

**2018 ANNUAL GROUNDWATER MONITORING
AND CORRECTIVE ACTION REPORT**

**COAL COMBUSTION RESIDUE (CCR) LANDFILL
PERMIT NO. #70-SDP-06-82P**

**MUSCATINE POWER & WATER
MUSCATINE, IOWA**

January 2019

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HR Green, Inc.
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2018 Annual GMCA Report
CCR Landfill – Muscatine Power & Water

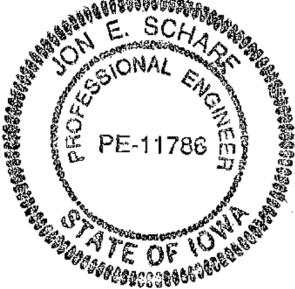
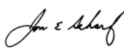
CERTIFICATION

**2018 ANNUAL GROUNDWATER MONITORING
AND CORRECTIVE ACTION REPORT**

CCR LANDFILL
Permit No. #70-SDP-06-82P


MUSCATINE POWER & WATER
MUSCATINE, IOWA

January 2019

	I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.	
		Date: 1/14/2019
	Jon E. Scharf, P.E.	
	License No. 11786	
	My renewal date is December 31, 2019	
	Pages or sheets covered by this seal: ENTIRE DOCUMENT	

Prepared By:

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I. GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

Under Federal CCR Rule 40 CFR Part 257.90 – *Groundwater Monitoring and Corrective Action* Muscatine Power and Water (MP&W) as the owner of an existing coal combustion residue (CCR) landfill must prepare annually a Groundwater Monitoring and Corrective Action Report. The report must, for the preceding calendar year, document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year. The prepared annual report must be placed in the facility's operating record as required under Part 257.105(h)(1).

The following sections cover the annual report's content requirements under Part 257.90(e) for calendar year 2018.

A. LOCATION AND SITE MAPS – §257.90(e)(1)

MP&W maintains a private CCR landfill that provides for the controlled disposal of CCR originating at its power generating facility located at 1700 Dick Drake Way in Muscatine. The approximate 80-acre landfill site is located 7.5 miles west of the power plant in the SW¼ of Section 16, Township 76 North, Range 3 West in Muscatine County (Figure 1, Appendix A).

The landfill has been in continuous operation since 1985. The CCR includes a mixture of gypsum, fly ash, bottom ash, and slag. The permitted disposal area is approximately 34 acres which is being developed in four phases, where the cells are constructed and filled in sequential order from east to west. Currently Phases I and II are open and are actively being filled with CCR (Figure 2, Appendix A).

The site is regulated by the Iowa Department of Natural Resources (IDNR) under [567] Iowa Administrative Code (IAC) Chapter 103 and by state Sanitary Disposal Project Permit #70-SDP-06-82P, issued August 9, 2010 and revised November 29, 2018, with an expiration date of August 9, 2020.

A comprehensive list of references for this facility is provided in Section II. Of primary interest herein is: *Groundwater Monitoring System and Sampling and Analysis Program, CCR Landfill* (HR Green, revised May 2, 2017). That document addresses the groundwater monitoring and corrective action requirements of the Federal CCR Rule Part 257.90-98 and is posted as a reference on MP&W's publicly accessible Internet site at <https://www.mpw.org/utilities/electric/ccr-rule>.

B. IDENTIFICATION OF WELLS – §257.90(e)(2)

Table 1 provides a summary of the existing groundwater monitoring wells for the federal groundwater monitoring program under 257.90 (Appendix B).

Well MW-22 was installed in February 2018 to provide an additional background quality monitoring point. This well is incorporated into the statistical analysis and interpretations herein.

No wells were decommissioned or abandoned in 2018.

In addition, there are other facility wells which are not part of the current federal CCR groundwater monitoring system because under §257.95(f-g) there has been no statistical trigger to further characterize the nature of a release. These other wells are part of the State of Iowa CCR rule [567] IAC Chapter 103 and include: MW-23, MW-24, and MW-25 installed in 2018, and MW-26 proposed for 2019. Pending collection of additional groundwater level measurements in 2019, MW-23 will be considered for inclusion into the federal monitoring system as an additional background quality monitoring point.

C. SUMMARY OF SAMPLE COLLECTION AND ANALYSIS – §257.90(e)(3)

Sample Collection and Results

Under 40 CFR Part 257.93(a) the Groundwater Monitoring Program (GMP) includes the following groundwater monitoring points: Upgradient wells: MW-8, MW-10, and MW-22 used to establish background quality; and Downgradient wells: MW-4A, MW-5B, MW-6A, MW-13, MW-14A, MW-15A, MW-18A, and MW-21 to monitor for downgradient impacts.

