2012	ND	1.0000	
Beryllium	ug/L	BW-2S	08/15/2012	ND	1.0000	
Beryllium	ug/L	BW-2S	02/14/2013	ND	1.0000	
Beryllium	ug/L	BW-2S	08/21/2013	ND	1.0000	
Beryllium	ug/L	BW-2S	08/27/2014	ND	1.0000	
Beryllium	ug/L	BW-2S	02/13/2015	ND	1.0000	
Beryllium	ug/L	BW-2S	08/17/2015	ND	1.0000	
Beryllium	ug/L	BW-2S	12/17/2015	ND	1.0000	
Beryllium	ug/L	BW-2S	02/15/2016	ND	1.0000	
Beryllium	ug/L	BW-2S	05/05/2016	ND	1.0000	
Beryllium	ug/L	BW-2S	08/04/2016	ND	1.0000	
Beryllium	ug/L	BW-2S	11/02/2016	ND	1.0000	
Beryllium	ug/L	BW-2S	02/13/2017	ND	1.0000	
Beryllium	ug/L	BW-2S	05/03/2017	ND	1.0000	
Beryllium	ug/L	BW-2S	08/16/2017	ND	1.0000	
Beryllium	ug/L	BW-2S	11/07/2017	ND	1.0000	
Boron	ug/L	BW-2S	12/17/2015	ND	100.0000	

* - Outlier for that well and constituent.
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Table 1

Upgradient Data

Constituent	Units	Well	Date		Result	
Boron	ug/L	BW-2S	02/15/2016	ND	100.0000	
Boron	ug/L	BW-2S	05/05/2016	ND	100.0000	
Boron	ug/L	BW-2S	08/04/2016	ND	100.0000	
Boron	ug/L	BW-2S	11/02/2016	ND	100.0000	
Boron	ug/L	BW-2S	02/13/2017	ND	100.0000	
Boron	ug/L	BW-2S	05/03/2017	ND	100.0000	
Boron	ug/L	BW-2S	08/16/2017	ND	100.0000	
Boron	ug/L	BW-2S	11/07/2017	ND	100.0000	
Cadmium	ug/L	BW-2S	10/05/2011	ND	5.0000	
Cadmium	ug/L	BW-2S	02/14/2012	ND	5.0000	
Cadmium	ug/L	BW-2S	08/15/2012	ND	5.0000	
Cadmium	ug/L	BW-2S	02/14/2013	ND	5.0000	
Cadmium	ug/L	BW-2S	08/21/2013	ND	5.0000	
Cadmium	ug/L	BW-2S	08/27/2014	ND	5.0000	
Cadmium	ug/L	BW-2S	02/13/2015	ND	5.0000	
Cadmium	ug/L	BW-2S	08/17/2015	ND	5.0000	
Cadmium	ug/L	BW-2S	12/17/2015	ND	5.0000	
Cadmium	ug/L	BW-2S	02/15/2016	ND	5.0000	
Cadmium	ug/L	BW-2S	05/05/2016	ND	5.0000	
Cadmium	ug/L	BW-2S	08/04/2016	ND	5.0000	
Cadmium	ug/L	BW-2S	11/02/2016	ND	5.0000	
Cadmium	ug/L	BW-2S	02/13/2017	ND	5.0000	
Cadmium	ug/L	BW-2S	05/03/2017	ND	5.0000	
Cadmium	ug/L	BW-2S	08/16/2017	ND	5.0000	
Cadmium	ug/L	BW-2S	11/07/2017	ND	5.0000	
Calcium	mg/L	BW-2S	12/17/2015		9.5000	
Calcium	mg/L	BW-2S	02/15/2016		21.0000	
Calcium	mg/L	BW-2S	05/05/2016		18.0000	
Calcium	mg/L	BW-2S	08/04/2016		23.0000	
Calcium	mg/L	BW-2S	11/02/2016		12.0000	
Calcium	mg/L	BW-2S	02/13/2017		4.6000	
Calcium	mg/L	BW-2S	05/03/2017		4.3000	
Calcium	mg/L	BW-2S	08/16/2017		23.0000	
Calcium	mg/L	BW-2S	11/07/2017		5.3000	
Chloride	mg/L	BW-2S	10/05/2011		10.0000	
Chloride	mg/L	BW-2S	02/14/2012		10.0000	
Chloride	mg/L	BW-2S	08/15/2012		14.0000	
Chloride	mg/L	BW-2S	02/14/2013		9.6000	
Chloride	mg/L	BW-2S	08/21/2013		9.1000	
Chloride	mg/L	BW-2S	08/27/2014		12.0000	
Chloride	mg/L	BW-2S	02/13/2015		11.0000	
Chloride	mg/L	BW-2S	08/17/2015		9.7000	
Chloride	mg/L	BW-2S	12/17/2015		12.0000	
Chloride	mg/L	BW-2S	02/15/2016		8.4000	
Chloride	mg/L	BW-2S	05/05/2016		9.4000	
Chloride	mg/L	BW-2S	08/04/2016		8.1000	
Chloride	mg/L	BW-2S	11/02/2016		12.0000	
Chloride	mg/L	BW-2S	02/13/2017		13.0000	
Chloride	mg/L	BW-2S	05/03/2017		13.0000	
Chloride	mg/L	BW-2S	08/16/2017		8.8000	
Chloride	mg/L	BW-2S	11/07/2017		16.0000	
Chromium	ug/L	BW-2S	10/05/2011	ND	10.0000	
Chromium	ug/L	BW-2S	02/14/2012	ND	10.0000	
Chromium	ug/L	BW-2S	08/15/2012	ND	10.0000	
Chromium	ug/L	BW-2S	02/14/2013	ND	10.0000	
Chromium	ug/L	BW-2S	08/21/2013	ND	10.0000	
Chromium	ug/L	BW-2S	08/27/2014	ND	10.0000	
Chromium	ug/L	BW-2S	02/13/2015	ND	10.0000	
Chromium	ug/L	BW-2S	08/17/2015	ND	10.0000	
Chromium	ug/L	BW-2S	12/17/2015	ND	10.0000	
Chromium	ug/L	BW-2S	02/15/2016	ND	10.0000	
Chromium	ug/L	BW-2S	05/05/2016	ND	10.0000	
Chromium	ug/L	BW-2S	08/04/2016	ND	10.0000	
Chromium	ug/L	BW-2S	11/02/2016	ND	10.0000	
Chromium	ug/L	BW-2S	02/13/2017	ND	10.0000	
Chromium	ug/L	BW-2S	05/03/2017	ND	10.0000	
Chromium	ug/L	BW-2S	08/16/2017	ND	10.0000	
Chromium	ug/L	BW-2S	11/07/2017	ND	10.0000	
Cobalt	ug/L	BW-2S	10/05/2011	ND	10.0000	
Cobalt	ug/L	BW-2S	02/14/2012	ND	10.0000	
Cobalt	ug/L	BW-2S	08/15/2012	ND	10.0000	
Cobalt	ug/L	BW-2S	02/14/2013	ND	10.0000	
Cobalt	ug/L	BW-2S	08/21/2013	ND	10.0000	
Cobalt	ug/L	BW-2S	08/27/2014	ND	10.0000	
Cobalt	ug/L	BW-2S	02/13/2015	ND	10.0000	
Cobalt	ug/L	BW-2S	08/17/2015	ND	10.0000	

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Table 1

Upgradient Data

Constituent	Units	Well	Date		Result	
Cobalt	ug/L	BW-2S	12/17/2015	ND	10.0000	
Cobalt	ug/L	BW-2S	02/15/2016	ND	10.0000	
Cobalt	ug/L	BW-2S	05/05/2016	ND	10.0000	
Cobalt	ug/L	BW-2S	08/04/2016	ND	10.0000	
Cobalt	ug/L	BW-2S	11/02/2016	ND	10.0000	
Cobalt	ug/L	BW-2S	02/13/2017	ND	10.0000	
Cobalt	ug/L	BW-2S	05/03/2017	ND	10.0000	
Cobalt	ug/L	BW-2S	08/16/2017	ND	10.0000	
Cobalt	ug/L	BW-2S	11/07/2017	ND	10.0000	
Fluoride	mg/L	BW-2S	12/17/2015	ND	0.5000	
Fluoride	mg/L	BW-2S	02/15/2016	ND	0.5000	
Fluoride	mg/L	BW-2S	05/05/2016	ND	0.5000	
Fluoride	mg/L	BW-2S	08/04/2016	ND	0.5000	
Fluoride	mg/L	BW-2S	11/02/2016	ND	0.5000	
Fluoride	mg/L	BW-2S	02/13/2017	ND	0.5000	
Fluoride	mg/L	BW-2S	05/03/2017	ND	0.5000	
Fluoride	mg/L	BW-2S	08/16/2017	ND	0.5000	
Fluoride	mg/L	BW-2S	11/07/2017	ND	0.5000	
Lead	ug/L	BW-2S	10/05/2011	ND	9.0000	
Lead	ug/L	BW-2S	02/14/2012	ND	9.0000	
Lead	ug/L	BW-2S	08/15/2012	ND	9.0000	
Lead	ug/L	BW-2S	02/14/2013	ND	9.0000	
Lead	ug/L	BW-2S	08/21/2013	ND	9.0000	
Lead	ug/L	BW-2S	08/27/2014	ND	9.0000	
Lead	ug/L	BW-2S	02/13/2015	ND	9.0000	
Lead	ug/L	BW-2S	08/17/2015	ND	9.0000	
Lead	ug/L	BW-2S	12/17/2015	ND	9.0000	
Lead	ug/L	BW-2S	02/15/2016	ND	9.0000	
Lead	ug/L	BW-2S	05/05/2016	ND	9.0000	
Lead	ug/L	BW-2S	08/04/2016	ND	9.0000	
Lead	ug/L	BW-2S	11/02/2016	ND	9.0000	
Lead	ug/L	BW-2S	02/13/2017	ND	9.0000	
Lead	ug/L	BW-2S	05/03/2017	ND	9.0000	
Lead	ug/L	BW-2S	08/16/2017	ND	9.0000	
Lead	ug/L	BW-2S	11/07/2017	ND	9.0000	
Lithium	ug/L	BW-2S	12/17/2015	ND	10.0000	
Lithium	ug/L	BW-2S	02/15/2016	ND	20.0000	
Lithium	ug/L	BW-2S	05/05/2016	ND	20.0000	
Lithium	ug/L	BW-2S	08/04/2016	ND	20.0000	
Lithium	ug/L	BW-2S	11/02/2016	ND	20.0000	
Lithium	ug/L	BW-2S	02/13/2017	ND	20.0000	
Lithium	ug/L	BW-2S	05/03/2017	ND	20.0000	
Lithium	ug/L	BW-2S	08/16/2017	ND	20.0000	
Lithium	ug/L	BW-2S	11/07/2017	ND	20.0000	
Mercury	ug/L	BW-2S	10/05/2011	ND	0.2000	
Mercury	ug/L	BW-2S	02/14/2012	ND	0.2000	
Mercury	ug/L	BW-2S	08/15/2012	ND	0.2000	
Mercury	ug/L	BW-2S	02/14/2013	ND	0.2000	
Mercury	ug/L	BW-2S	08/21/2013	ND	0.2000	
Mercury	ug/L	BW-2S	08/27/2014	ND	0.2000	
Mercury	ug/L	BW-2S	02/13/2015	ND	0.2000	
Mercury	ug/L	BW-2S	08/17/2015	ND	0.2000	
Mercury	ug/L	BW-2S	12/17/2015	ND	0.2000	
Mercury	ug/L	BW-2S	02/15/2016	ND	0.2000	
Mercury	ug/L	BW-2S	05/05/2016	ND	0.2000	
Mercury	ug/L	BW-2S	08/04/2016	ND	0.2000	
Mercury	ug/L	BW-2S	11/02/2016	ND	0.2000	
Mercury	ug/L	BW-2S	02/13/2017	ND	0.2000	
Mercury	ug/L	BW-2S	05/03/2017	ND	0.2000	
Mercury	ug/L	BW-2S	08/16/2017	ND	0.2000	
Mercury	ug/L	BW-2S	11/07/2017	ND	0.2000	
Molybdenum	ug/L	BW-2S	12/17/2015	ND	20.0000	
Molybdenum	ug/L	BW-2S	02/15/2016	ND	20.0000	
Molybdenum	ug/L	BW-2S	05/05/2016	ND	20.0000	
Molybdenum	ug/L	BW-2S	08/04/2016	ND	20.0000	
Molybdenum	ug/L	BW-2S	11/02/2016	ND	20.0000	
Molybdenum	ug/L	BW-2S	02/13/2017	ND	20.0000	
Molybdenum	ug/L	BW-2S	05/03/2017	ND	20.0000	
Molybdenum	ug/L	BW-2S	08/16/2017	ND	20.0000	
Molybdenum	ug/L	BW-2S	11/07/2017	ND	20.0000	
pH (Field)	S.U.	BW-2S	10/05/2011		5.4500	
pH (Field)	S.U.	BW-2S	02/14/2012		5.0100	
pH (Field)	S.U.	BW-2S	08/15/2012		5.8400	
pH (Field)	S.U.	BW-2S	02/14/2013		4.8000	
pH (Field)	S.U.	BW-2S	08/21/2013		5.5600	
pH (Field)	S.U.	BW-2S	08/27/2014		5.4700	

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Table 1

Upgradient Data

Constituent	Units	Well	Date		Result	
pH (Field)	S.U.	BW-2S	02/13/2015		5.5200	
pH (Field)	S.U.	BW-2S	08/17/2015		6.1100	
pH (Field)	S.U.	BW-2S	12/17/2015		5.5400	
pH (Field)	S.U.	BW-2S	02/15/2016		5.8700	
pH (Field)	S.U.	BW-2S	02/25/2016		5.9400	
pH (Field)	S.U.	BW-2S	05/05/2016		5.5100	
pH (Field)	S.U.	BW-2S	08/04/2016		5.6100	
pH (Field)	S.U.	BW-2S	11/02/2016		5.5700	
pH (Field)	S.U.	BW-2S	02/13/2017		5.2100	
pH (Field)	S.U.	BW-2S	05/03/2017		5.0300	
pH (Field)	S.U.	BW-2S	08/16/2017		5.3500	
pH (Field)	S.U.	BW-2S	11/07/2017		5.4100	
Radium-226	pCi/L	BW-2S	12/17/2015	ND	0.0756	
Radium-226	pCi/L	BW-2S	02/25/2016	ND	0.1260	
Radium-226	pCi/L	BW-2S	05/05/2016	ND	0.0595	
Radium-226	pCi/L	BW-2S	08/04/2016	ND	0.0673	
Radium-226	pCi/L	BW-2S	11/02/2016	ND	0.2420	
Radium-226	pCi/L	BW-2S	02/13/2017	ND	0.1330	
Radium-226	pCi/L	BW-2S	05/03/2017	ND	0.1120	
Radium-226	pCi/L	BW-2S	08/16/2017		0.3060	
Radium-226	pCi/L	BW-2S	11/07/2017		0.2940	
Radium-228	pCi/L	BW-2S	12/17/2015	ND	0.2960	
Radium-228	pCi/L	BW-2S	02/25/2016		0.6940	
Radium-228	pCi/L	BW-2S	05/05/2016		0.3290	
Radium-228	pCi/L	BW-2S	08/04/2016		0.1940	
Radium-228	pCi/L	BW-2S	11/02/2016		0.2740	
Radium-228	pCi/L	BW-2S	02/13/2017	ND	0.5000	
Radium-228	pCi/L	BW-2S	05/03/2017	ND	0.3830	
Radium-228	pCi/L	BW-2S	08/16/2017		0.8060	
Radium-228	pCi/L	BW-2S	11/07/2017		0.3800	
Residue, filterable (tds)	mg/L	BW-2S	10/05/2011		60.0000	
Residue, filterable (tds)	mg/L	BW-2S	02/14/2012		52.0000	
Residue, filterable (tds)	mg/L	BW-2S	08/15/2012		280.0000	
Residue, filterable (tds)	mg/L	BW-2S	02/14/2013		73.0000	
Residue, filterable (tds)	mg/L	BW-2S	08/21/2013		170.0000	
Residue, filterable (tds)	mg/L	BW-2S	08/27/2014		66.0000	
Residue, filterable (tds)	mg/L	BW-2S	02/13/2015		89.0000	
Residue, filterable (tds)	mg/L	BW-2S	08/17/2015		160.0000	
Residue, filterable (tds)	mg/L	BW-2S	12/17/2015		70.0000	
Residue, filterable (tds)	mg/L	BW-2S	02/15/2016		140.0000	
Residue, filterable (tds)	mg/L	BW-2S	05/05/2016		120.0000	
Residue, filterable (tds)	mg/L	BW-2S	08/04/2016		150.0000	
Residue, filterable (tds)	mg/L	BW-2S	11/02/2016		100.0000	
Residue, filterable (tds)	mg/L	BW-2S	02/13/2017		61.0000	
Residue, filterable (tds)	mg/L	BW-2S	05/03/2017		62.0000	
Residue, filterable (tds)	mg/L	BW-2S	08/16/2017		130.0000	
Residue, filterable (tds)	mg/L	BW-2S	11/07/2017		59.0000	
Selenium	ug/L	BW-2S	10/05/2011	ND	15.0000	
Selenium	ug/L	BW-2S	02/14/2012	ND	15.0000	
Selenium	ug/L	BW-2S	08/15/2012	ND	15.0000	
Selenium	ug/L	BW-2S	02/14/2013	ND	15.0000	
Selenium	ug/L	BW-2S	08/21/2013	ND	15.0000	
Selenium	ug/L	BW-2S	08/27/2014	ND	15.0000	
Selenium	ug/L	BW-2S	02/13/2015	ND	15.0000	
Selenium	ug/L	BW-2S	08/17/2015	ND	15.0000	
Selenium	ug/L	BW-2S	12/17/2015	ND	15.0000	
Selenium	ug/L	BW-2S	02/15/2016	ND	15.0000	
Selenium	ug/L	BW-2S	05/05/2016	ND	15.0000	
Selenium	ug/L	BW-2S	08/04/2016	ND	15.0000	
Selenium	ug/L	BW-2S	11/02/2016	ND	15.0000	
Selenium	ug/L	BW-2S	02/13/2017	ND	15.0000	
Selenium	ug/L	BW-2S	05/03/2017	ND	20.0000	
Selenium	ug/L	BW-2S	08/16/2017	ND	20.0000	
Selenium	ug/L	BW-2S	11/07/2017	ND	20.0000	
Sulfate	mg/L	BW-2S	12/17/2015	ND	5.0000	
Sulfate	mg/L	BW-2S	02/15/2016	ND	5.0000	
Sulfate	mg/L	BW-2S	05/05/2016	ND	5.0000	
Sulfate	mg/L	BW-2S	08/04/2016	ND	5.0000	
Sulfate	mg/L	BW-2S	11/02/2016	ND	5.0000	
Sulfate	mg/L	BW-2S	02/13/2017	ND	5.0000	
Sulfate	mg/L	BW-2S	05/03/2017	ND	5.0000	
Sulfate	mg/L	BW-2S	08/16/2017		9.2000	
Sulfate	mg/L	BW-2S	11/07/2017	ND	5.0000	
Thallium	ug/L	BW-2S	10/05/2011	ND	1.0000	
Thallium	ug/L	BW-2S	02/14/2012	ND	1.0000	
Thallium	ug/L	BW-2S	08/15/2012	ND	1.0000	

* - Outlier for that well and constituent.
ND = Not detected, result = detection limit.

Table 1

Upgradient Data

Constituent	Units	Well	Date		Result	
Thallium	ug/L	BW-2S	02/14/2013	ND	1.0000	
Thallium	ug/L	BW-2S	08/21/2013	ND	1.0000	
Thallium	ug/L	BW-2S	08/27/2014	ND	1.0000	
Thallium	ug/L	BW-2S	02/13/2015	ND	1.0000	
Thallium	ug/L	BW-2S	08/17/2015	ND	1.0000	
Thallium	ug/L	BW-2S	12/17/2015	ND	1.0000	
Thallium	ug/L	BW-2S	02/15/2016	ND	1.0000	
Thallium	ug/L	BW-2S	05/05/2016	ND	1.0000	
Thallium	ug/L	BW-2S	08/04/2016	ND	1.0000	
Thallium	ug/L	BW-2S	11/02/2016	ND	1.0000	
Thallium	ug/L	BW-2S	02/13/2017	ND	1.0000	
Thallium	ug/L	BW-2S	05/03/2017	ND	1.0000	
Thallium	ug/L	BW-2S	08/16/2017	ND	1.0000	
Thallium	ug/L	BW-2S	11/07/2017	ND	1.0000	
Antimony	ug/L	BW-3SR	02/15/2012	ND	2.0000	
Antimony	ug/L	BW-3SR	08/16/2012	ND	2.0000	
Antimony	ug/L	BW-3SR	02/15/2013	ND	2.0000	
Antimony	ug/L	BW-3SR	08/21/2013	ND	2.0000	
Antimony	ug/L	BW-3SR	08/27/2014	ND	2.0000	
Antimony	ug/L	BW-3SR	02/13/2015	ND	2.0000	
Antimony	ug/L	BW-3SR	08/17/2015	ND	2.0000	
Antimony	ug/L	BW-3SR	12/17/2015	ND	2.0000	
Antimony	ug/L	BW-3SR	02/16/2016	ND	2.0000	
Antimony	ug/L	BW-3SR	05/05/2016	ND	2.0000	
Antimony	ug/L	BW-3SR	08/04/2016	ND	2.0000	
Antimony	ug/L	BW-3SR	11/03/2016	ND	2.0000	
Antimony	ug/L	BW-3SR	02/13/2017	ND	2.0000	
Antimony	ug/L	BW-3SR	05/03/2017	ND	2.0000	
Antimony	ug/L	BW-3SR	08/16/2017	ND	2.0000	
Antimony	ug/L	BW-3SR	11/07/2017	ND	2.0000	
Arsenic	ug/L	BW-3SR	02/15/2012	ND	5.0000	
Arsenic	ug/L	BW-3SR	08/16/2012	ND	5.0000	
Arsenic	ug/L	BW-3SR	02/15/2013	ND	5.0000	
Arsenic	ug/L	BW-3SR	08/21/2013	ND	5.0000	
Arsenic	ug/L	BW-3SR	08/27/2014	ND	5.0000	
Arsenic	ug/L	BW-3SR	02/13/2015	ND	5.0000	
Arsenic	ug/L	BW-3SR	08/17/2015	ND	5.0000	
Arsenic	ug/L	BW-3SR	12/17/2015	ND	5.0000	
Arsenic	ug/L	BW-3SR	02/16/2016	ND	5.0000	
Arsenic	ug/L	BW-3SR	05/05/2016	ND	5.0000	
Arsenic	ug/L	BW-3SR	08/04/2016	ND	5.0000	
Arsenic	ug/L	BW-3SR	11/03/2016	ND	5.0000	
Arsenic	ug/L	BW-3SR	02/13/2017	ND	5.0000	
Arsenic	ug/L	BW-3SR	05/03/2017	ND	5.0000	
Arsenic	ug/L	BW-3SR	08/16/2017	ND	5.0000	
Arsenic	ug/L	BW-3SR	11/07/2017	ND	5.0000	
Barium	ug/L	BW-3SR	02/15/2012		13.0000	
Barium	ug/L	BW-3SR	08/16/2012		11.0000	
Barium	ug/L	BW-3SR	02/15/2013		13.0000	
Barium	ug/L	BW-3SR	08/21/2013		13.0000	
Barium	ug/L	BW-3SR	08/27/2014		13.0000	
Barium	ug/L	BW-3SR	02/13/2015	ND	10.0000	
Barium	ug/L	BW-3SR	08/17/2015	ND	10.0000	
Barium	ug/L	BW-3SR	12/17/2015	ND	10.0000	
Barium	ug/L	BW-3SR	02/16/2016		18.0000	
Barium	ug/L	BW-3SR	05/05/2016	ND	10.0000	
Barium	ug/L	BW-3SR	08/04/2016	ND	10.0000	
Barium	ug/L	BW-3SR	11/03/2016	ND	10.0000	
Barium	ug/L	BW-3SR	02/13/2017	ND	10.0000	
Barium	ug/L	BW-3SR	05/03/2017		16.0000	
Barium	ug/L	BW-3SR	08/16/2017	ND	10.0000	
Barium	ug/L	BW-3SR	11/07/2017	ND	10.0000	
Beryllium	ug/L	BW-3SR	02/15/2012	ND	1.0000	
Beryllium	ug/L	BW-3SR	08/16/2012	ND	1.0000	
Beryllium	ug/L	BW-3SR	02/15/2013	ND	1.0000	
Beryllium	ug/L	BW-3SR	08/21/2013	ND	1.0000	
Beryllium	ug/L	BW-3SR	08/27/2014	ND	1.0000	
Beryllium	ug/L	BW-3SR	02/13/2015	ND	1.0000	
Beryllium	ug/L	BW-3SR	08/17/2015	ND	1.0000	
Beryllium	ug/L	BW-3SR	12/17/2015	ND	1.0000	
Beryllium	ug/L	BW-3SR	02/16/2016	ND	1.0000	
Beryllium	ug/L	BW-3SR	05/05/2016	ND	1.0000	
Beryllium	ug/L	BW-3SR	08/04/2016	ND	1.0000	
Beryllium	ug/L	BW-3SR	11/03/2016	ND	1.0000	
Beryllium	ug/L	BW-3SR	02/13/2017	ND	1.0000	
Beryllium	ug/L	BW-3SR	05/03/2017	ND	1.0000	

* - Outlier for that well and constituent.
ND = Not detected, result = detection limit.

Table 1

Upgradient Data

Constituent	Units	Well	Date		Result	
Beryllium	ug/L	BW-3SR	08/16/2017	ND	1.0000	
Beryllium	ug/L	BW-3SR	11/07/2017	ND	1.0000	
Boron	ug/L	BW-3SR	12/17/2015	ND	100.0000	
Boron	ug/L	BW-3SR	02/16/2016	ND	100.0000	
Boron	ug/L	BW-3SR	05/05/2016	ND	100.0000	
Boron	ug/L	BW-3SR	08/04/2016	ND	100.0000	
Boron	ug/L	BW-3SR	11/03/2016	ND	100.0000	
Boron	ug/L	BW-3SR	02/13/2017	ND	100.0000	
Boron	ug/L	BW-3SR	05/03/2017		210.0000	
Boron	ug/L	BW-3SR	08/16/2017	ND	100.0000	
Boron	ug/L	BW-3SR	11/07/2017	ND	100.0000	
Cadmium	ug/L	BW-3SR	02/15/2012	ND	5.0000	
Cadmium	ug/L	BW-3SR	08/16/2012	ND	5.0000	
Cadmium	ug/L	BW-3SR	02/15/2013	ND	5.0000	
Cadmium	ug/L	BW-3SR	08/21/2013	ND	5.0000	
Cadmium	ug/L	BW-3SR	08/27/2014	ND	5.0000	
Cadmium	ug/L	BW-3SR	02/13/2015	ND	5.0000	
Cadmium	ug/L	BW-3SR	08/17/2015	ND	5.0000	
Cadmium	ug/L	BW-3SR	12/17/2015	ND	5.0000	
Cadmium	ug/L	BW-3SR	02/16/2016	ND	5.0000	
Cadmium	ug/L	BW-3SR	05/05/2016	ND	5.0000	
Cadmium	ug/L	BW-3SR	08/04/2016	ND	5.0000	
Cadmium	ug/L	BW-3SR	11/03/2016	ND	5.0000	
Cadmium	ug/L	BW-3SR	02/13/2017	ND	5.0000	
Cadmium	ug/L	BW-3SR	05/03/2017	ND	5.0000	
Cadmium	ug/L	BW-3SR	08/16/2017	ND	5.0000	
Cadmium	ug/L	BW-3SR	11/07/2017	ND	5.0000	
Calcium	mg/L	BW-3SR	12/17/2015		27.0000	
Calcium	mg/L	BW-3SR	02/16/2016		2.4000	*
Calcium	mg/L	BW-3SR	05/05/2016		30.0000	
Calcium	mg/L	BW-3SR	08/04/2016		29.0000	
Calcium	mg/L	BW-3SR	11/03/2016		28.0000	
Calcium	mg/L	BW-3SR	02/13/2017		24.0000	
Calcium	mg/L	BW-3SR	05/03/2017		81.0000	
Calcium	mg/L	BW-3SR	08/16/2017		33.0000	
Calcium	mg/L	BW-3SR	11/07/2017		28.0000	
Chloride	mg/L	BW-3SR	02/15/2012		19.0000	
Chloride	mg/L	BW-3SR	08/16/2012		9.9000	
Chloride	mg/L	BW-3SR	02/15/2013		15.0000	
Chloride	mg/L	BW-3SR	08/21/2013		13.0000	
Chloride	mg/L	BW-3SR	08/27/2014		25.0000	
Chloride	mg/L	BW-3SR	02/13/2015		22.0000	
Chloride	mg/L	BW-3SR	08/17/2015		14.0000	
Chloride	mg/L	BW-3SR	12/17/2015		14.0000	
Chloride	mg/L	BW-3SR	02/16/2016		12.0000	
Chloride	mg/L	BW-3SR	05/05/2016		27.0000	
Chloride	mg/L	BW-3SR	08/04/2016		16.0000	
Chloride	mg/L	BW-3SR	11/03/2016		16.0000	
Chloride	mg/L	BW-3SR	02/13/2017		30.0000	
Chloride	mg/L	BW-3SR	05/03/2017		19.0000	
Chloride	mg/L	BW-3SR	08/16/2017		19.0000	
Chloride	mg/L	BW-3SR	11/07/2017		24.0000	
Chromium	ug/L	BW-3SR	02/15/2012	ND	10.0000	
Chromium	ug/L	BW-3SR	08/16/2012	ND	10.0000	
Chromium	ug/L	BW-3SR	02/15/2013	ND	10.0000	
Chromium	ug/L	BW-3SR	08/21/2013	ND	10.0000	
Chromium	ug/L	BW-3SR	08/27/2014	ND	10.0000	
Chromium	ug/L	BW-3SR	02/13/2015	ND	10.0000	
Chromium	ug/L	BW-3SR	08/17/2015	ND	10.0000	
Chromium	ug/L	BW-3SR	12/17/2015	ND	10.0000	
Chromium	ug/L	BW-3SR	02/16/2016	ND	10.0000	
Chromium	ug/L	BW-3SR	05/05/2016	ND	10.0000	
Chromium	ug/L	BW-3SR	08/04/2016	ND	10.0000	
Chromium	ug/L	BW-3SR	11/03/2016	ND	10.0000	
Chromium	ug/L	BW-3SR	02/13/2017	ND	10.0000	
Chromium	ug/L	BW-3SR	05/03/2017	ND	10.0000	
Chromium	ug/L	BW-3SR	08/16/2017	ND	10.0000	
Chromium	ug/L	BW-3SR	11/07/2017	ND	10.0000	
Cobalt	ug/L	BW-3SR	02/15/2012	ND	10.0000	
Cobalt	ug/L	BW-3SR	08/16/2012	ND	10.0000	
Cobalt	ug/L	BW-3SR	02/15/2013	ND	10.0000	
Cobalt	ug/L	BW-3SR	08/21/2013	ND	10.0000	
Cobalt	ug/L	BW-3SR	08/27/2014	ND	10.0000	
Cobalt	ug/L	BW-3SR	02/13/2015	ND	10.0000	
Cobalt	ug/L	BW-3SR	08/17/2015	ND	10.0000	
Cobalt	ug/L	BW-3SR	12/17/2015	ND	10.0000	

* - Outlier for that well and constituent.
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Table 1

Upgradient Data

Constituent	Units	Well	Date		Result	
Cobalt	ug/L	BW-3SR	02/16/2016	ND	10.0000	
Cobalt	ug/L	BW-3SR	05/05/2016	ND	10.0000	
Cobalt	ug/L	BW-3SR	08/04/2016	ND	10.0000	
Cobalt	ug/L	BW-3SR	11/03/2016	ND	10.0000	
Cobalt	ug/L	BW-3SR	02/13/2017	ND	10.0000	
Cobalt	ug/L	BW-3SR	05/03/2017	ND	10.0000	
Cobalt	ug/L	BW-3SR	08/16/2017	ND	10.0000	
Cobalt	ug/L	BW-3SR	11/07/2017	ND	10.0000	
Fluoride	mg/L	BW-3SR	12/17/2015	ND	0.5000	
Fluoride	mg/L	BW-3SR	02/16/2016	ND	0.5000	
Fluoride	mg/L	BW-3SR	05/05/2016	ND	0.5000	
Fluoride	mg/L	BW-3SR	08/04/2016	ND	0.5000	
Fluoride	mg/L	BW-3SR	11/03/2016	ND	0.5000	
Fluoride	mg/L	BW-3SR	02/13/2017	ND	0.5000	
Fluoride	mg/L	BW-3SR	05/03/2017	ND	0.5000	
Fluoride	mg/L	BW-3SR	08/16/2017		0.5900	
Fluoride	mg/L	BW-3SR	11/07/2017	ND	0.5000	
Lead	ug/L	BW-3SR	02/15/2012	ND	9.0000	
Lead	ug/L	BW-3SR	08/16/2012	ND	9.0000	
Lead	ug/L	BW-3SR	02/15/2013	ND	9.0000	
Lead	ug/L	BW-3SR	08/21/2013	ND	9.0000	
Lead	ug/L	BW-3SR	08/27/2014	ND	9.0000	
Lead	ug/L	BW-3SR	02/13/2015	ND	9.0000	
Lead	ug/L	BW-3SR	08/17/2015	ND	9.0000	
Lead	ug/L	BW-3SR	12/17/2015	ND	9.0000	
Lead	ug/L	BW-3SR	02/16/2016	ND	9.0000	
Lead	ug/L	BW-3SR	05/05/2016	ND	9.0000	
Lead	ug/L	BW-3SR	08/04/2016	ND	9.0000	
Lead	ug/L	BW-3SR	11/03/2016	ND	9.0000	
Lead	ug/L	BW-3SR	02/13/2017	ND	9.0000	
Lead	ug/L	BW-3SR	05/03/2017	ND	9.0000	
Lead	ug/L	BW-3SR	08/16/2017	ND	9.0000	
Lead	ug/L	BW-3SR	11/07/2017	ND	9.0000	
Lithium	ug/L	BW-3SR	12/17/2015	ND	10.0000	
Lithium	ug/L	BW-3SR	02/16/2016	ND	20.0000	
Lithium	ug/L	BW-3SR	05/05/2016	ND	20.0000	
Lithium	ug/L	BW-3SR	08/04/2016	ND	20.0000	
Lithium	ug/L	BW-3SR	11/03/2016	ND	20.0000	
Lithium	ug/L	BW-3SR	02/13/2017	ND	20.0000	
Lithium	ug/L	BW-3SR	05/03/2017	ND	20.0000	
Lithium	ug/L	BW-3SR	08/16/2017	ND	20.0000	
Lithium	ug/L	BW-3SR	11/07/2017	ND	20.0000	
Mercury	ug/L	BW-3SR	02/15/2012	ND	0.2000	
Mercury	ug/L	BW-3SR	08/16/2012	ND	0.2000	
Mercury	ug/L	BW-3SR	02/15/2013	ND	0.2000	
Mercury	ug/L	BW-3SR	08/21/2013	ND	0.2000	
Mercury	ug/L	BW-3SR	08/27/2014	ND	0.2000	
Mercury	ug/L	BW-3SR	02/13/2015	ND	0.2000	
Mercury	ug/L	BW-3SR	08/17/2015	ND	0.2000	
Mercury	ug/L	BW-3SR	12/17/2015	ND	0.2000	
Mercury	ug/L	BW-3SR	02/16/2016	ND	0.2000	
Mercury	ug/L	BW-3SR	05/05/2016	ND	0.2000	
Mercury	ug/L	BW-3SR	08/04/2016	ND	0.2000	
Mercury	ug/L	BW-3SR	11/03/2016	ND	0.2000	
Mercury	ug/L	BW-3SR	02/13/2017	ND	0.2000	
Mercury	ug/L	BW-3SR	05/03/2017	ND	0.2000	
Mercury	ug/L	BW-3SR	08/16/2017	ND	0.2000	
Mercury	ug/L	BW-3SR	11/07/2017	ND	0.2000	
Molybdenum	ug/L	BW-3SR	12/17/2015	ND	20.0000	
Molybdenum	ug/L	BW-3SR	02/16/2016	ND	20.0000	
Molybdenum	ug/L	BW-3SR	05/05/2016	ND	20.0000	
Molybdenum	ug/L	BW-3SR	08/04/2016	ND	20.0000	
Molybdenum	ug/L	BW-3SR	11/03/2016	ND	20.0000	
Molybdenum	ug/L	BW-3SR	02/13/2017	ND	20.0000	
Molybdenum	ug/L	BW-3SR	05/03/2017	ND	20.0000	
Molybdenum	ug/L	BW-3SR	08/16/2017	ND	20.0000	
Molybdenum	ug/L	BW-3SR	11/07/2017	ND	20.0000	
pH (Field)	S.U.	BW-3SR	02/15/2012		5.0300	
pH (Field)	S.U.	BW-3SR	08/16/2012		5.4800	
pH (Field)	S.U.	BW-3SR	02/15/2013		5.3000	
pH (Field)	S.U.	BW-3SR	08/21/2013		5.3700	
pH (Field)	S.U.	BW-3SR	08/27/2014		5.4800	
pH (Field)	S.U.	BW-3SR	02/13/2015		5.6200	
pH (Field)	S.U.	BW-3SR	08/17/2015		5.7900	
pH (Field)	S.U.	BW-3SR	12/17/2015		5.4400	
pH (Field)	S.U.	BW-3SR	02/16/2016		4.9200	

* - Outlier for that well and constituent.
ND = Not detected, result = detection limit.

Table 1

Upgradient Data

Constituent	Units	Well	Date		Result	
pH (Field)	S.U.	BW-3SR	02/25/2016		5.7000	
pH (Field)	S.U.	BW-3SR	05/05/2016		5.3700	
pH (Field)	S.U.	BW-3SR	08/04/2016		5.6700	
pH (Field)	S.U.	BW-3SR	11/03/2016		5.6900	
pH (Field)	S.U.	BW-3SR	02/13/2017		5.5700	
pH (Field)	S.U.	BW-3SR	05/03/2017		5.5100	
pH (Field)	S.U.	BW-3SR	08/16/2017		5.3300	
pH (Field)	S.U.	BW-3SR	11/07/2017		5.2300	
Radium-226	pCi/L	BW-3SR	12/17/2015	ND	0.0620	
Radium-226	pCi/L	BW-3SR	02/25/2016	ND	0.1630	
Radium-226	pCi/L	BW-3SR	05/05/2016	ND	0.0567	
Radium-226	pCi/L	BW-3SR	08/04/2016		5.8000	
Radium-226	pCi/L	BW-3SR	11/03/2016		0.3630	
Radium-226	pCi/L	BW-3SR	02/13/2017	ND	0.1250	
Radium-226	pCi/L	BW-3SR	05/03/2017		2.1100	
Radium-226	pCi/L	BW-3SR	08/16/2017		0.2320	
Radium-226	pCi/L	BW-3SR	11/07/2017		0.3020	
Radium-228	pCi/L	BW-3SR	12/17/2015		0.2710	
Radium-228	pCi/L	BW-3SR	02/25/2016		0.3780	
Radium-228	pCi/L	BW-3SR	05/05/2016		0.3010	
Radium-228	pCi/L	BW-3SR	08/04/2016		1.7000	
Radium-228	pCi/L	BW-3SR	11/03/2016	ND	0.4030	
Radium-228	pCi/L	BW-3SR	02/13/2017	ND	0.4420	
Radium-228	pCi/L	BW-3SR	05/03/2017		7.9100	
Radium-228	pCi/L	BW-3SR	08/16/2017		0.3750	
Radium-228	pCi/L	BW-3SR	11/07/2017		0.4310	
Residue, filterable (tds)	mg/L	BW-3SR	02/15/2012		63.0000	
Residue, filterable (tds)	mg/L	BW-3SR	08/16/2012		250.0000	
Residue, filterable (tds)	mg/L	BW-3SR	02/15/2013		180.0000	
Residue, filterable (tds)	mg/L	BW-3SR	08/21/2013		180.0000	
Residue, filterable (tds)	mg/L	BW-3SR	08/27/2014		190.0000	
Residue, filterable (tds)	mg/L	BW-3SR	02/13/2015		170.0000	
Residue, filterable (tds)	mg/L	BW-3SR	08/17/2015		190.0000	
Residue, filterable (tds)	mg/L	BW-3SR	12/17/2015		160.0000	
Residue, filterable (tds)	mg/L	BW-3SR	02/16/2016		27.0000	
Residue, filterable (tds)	mg/L	BW-3SR	05/05/2016		160.0000	
Residue, filterable (tds)	mg/L	BW-3SR	08/04/2016		170.0000	
Residue, filterable (tds)	mg/L	BW-3SR	11/03/2016		190.0000	
Residue, filterable (tds)	mg/L	BW-3SR	02/13/2017		140.0000	
Residue, filterable (tds)	mg/L	BW-3SR	05/03/2017		500.0000	
Residue, filterable (tds)	mg/L	BW-3SR	08/16/2017		180.0000	
Residue, filterable (tds)	mg/L	BW-3SR	11/07/2017		190.0000	
Selenium	ug/L	BW-3SR	02/15/2012	ND	15.0000	
Selenium	ug/L	BW-3SR	08/16/2012	ND	15.0000	
Selenium	ug/L	BW-3SR	02/15/2013	ND	15.0000	
Selenium	ug/L	BW-3SR	08/21/2013	ND	15.0000	
Selenium	ug/L	BW-3SR	08/27/2014	ND	15.0000	
Selenium	ug/L	BW-3SR	02/13/2015	ND	15.0000	
Selenium	ug/L	BW-3SR	08/17/2015	ND	15.0000	
Selenium	ug/L	BW-3SR	12/17/2015	ND	15.0000	
Selenium	ug/L	BW-3SR	02/16/2016	ND	15.0000	
Selenium	ug/L	BW-3SR	05/05/2016	ND	15.0000	
Selenium	ug/L	BW-3SR	08/04/2016	ND	15.0000	
Selenium	ug/L	BW-3SR	11/03/2016	ND	15.0000	
Selenium	ug/L	BW-3SR	02/13/2017	ND	15.0000	
Selenium	ug/L	BW-3SR	05/03/2017	ND	20.0000	
Selenium	ug/L	BW-3SR	08/16/2017	ND	20.0000	
Selenium	ug/L	BW-3SR	11/07/2017	ND	20.0000	
Sulfate	mg/L	BW-3SR	12/17/2015		25.0000	
Sulfate	mg/L	BW-3SR	02/16/2016	ND	5.0000	
Sulfate	mg/L	BW-3SR	05/05/2016		30.0000	
Sulfate	mg/L	BW-3SR	08/04/2016		21.0000	
Sulfate	mg/L	BW-3SR	11/03/2016		29.0000	
Sulfate	mg/L	BW-3SR	02/13/2017		17.0000	
Sulfate	mg/L	BW-3SR	05/03/2017		290.0000	*
Sulfate	mg/L	BW-3SR	08/16/2017		23.0000	
Sulfate	mg/L	BW-3SR	11/07/2017		22.0000	
Thallium	ug/L	BW-3SR	02/15/2012	ND	1.0000	
Thallium	ug/L	BW-3SR	08/16/2012	ND	1.0000	
Thallium	ug/L	BW-3SR	02/15/2013	ND	1.0000	
Thallium	ug/L	BW-3SR	08/21/2013	ND	1.0000	
Thallium	ug/L	BW-3SR	08/27/2014	ND	1.0000	
Thallium	ug/L	BW-3SR	02/13/2015	ND	1.0000	
Thallium	ug/L	BW-3SR	08/17/2015	ND	1.0000	
Thallium	ug/L	BW-3SR	12/17/2015	ND	1.0000	
Thallium	ug/L	BW-3SR	02/16/2016	ND	1.0000	

* - Outlier for that well and constituent.
ND = Not detected, result = detection limit.

Table 1

Upgradient Data

Constituent	Units	Well	Date		Result	
Thallium	ug/L	BW-3SR	05/05/2016	ND	1.0000	
Thallium	ug/L	BW-3SR	08/04/2016	ND	1.0000	
Thallium	ug/L	BW-3SR	11/03/2016	ND	1.0000	
Thallium	ug/L	BW-3SR	02/13/2017	ND	1.0000	
Thallium	ug/L	BW-3SR	05/03/2017	ND	1.0000	
Thallium	ug/L	BW-3SR	08/16/2017	ND	1.0000	
Thallium	ug/L	BW-3SR	11/07/2017	ND	1.0000	
Antimony	ug/L	BW-4S	10/04/2011	ND	2.0000	
Antimony	ug/L	BW-4S	02/13/2012	ND	2.0000	
Antimony	ug/L	BW-4S	08/15/2012	ND	2.0000	
Antimony	ug/L	BW-4S	02/15/2013	ND	2.0000	
Antimony	ug/L	BW-4S	08/21/2013	ND	2.0000	
Antimony	ug/L	BW-4S	08/27/2014	ND	2.0000	
Antimony	ug/L	BW-4S	02/13/2015	ND	2.0000	
Antimony	ug/L	BW-4S	08/17/2015	ND	2.0000	
Antimony	ug/L	BW-4S	12/17/2015	ND	2.0000	
Antimony	ug/L	BW-4S	02/15/2016	ND	2.0000	
Antimony	ug/L	BW-4S	05/05/2016	ND	2.0000	
Antimony	ug/L	BW-4S	08/04/2016	ND	2.0000	
Antimony	ug/L	BW-4S	11/02/2016	ND	2.0000	
Antimony	ug/L	BW-4S	02/13/2017	ND	2.0000	
Antimony	ug/L	BW-4S	05/03/2017	ND	2.0000	
Antimony	ug/L	BW-4S	08/16/2017	ND	2.0000	
Antimony	ug/L	BW-4S	11/07/2017	ND	2.0000	
Arsenic	ug/L	BW-4S	10/04/2011	ND	5.0000	
Arsenic	ug/L	BW-4S	02/13/2012	ND	5.0000	
Arsenic	ug/L	BW-4S	08/15/2012	ND	5.0000	
Arsenic	ug/L	BW-4S	02/15/2013	ND	5.0000	
Arsenic	ug/L	BW-4S	08/21/2013	ND	5.0000	
Arsenic	ug/L	BW-4S	08/27/2014	ND	5.0000	
Arsenic	ug/L	BW-4S	02/13/2015	ND	5.0000	
Arsenic	ug/L	BW-4S	08/17/2015	ND	5.0000	
Arsenic	ug/L	BW-4S	12/17/2015	ND	5.0000	
Arsenic	ug/L	BW-4S	02/15/2016	ND	5.0000	
Arsenic	ug/L	BW-4S	05/05/2016	ND	5.0000	
Arsenic	ug/L	BW-4S	08/04/2016	ND	5.0000	
Arsenic	ug/L	BW-4S	11/02/2016	ND	5.0000	
Arsenic	ug/L	BW-4S	02/13/2017	ND	5.0000	
Arsenic	ug/L	BW-4S	05/03/2017	ND	5.0000	
Arsenic	ug/L	BW-4S	08/16/2017	ND	5.0000	
Arsenic	ug/L	BW-4S	11/07/2017	ND	5.0000	
Barium	ug/L	BW-4S	10/04/2011		93.0000	
Barium	ug/L	BW-4S	02/13/2012		67.0000	
Barium	ug/L	BW-4S	08/15/2012		100.0000	
Barium	ug/L	BW-4S	02/15/2013		87.0000	
Barium	ug/L	BW-4S	08/21/2013		57.0000	
Barium	ug/L	BW-4S	08/27/2014		68.0000	
Barium	ug/L	BW-4S	02/13/2015		49.0000	
Barium	ug/L	BW-4S	08/17/2015		64.0000	
Barium	ug/L	BW-4S	12/17/2015		47.0000	
Barium	ug/L	BW-4S	02/15/2016		28.0000	
Barium	ug/L	BW-4S	05/05/2016		16.0000	
Barium	ug/L	BW-4S	08/04/2016		46.0000	
Barium	ug/L	BW-4S	11/02/2016		24.0000	
Barium	ug/L	BW-4S	02/13/2017		16.0000	
Barium	ug/L	BW-4S	05/03/2017		42.0000	
Barium	ug/L	BW-4S	08/16/2017		60.0000	
Barium	ug/L	BW-4S	11/07/2017		53.0000	
Beryllium	ug/L	BW-4S	10/04/2011	ND	1.0000	
Beryllium	ug/L	BW-4S	02/13/2012	ND	1.0000	
Beryllium	ug/L	BW-4S	08/15/2012	ND	1.0000	
Beryllium	ug/L	BW-4S	02/15/2013	ND	1.0000	
Beryllium	ug/L	BW-4S	08/21/2013	ND	1.0000	
Beryllium	ug/L	BW-4S	08/27/2014	ND	1.0000	
Beryllium	ug/L	BW-4S	02/13/2015	ND	1.0000	
Beryllium	ug/L	BW-4S	08/17/2015	ND	1.0000	
Beryllium	ug/L	BW-4S	12/17/2015	ND	1.0000	
Beryllium	ug/L	BW-4S	02/15/2016	ND	1.0000	
Beryllium	ug/L	BW-4S	05/05/2016	ND	1.0000	
Beryllium	ug/L	BW-4S	08/04/2016	ND	1.0000	
Beryllium	ug/L	BW-4S	11/02/2016	ND	1.0000	
Beryllium	ug/L	BW-4S	02/13/2017	ND	1.0000	
Beryllium	ug/L	BW-4S	05/03/2017	ND	1.0000	
Beryllium	ug/L	BW-4S	08/16/2017	ND	1.0000	
Beryllium	ug/L	BW-4S	11/07/2017	ND	1.0000	
Boron	ug/L	BW-4S	12/17/2015	ND	100.0000	

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Table 1

Upgradient Data

Constituent	Units	Well	Date		Result	
Boron	ug/L	BW-4S	02/15/2016	ND	100.0000	
Boron	ug/L	BW-4S	05/05/2016	ND	100.0000	
Boron	ug/L	BW-4S	08/04/2016	ND	100.0000	
Boron	ug/L	BW-4S	11/02/2016	ND	100.0000	
Boron	ug/L	BW-4S	02/13/2017	ND	100.0000	
Boron	ug/L	BW-4S	05/03/2017	ND	100.0000	
Boron	ug/L	BW-4S	08/16/2017	ND	100.0000	
Boron	ug/L	BW-4S	11/07/2017	ND	100.0000	
Cadmium	ug/L	BW-4S	10/04/2011	ND	5.0000	
Cadmium	ug/L	BW-4S	02/13/2012	ND	5.0000	
Cadmium	ug/L	BW-4S	08/15/2012	ND	5.0000	
Cadmium	ug/L	BW-4S	02/15/2013	ND	5.0000	
Cadmium	ug/L	BW-4S	08/21/2013	ND	5.0000	
Cadmium	ug/L	BW-4S	08/27/2014	ND	5.0000	
Cadmium	ug/L	BW-4S	02/13/2015	ND	5.0000	
Cadmium	ug/L	BW-4S	08/17/2015	ND	5.0000	
Cadmium	ug/L	BW-4S	12/17/2015	ND	5.0000	
Cadmium	ug/L	BW-4S	02/15/2016	ND	5.0000	
Cadmium	ug/L	BW-4S	05/05/2016	ND	5.0000	
Cadmium	ug/L	BW-4S	08/04/2016	ND	5.0000	
Cadmium	ug/L	BW-4S	11/02/2016	ND	5.0000	
Cadmium	ug/L	BW-4S	02/13/2017	ND	5.0000	
Cadmium	ug/L	BW-4S	05/03/2017	ND	5.0000	
Cadmium	ug/L	BW-4S	08/16/2017	ND	5.0000	
Cadmium	ug/L	BW-4S	11/07/2017	ND	5.0000	
Calcium	mg/L	BW-4S	12/17/2015		5.4000	
Calcium	mg/L	BW-4S	02/15/2016		4.0000	
Calcium	mg/L	BW-4S	05/05/2016		4.5000	
Calcium	mg/L	BW-4S	08/04/2016		4.1000	
Calcium	mg/L	BW-4S	11/02/2016		2.0000	
Calcium	mg/L	BW-4S	02/13/2017		2.1000	
Calcium	mg/L	BW-4S	05/03/2017		9.8000	
Calcium	mg/L	BW-4S	08/16/2017		12.0000	
Calcium	mg/L	BW-4S	11/07/2017		8.8000	
Chloride	mg/L	BW-4S	10/04/2011		7.8000	
Chloride	mg/L	BW-4S	02/13/2012		7.1000	
Chloride	mg/L	BW-4S	08/15/2012		7.4000	
Chloride	mg/L	BW-4S	02/15/2013		9.1000	
Chloride	mg/L	BW-4S	08/21/2013		9.0000	
Chloride	mg/L	BW-4S	08/27/2014		8.1000	
Chloride	mg/L	BW-4S	02/13/2015		11.0000	
Chloride	mg/L	BW-4S	08/17/2015		11.0000	
Chloride	mg/L	BW-4S	12/17/2015		12.0000	
Chloride	mg/L	BW-4S	02/15/2016		12.0000	
Chloride	mg/L	BW-4S	05/05/2016		12.0000	
Chloride	mg/L	BW-4S	08/04/2016		13.0000	
Chloride	mg/L	BW-4S	11/02/2016		13.0000	
Chloride	mg/L	BW-4S	02/13/2017		12.0000	
Chloride	mg/L	BW-4S	05/03/2017		11.0000	
Chloride	mg/L	BW-4S	08/16/2017		10.0000	
Chloride	mg/L	BW-4S	11/07/2017		13.0000	
Chromium	ug/L	BW-4S	10/04/2011	ND	10.0000	
Chromium	ug/L	BW-4S	02/13/2012	ND	10.0000	
Chromium	ug/L	BW-4S	08/15/2012	ND	10.0000	
Chromium	ug/L	BW-4S	02/15/2013	ND	10.0000	
Chromium	ug/L	BW-4S	08/21/2013	ND	10.0000	
Chromium	ug/L	BW-4S	08/27/2014	ND	10.0000	
Chromium	ug/L	BW-4S	02/13/2015	ND	10.0000	
Chromium	ug/L	BW-4S	08/17/2015	ND	10.0000	
Chromium	ug/L	BW-4S	12/17/2015	ND	10.0000	
Chromium	ug/L	BW-4S	02/15/2016	ND	10.0000	
Chromium	ug/L	BW-4S	05/05/2016	ND	10.0000	
Chromium	ug/L	BW-4S	08/04/2016	ND	10.0000	
Chromium	ug/L	BW-4S	11/02/2016	ND	10.0000	
Chromium	ug/L	BW-4S	02/13/2017	ND	10.0000	
Chromium	ug/L	BW-4S	05/03/2017	ND	10.0000	
Chromium	ug/L	BW-4S	08/16/2017	ND	10.0000	
Chromium	ug/L	BW-4S	11/07/2017	ND	10.0000	
Cobalt	ug/L	BW-4S	10/04/2011	ND	10.0000	
Cobalt	ug/L	BW-4S	02/13/2012	ND	10.0000	
Cobalt	ug/L	BW-4S	08/15/2012	ND	10.0000	
Cobalt	ug/L	BW-4S	02/15/2013	ND	10.0000	
Cobalt	ug/L	BW-4S	08/21/2013	ND	10.0000	
Cobalt	ug/L	BW-4S	08/27/2014	ND	10.0000	
Cobalt	ug/L	BW-4S	02/13/2015	ND	10.0000	
Cobalt	ug/L	BW-4S	08/17/2015	ND	10.0000	

* - Outlier for that well and constituent.
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Table 1

Upgradient Data

Constituent	Units	Well	Date		Result	
Cobalt	ug/L	BW-4S	12/17/2015	ND	10.0000	
Cobalt	ug/L	BW-4S	02/15/2016	ND	10.0000	
Cobalt	ug/L	BW-4S	05/05/2016	ND	10.0000	
Cobalt	ug/L	BW-4S	08/04/2016	ND	10.0000	
Cobalt	ug/L	BW-4S	11/02/2016	ND	10.0000	
Cobalt	ug/L	BW-4S	02/13/2017	ND	10.0000	
Cobalt	ug/L	BW-4S	05/03/2017	ND	10.0000	
Cobalt	ug/L	BW-4S	08/16/2017	ND	10.0000	
Cobalt	ug/L	BW-4S	11/07/2017	ND	10.0000	
Fluoride	mg/L	BW-4S	12/17/2015	ND	0.5000	
Fluoride	mg/L	BW-4S	02/15/2016	ND	0.5000	
Fluoride	mg/L	BW-4S	05/05/2016	ND	0.5000	
Fluoride	mg/L	BW-4S	08/04/2016	ND	0.5000	
Fluoride	mg/L	BW-4S	11/02/2016	ND	0.5000	
Fluoride	mg/L	BW-4S	02/13/2017	ND	0.5000	
Fluoride	mg/L	BW-4S	05/03/2017	ND	0.5000	
Fluoride	mg/L	BW-4S	08/16/2017	ND	0.5000	
Fluoride	mg/L	BW-4S	11/07/2017	ND	0.5000	
Lead	ug/L	BW-4S	10/04/2011	ND	9.0000	
Lead	ug/L	BW-4S	02/13/2012	ND	9.0000	
Lead	ug/L	BW-4S	08/15/2012	ND	9.0000	
Lead	ug/L	BW-4S	02/15/2013	ND	9.0000	
Lead	ug/L	BW-4S	08/21/2013	ND	9.0000	
Lead	ug/L	BW-4S	08/27/2014	ND	9.0000	
Lead	ug/L	BW-4S	02/13/2015	ND	9.0000	
Lead	ug/L	BW-4S	08/17/2015	ND	9.0000	
Lead	ug/L	BW-4S	12/17/2015	ND	9.0000	
Lead	ug/L	BW-4S	02/15/2016	ND	9.0000	
Lead	ug/L	BW-4S	05/05/2016	ND	9.0000	
Lead	ug/L	BW-4S	08/04/2016	ND	9.0000	
Lead	ug/L	BW-4S	11/02/2016	ND	9.0000	
Lead	ug/L	BW-4S	02/13/2017	ND	9.0000	
Lead	ug/L	BW-4S	05/03/2017	ND	9.0000	
Lead	ug/L	BW-4S	08/16/2017	ND	9.0000	
Lead	ug/L	BW-4S	11/07/2017	ND	9.0000	
Lithium	ug/L	BW-4S	12/17/2015	ND	10.0000	
Lithium	ug/L	BW-4S	02/15/2016	ND	20.0000	
Lithium	ug/L	BW-4S	05/05/2016	ND	20.0000	
Lithium	ug/L	BW-4S	08/04/2016	ND	20.0000	
Lithium	ug/L	BW-4S	11/02/2016	ND	20.0000	
Lithium	ug/L	BW-4S	02/13/2017	ND	20.0000	
Lithium	ug/L	BW-4S	05/03/2017	ND	20.0000	
Lithium	ug/L	BW-4S	08/16/2017	ND	20.0000	
Lithium	ug/L	BW-4S	11/07/2017	ND	20.0000	
Mercury	ug/L	BW-4S	10/04/2011	ND	0.2000	
Mercury	ug/L	BW-4S	02/13/2012	ND	0.2000	
Mercury	ug/L	BW-4S	08/15/2012	ND	0.2000	
Mercury	ug/L	BW-4S	02/15/2013	ND	0.2000	
Mercury	ug/L	BW-4S	08/21/2013	ND	0.2000	
Mercury	ug/L	BW-4S	08/27/2014	ND	0.2000	
Mercury	ug/L	BW-4S	02/13/2015	ND	0.2000	
Mercury	ug/L	BW-4S	08/17/2015	ND	0.2000	
Mercury	ug/L	BW-4S	12/17/2015	ND	0.2000	
Mercury	ug/L	BW-4S	02/15/2016	ND	0.2000	
Mercury	ug/L	BW-4S	05/05/2016	ND	0.2000	
Mercury	ug/L	BW-4S	08/04/2016	ND	0.2000	
Mercury	ug/L	BW-4S	11/02/2016	ND	0.2000	
Mercury	ug/L	BW-4S	02/13/2017	ND	0.2000	
Mercury	ug/L	BW-4S	05/03/2017	ND	0.2000	
Mercury	ug/L	BW-4S	08/16/2017	ND	0.2000	
Mercury	ug/L	BW-4S	11/07/2017	ND	0.2000	
Molybdenum	ug/L	BW-4S	12/17/2015	ND	20.0000	
Molybdenum	ug/L	BW-4S	02/15/2016	ND	20.0000	
Molybdenum	ug/L	BW-4S	05/05/2016	ND	20.0000	
Molybdenum	ug/L	BW-4S	08/04/2016	ND	20.0000	
Molybdenum	ug/L	BW-4S	11/02/2016	ND	20.0000	
Molybdenum	ug/L	BW-4S	02/13/2017	ND	20.0000	
Molybdenum	ug/L	BW-4S	05/03/2017	ND	20.0000	
Molybdenum	ug/L	BW-4S	08/16/2017	ND	20.0000	
Molybdenum	ug/L	BW-4S	11/07/2017	ND	20.0000	
pH (Field)	S.U.	BW-4S	10/04/2011		4.6800	
pH (Field)	S.U.	BW-4S	02/13/2012		4.6300	
pH (Field)	S.U.	BW-4S	08/15/2012		4.5200	
pH (Field)	S.U.	BW-4S	02/15/2013		4.2700	
pH (Field)	S.U.	BW-4S	08/21/2013		4.1200	
pH (Field)	S.U.	BW-4S	08/27/2014		4.3800	

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Table 1

Upgradient Data

Constituent	Units	Well	Date		Result	
pH (Field)	S.U.	BW-4S	02/13/2015		4.4000	
pH (Field)	S.U.	BW-4S	08/17/2015		4.3900	
pH (Field)	S.U.	BW-4S	12/17/2015		3.8800	
pH (Field)	S.U.	BW-4S	02/15/2016		4.3600	
pH (Field)	S.U.	BW-4S	02/24/2016		4.2700	
pH (Field)	S.U.	BW-4S	05/05/2016		4.0600	
pH (Field)	S.U.	BW-4S	08/04/2016		4.2900	
pH (Field)	S.U.	BW-4S	11/02/2016		4.3200	
pH (Field)	S.U.	BW-4S	02/13/2017		4.4600	
pH (Field)	S.U.	BW-4S	05/03/2017		4.1800	
pH (Field)	S.U.	BW-4S	08/16/2017		4.0000	
pH (Field)	S.U.	BW-4S	11/07/2017		3.8900	
Radium-226	pCi/L	BW-4S	12/17/2015		18.9000	
Radium-226	pCi/L	BW-4S	02/24/2016		14.1000	
Radium-226	pCi/L	BW-4S	05/05/2016		9.3700	
Radium-226	pCi/L	BW-4S	08/04/2016		4.8600	
Radium-226	pCi/L	BW-4S	11/02/2016		9.7000	
Radium-226	pCi/L	BW-4S	02/13/2017		6.9000	
Radium-226	pCi/L	BW-4S	05/03/2017		12.8000	
Radium-226	pCi/L	BW-4S	08/16/2017		14.8000	
Radium-226	pCi/L	BW-4S	11/07/2017		20.1000	
Radium-228	pCi/L	BW-4S	12/17/2015		4.7400	
Radium-228	pCi/L	BW-4S	02/24/2016		4.6000	
Radium-228	pCi/L	BW-4S	05/05/2016		4.3600	
Radium-228	pCi/L	BW-4S	08/04/2016		1.3300	
Radium-228	pCi/L	BW-4S	11/02/2016		3.1700	
Radium-228	pCi/L	BW-4S	02/13/2017		3.3400	
Radium-228	pCi/L	BW-4S	05/03/2017		6.3300	
Radium-228	pCi/L	BW-4S	08/16/2017		7.2200	
Radium-228	pCi/L	BW-4S	11/07/2017		9.3900	
Residue, filterable (tds)	mg/L	BW-4S	10/04/2011		230.0000	
Residue, filterable (tds)	mg/L	BW-4S	02/13/2012		240.0000	
Residue, filterable (tds)	mg/L	BW-4S	08/15/2012		190.0000	
Residue, filterable (tds)	mg/L	BW-4S	02/15/2013		240.0000	
Residue, filterable (tds)	mg/L	BW-4S	08/21/2013		210.0000	
Residue, filterable (tds)	mg/L	BW-4S	08/27/2014		280.0000	
Residue, filterable (tds)	mg/L	BW-4S	02/13/2015		270.0000	
Residue, filterable (tds)	mg/L	BW-4S	08/17/2015		300.0000	
Residue, filterable (tds)	mg/L	BW-4S	12/17/2015		260.0000	
Residue, filterable (tds)	mg/L	BW-4S	02/15/2016		250.0000	
Residue, filterable (tds)	mg/L	BW-4S	05/05/2016		230.0000	
Residue, filterable (tds)	mg/L	BW-4S	08/04/2016		230.0000	
Residue, filterable (tds)	mg/L	BW-4S	11/02/2016		220.0000	
Residue, filterable (tds)	mg/L	BW-4S	02/13/2017		200.0000	
Residue, filterable (tds)	mg/L	BW-4S	05/03/2017		270.0000	
Residue, filterable (tds)	mg/L	BW-4S	08/16/2017		250.0000	
Residue, filterable (tds)	mg/L	BW-4S	11/07/2017		320.0000	
Selenium	ug/L	BW-4S	10/04/2011	ND	15.0000	
Selenium	ug/L	BW-4S	02/13/2012	ND	15.0000	
Selenium	ug/L	BW-4S	08/15/2012	ND	15.0000	
Selenium	ug/L	BW-4S	02/15/2013	ND	15.0000	
Selenium	ug/L	BW-4S	08/21/2013	ND	15.0000	
Selenium	ug/L	BW-4S	08/27/2014	ND	15.0000	
Selenium	ug/L	BW-4S	02/13/2015	ND	15.0000	
Selenium	ug/L	BW-4S	08/17/2015	ND	15.0000	
Selenium	ug/L	BW-4S	12/17/2015	ND	15.0000	
Selenium	ug/L	BW-4S	02/15/2016	ND	15.0000	
Selenium	ug/L	BW-4S	05/05/2016	ND	15.0000	
Selenium	ug/L	BW-4S	08/04/2016	ND	15.0000	
Selenium	ug/L	BW-4S	11/02/2016	ND	15.0000	
Selenium	ug/L	BW-4S	02/13/2017	ND	15.0000	
Selenium	ug/L	BW-4S	05/03/2017	ND	20.0000	
Selenium	ug/L	BW-4S	08/16/2017	ND	20.0000	
Selenium	ug/L	BW-4S	11/07/2017	ND	20.0000	
Sulfate	mg/L	BW-4S	12/17/2015		170.0000	
Sulfate	mg/L	BW-4S	02/15/2016		160.0000	
Sulfate	mg/L	BW-4S	05/05/2016		150.0000	
Sulfate	mg/L	BW-4S	08/04/2016		140.0000	
Sulfate	mg/L	BW-4S	11/02/2016		160.0000	
Sulfate	mg/L	BW-4S	02/13/2017		120.0000	
Sulfate	mg/L	BW-4S	05/03/2017		190.0000	
Sulfate	mg/L	BW-4S	08/16/2017		170.0000	
Sulfate	mg/L	BW-4S	11/07/2017		210.0000	
Thallium	ug/L	BW-4S	10/04/2011	ND	1.0000	
Thallium	ug/L	BW-4S	02/13/2012	ND	1.0000	
Thallium	ug/L	BW-4S	08/15/2012	ND	1.0000	

* - Outlier for that well and constituent.
ND = Not detected, result = detection limit.

Table 1

Upgradient Data

Constituent	Units	Well	Date		Result	
Thallium	ug/L	BW-4S	02/15/2013	ND	1.0000	
Thallium	ug/L	BW-4S	08/21/2013	ND	1.0000	
Thallium	ug/L	BW-4S	08/27/2014	ND	1.0000	
Thallium	ug/L	BW-4S	02/13/2015	ND	1.0000	
Thallium	ug/L	BW-4S	08/17/2015	ND	1.0000	
Thallium	ug/L	BW-4S	12/17/2015	ND	1.0000	
Thallium	ug/L	BW-4S	02/15/2016	ND	1.0000	
Thallium	ug/L	BW-4S	05/05/2016	ND	1.0000	
Thallium	ug/L	BW-4S	08/04/2016	ND	1.0000	
Thallium	ug/L	BW-4S	11/02/2016	ND	1.0000	
Thallium	ug/L	BW-4S	02/13/2017	ND	1.0000	
Thallium	ug/L	BW-4S	05/03/2017	ND	1.0000	
Thallium	ug/L	BW-4S	08/16/2017	ND	1.0000	
Thallium	ug/L	BW-4S	11/07/2017	ND	1.0000	
Antimony	ug/L	BW-5S	10/04/2011	ND	2.0000	
Antimony	ug/L	BW-5S	02/15/2012	ND	2.0000	
Antimony	ug/L	BW-5S	08/15/2012	ND	2.0000	
Antimony	ug/L	BW-5S	02/15/2013	ND	2.0000	
Antimony	ug/L	BW-5S	08/21/2013	ND	2.0000	
Antimony	ug/L	BW-5S	08/27/2014	ND	2.0000	
Antimony	ug/L	BW-5S	02/13/2015	ND	2.0000	
Antimony	ug/L	BW-5S	08/17/2015	ND	2.0000	
Antimony	ug/L	BW-5S	02/15/2016	ND	2.0000	
Antimony	ug/L	BW-5S	05/05/2016	ND	2.0000	
Antimony	ug/L	BW-5S	08/04/2016	ND	2.0000	
Antimony	ug/L	BW-5S	11/02/2016	ND	2.0000	
Antimony	ug/L	BW-5S	02/13/2017	ND	2.0000	
Antimony	ug/L	BW-5S	05/03/2017	ND	2.0000	
Antimony	ug/L	BW-5S	08/16/2017	ND	2.0000	
Antimony	ug/L	BW-5S	11/07/2017	ND	2.0000	
Arsenic	ug/L	BW-5S	10/04/2011	ND	5.0000	
Arsenic	ug/L	BW-5S	02/15/2012	ND	5.0000	
Arsenic	ug/L	BW-5S	08/15/2012	ND	5.0000	
Arsenic	ug/L	BW-5S	02/15/2013	ND	5.0000	
Arsenic	ug/L	BW-5S	08/21/2013	ND	5.0000	
Arsenic	ug/L	BW-5S	08/27/2014	ND	5.0000	
Arsenic	ug/L	BW-5S	02/13/2015	ND	5.0000	
Arsenic	ug/L	BW-5S	08/17/2015	ND	5.0000	
Arsenic	ug/L	BW-5S	02/15/2016	ND	5.0000	
Arsenic	ug/L	BW-5S	05/05/2016	ND	5.0000	
Arsenic	ug/L	BW-5S	08/04/2016	ND	5.0000	
Arsenic	ug/L	BW-5S	11/02/2016	ND	5.0000	
Arsenic	ug/L	BW-5S	02/13/2017	ND	5.0000	
Arsenic	ug/L	BW-5S	05/03/2017	ND	5.0000	
Arsenic	ug/L	BW-5S	08/16/2017	ND	5.0000	
Arsenic	ug/L	BW-5S	11/07/2017	ND	5.0000	
Barium	ug/L	BW-5S	10/04/2011		55.0000	
Barium	ug/L	BW-5S	02/15/2012		41.0000	
Barium	ug/L	BW-5S	08/15/2012		13.0000	
Barium	ug/L	BW-5S	02/15/2013		68.0000	
Barium	ug/L	BW-5S	08/21/2013	ND	10.0000	
Barium	ug/L	BW-5S	08/27/2014		35.0000	
Barium	ug/L	BW-5S	02/13/2015	ND	10.0000	
Barium	ug/L	BW-5S	08/17/2015	ND	10.0000	
Barium	ug/L	BW-5S	02/15/2016	ND	10.0000	
Barium	ug/L	BW-5S	05/05/2016	ND	10.0000	
Barium	ug/L	BW-5S	08/04/2016	ND	10.0000	
Barium	ug/L	BW-5S	11/02/2016		36.0000	
Barium	ug/L	BW-5S	02/13/2017		85.0000	
Barium	ug/L	BW-5S	05/03/2017		85.0000	
Barium	ug/L	BW-5S	08/16/2017	ND	10.0000	
Barium	ug/L	BW-5S	11/07/2017		17.0000	
Beryllium	ug/L	BW-5S	10/04/2011	ND	1.0000	
Beryllium	ug/L	BW-5S	02/15/2012	ND	1.0000	
Beryllium	ug/L	BW-5S	08/15/2012	ND	1.0000	
Beryllium	ug/L	BW-5S	02/15/2013	ND	1.0000	
Beryllium	ug/L	BW-5S	08/21/2013	ND	1.0000	
Beryllium	ug/L	BW-5S	08/27/2014	ND	1.0000	
Beryllium	ug/L	BW-5S	02/13/2015	ND	1.0000	
Beryllium	ug/L	BW-5S	08/17/2015	ND	1.0000	
Beryllium	ug/L	BW-5S	02/15/2016	ND	1.0000	
Beryllium	ug/L	BW-5S	05/05/2016	ND	1.0000	
Beryllium	ug/L	BW-5S	08/04/2016	ND	1.0000	
Beryllium	ug/L	BW-5S	11/02/2016	ND	1.0000	
Beryllium	ug/L	BW-5S	02/13/2017	ND	1.0000	
Beryllium	ug/L	BW-5S	05/03/2017	ND	1.0000	

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Table 1

Upgradient Data

Constituent	Units	Well	Date		Result	
Beryllium	ug/L	BW-5S	08/16/2017	ND	1.0000	
Beryllium	ug/L	BW-5S	11/07/2017	ND	1.0000	
Boron	ug/L	BW-5S	02/15/2016	ND	100.0000	
Boron	ug/L	BW-5S	05/05/2016	ND	100.0000	
Boron	ug/L	BW-5S	08/04/2016	ND	100.0000	
Boron	ug/L	BW-5S	11/02/2016	ND	100.0000	
Boron	ug/L	BW-5S	02/13/2017	ND	100.0000	
Boron	ug/L	BW-5S	05/03/2017	ND	100.0000	
Boron	ug/L	BW-5S	08/16/2017	ND	100.0000	
Boron	ug/L	BW-5S	11/07/2017	ND	100.0000	
Cadmium	ug/L	BW-5S	10/04/2011	ND	5.0000	
Cadmium	ug/L	BW-5S	02/15/2012	ND	5.0000	
Cadmium	ug/L	BW-5S	08/15/2012	ND	5.0000	
Cadmium	ug/L	BW-5S	02/15/2013	ND	5.0000	
Cadmium	ug/L	BW-5S	08/21/2013	ND	5.0000	
Cadmium	ug/L	BW-5S	08/27/2014	ND	5.0000	
Cadmium	ug/L	BW-5S	02/13/2015	ND	5.0000	
Cadmium	ug/L	BW-5S	08/17/2015	ND	5.0000	
Cadmium	ug/L	BW-5S	02/15/2016	ND	5.0000	
Cadmium	ug/L	BW-5S	05/05/2016	ND	5.0000	
Cadmium	ug/L	BW-5S	08/04/2016	ND	5.0000	
Cadmium	ug/L	BW-5S	11/02/2016	ND	5.0000	
Cadmium	ug/L	BW-5S	02/13/2017	ND	5.0000	
Cadmium	ug/L	BW-5S	05/03/2017	ND	5.0000	
Cadmium	ug/L	BW-5S	08/16/2017	ND	5.0000	
Cadmium	ug/L	BW-5S	11/07/2017	ND	5.0000	
Calcium	mg/L	BW-5S	02/15/2016		31.0000	
Calcium	mg/L	BW-5S	05/05/2016		22.0000	
Calcium	mg/L	BW-5S	08/04/2016		22.0000	
Calcium	mg/L	BW-5S	11/02/2016		25.0000	
Calcium	mg/L	BW-5S	02/13/2017		14.0000	
Calcium	mg/L	BW-5S	05/03/2017		14.0000	
Calcium	mg/L	BW-5S	08/16/2017		19.0000	
Calcium	mg/L	BW-5S	11/07/2017		31.0000	
Chloride	mg/L	BW-5S	10/04/2011		11.0000	
Chloride	mg/L	BW-5S	02/15/2012		11.0000	
Chloride	mg/L	BW-5S	08/15/2012		5.4000	
Chloride	mg/L	BW-5S	02/15/2013		16.0000	
Chloride	mg/L	BW-5S	08/21/2013		9.1000	
Chloride	mg/L	BW-5S	08/27/2014		9.8000	
Chloride	mg/L	BW-5S	02/13/2015		5.6000	
Chloride	mg/L	BW-5S	08/17/2015		3.1000	
Chloride	mg/L	BW-5S	02/15/2016		6.5000	
Chloride	mg/L	BW-5S	05/05/2016		3.3000	
Chloride	mg/L	BW-5S	08/04/2016	ND	3.0000	
Chloride	mg/L	BW-5S	11/02/2016		14.0000	
Chloride	mg/L	BW-5S	02/13/2017		13.0000	
Chloride	mg/L	BW-5S	05/03/2017		13.0000	
Chloride	mg/L	BW-5S	08/16/2017	ND	3.0000	
Chloride	mg/L	BW-5S	11/07/2017		12.0000	
Chromium	ug/L	BW-5S	10/04/2011	ND	10.0000	
Chromium	ug/L	BW-5S	02/15/2012	ND	10.0000	
Chromium	ug/L	BW-5S	08/15/2012	ND	10.0000	
Chromium	ug/L	BW-5S	02/15/2013	ND	10.0000	
Chromium	ug/L	BW-5S	08/21/2013	ND	10.0000	
Chromium	ug/L	BW-5S	08/27/2014	ND	10.0000	
Chromium	ug/L	BW-5S	02/13/2015	ND	10.0000	
Chromium	ug/L	BW-5S	08/17/2015	ND	10.0000	
Chromium	ug/L	BW-5S	02/15/2016	ND	10.0000	
Chromium	ug/L	BW-5S	05/05/2016	ND	10.0000	
Chromium	ug/L	BW-5S	08/04/2016	ND	10.0000	
Chromium	ug/L	BW-5S	11/02/2016	ND	10.0000	
Chromium	ug/L	BW-5S	02/13/2017	ND	10.0000	
Chromium	ug/L	BW-5S	05/03/2017	ND	10.0000	
Chromium	ug/L	BW-5S	08/16/2017	ND	10.0000	
Chromium	ug/L	BW-5S	11/07/2017	ND	10.0000	
Cobalt	ug/L	BW-5S	10/04/2011	ND	10.0000	
Cobalt	ug/L	BW-5S	02/15/2012	ND	10.0000	
Cobalt	ug/L	BW-5S	08/15/2012	ND	10.0000	
Cobalt	ug/L	BW-5S	02/15/2013	ND	10.0000	
Cobalt	ug/L	BW-5S	08/21/2013	ND	10.0000	
Cobalt	ug/L	BW-5S	08/27/2014	ND	10.0000	
Cobalt	ug/L	BW-5S	02/13/2015	ND	10.0000	
Cobalt	ug/L	BW-5S	08/17/2015	ND	10.0000	
Cobalt	ug/L	BW-5S	02/15/2016	ND	10.0000	
Cobalt	ug/L	BW-5S	05/05/2016	ND	10.0000	

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Table 1

Upgradient Data

Constituent	Units	Well	Date		Result	
Cobalt	ug/L	BW-5S	08/04/2016	ND	10.0000	
Cobalt	ug/L	BW-5S	11/02/2016	ND	10.0000	
Cobalt	ug/L	BW-5S	02/13/2017	ND	10.0000	
Cobalt	ug/L	BW-5S	05/03/2017	ND	10.0000	
Cobalt	ug/L	BW-5S	08/16/2017	ND	10.0000	
Cobalt	ug/L	BW-5S	11/07/2017	ND	10.0000	
Fluoride	mg/L	BW-5S	02/15/2016	ND	0.5000	
Fluoride	mg/L	BW-5S	05/05/2016	ND	0.5000	
Fluoride	mg/L	BW-5S	08/04/2016	ND	0.5000	
Fluoride	mg/L	BW-5S	11/02/2016	ND	0.5000	
Fluoride	mg/L	BW-5S	02/13/2017	ND	0.5000	
Fluoride	mg/L	BW-5S	05/03/2017	ND	0.5000	
Fluoride	mg/L	BW-5S	08/16/2017	ND	0.5000	
Fluoride	mg/L	BW-5S	11/07/2017	ND	0.5000	
Lead	ug/L	BW-5S	10/04/2011	ND	9.0000	
Lead	ug/L	BW-5S	02/15/2012	ND	9.0000	
Lead	ug/L	BW-5S	08/15/2012	ND	9.0000	
Lead	ug/L	BW-5S	02/15/2013	ND	9.0000	
Lead	ug/L	BW-5S	08/21/2013	ND	9.0000	
Lead	ug/L	BW-5S	08/27/2014	ND	9.0000	
Lead	ug/L	BW-5S	02/13/2015	ND	9.0000	
Lead	ug/L	BW-5S	08/17/2015	ND	9.0000	
Lead	ug/L	BW-5S	02/15/2016	ND	9.0000	
Lead	ug/L	BW-5S	05/05/2016	ND	9.0000	
Lead	ug/L	BW-5S	08/04/2016	ND	9.0000	
Lead	ug/L	BW-5S	11/02/2016	ND	9.0000	
Lead	ug/L	BW-5S	02/13/2017	ND	9.0000	
Lead	ug/L	BW-5S	05/03/2017	ND	9.0000	
Lead	ug/L	BW-5S	08/16/2017	ND	9.0000	
Lead	ug/L	BW-5S	11/07/2017	ND	9.0000	
Lithium	ug/L	BW-5S	02/15/2016	ND	20.0000	
Lithium	ug/L	BW-5S	05/05/2016	ND	20.0000	
Lithium	ug/L	BW-5S	08/04/2016	ND	20.0000	
Lithium	ug/L	BW-5S	11/02/2016	ND	20.0000	
Lithium	ug/L	BW-5S	02/13/2017	ND	20.0000	
Lithium	ug/L	BW-5S	05/03/2017	ND	20.0000	
Lithium	ug/L	BW-5S	08/16/2017	ND	20.0000	
Lithium	ug/L	BW-5S	11/07/2017	ND	20.0000	
Mercury	ug/L	BW-5S	10/04/2011	ND	0.2000	
Mercury	ug/L	BW-5S	02/15/2012	ND	0.2000	
Mercury	ug/L	BW-5S	08/15/2012	ND	0.2000	
Mercury	ug/L	BW-5S	02/15/2013	ND	0.2000	
Mercury	ug/L	BW-5S	08/21/2013	ND	0.2000	
Mercury	ug/L	BW-5S	08/27/2014	ND	0.2000	
Mercury	ug/L	BW-5S	02/13/2015	ND	0.2000	
Mercury	ug/L	BW-5S	08/17/2015	ND	0.2000	
Mercury	ug/L	BW-5S	02/15/2016	ND	0.2000	
Mercury	ug/L	BW-5S	05/05/2016	ND	0.2000	
Mercury	ug/L	BW-5S	08/04/2016	ND	0.2000	
Mercury	ug/L	BW-5S	11/02/2016	ND	0.2000	
Mercury	ug/L	BW-5S	02/13/2017	ND	0.2000	
Mercury	ug/L	BW-5S	05/03/2017	ND	0.2000	
Mercury	ug/L	BW-5S	08/16/2017	ND	0.2000	
Mercury	ug/L	BW-5S	11/07/2017	ND	0.2000	
Molybdenum	ug/L	BW-5S	02/15/2016	ND	20.0000	
Molybdenum	ug/L	BW-5S	05/05/2016	ND	20.0000	
Molybdenum	ug/L	BW-5S	08/04/2016	ND	20.0000	
Molybdenum	ug/L	BW-5S	11/02/2016	ND	20.0000	
Molybdenum	ug/L	BW-5S	02/13/2017	ND	20.0000	
Molybdenum	ug/L	BW-5S	05/03/2017	ND	20.0000	
Molybdenum	ug/L	BW-5S	08/16/2017	ND	20.0000	
Molybdenum	ug/L	BW-5S	11/07/2017	ND	20.0000	
pH (Field)	S.U.	BW-5S	10/04/2011		4.9900	
pH (Field)	S.U.	BW-5S	02/15/2012		4.5700	
pH (Field)	S.U.	BW-5S	08/15/2012		5.6300	
pH (Field)	S.U.	BW-5S	02/15/2013		4.8200	
pH (Field)	S.U.	BW-5S	08/21/2013		5.2900	
pH (Field)	S.U.	BW-5S	08/27/2014		5.3700	
pH (Field)	S.U.	BW-5S	02/13/2015		5.6500	
pH (Field)	S.U.	BW-5S	08/17/2015		5.9300	
pH (Field)	S.U.	BW-5S	02/15/2016		5.7900	
pH (Field)	S.U.	BW-5S	02/24/2016		5.7100	
pH (Field)	S.U.	BW-5S	05/05/2016		5.4200	
pH (Field)	S.U.	BW-5S	08/04/2016		5.3900	
pH (Field)	S.U.	BW-5S	11/02/2016		5.3800	
pH (Field)	S.U.	BW-5S	02/13/2017		5.0900	

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Table 1

Upgradient Data

Constituent	Units	Well	Date		Result	
pH (Field)	S.U.	BW-5S	05/03/2017		4.9800	
pH (Field)	S.U.	BW-5S	08/16/2017		5.0700	
pH (Field)	S.U.	BW-5S	11/07/2017		5.1500	
Radium-226	pCi/L	BW-5S	02/24/2016	ND	0.1350	
Radium-226	pCi/L	BW-5S	05/05/2016	ND	0.0638	
Radium-226	pCi/L	BW-5S	08/04/2016	ND	0.0790	
Radium-226	pCi/L	BW-5S	11/02/2016		4.3300	
Radium-226	pCi/L	BW-5S	02/13/2017		13.1000	
Radium-226	pCi/L	BW-5S	05/03/2017		9.7900	
Radium-226	pCi/L	BW-5S	08/16/2017		0.4160	
Radium-226	pCi/L	BW-5S	11/07/2017		1.6100	
Radium-228	pCi/L	BW-5S	02/24/2016		0.2970	
Radium-228	pCi/L	BW-5S	05/05/2016		0.0838	
Radium-228	pCi/L	BW-5S	08/04/2016	ND	0.4710	
Radium-228	pCi/L	BW-5S	11/02/2016		3.6200	
Radium-228	pCi/L	BW-5S	02/13/2017		17.5000	
Radium-228	pCi/L	BW-5S	05/03/2017		14.4000	
Radium-228	pCi/L	BW-5S	08/16/2017	ND	0.3570	
Radium-228	pCi/L	BW-5S	11/07/2017		1.7700	
Residue, filterable (tds)	mg/L	BW-5S	10/04/2011		140.0000	
Residue, filterable (tds)	mg/L	BW-5S	02/15/2012		120.0000	
Residue, filterable (tds)	mg/L	BW-5S	08/15/2012		220.0000	
Residue, filterable (tds)	mg/L	BW-5S	02/15/2013		230.0000	
Residue, filterable (tds)	mg/L	BW-5S	08/21/2013		180.0000	
Residue, filterable (tds)	mg/L	BW-5S	08/27/2014		120.0000	
Residue, filterable (tds)	mg/L	BW-5S	02/13/2015		140.0000	
Residue, filterable (tds)	mg/L	BW-5S	08/17/2015		130.0000	
Residue, filterable (tds)	mg/L	BW-5S	02/15/2016		180.0000	
Residue, filterable (tds)	mg/L	BW-5S	05/05/2016		120.0000	
Residue, filterable (tds)	mg/L	BW-5S	08/04/2016		120.0000	
Residue, filterable (tds)	mg/L	BW-5S	11/02/2016		280.0000	
Residue, filterable (tds)	mg/L	BW-5S	02/13/2017		310.0000	
Residue, filterable (tds)	mg/L	BW-5S	05/03/2017		310.0000	
Residue, filterable (tds)	mg/L	BW-5S	08/16/2017		110.0000	
Residue, filterable (tds)	mg/L	BW-5S	11/07/2017		350.0000	
Selenium	ug/L	BW-5S	10/04/2011	ND	15.0000	
Selenium	ug/L	BW-5S	02/15/2012	ND	15.0000	
Selenium	ug/L	BW-5S	08/15/2012	ND	15.0000	
Selenium	ug/L	BW-5S	02/15/2013	ND	15.0000	
Selenium	ug/L	BW-5S	08/21/2013	ND	15.0000	
Selenium	ug/L	BW-5S	08/27/2014	ND	15.0000	
Selenium	ug/L	BW-5S	02/13/2015	ND	15.0000	
Selenium	ug/L	BW-5S	08/17/2015	ND	15.0000	
Selenium	ug/L	BW-5S	02/15/2016	ND	15.0000	
Selenium	ug/L	BW-5S	05/05/2016	ND	15.0000	
Selenium	ug/L	BW-5S	08/04/2016	ND	15.0000	
Selenium	ug/L	BW-5S	11/02/2016	ND	15.0000	
Selenium	ug/L	BW-5S	02/13/2017	ND	15.0000	
Selenium	ug/L	BW-5S	05/03/2017	ND	20.0000	
Selenium	ug/L	BW-5S	08/16/2017	ND	20.0000	
Selenium	ug/L	BW-5S	11/07/2017	ND	20.0000	
Sulfate	mg/L	BW-5S	02/15/2016		52.0000	
Sulfate	mg/L	BW-5S	05/05/2016		8.9000	
Sulfate	mg/L	BW-5S	08/04/2016		12.0000	
Sulfate	mg/L	BW-5S	11/02/2016		140.0000	
Sulfate	mg/L	BW-5S	02/13/2017		180.0000	
Sulfate	mg/L	BW-5S	05/03/2017		200.0000	
Sulfate	mg/L	BW-5S	08/16/2017		11.0000	
Sulfate	mg/L	BW-5S	11/07/2017		180.0000	
Thallium	ug/L	BW-5S	10/04/2011	ND	1.0000	
Thallium	ug/L	BW-5S	02/15/2012	ND	1.0000	
Thallium	ug/L	BW-5S	08/15/2012	ND	1.0000	
Thallium	ug/L	BW-5S	02/15/2013	ND	1.0000	
Thallium	ug/L	BW-5S	08/21/2013	ND	1.0000	
Thallium	ug/L	BW-5S	08/27/2014	ND	1.0000	
Thallium	ug/L	BW-5S	02/13/2015	ND	1.0000	
Thallium	ug/L	BW-5S	08/17/2015	ND	1.0000	
Thallium	ug/L	BW-5S	02/15/2016	ND	1.0000	
Thallium	ug/L	BW-5S	05/05/2016	ND	1.0000	
Thallium	ug/L	BW-5S	08/04/2016	ND	1.0000	
Thallium	ug/L	BW-5S	11/02/2016	ND	1.0000	
Thallium	ug/L	BW-5S	02/13/2017	ND	1.0000	
Thallium	ug/L	BW-5S	05/03/2017	ND	1.0000	
Thallium	ug/L	BW-5S	08/16/2017	ND	1.0000	
Thallium	ug/L	BW-5S	11/07/2017	ND	1.0000	

* - Outlier for that well and constituent.
ND = Not detected, result = detection limit.

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Antimony	ug/L	DW-1SR	11/07/2017	ND	2.0000		2.0000
Arsenic	ug/L	DW-1SR	11/07/2017	ND	5.0000		7.8000
Barium	ug/L	DW-1SR	11/07/2017	ND	10.0000		83.4650
Beryllium	ug/L	DW-1SR	11/07/2017	ND	1.0000		1.0000
Boron	ug/L	DW-1SR	11/07/2017	ND	100.0000		210.0000
Cadmium	ug/L	DW-1SR	11/07/2017	ND	5.0000		5.0000
Calcium	mg/L	DW-1SR	11/07/2017		8.9000		50.6760
Chloride	mg/L	DW-1SR	11/07/2017	ND	3.0000		24.0765
Chromium	ug/L	DW-1SR	11/07/2017	ND	10.0000		10.0000
Cobalt	ug/L	DW-1SR	11/07/2017	ND	10.0000		10.0000
Fluoride	mg/L	DW-1SR	11/07/2017	ND	0.5000		0.5900
Lead	ug/L	DW-1SR	11/07/2017	ND	9.0000		9.0000
Lithium	ug/L	DW-1SR	11/07/2017	ND	20.0000		20.0000
Mercury	ug/L	DW-1SR	11/07/2017	ND	0.2000		0.2000
Molybdenum	ug/L	DW-1SR	11/07/2017	ND	20.0000		20.0000
pH (Field)	S.U.	DW-1SR	11/07/2017		4.4100		3.43 - 6.56
Radium-226	pCi/L	DW-1SR	11/07/2017		0.2700		17.5036
Radium-228	pCi/L	DW-1SR	11/07/2017		1.0100		11.7358
Residue, filterable (tds)	mg/L	DW-1SR	11/07/2017		150.0000		510.2459
Selenium	ug/L	DW-1SR	11/07/2017	ND	20.0000		15.0000
Sulfate	mg/L	DW-1SR	11/07/2017		10.0000		240.3465
Thallium	ug/L	DW-1SR	11/07/2017	ND	1.0000		1.0000
Antimony	ug/L	DW-2SR	11/07/2017	ND	2.0000		2.0000
Arsenic	ug/L	DW-2SR	11/07/2017	ND	5.0000		7.8000
Barium	ug/L	DW-2SR	11/07/2017		37.0000		83.4650
Beryllium	ug/L	DW-2SR	11/07/2017	ND	1.0000		1.0000
Boron	ug/L	DW-2SR	11/07/2017		140.0000		210.0000
Cadmium	ug/L	DW-2SR	11/07/2017	ND	5.0000		5.0000
Calcium	mg/L	DW-2SR	11/07/2017		72.0000	*	50.6760
Chloride	mg/L	DW-2SR	11/07/2017		300.0000	*	24.0765
Chromium	ug/L	DW-2SR	11/07/2017	ND	10.0000		10.0000
Cobalt	ug/L	DW-2SR	11/07/2017	ND	10.0000		10.0000
Fluoride	mg/L	DW-2SR	11/07/2017		0.5300		0.5900
Lead	ug/L	DW-2SR	11/07/2017	ND	9.0000		9.0000
Lithium	ug/L	DW-2SR	11/07/2017	ND	20.0000		20.0000
Mercury	ug/L	DW-2SR	11/07/2017	ND	0.2000		0.2000
Molybdenum	ug/L	DW-2SR	11/07/2017	ND	20.0000		20.0000
pH (Field)	S.U.	DW-2SR	11/07/2017		4.0700		3.43 - 6.56
Radium-226	pCi/L	DW-2SR	11/07/2017		1.6600		17.5036
Radium-228	pCi/L	DW-2SR	11/07/2017		4.7800		11.7358
Residue, filterable (tds)	mg/L	DW-2SR	11/07/2017		810.0000	*	510.2459
Selenium	ug/L	DW-2SR	11/07/2017	ND	20.0000		15.0000
Sulfate	mg/L	DW-2SR	11/07/2017		160.0000		240.3465
Thallium	ug/L	DW-2SR	11/07/2017	ND	1.0000		1.0000
Antimony	ug/L	DW-3SR	11/07/2017	ND	2.0000		2.0000
Arsenic	ug/L	DW-3SR	11/07/2017	ND	5.0000		7.8000
Barium	ug/L	DW-3SR	11/07/2017		34.0000		83.4650
Beryllium	ug/L	DW-3SR	11/07/2017	ND	1.0000		1.0000
Boron	ug/L	DW-3SR	11/07/2017		130.0000		210.0000
Cadmium	ug/L	DW-3SR	11/07/2017	ND	5.0000		5.0000
Calcium	mg/L	DW-3SR	11/07/2017		140.0000	*	50.6760
Chloride	mg/L	DW-3SR	11/07/2017		330.0000	*	24.0765
Chromium	ug/L	DW-3SR	11/07/2017	ND	10.0000		10.0000
Cobalt	ug/L	DW-3SR	11/07/2017	ND	10.0000		10.0000
Fluoride	mg/L	DW-3SR	11/07/2017	ND	0.5000		0.5900
Lead	ug/L	DW-3SR	11/07/2017	ND	9.0000		9.0000
Lithium	ug/L	DW-3SR	11/07/2017	ND	20.0000		20.0000
Mercury	ug/L	DW-3SR	11/07/2017	ND	0.2000		0.2000
Molybdenum	ug/L	DW-3SR	11/07/2017	ND	20.0000		20.0000
pH (Field)	S.U.	DW-3SR	11/07/2017		4.4400		3.43 - 6.56
Radium-226	pCi/L	DW-3SR	11/07/2017		2.0700		17.5036
Radium-228	pCi/L	DW-3SR	11/07/2017		3.3300		11.7358
Residue, filterable (tds)	mg/L	DW-3SR	11/07/2017		950.0000	*	510.2459
Selenium	ug/L	DW-3SR	11/07/2017	ND	20.0000		15.0000
Sulfate	mg/L	DW-3SR	11/07/2017		240.0000		240.3465
Thallium	ug/L	DW-3SR	11/07/2017	ND	1.0000		1.0000
Antimony	ug/L	DW-4SR	11/07/2017	ND	2.0000		2.0000
Arsenic	ug/L	DW-4SR	11/07/2017	ND	5.0000		7.8000
Barium	ug/L	DW-4SR	11/07/2017		19.0000		83.4650
Beryllium	ug/L	DW-4SR	11/07/2017	ND	1.0000		1.0000
Boron	ug/L	DW-4SR	11/07/2017	ND	100.0000		210.0000
Cadmium	ug/L	DW-4SR	11/07/2017	ND	5.0000		5.0000

* - Current value failed - awaiting verification.
** - Current value passed - previous exceedance not verified.
*** - Current value failed - exceedance verified.
**** - Current value passed - awaiting one more verification.
***** - Insufficient background data to compute prediction limit.
ND = Not Detected, result = detection limit.

Table 2

Most Current Downgradient Monitoring Data

Constituent	Units	Well	Date		Result		Pred. Limit
Calcium	mg/L	DW-4SR	11/07/2017		21.0000		50.6760
Chloride	mg/L	DW-4SR	11/07/2017		3.6000		24.0765
Chromium	ug/L	DW-4SR	11/07/2017	ND	10.0000		10.0000
Cobalt	ug/L	DW-4SR	11/07/2017	ND	10.0000		10.0000
Fluoride	mg/L	DW-4SR	11/07/2017	ND	0.5000		0.5900
Lead	ug/L	DW-4SR	11/07/2017	ND	9.0000		9.0000
Lithium	ug/L	DW-4SR	11/07/2017	ND	20.0000		20.0000
Mercury	ug/L	DW-4SR	11/07/2017	ND	0.2000		0.2000
Molybdenum	ug/L	DW-4SR	11/07/2017	ND	20.0000		20.0000
pH (Field)	S.U.	DW-4SR	11/07/2017		4.6400		3.43 - 6.56
Radium-226	pCi/L	DW-4SR	11/07/2017		1.5400		17.5036
Radium-228	pCi/L	DW-4SR	11/07/2017		2.5400		11.7358
Residue, filterable (tds)	mg/L	DW-4SR	11/07/2017		200.0000		510.2459
Selenium	ug/L	DW-4SR	11/07/2017	ND	20.0000		15.0000
Sulfate	mg/L	DW-4SR	11/07/2017		87.0000		240.3465
Thallium	ug/L	DW-4SR	11/07/2017	ND	1.0000		1.0000

* - Current value failed - awaiting verification.
** - Current value passed - previous exceedance not verified.
*** - Current value failed - exceedance verified.
**** - Current value passed - awaiting one more verification.
***** - Insufficient background data to compute prediction limit.
ND = Not Detected, result = detection limit.

Table 3

Detection Frequencies in Upgradient and Downgradient Wells

Constituent	Detect	Upgradient N	Proportion	Detect	Downgradient N	Proportion
Antimony	0	83	0.000	0	47	0.000
Arsenic	3	83	0.036	0	47	0.000
Barium	42	83	0.506	37	47	0.787
Beryllium	0	83	0.000	0	47	0.000
Boron	1	44	0.023	19	35	0.543
Cadmium	0	83	0.000	0	47	0.000
Calcium	43	43	1.000	35	35	1.000
Chloride	80	83	0.964	40	47	0.851
Chromium	0	83	0.000	0	47	0.000
Cobalt	0	83	0.000	0	47	0.000
Fluoride	1	44	0.023	1	35	0.029
Lead	0	83	0.000	0	47	0.000
Lithium	0	44	0.000	0	35	0.000
Mercury	0	83	0.000	0	47	0.000
Molybdenum	0	44	0.000	0	35	0.000
pH (Field)	88	88	1.000	51	51	1.000
Radium-226	23	44	0.523	24	35	0.686
Radium-228	32	44	0.727	29	35	0.829
Residue, filterable (tds)	83	83	1.000	47	47	1.000
Selenium	0	83	0.000	0	47	0.000
Sulfate	33	43	0.767	35	35	1.000
Thallium	0	83	0.000	0	47	0.000

N = Total number of measurements in all wells.
Detect = Total number of detections in all wells.
Proportion = Detect/N.

Table 4

Shapiro Wilk Test of Normality for Multiple Groups

Constituent	N (Detects)	Detect Freq	G raw	G log	Critical Value	Limit Type
Antimony	0	0.000				nonpar
Arsenic	3	0.036	1.091	1.187	2.326	nonpar
Barium	42	0.506	1.362	1.729	2.326	normal
Beryllium	0	0.000				nonpar
Boron	1	0.023				nonpar
Cadmium	0	0.000				nonpar
Calcium	43	1.000	2.229	0.889	2.326	normal
Chloride	80	0.964	2.022	1.402	2.326	normal
Chromium	0	0.000				nonpar
Cobalt	0	0.000				nonpar
Fluoride	1	0.023				nonpar
Lead	0	0.000				nonpar
Lithium	0	0.000				nonpar
Mercury	0	0.000				nonpar
Molybdenum	0	0.000				nonpar
pH (Field)	88	1.000	0.956	0.484	2.326	normal
Radium-226	23	0.523	0.536	0.069	2.326	normal
Radium-228	32	0.727	2.067	1.129	2.326	normal
Residue, filterable (tds)	83	1.000	3.368	2.221	2.326	lognor
Selenium	0	0.000				nonpar
Sulfate	33	0.767	0.465	0.378	2.326	normal
Thallium	0	0.000				nonpar

Fit to distribution is confirmed if G < critical value.
If detection frequency is < 50% nonparametric or Poisson limit is used

Table 5

Summary Statistics and Prediction Limits

Constituent	Units	Model Type	N	Detect	Mean	SD	Pred Limit	Conf*
Antimony	ug/L	nonpar	83	0			2.0000	0.99
Arsenic	ug/L	nonpar	83	3			7.8000	0.99
Barium	ug/L	normal	83	42	18.9277	27.0378	83.4650	
Beryllium	ug/L	nonpar	83	0			1.0000	0.99
Boron	ug/L	nonpar	44	1			210.0000	0.99
Cadmium	ug/L	nonpar	83	0			5.0000	0.99
Calcium	mg/L	normal	43	43	15.9767	14.1842	50.6760	
Chloride	mg/L	normal	83	80	10.9494	5.4996	24.0765	
Chromium	ug/L	nonpar	83	0			10.0000	0.99
Cobalt	ug/L	nonpar	83	0			10.0000	0.99
Fluoride	mg/L	nonpar	44	1			0.5900	0.99
Lead	ug/L	nonpar	83	0			9.0000	0.99
Lithium	ug/L	nonpar	44	0			20.0000	0.99
Mercury	ug/L	nonpar	83	0			0.2000	0.99
Molybdenum	ug/L	nonpar	44	0			20.0000	0.99
pH (Field)	S.U.	normal	88	88	4.9964	0.5897	3.43 - 6.56	
Radium-226	pCi/L	normal	44	23	3.4291	5.7600	17.5036	
Radium-228	pCi/L	normal	44	32	2.2288	3.8908	11.7358	
Residue, filterable (tds)	mg/L	lognor	83	83	5.0050	0.5153	510.2459	
Selenium	ug/L	nonpar	83	0			15.0000	0.99
Sulfate	mg/L	normal	43	33	58.8419	74.1944	240.3465	
Thallium	ug/L	nonpar	83	0			1.0000	0.99

* - Confidence level for passing initial test or one verification resample at all downgradient wells for a single constituent (nonparametric test only).
Model Type refers to type of prediction limit.
For lognormal limit, mean and sd in natural log units and prediction limit in original units.
All sample sizes and statistics are based on outlier free data.
For nonparametric limits, median reporting limits are substituted for extreme reporting limit values.

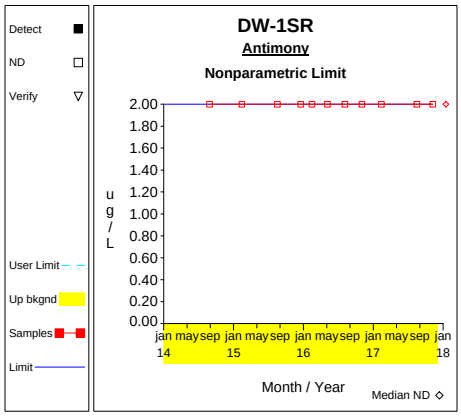
Table 6

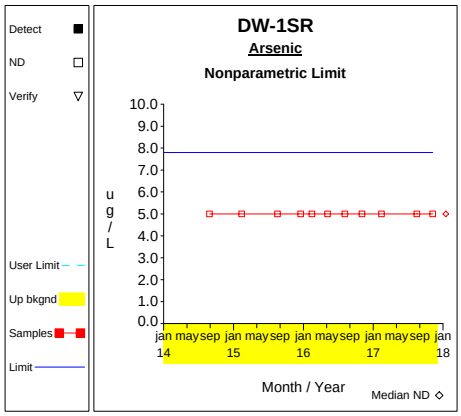
Historical Downgradient Data for Constituent-Well Combinations that Failed the Current Statistical Evaluation or are in Verification Resampling Mode

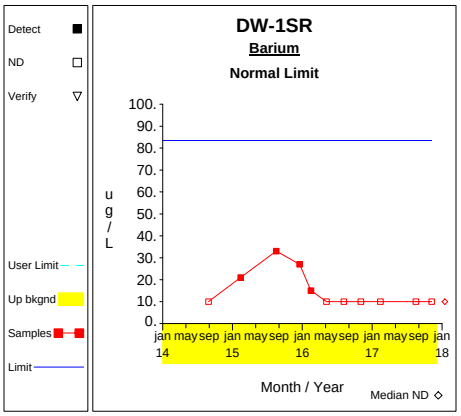
Constituent	Units	Well	Date		Result		Pred. Limit
Calcium	mg/L	DW-2SR	12/17/2015		140.0000	*	50.6760
Calcium	mg/L	DW-2SR	02/15/2016		100.0000	*	50.6760
Calcium	mg/L	DW-2SR	05/05/2016		36.0000		50.6760
Calcium	mg/L	DW-2SR	08/04/2016		38.0000		50.6760
Calcium	mg/L	DW-2SR	11/02/2016		31.0000		50.6760
Calcium	mg/L	DW-2SR	02/13/2017		29.0000		50.6760
Calcium	mg/L	DW-2SR	05/03/2017		30.0000		50.6760
Calcium	mg/L	DW-2SR	08/16/2017		26.0000		50.6760
Calcium	mg/L	DW-2SR	11/07/2017		72.0000	*	50.6760
Chloride	mg/L	DW-2SR	08/28/2014		13.0000		24.0765
Chloride	mg/L	DW-2SR	02/13/2015	ND	3.0000		24.0765
Chloride	mg/L	DW-2SR	08/17/2015		15.0000		24.0765
Chloride	mg/L	DW-2SR	12/17/2015		64.0000	*	24.0765
Chloride	mg/L	DW-2SR	02/15/2016		47.0000	*	24.0765
Chloride	mg/L	DW-2SR	05/05/2016		26.0000	*	24.0765
Chloride	mg/L	DW-2SR	08/04/2016		14.0000		24.0765
Chloride	mg/L	DW-2SR	11/02/2016		6.2000		24.0765
Chloride	mg/L	DW-2SR	02/13/2017		5.6000		24.0765
Chloride	mg/L	DW-2SR	05/03/2017		6.9000		24.0765
Chloride	mg/L	DW-2SR	08/16/2017		56.0000	*	24.0765
Chloride	mg/L	DW-2SR	11/07/2017		300.0000	*	24.0765
Residue, filterable (tds)	mg/L	DW-2SR	08/28/2014		290.0000		510.2459
Residue, filterable (tds)	mg/L	DW-2SR	02/13/2015		190.0000		510.2459
Residue, filterable (tds)	mg/L	DW-2SR	08/17/2015		1200.0000	*	510.2459
Residue, filterable (tds)	mg/L	DW-2SR	12/17/2015		870.0000	*	510.2459
Residue, filterable (tds)	mg/L	DW-2SR	02/15/2016		690.0000	*	510.2459
Residue, filterable (tds)	mg/L	DW-2SR	05/05/2016		360.0000		510.2459
Residue, filterable (tds)	mg/L	DW-2SR	08/04/2016		310.0000		510.2459
Residue, filterable (tds)	mg/L	DW-2SR	11/02/2016		270.0000		510.2459
Residue, filterable (tds)	mg/L	DW-2SR	02/13/2017		220.0000		510.2459
Residue, filterable (tds)	mg/L	DW-2SR	05/03/2017		320.0000		510.2459
Residue, filterable (tds)	mg/L	DW-2SR	08/16/2017		210.0000		510.2459
Residue, filterable (tds)	mg/L	DW-2SR	11/07/2017		810.0000	*	510.2459
Calcium	mg/L	DW-3SR	12/17/2015		64.0000	*	50.6760
Calcium	mg/L	DW-3SR	02/16/2016		74.0000	*	50.6760
Calcium	mg/L	DW-3SR	05/05/2016		49.0000		50.6760
Calcium	mg/L	DW-3SR	08/04/2016		51.0000	*	50.6760
Calcium	mg/L	DW-3SR	11/03/2016		87.0000	*	50.6760
Calcium	mg/L	DW-3SR	02/13/2017		79.0000	*	50.6760
Calcium	mg/L	DW-3SR	05/03/2017		21.0000		50.6760
Calcium	mg/L	DW-3SR	08/16/2017		20.0000		50.6760
Calcium	mg/L	DW-3SR	11/07/2017		140.0000	*	50.6760
Chloride	mg/L	DW-3SR	08/28/2014		7.6000		24.0765
Chloride	mg/L	DW-3SR	02/13/2015		8.3000		24.0765
Chloride	mg/L	DW-3SR	08/17/2015		6.6000		24.0765
Chloride	mg/L	DW-3SR	12/17/2015		10.0000		24.0765
Chloride	mg/L	DW-3SR	02/16/2016		17.0000		24.0765
Chloride	mg/L	DW-3SR	05/05/2016		4.6000		24.0765
Chloride	mg/L	DW-3SR	08/04/2016		6.2000		24.0765
Chloride	mg/L	DW-3SR	11/03/2016		18.0000		24.0765
Chloride	mg/L	DW-3SR	02/13/2017		17.0000		24.0765
Chloride	mg/L	DW-3SR	05/03/2017		29.0000	*	24.0765
Chloride	mg/L	DW-3SR	08/16/2017	ND	3.0000		24.0765
Chloride	mg/L	DW-3SR	11/07/2017		330.0000	*	24.0765
Residue, filterable (tds)	mg/L	DW-3SR	08/28/2014		540.0000	*	510.2459
Residue, filterable (tds)	mg/L	DW-3SR	02/13/2015		420.0000		510.2459
Residue, filterable (tds)	mg/L	DW-3SR	08/17/2015		350.0000		510.2459
Residue, filterable (tds)	mg/L	DW-3SR	12/17/2015		310.0000		510.2459
Residue, filterable (tds)	mg/L	DW-3SR	02/16/2016		370.0000		510.2459
Residue, filterable (tds)	mg/L	DW-3SR	05/05/2016		280.0000		510.2459
Residue, filterable (tds)	mg/L	DW-3SR	08/04/2016		260.0000		510.2459
Residue, filterable (tds)	mg/L	DW-3SR	11/03/2016		460.0000		510.2459
Residue, filterable (tds)	mg/L	DW-3SR	02/13/2017		430.0000		510.2459
Residue, filterable (tds)	mg/L	DW-3SR	05/03/2017		150.0000		510.2459
Residue, filterable (tds)	mg/L	DW-3SR	08/16/2017		160.0000		510.2459
Residue, filterable (tds)	mg/L	DW-3SR	11/07/2017		950.0000	*	510.2459

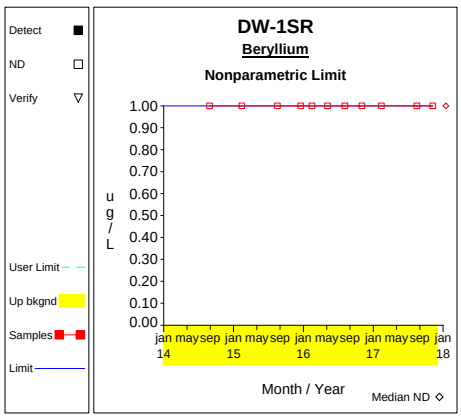
* - Significantly increased over background.
ND = Not Detected, result = detection limit.

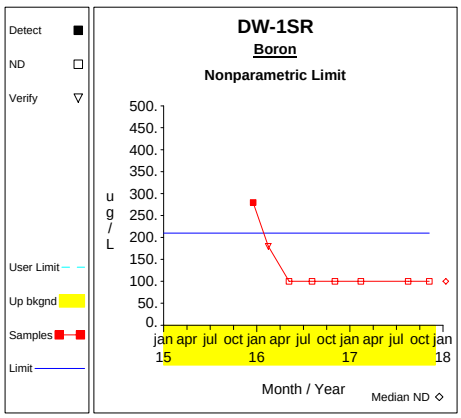
Up vs. Down Prediction Limits

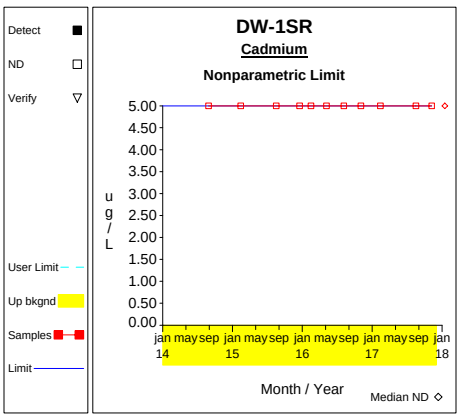


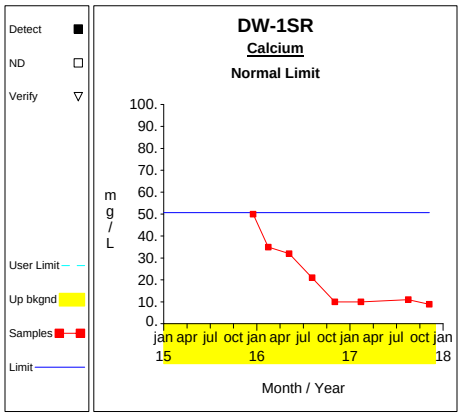


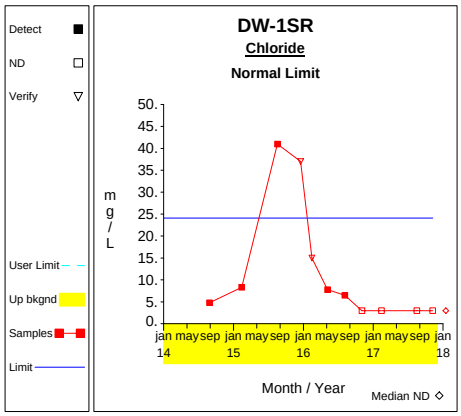


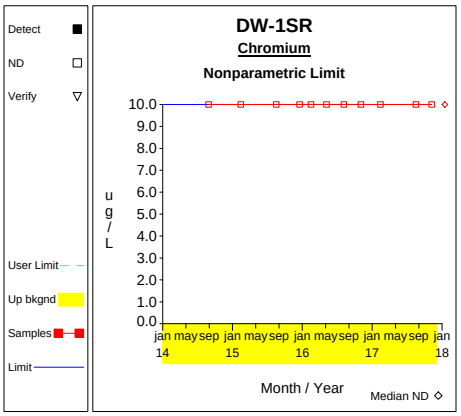


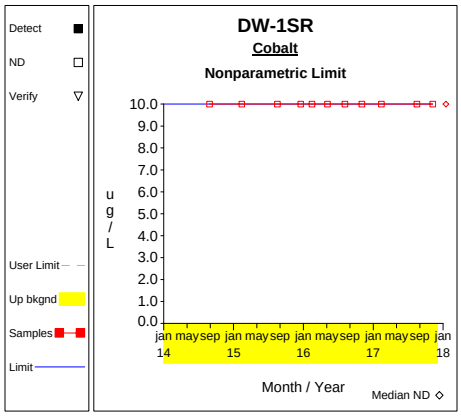


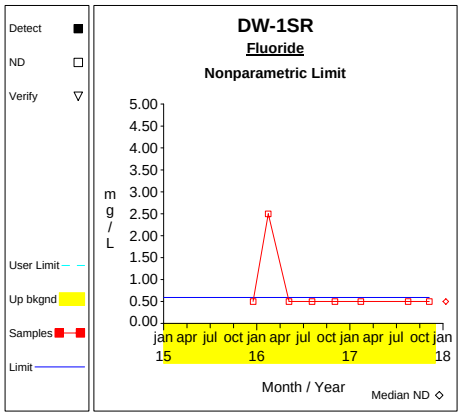


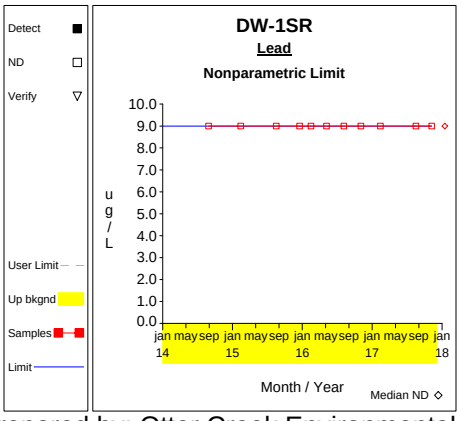




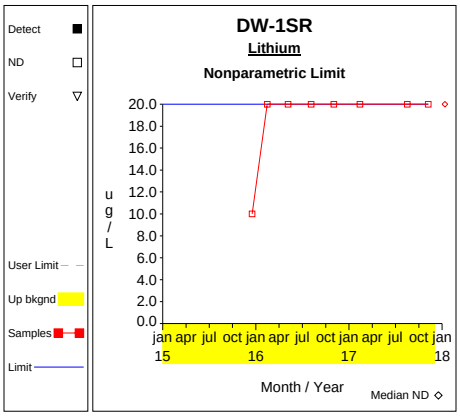


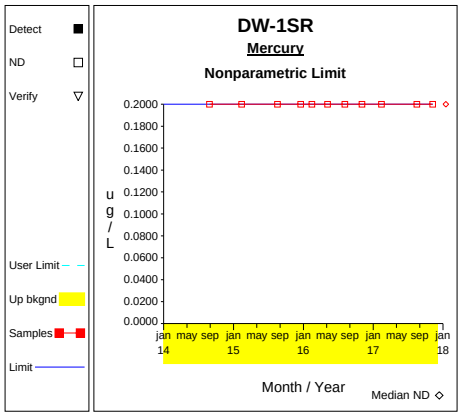


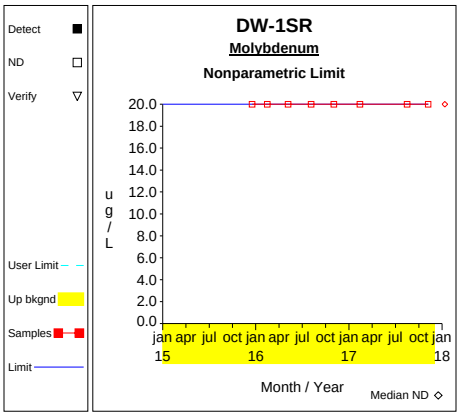


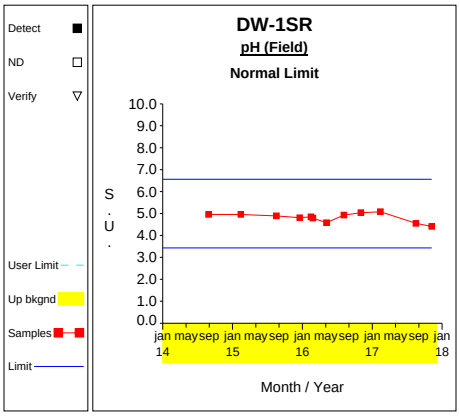


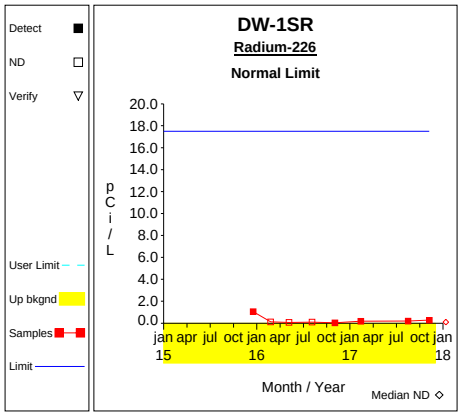
Up vs. Down Prediction Limits

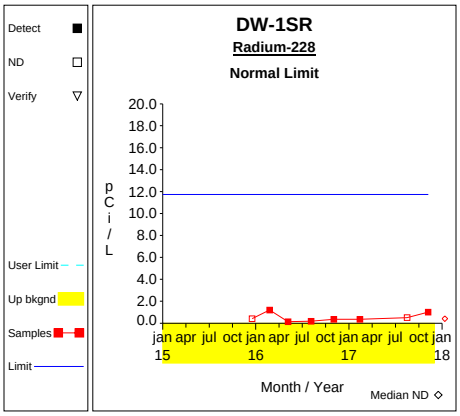


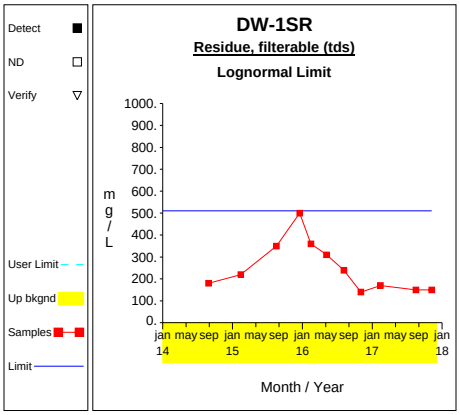


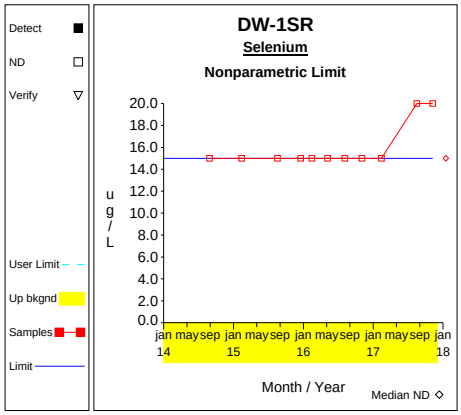


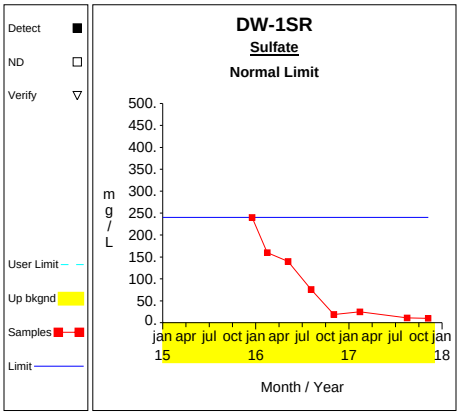


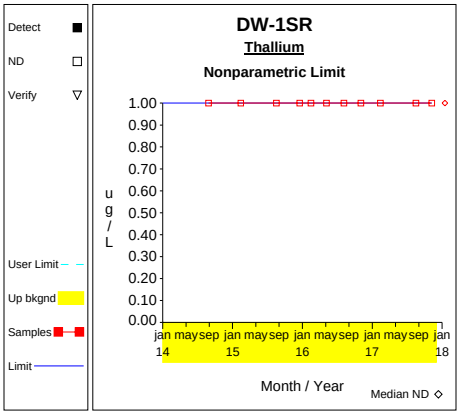




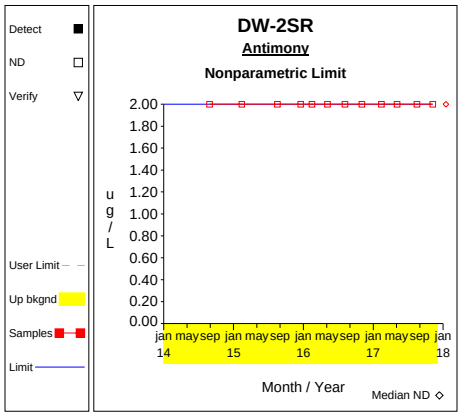


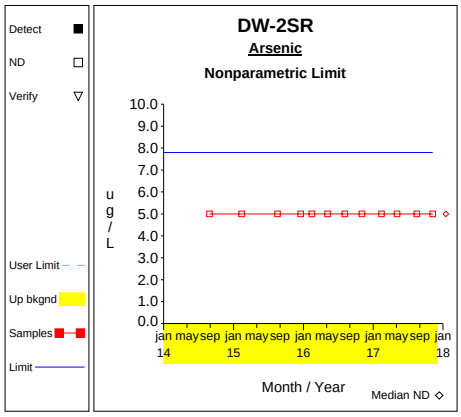


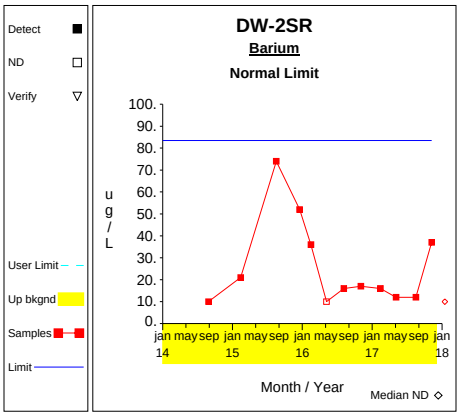


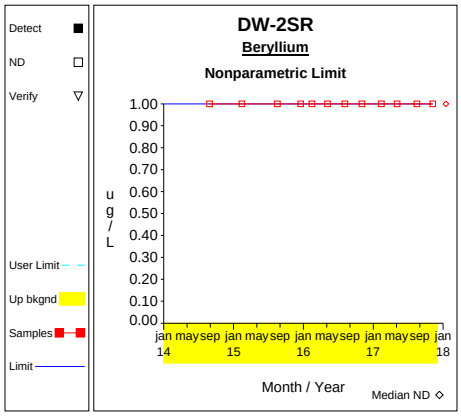


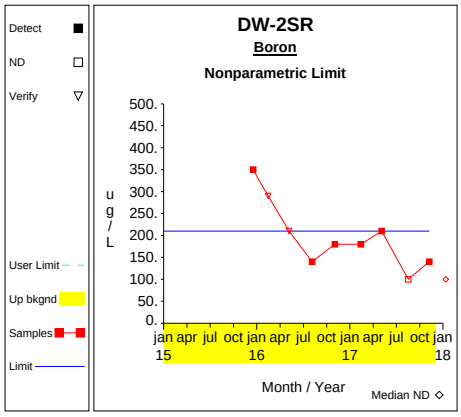
Up vs. Down Prediction Limits

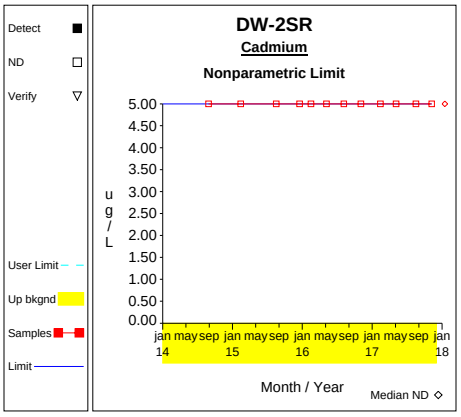


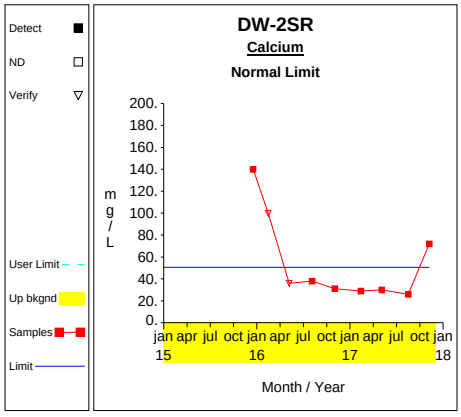


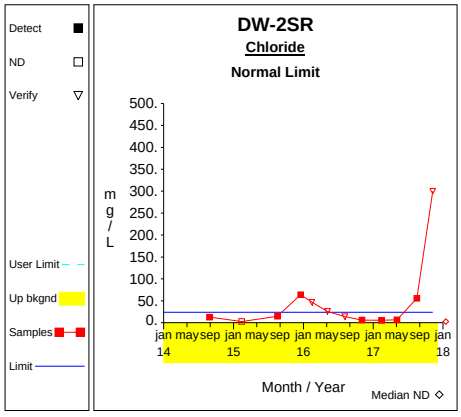


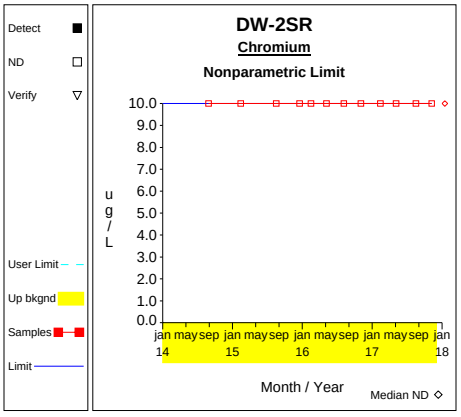


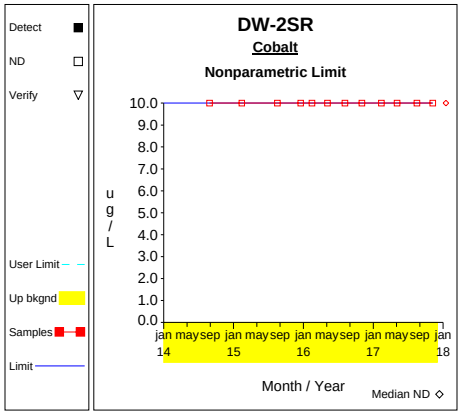


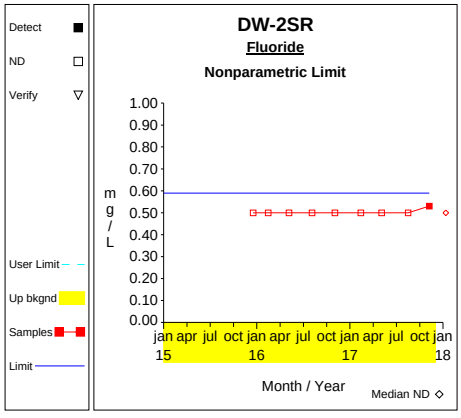


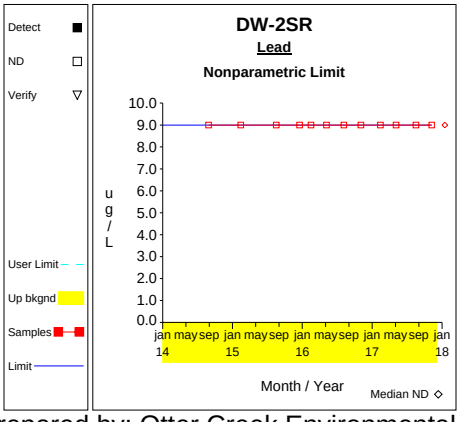












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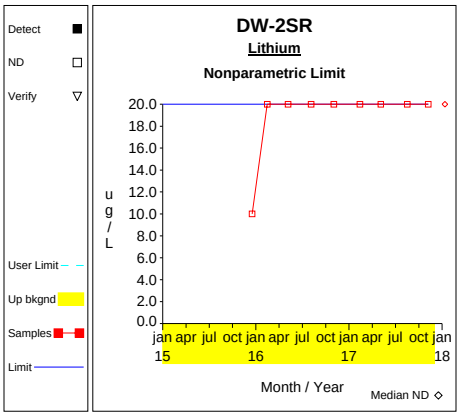
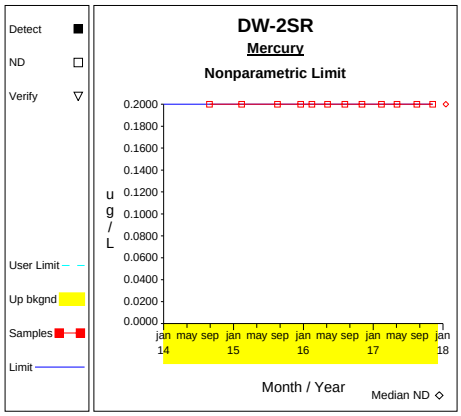
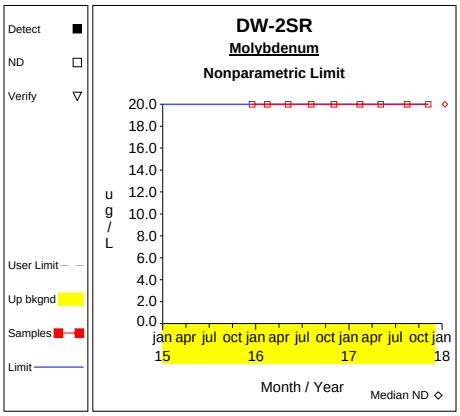
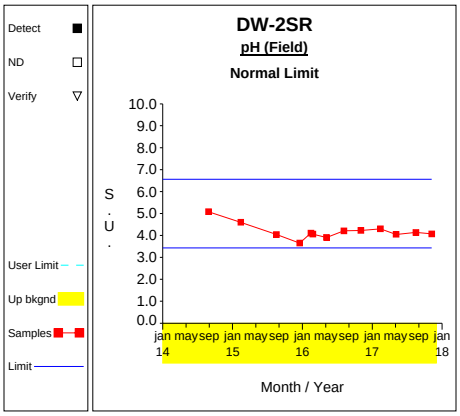
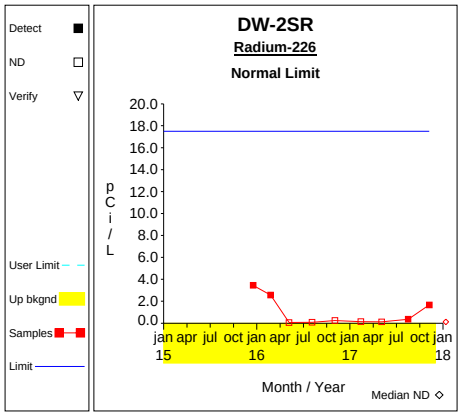
Up vs. Down Prediction Limits

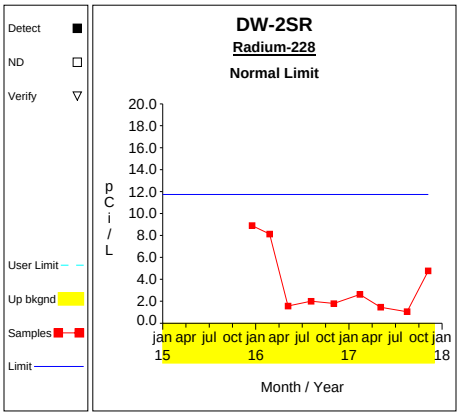


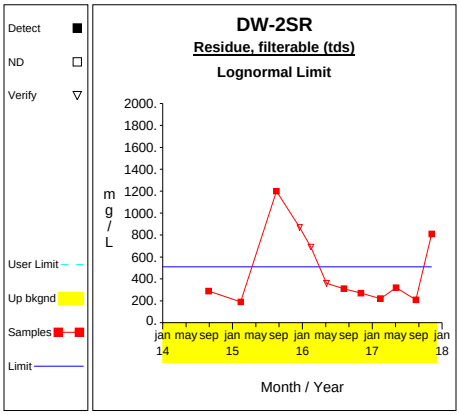


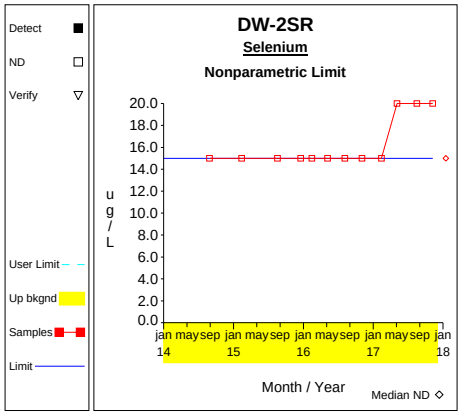


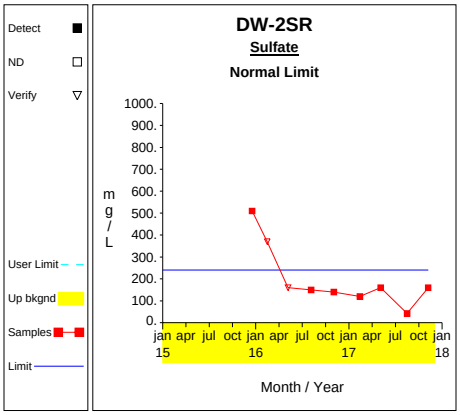


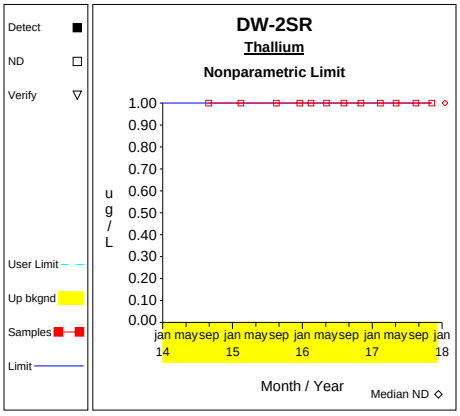




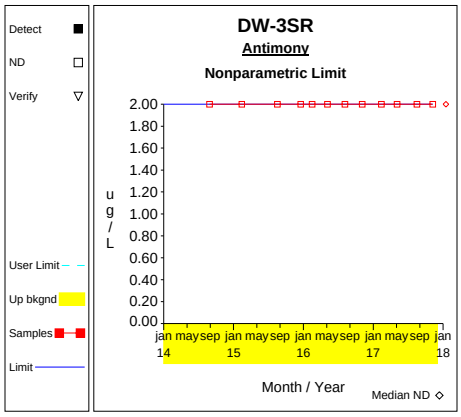


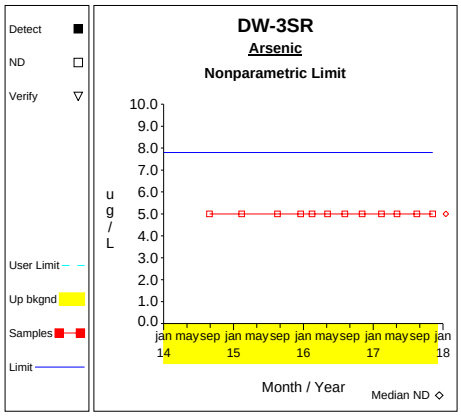


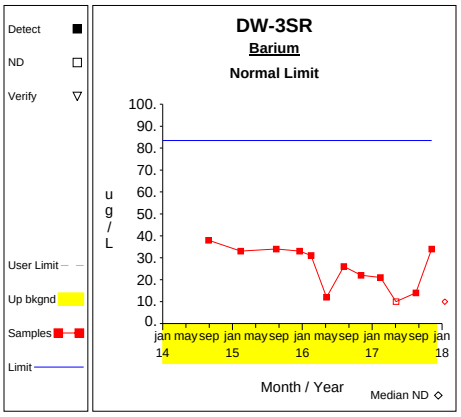


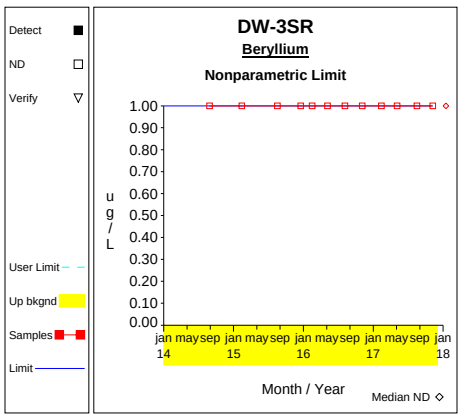


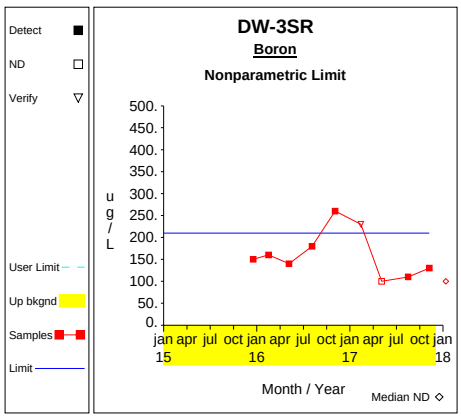
Up vs. Down Prediction Limits

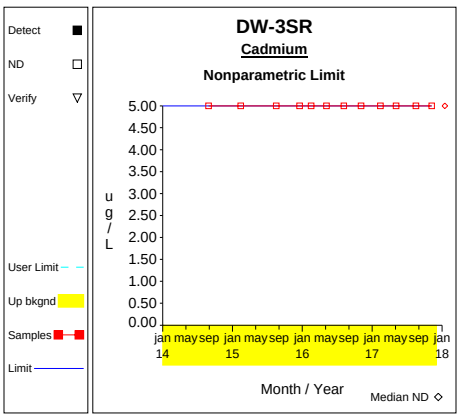


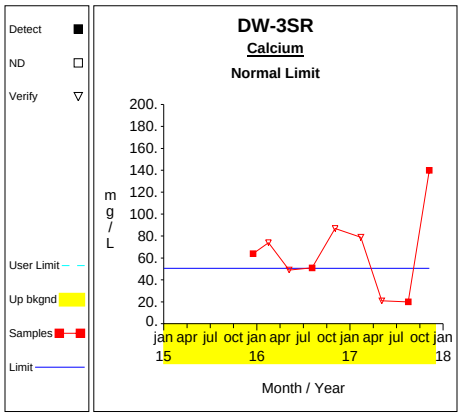


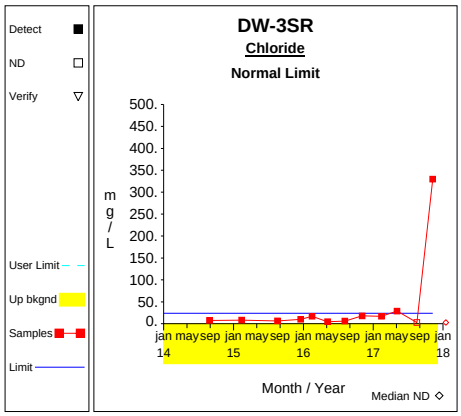


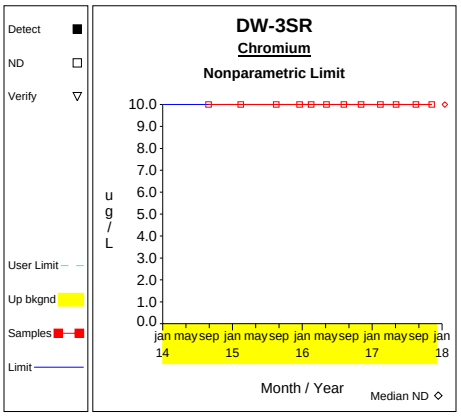


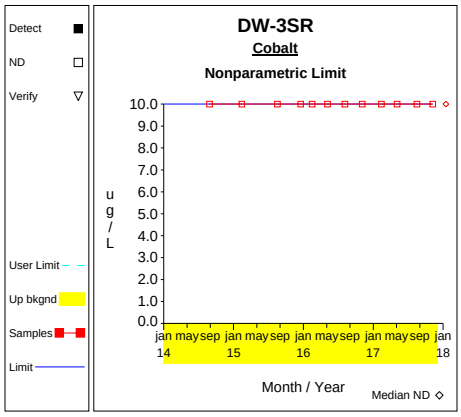


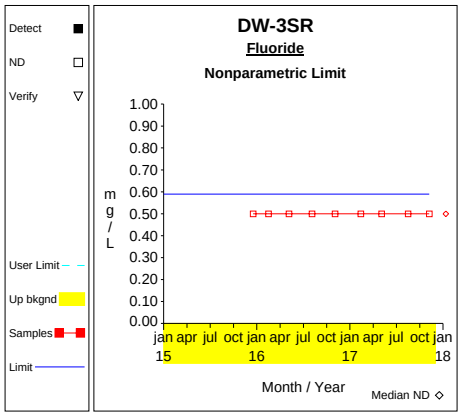


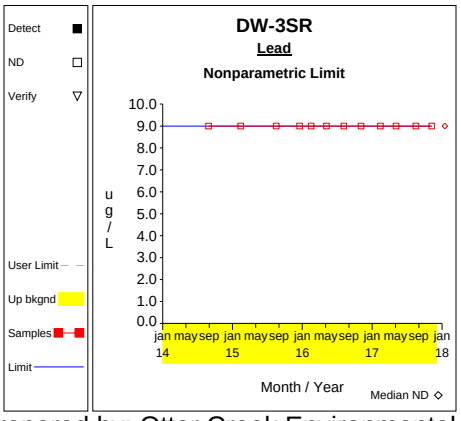












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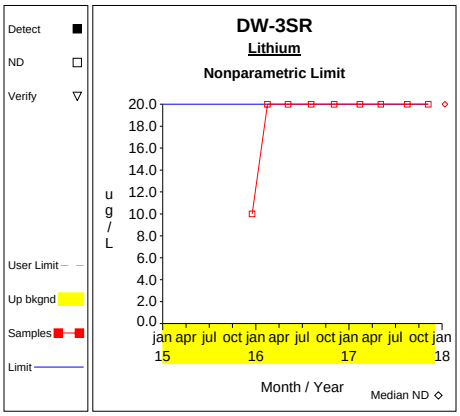
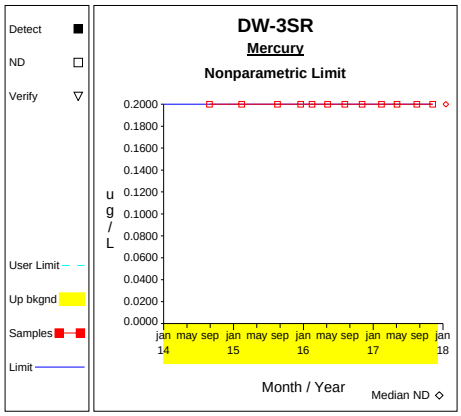
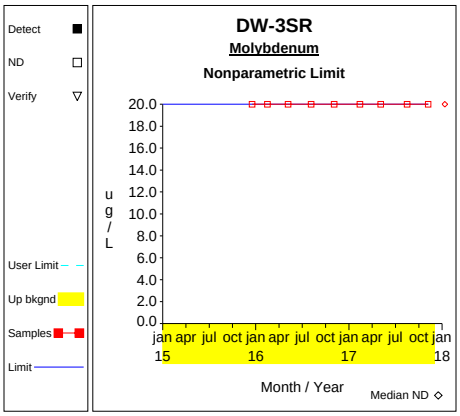
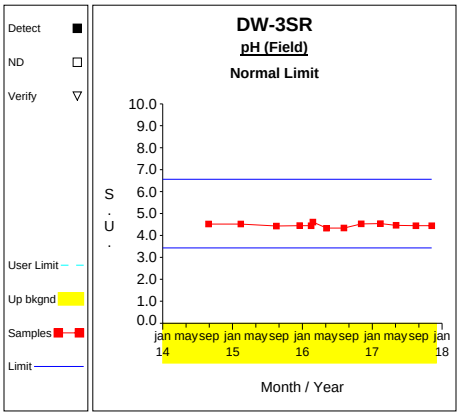
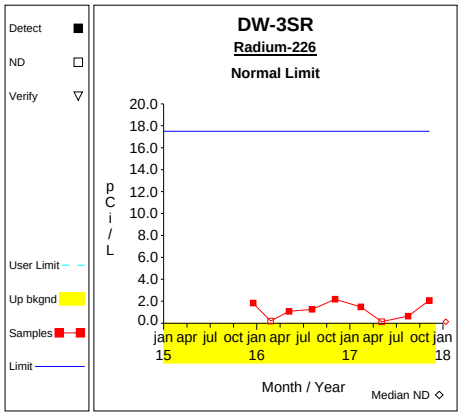
Up vs. Down Prediction Limits

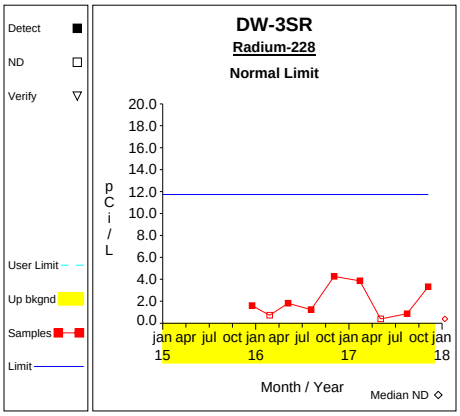


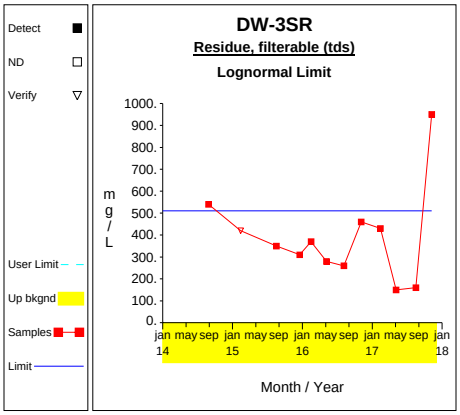


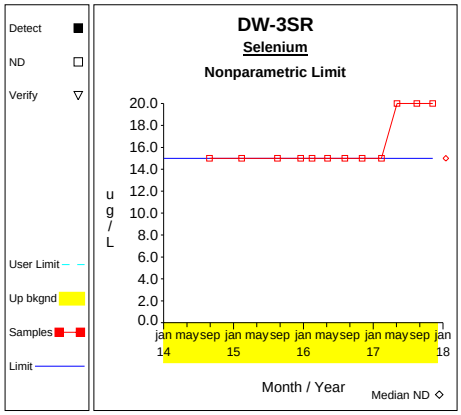


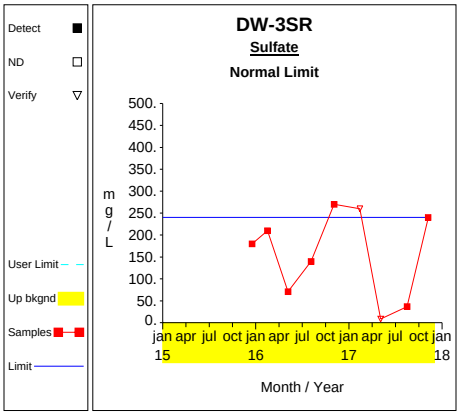


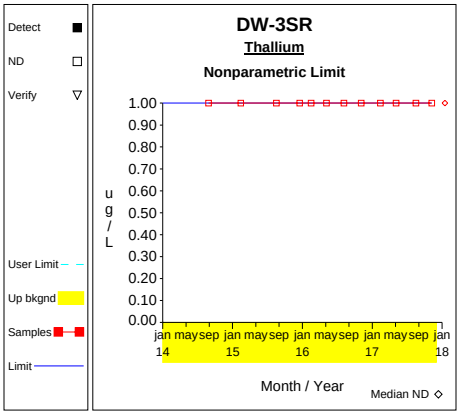




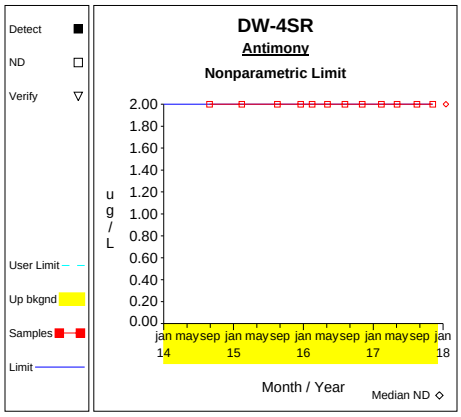


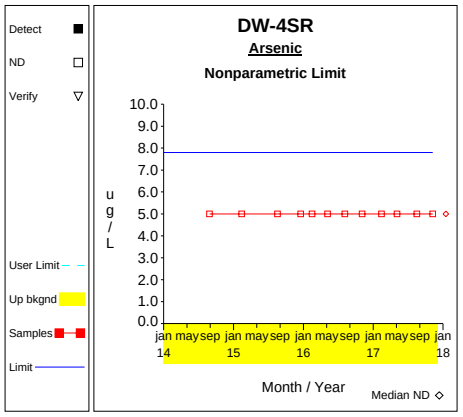


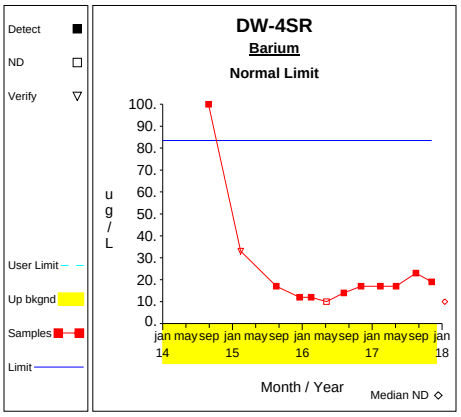


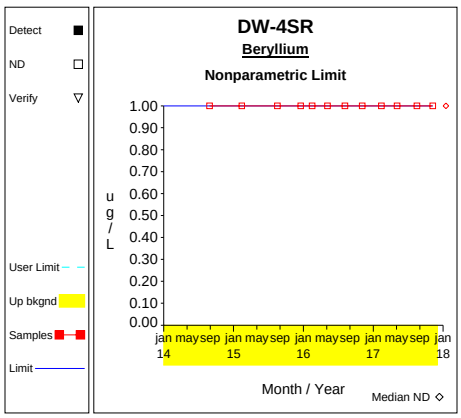


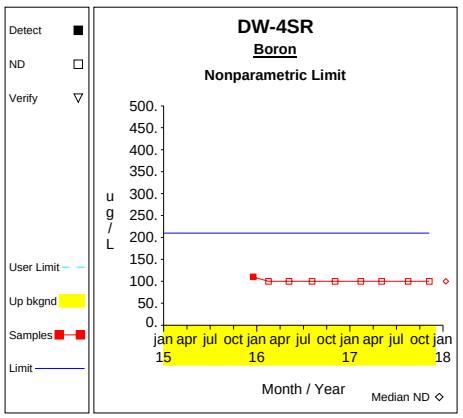
Up vs. Down Prediction Limits

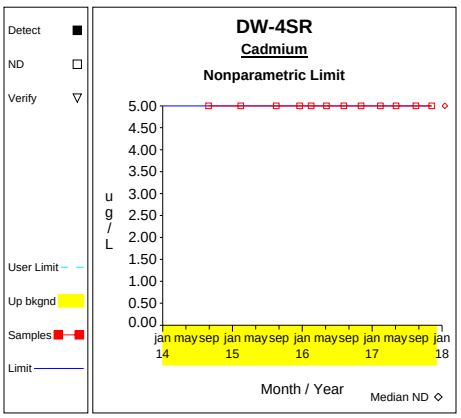


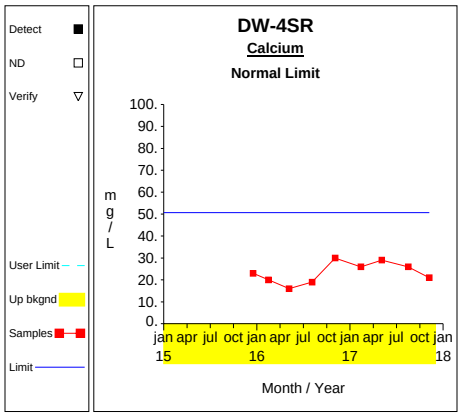


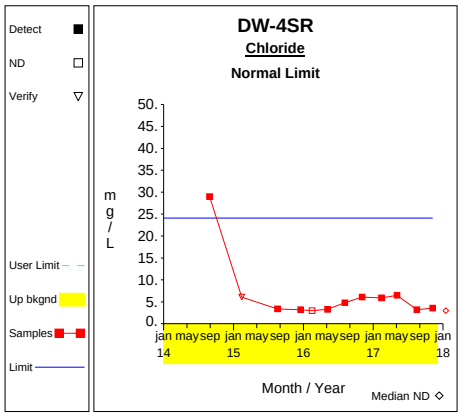


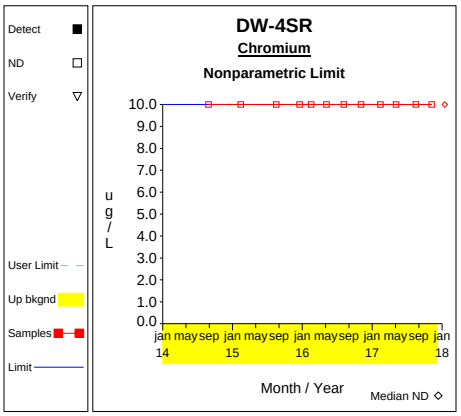


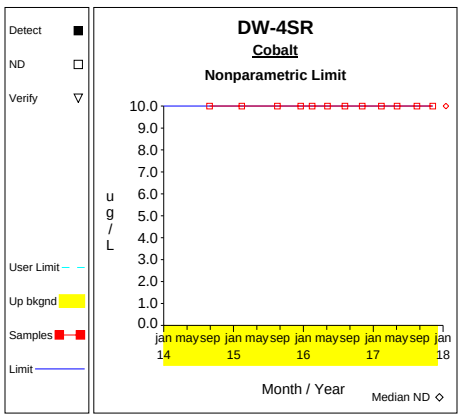


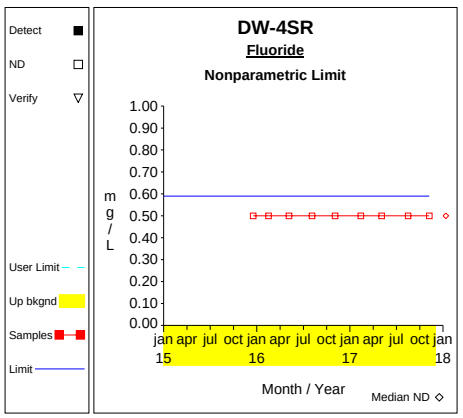


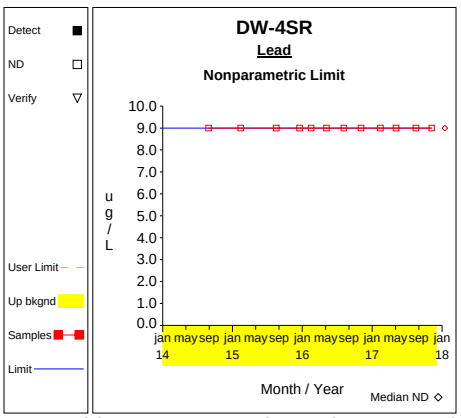




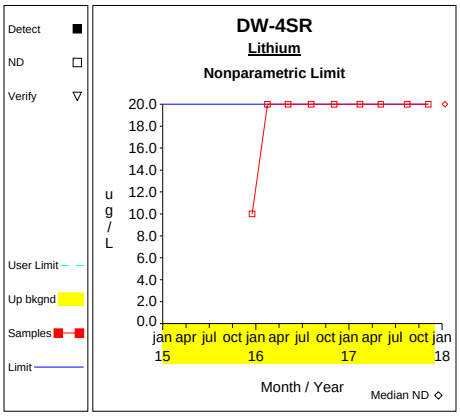


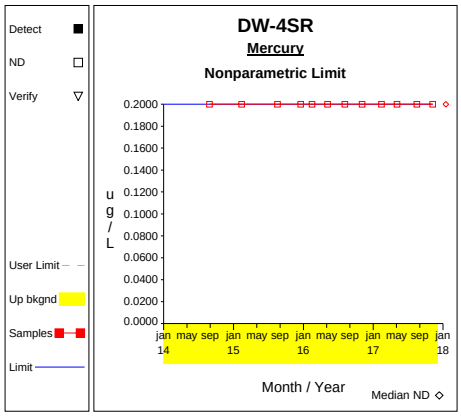


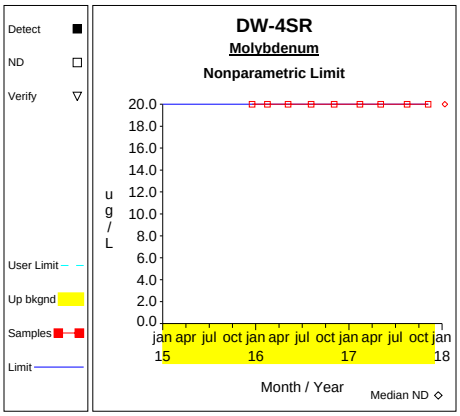


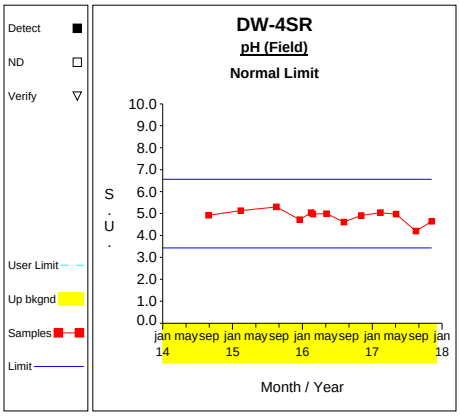


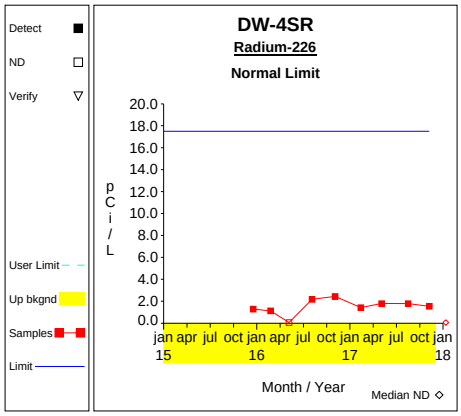
Up vs. Down Prediction Limits

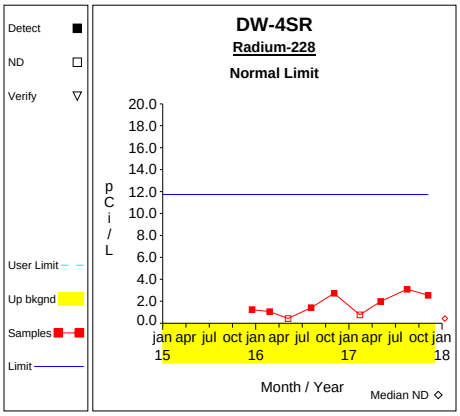


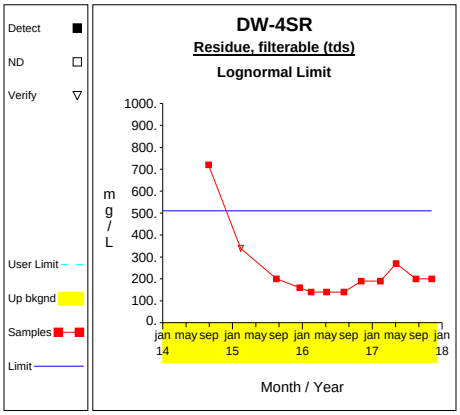


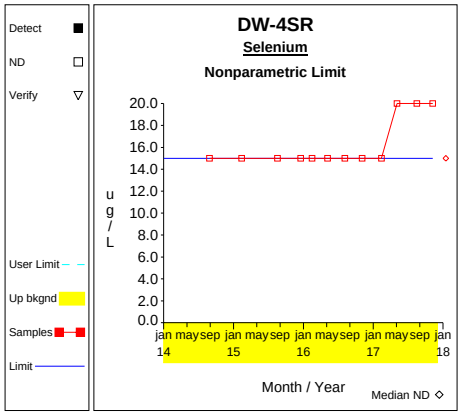


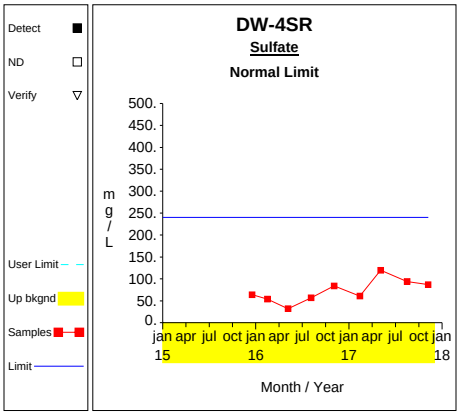


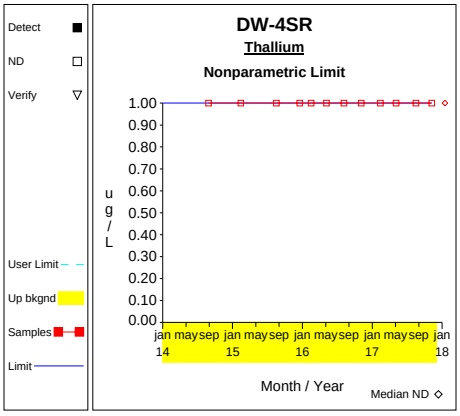






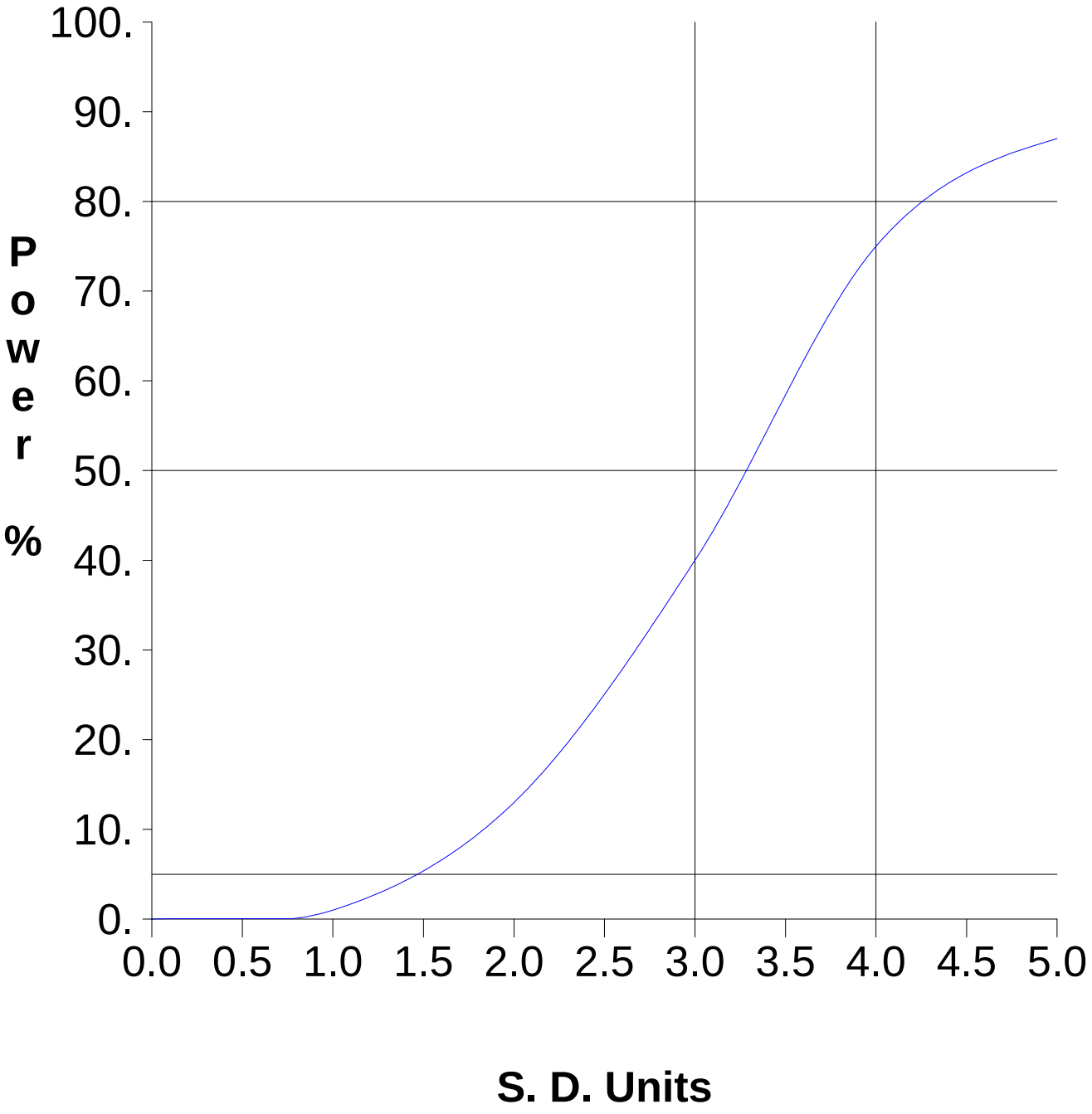




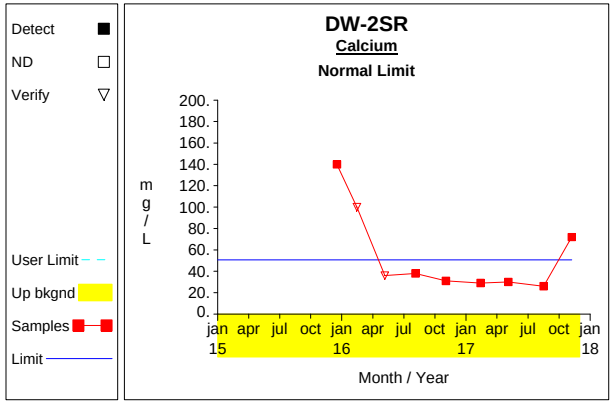


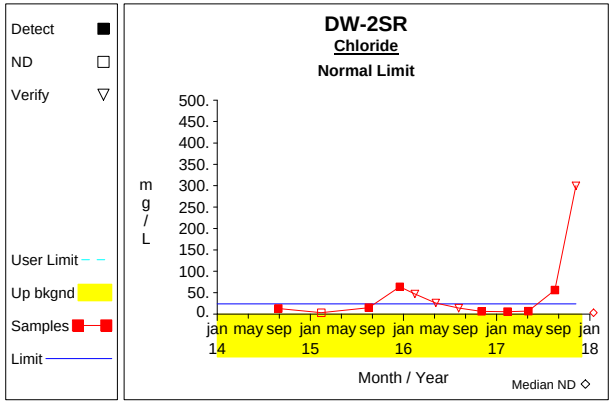
False Positive and False Negative Rates for Current

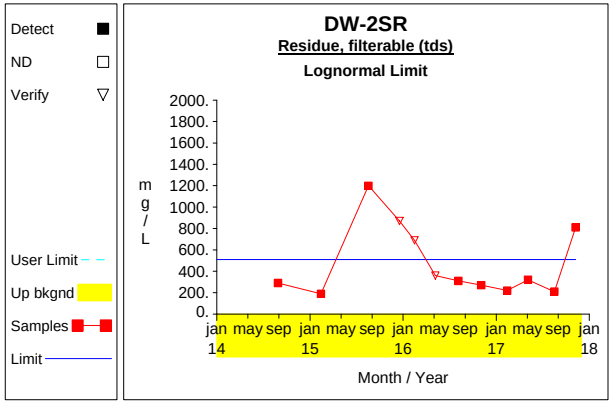
Upgradient vs. Downgradient Monitoring Program

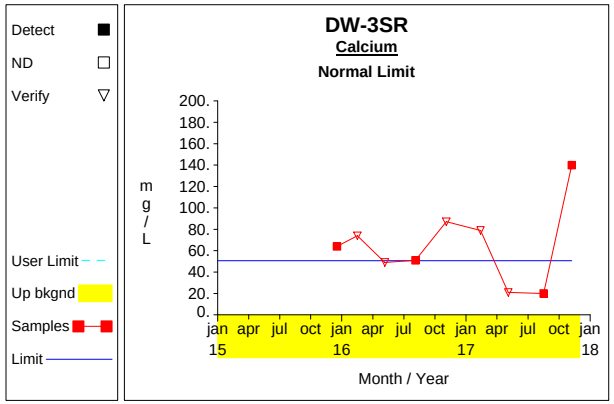


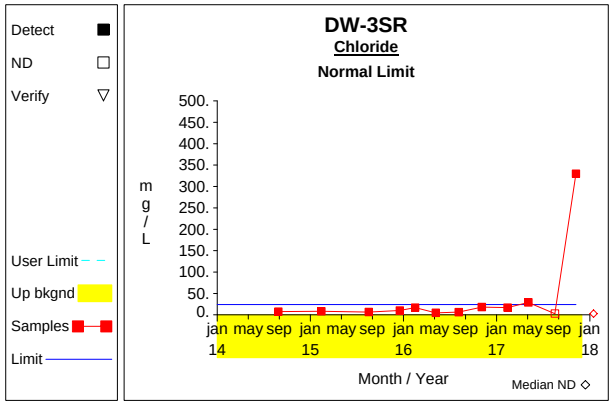
Up vs. Down Prediction Limits

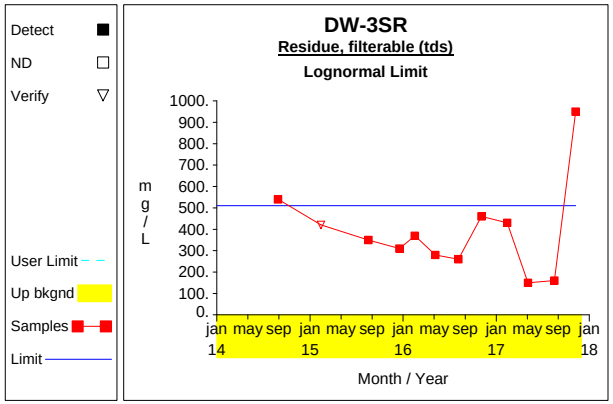












Attachment C

Summary Tables and Graphs for the Intrawell Comparisons

Table 1

Summary Statistics and Intermediate Computations for Combined Shewhart-Cusum Control Charts

Constituent	Units	Well	N	Mean	SD	S(i-1)	S(i)	Limit
Antimony	ug/L	DW-1SR	8					2.0000**
Arsenic	ug/L	DW-1SR	8					5.0000**
Barium	ug/L	DW-1SR	8	17.0000	9.0396	17.0000	17.0000	57.6782
Beryllium	ug/L	DW-1SR	8					1.0000**
Boron	ug/L	DW-1SR	5	152.0000	79.4984	152.0000	152.0000	509.7429
Cadmium	ug/L	DW-1SR	8					5.0000**
Calcium	mg/L	DW-1SR	5	29.6000	15.0765	29.6000	29.6000	97.4441
Chloride	mg/L	DW-1SR	8	15.4250	15.0027	15.4250	15.4250	82.9373
Chromium	ug/L	DW-1SR	8					10.0000**
Cobalt	ug/L	DW-1SR	8					10.0000**
Fluoride	mg/L	DW-1SR	5					**
Lead	ug/L	DW-1SR	8					9.0000**
Lithium	ug/L	DW-1SR	5					**
Mercury	ug/L	DW-1SR	8					0.2000**
Molybdenum	ug/L	DW-1SR	5					**
pH (Field)	S.U.	DW-1SR	9	4.8678	0.1340	4.8678	4.8678	4.26 - 5.47
Radium-226	pCi/L	DW-1SR	4	0.0751	0.0278	0.2403	0.3183	0.2002
Radium-228	pCi/L	DW-1SR	5	0.4536	0.4328	0.4536	0.5772	2.4012
Residue, filterable (tds)	mg/L	DW-1SR	8	287.5000	116.4658	287.5000	287.5000	811.5962
Selenium	ug/L	DW-1SR	8					15.0000**
Sulfate	mg/L	DW-1SR	5	127.0000	84.1011	127.0000	127.0000	505.4551
Thallium	ug/L	DW-1SR	8					1.0000**
Antimony	ug/L	DW-2SR	8					2.0000**
Arsenic	ug/L	DW-2SR	8					5.0000**
Barium	ug/L	DW-2SR	8	29.5000	22.9907	29.5000	29.5000	132.9581
Beryllium	ug/L	DW-2SR	8					1.0000**
Boron	ug/L	DW-2SR	5	234.0000	85.0294	234.0000	234.0000	616.6323
Cadmium	ug/L	DW-2SR	8					5.0000**
Calcium	mg/L	DW-2SR	5	69.0000	48.7237	69.0000	69.0000	288.2567
Chloride	mg/L	DW-2SR	8	23.5250	21.3509	34.6491	289.7731	119.6042
Chromium	ug/L	DW-2SR	8					10.0000**
Cobalt	ug/L	DW-2SR	8					10.0000**
Fluoride	mg/L	DW-2SR	5					**
Lead	ug/L	DW-2SR	8					9.0000**
Lithium	ug/L	DW-2SR	5					**
Mercury	ug/L	DW-2SR	8					0.2000**
Molybdenum	ug/L	DW-2SR	5					**
pH (Field)	S.U.	DW-2SR	9	4.2100	0.4145	4.2100	4.2100	2.34 - 6.08
Radium-226	pCi/L	DW-2SR	5	1.2499	1.6328	1.2499	1.2499	8.5975
Radium-228	pCi/L	DW-2SR	5	4.4760	3.7004	4.4760	4.4760	21.1278
Residue, filterable (tds)	mg/L	DW-2SR	8	522.5000	360.1091	522.5000	522.5000	2142.9910
Selenium	ug/L	DW-2SR	8					15.0000**
Sulfate	mg/L	DW-2SR	5	266.0000	166.5233	266.0000	266.0000	1015.3547
Thallium	ug/L	DW-2SR	8					1.0000**
Antimony	ug/L	DW-3SR	8					2.0000**
Arsenic	ug/L	DW-3SR	8					5.0000**
Barium	ug/L	DW-3SR	8	28.6250	8.3484	28.6250	28.6250	66.1930
Beryllium	ug/L	DW-3SR	8					1.0000**
Boron	ug/L	DW-3SR	5	178.0000	48.1664	178.0000	178.0000	394.7487
Cadmium	ug/L	DW-3SR	8					5.0000**
Calcium	mg/L	DW-3SR	5	65.0000	15.9531	65.0000	124.0469	136.7888
Chloride	mg/L	DW-3SR	8	9.7875	5.0207	11.3630	326.5549	32.3804
Chromium	ug/L	DW-3SR	8					10.0000**
Cobalt	ug/L	DW-3SR	8					10.0000**
Fluoride	mg/L	DW-3SR	5					**
Lead	ug/L	DW-3SR	8					9.0000**
Lithium	ug/L	DW-3SR	5					**
Mercury	ug/L	DW-3SR	8					0.2000**
Molybdenum	ug/L	DW-3SR	5					**
pH (Field)	S.U.	DW-3SR	9	4.4633	0.0917	4.4633	4.4633	4.05 - 4.88
Radium-226	pCi/L	DW-3SR	5	1.3080	0.7644	1.3080	1.3080	4.7477
Radium-228	pCi/L	DW-3SR	5	1.9302	1.3724	1.9302	1.9576	8.1062
Residue, filterable (tds)	mg/L	DW-3SR	8	373.7500	95.3096	373.7500	854.6904	802.6434
Selenium	ug/L	DW-3SR	8					15.0000**
Sulfate	mg/L	DW-3SR	5	174.2000	74.6873	174.2000	174.2000	510.2931
Thallium	ug/L	DW-3SR	8					1.0000**
Antimony	ug/L	DW-4SR	8					2.0000**
Arsenic	ug/L	DW-4SR	8					5.0000**
Barium	ug/L	DW-4SR	8	26.8750	30.4088	26.8750	26.8750	163.7147
Beryllium	ug/L	DW-4SR	8					1.0000**
Boron	ug/L	DW-4SR	5					**
Cadmium	ug/L	DW-4SR	8					5.0000**
Calcium	mg/L	DW-4SR	5	21.6000	5.3198	22.7605	21.6000	45.5390

* - Insufficient Data
** - Detection Frequency < 25%
*** - Zero Variance

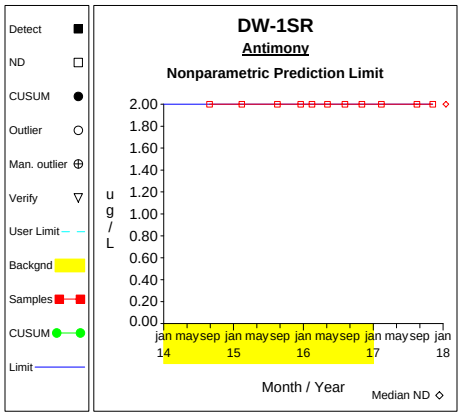
Table 1

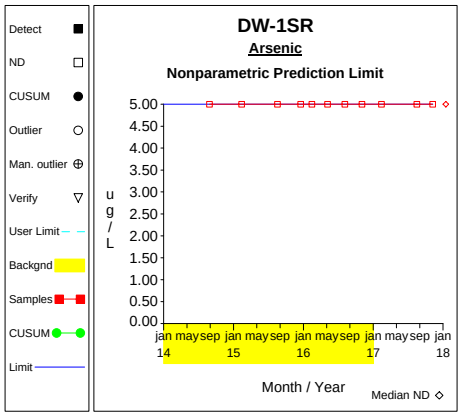
Summary Statistics and Intermediate Computations for Combined Shewhart-Cusum Control Charts

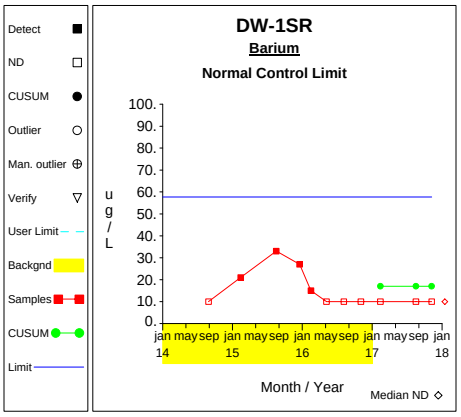
Constituent	Units	Well	N	Mean	SD	S(i-1)	S(i)	Limit
Chloride	mg/L	DW-4SR	7	4.2714	1.3805	4.2714	4.2714	10.4836
Chromium	ug/L	DW-4SR	8					10.0000**
Cobalt	ug/L	DW-4SR	8					10.0000**
Fluoride	mg/L	DW-4SR	5					**
Lead	ug/L	DW-4SR	8					9.0000**
Lithium	ug/L	DW-4SR	5					**
Mercury	ug/L	DW-4SR	8					0.2000**
Molybdenum	ug/L	DW-4SR	5					**
pH (Field)	S.U.	DW-4SR	9	4.9556	0.2050	4.9556	4.9556	4.03 - 5.88
Radium-226	pCi/L	DW-4SR	5	1.4165	0.9424	1.4165	1.4165	5.6575
Radium-228	pCi/L	DW-4SR	5	1.3706	0.8417	2.2583	2.5860	5.1583
Residue, filterable (tds)	mg/L	DW-4SR	8	253.7500	199.7811	253.7500	253.7500	1152.7651
Selenium	ug/L	DW-4SR	8					15.0000**
Sulfate	mg/L	DW-4SR	5	58.2000	18.7403	118.3193	128.3790	142.5315
Thallium	ug/L	DW-4SR	8					1.0000**

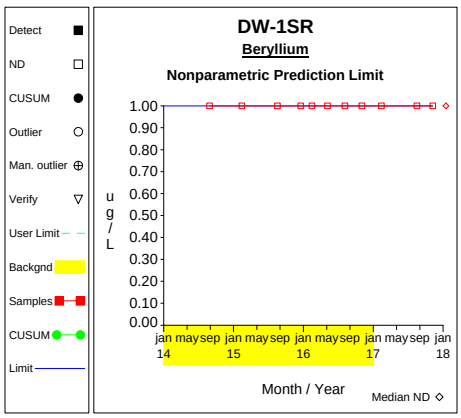
* - Insufficient Data
** - Detection Frequency < 25%
*** - Zero Variance

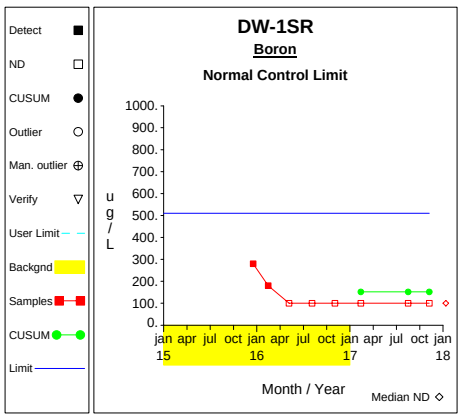
Intra-Well Control Charts

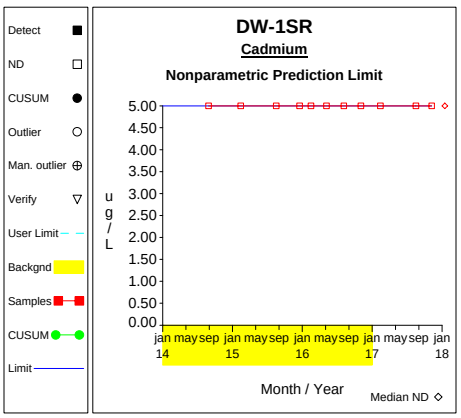


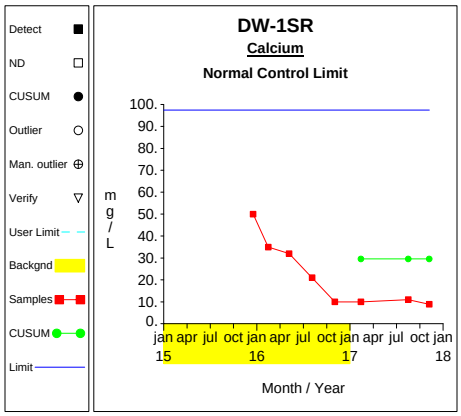


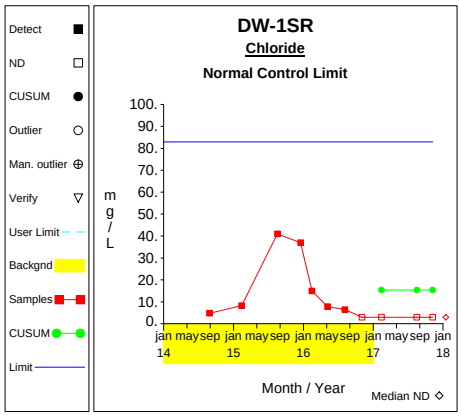


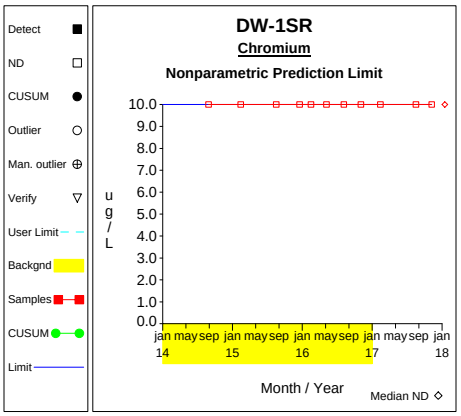


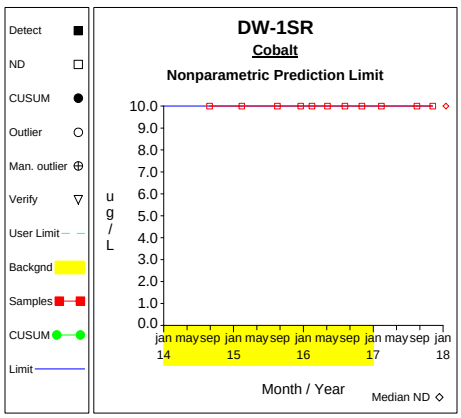


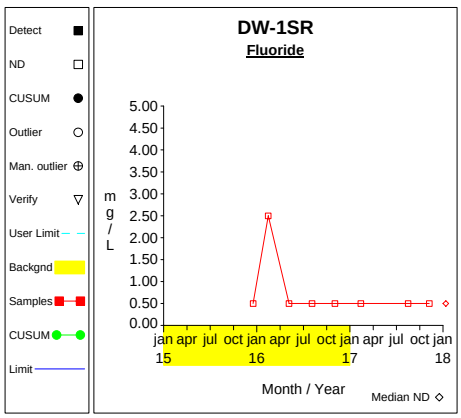


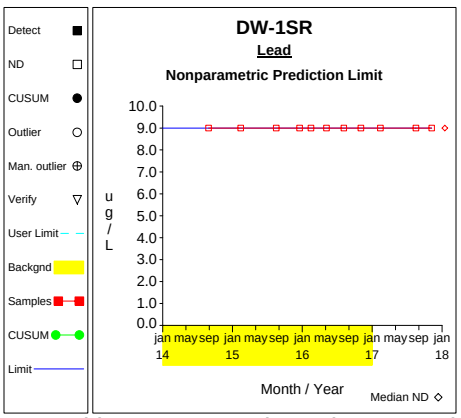












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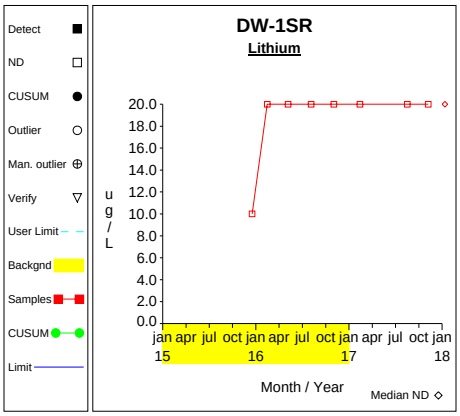

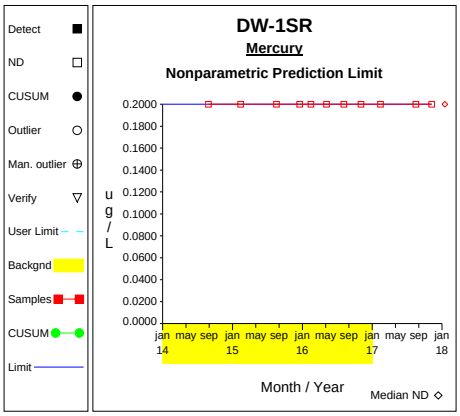

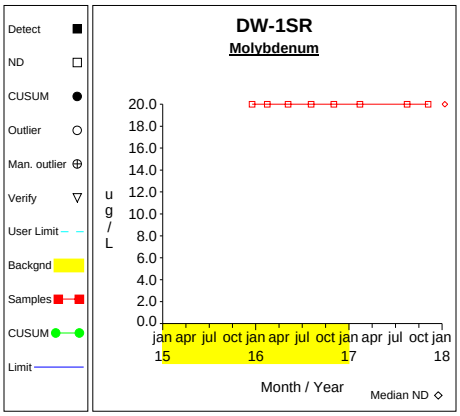

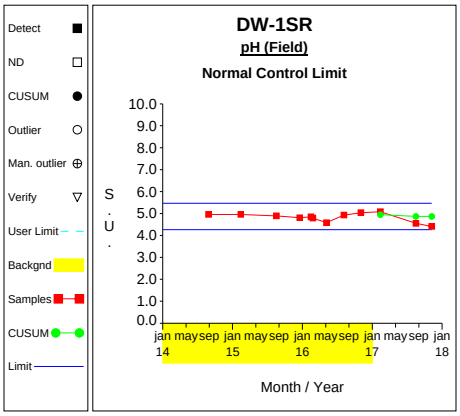

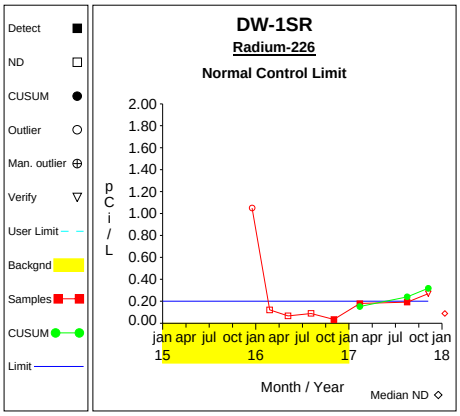

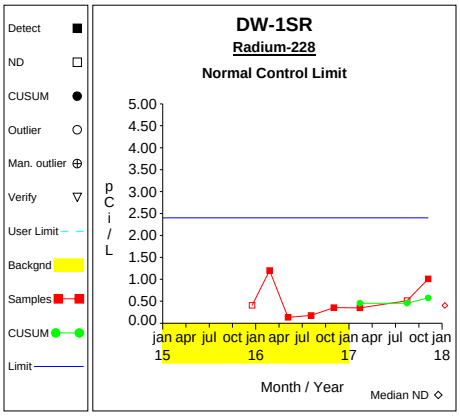

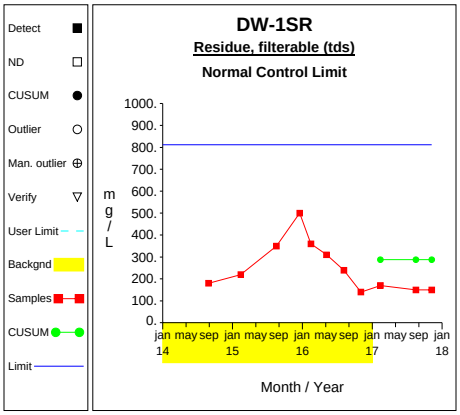

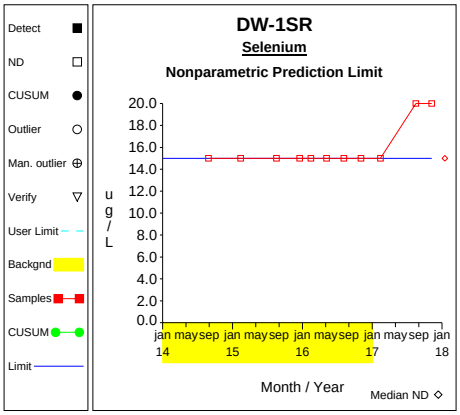

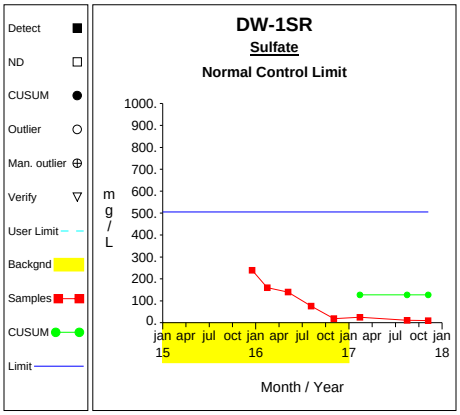

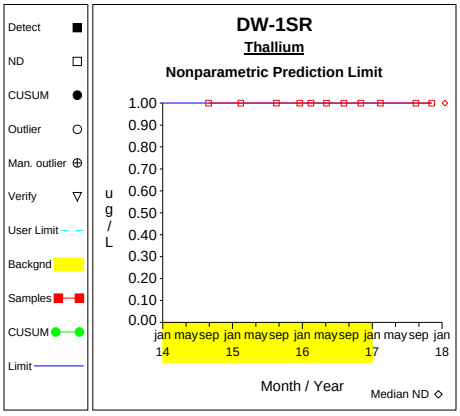

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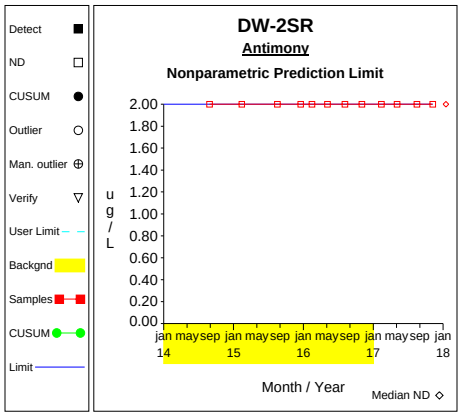

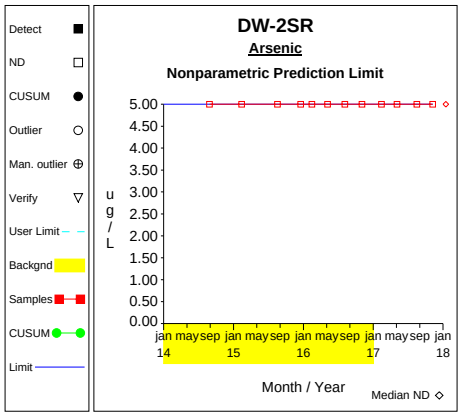

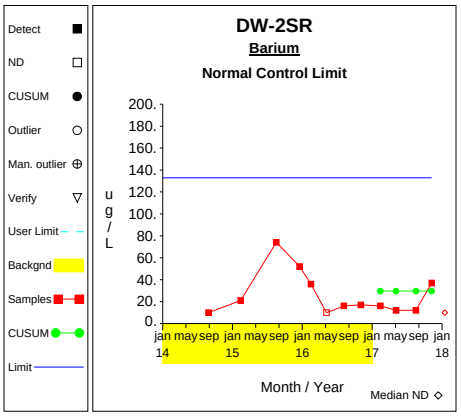

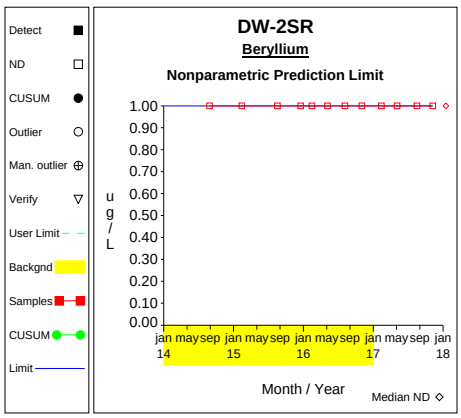

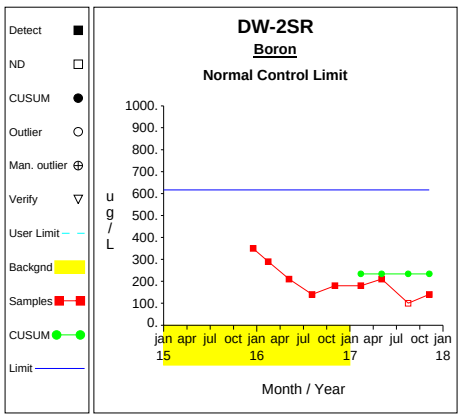

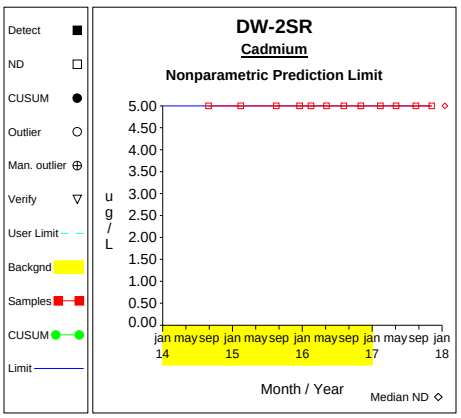

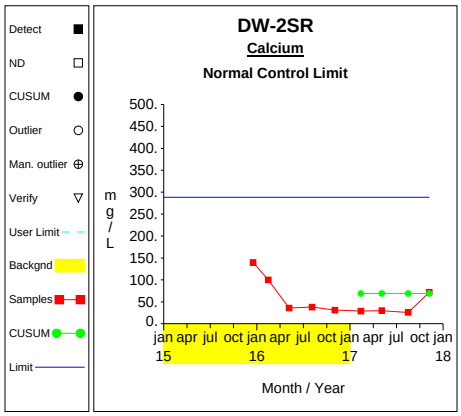

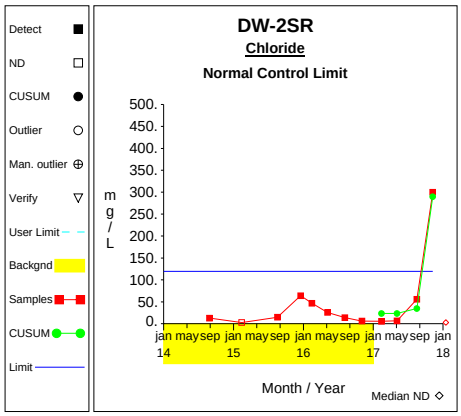

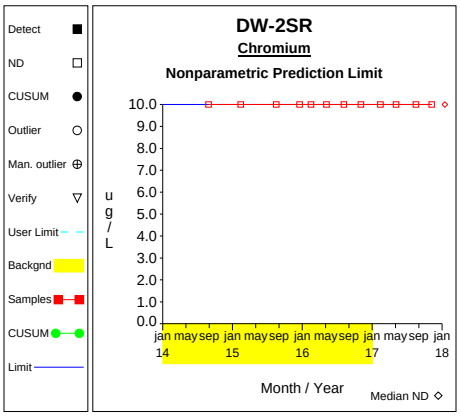

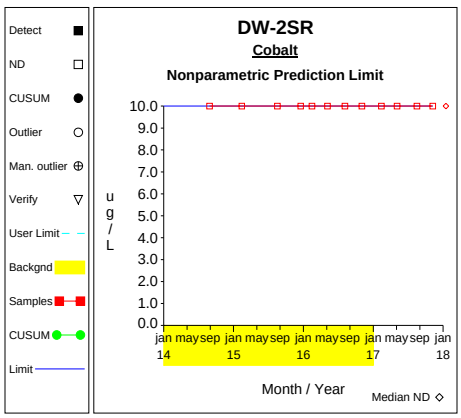

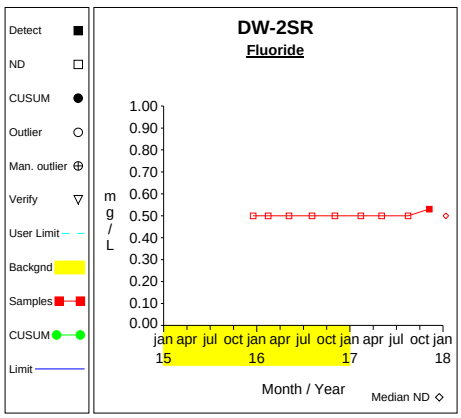

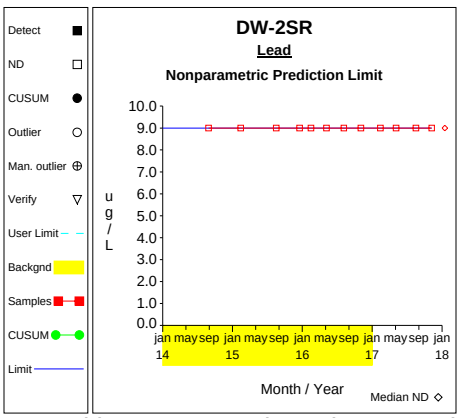

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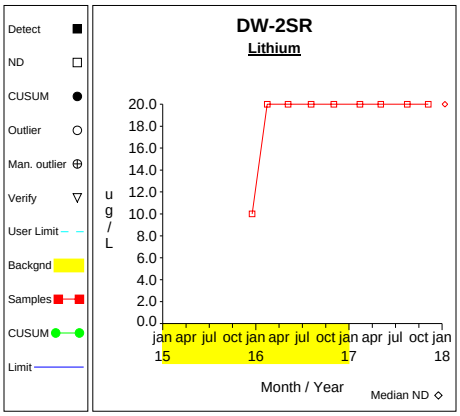

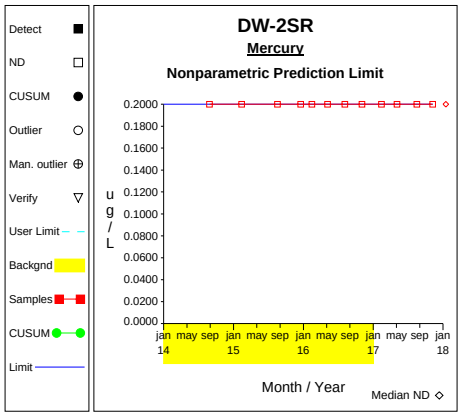

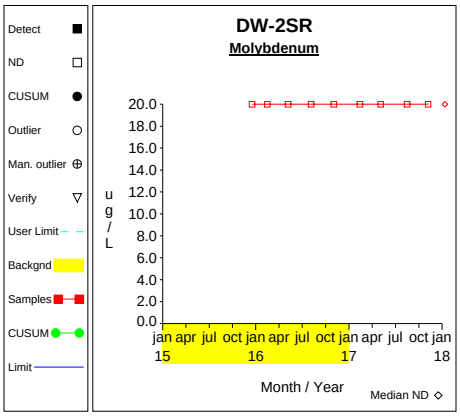

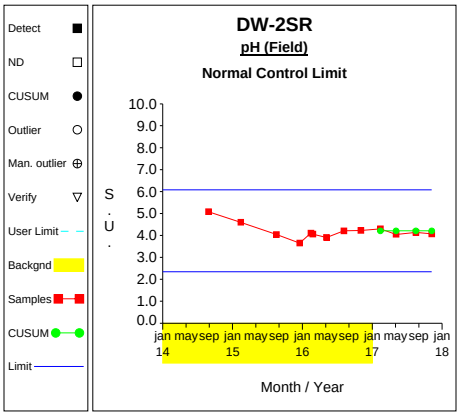

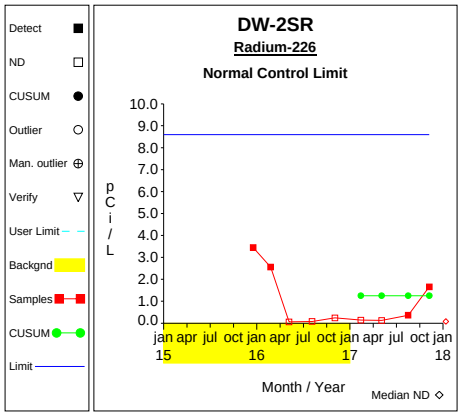

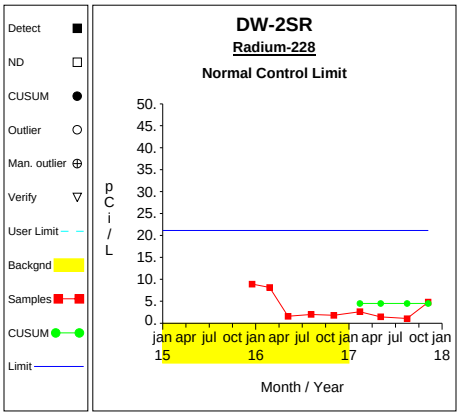

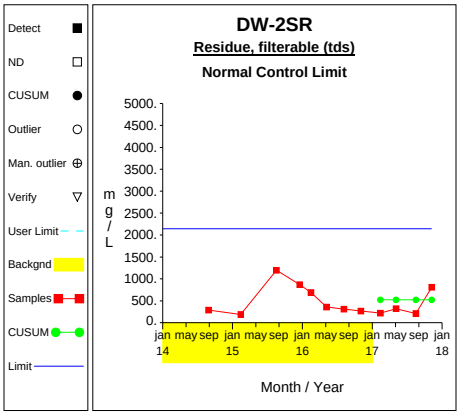

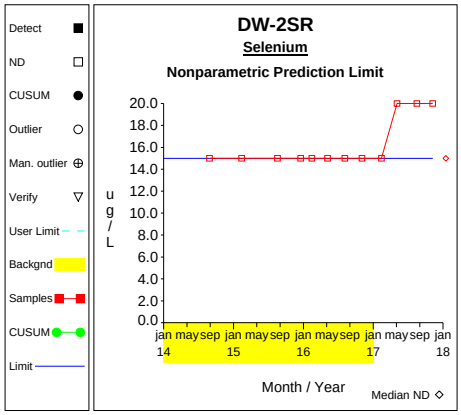

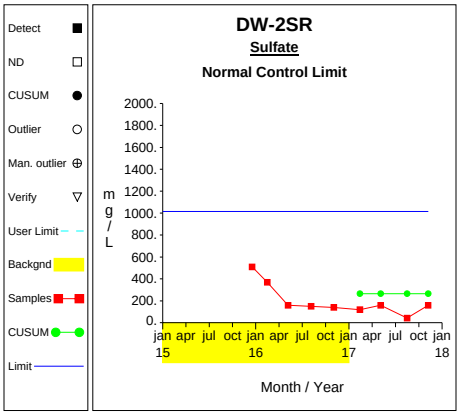

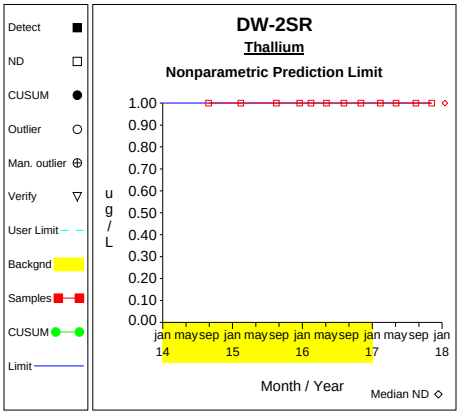

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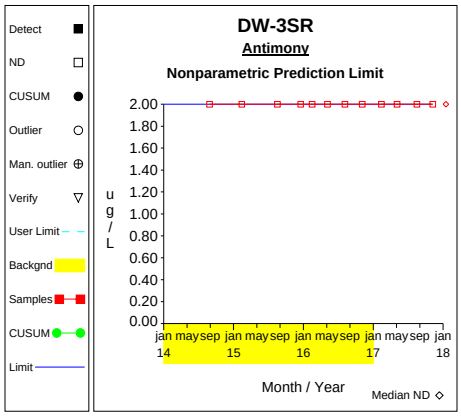

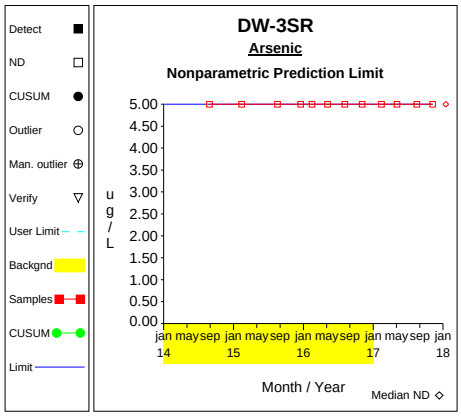

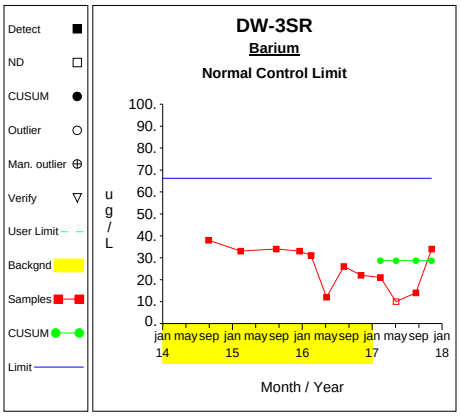

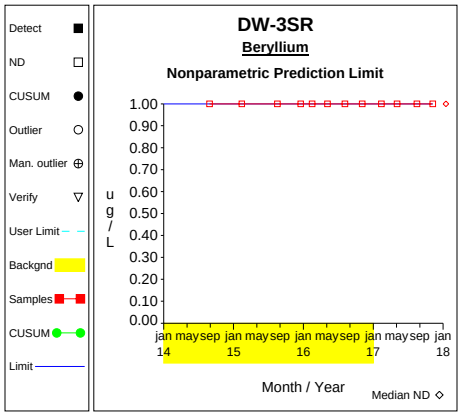

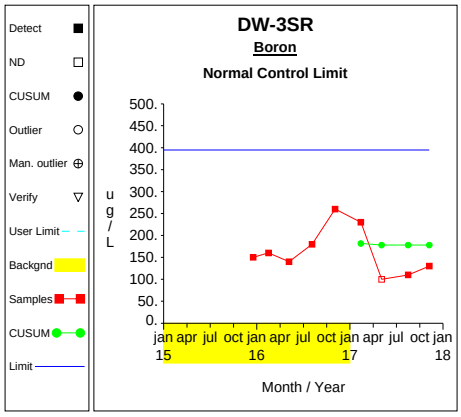

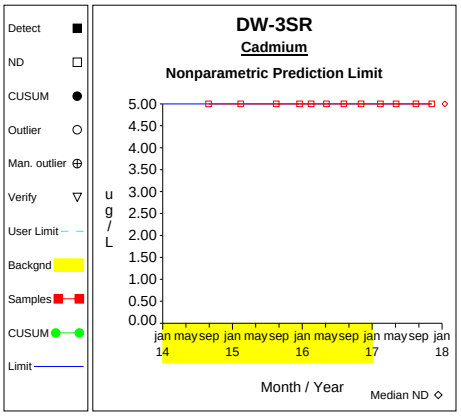

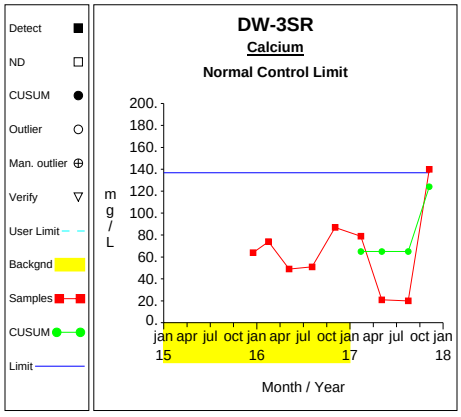

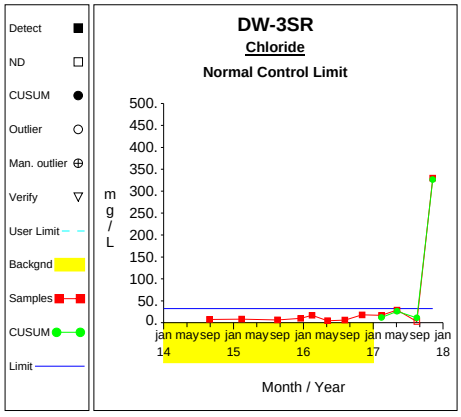

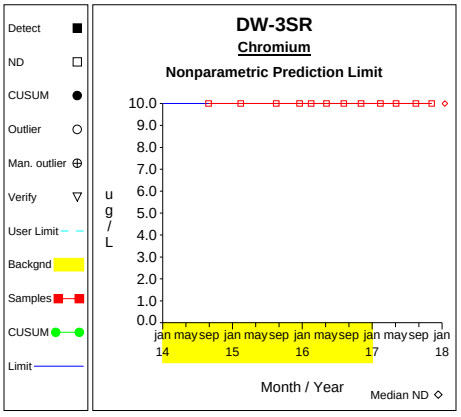

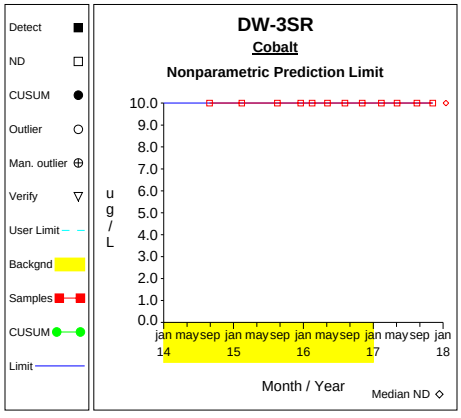

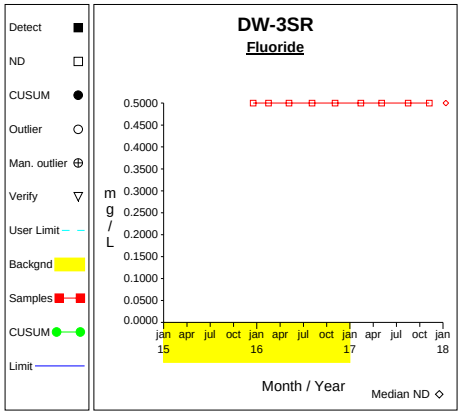

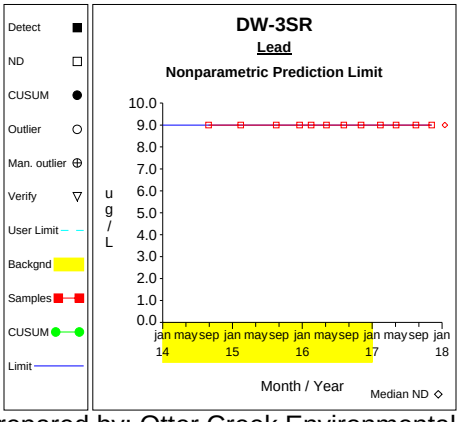

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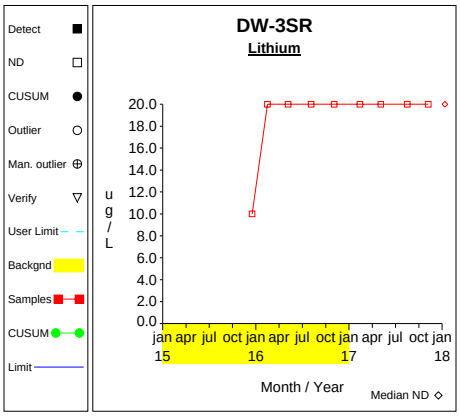
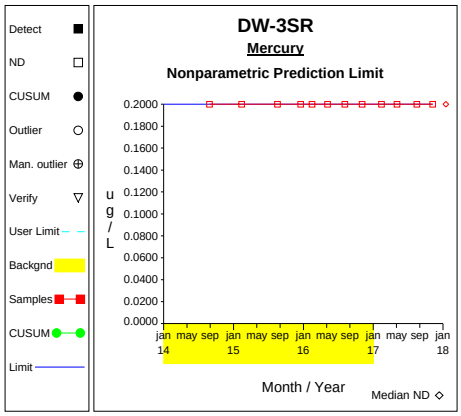
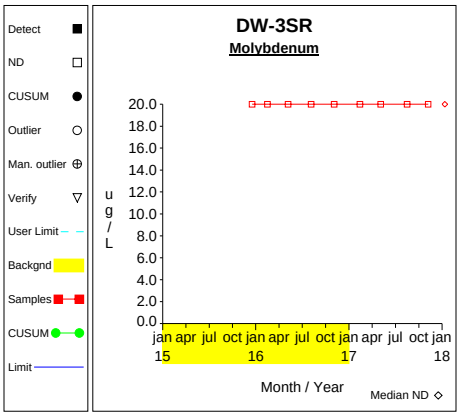
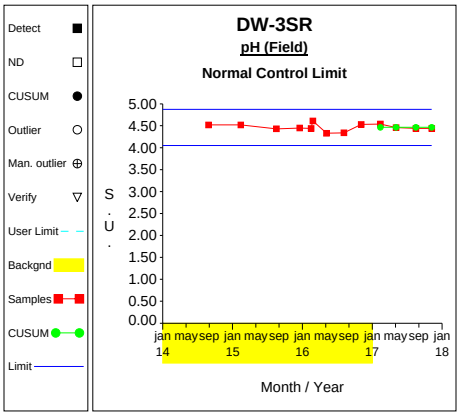
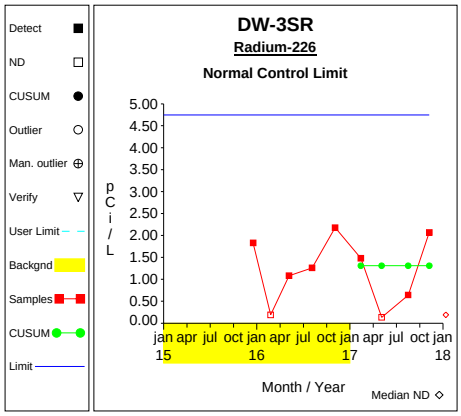
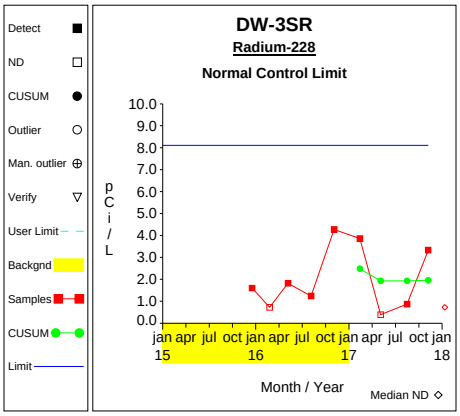


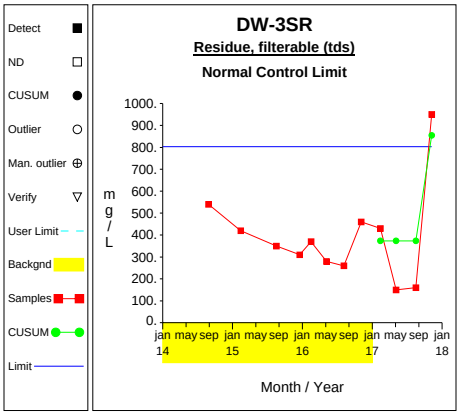


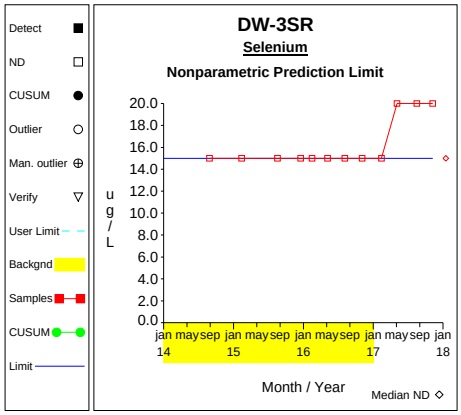


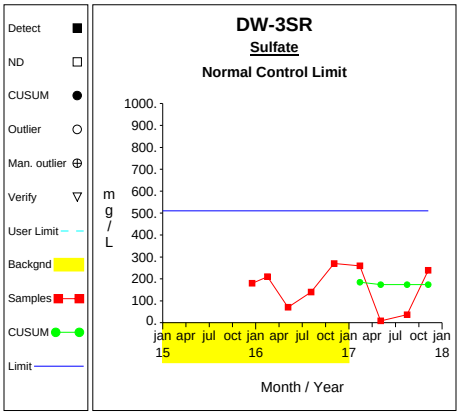


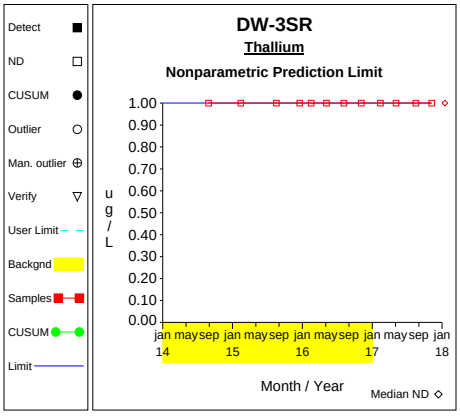




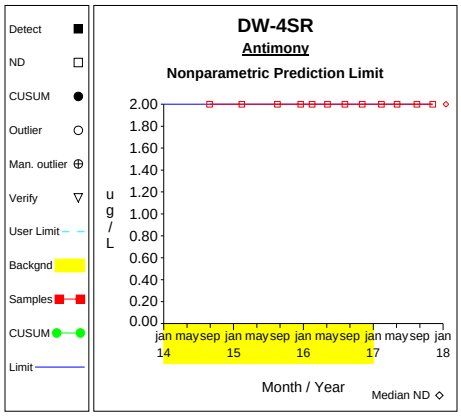


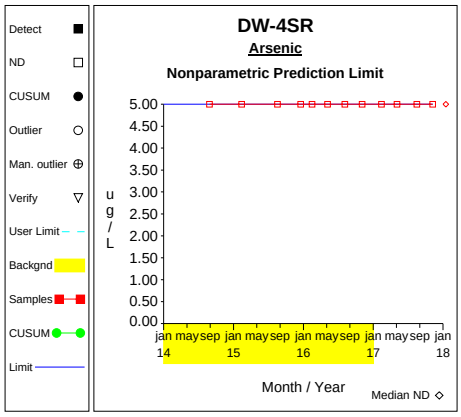


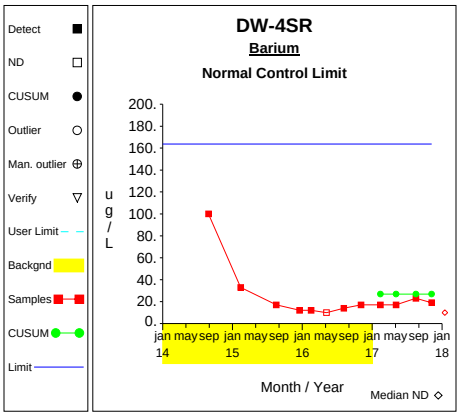


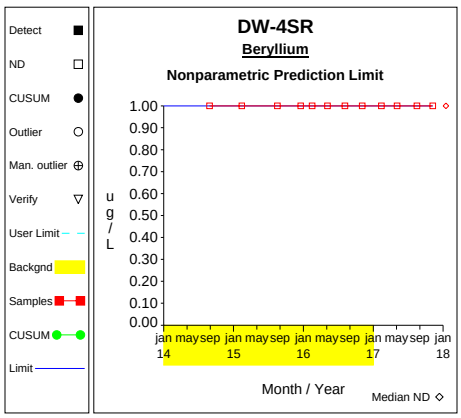


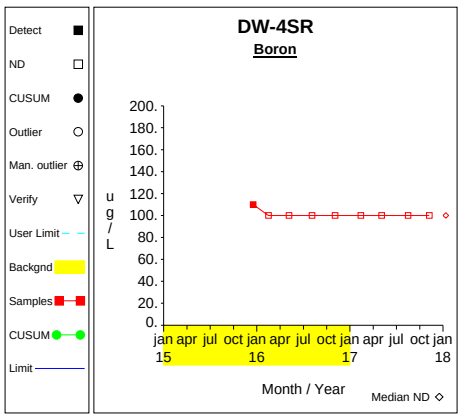
Intra-Well Control Charts

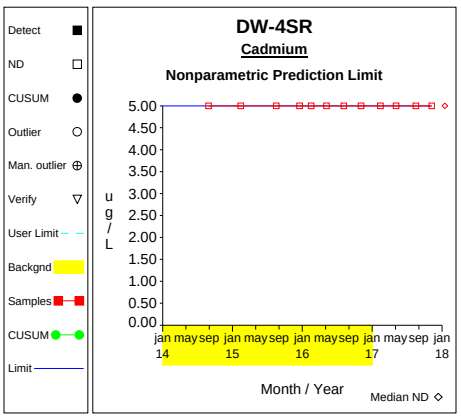


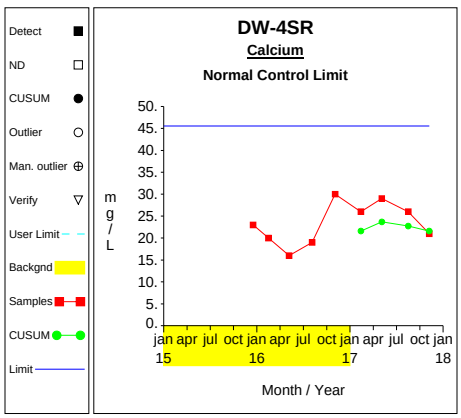


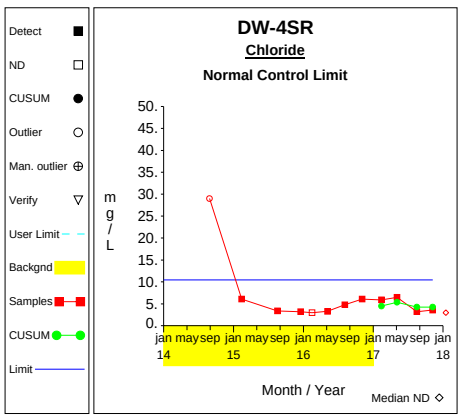


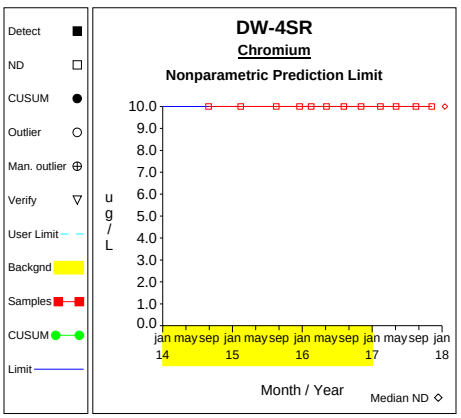


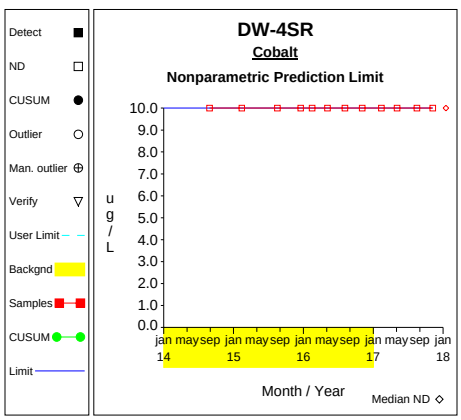


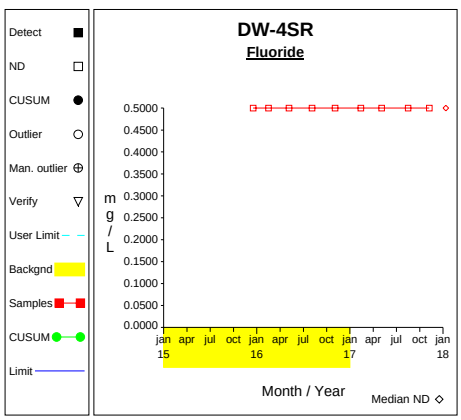


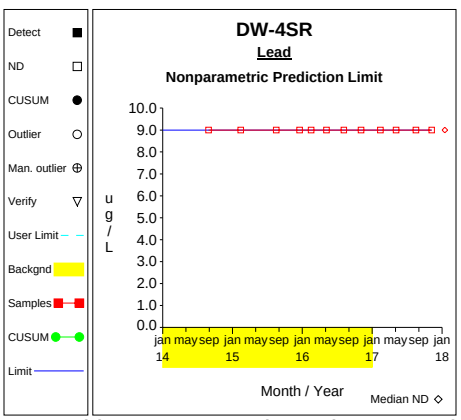




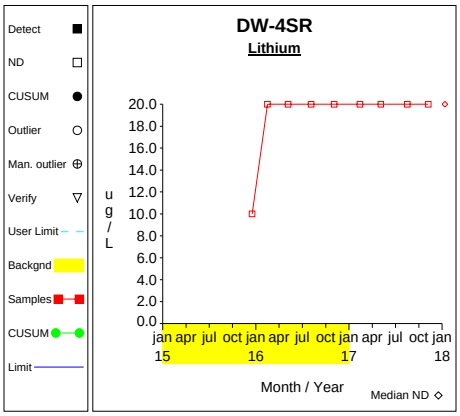


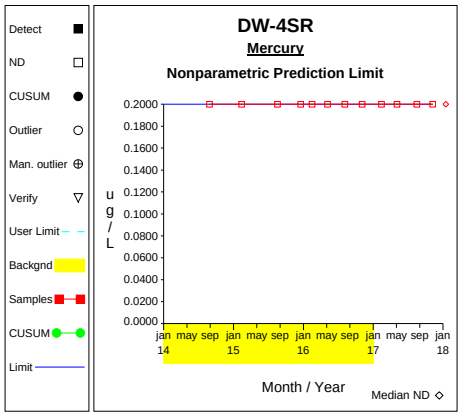


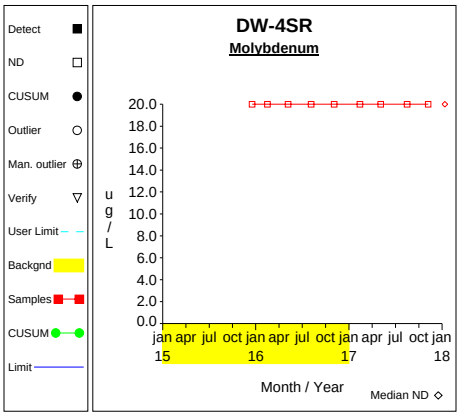


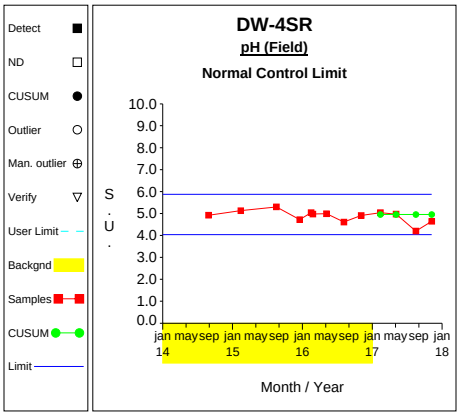


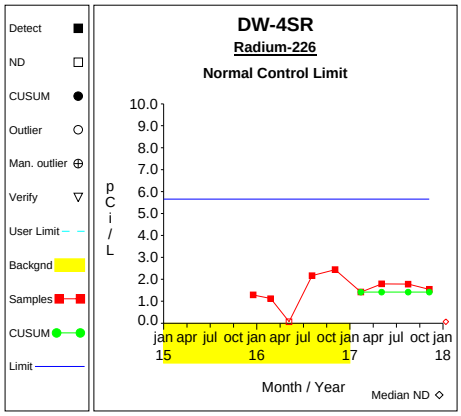
Intra-Well Control Charts

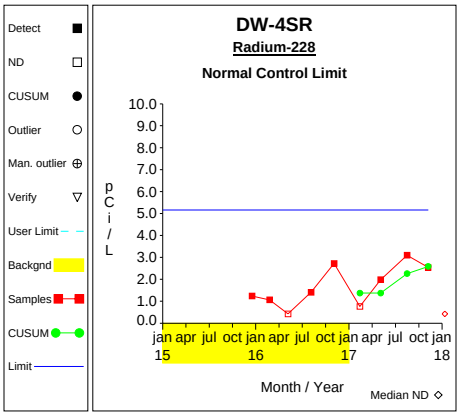


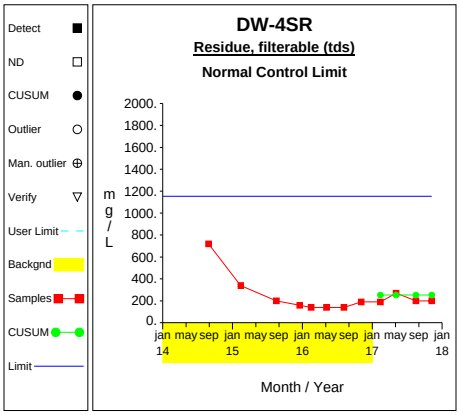


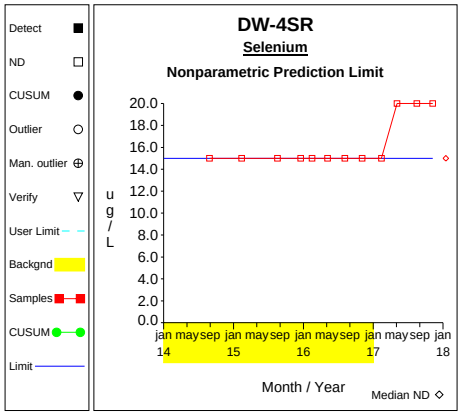


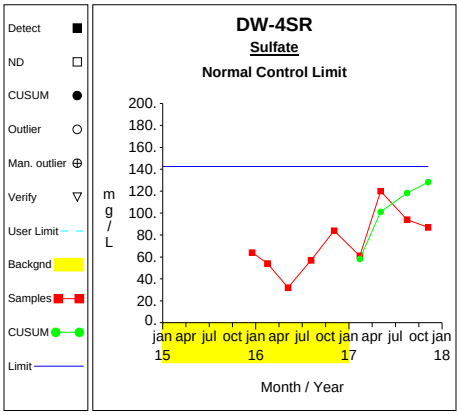


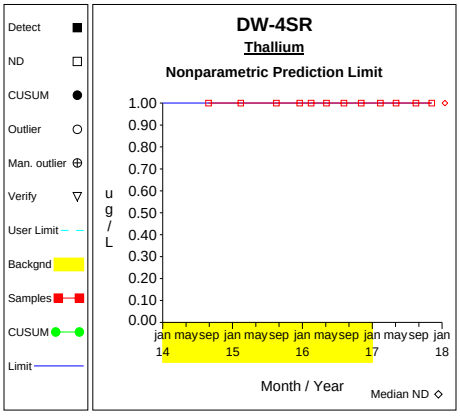




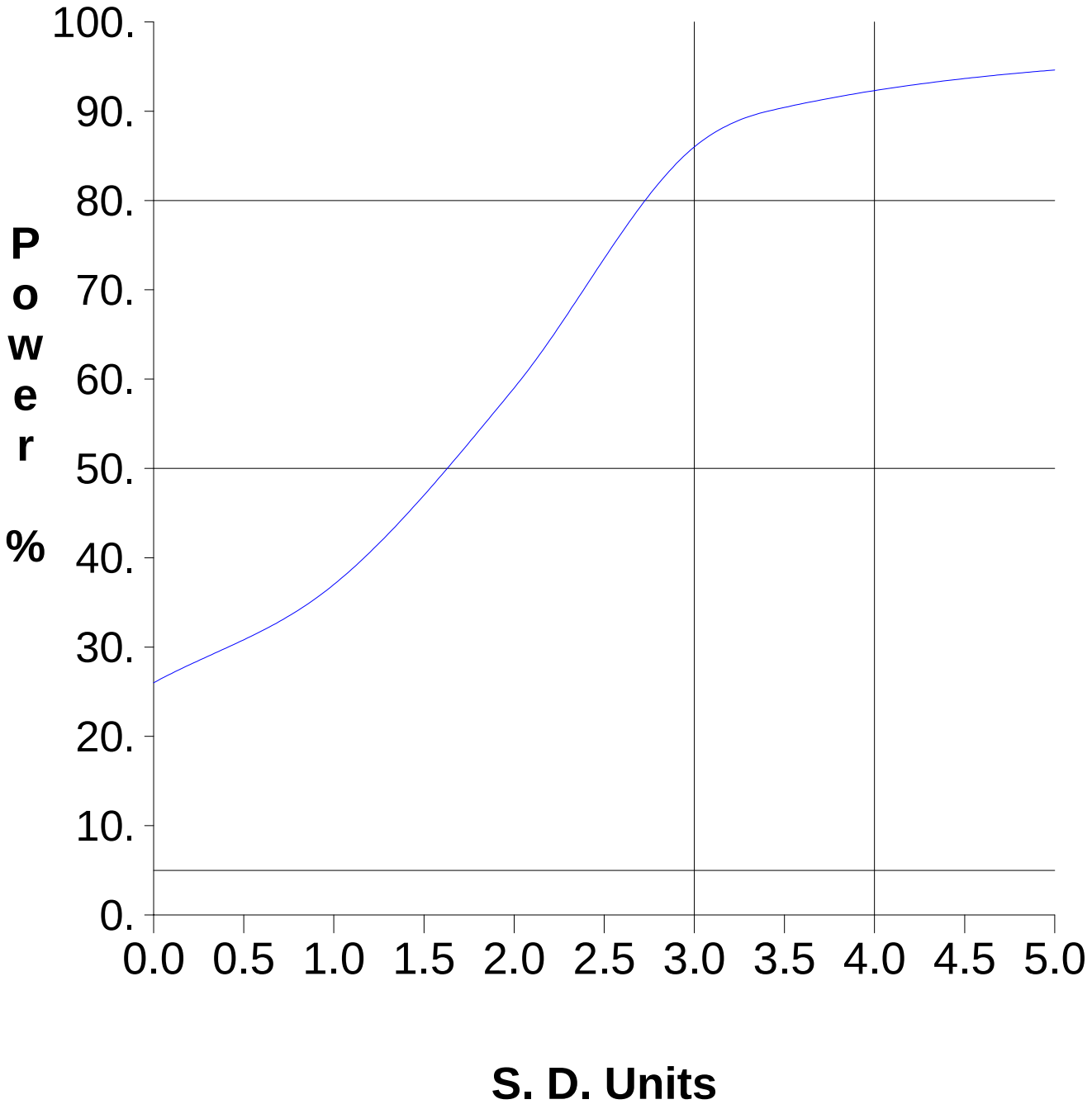








False Positive and False Negative Rates for Current Intra-Well Control Charts Monitoring Program



Intra-Well Control Charts