Table 1 provides a summary of the groundwater monitoring points (Appendix B), including:

- (1) Location coordinates (see also Figure 2),
- (2) Construction details,
- (3) Function as a monitoring well or water level measuring point,
- (4) Hydrogeologic unit monitored, and
- (5) Recent water level measurement used for the current evaluation of horizontal groundwater flow pattern and vertical gradients.

The monitoring wells are sampled for the constituents specified in Appendix III and Appendix IV to Part 257, as follows:

- Appendix III: boron, calcium, chloride, fluoride, pH, sulfates, and total dissolved solids.
- Appendix IV: antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, fluoride, lead, lithium, mercury, molybdenum, selenium, thallium, and radium 226 & 228 combined.

Table 2 provides the implementation schedule for the GMP (Appendix B), consisting of:

- (1) Well function as either an upgradient or downgradient monitoring point
- (2) Number of samples collected in each monitoring program,
- (3) Dates of completed sampling events, constituents tested, and reason for sampling including:

- a. Establish background quality,
- b. Detection monitoring,
- c. Resampling events to verify an initial SSI,
- d. Assessment monitoring, and
- e. Corrective action monitoring.

Samples are collected and handled as described in *Procedure for Groundwater and Surface Water Sampling* (HR Green). Samples are then analyzed for the Appendix III and/or Appendix IV lists by certified testing laboratory TestAmerica Laboratories, Inc. in Cedar Falls, Iowa.

A summary tabulation of the groundwater sampling data obtained under §257.90 through §257.98 is provided (Appendix C). This tabulation covers the period of June 2016 through December 2018, including 11 events used to establish background quality, the first detection (compliance) event, a resampling event, and the assessment monitoring events in 2018.

The laboratory's analytical reports, the field low-flow sampling forms, and the DNR Sampling Forms are also provided for the sampling events evaluated herein (Appendix C).

Analysis

The analyzed data were then used to calculate statistical limits for each well/constituent pair. Statistical calculations were performed by Groundwater Stats Consulting using industry standard SANITAS™ Statistical Software, an EPA-compliant package (EPA 2009, Unified Guidance). The full procedure is as detailed in the document entitled: *Groundwater Monitoring System and Sampling and Analysis Program, CCR Landfill* (HR Green, revised May 2, 2017).

The statistical report dated October 11, 2018 incorporates all data collected through 2018 and the corresponding statistical analyses, including narratives, background limits, prediction limits, statistically significant increases (SSI), trend tests, confidence intervals, statistically significant Levels (SSL), and groundwater protection standards (GWPS), etc., and is provided herein for reference (Appendix D) and discussed below.

D. DISCUSSION OF FINDINGS – §257.90(e)(4)

The review is being conducted in accordance with the statistical methodologies presented in *Groundwater Monitoring System and Sampling and Analysis Program, CCR Landfill* (HR Green, May 2017; see Tables III-4, III-6, III-8, and III-9 in Appendix D).

The implementation schedule (Table 2) and monitoring program summary (Table 3) track the major milestones of the MP&W groundwater monitoring system and sampling and analysis program.

Appendix III constituents include: boron, calcium, chloride, fluoride, pH, sulfate, and total dissolved solids.

Appendix IV constituents include: antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, combined radium 226+228, fluoride, lead, lithium, mercury, molybdenum, selenium, and thallium.

Year 2017

Establishment of background water quality occurred by testing all wells for Appendix III & IV constituents during the period of June 2016 through August 2017 (8 sampling events, spaced to capture seasonality), following which the detection monitoring program was initiated.

The first detection monitoring event was on October 16, 2017, where Appendix III constituents were tested. An initial 22 well/constituent pairs were determined to exceed their respective statistical limits (Groundwater Stats Consulting, November 15, 2017), which are called initial SSI, or statistically significant increase above background concentration.

A resampling event for the 22 well/constituent pairs was conducted on November 28, 2017 to confirm that each is in fact an SSI and not a false positive. Based on re-sampling and statistical analysis there were 3 false positives (calcium, sulfate, and total dissolved solids at MW-13) and 19 confirmed SSI (Groundwater Stats Consulting, December 19, 2017).

Under §257.95(a), the confirmed SSI directed the facility transition into assessment monitoring beginning in 2018.

Year 2018

For assessment monitoring, Appendix III & IV constituents were tested during 2018. The events were conducted March 6, June 19, and August 28, 2018. These events are intended to satisfy the requirements of both the initial scan and the semi-annual and assessment monitoring requirements.¹

Specifically, assessment monitoring was initiated at the March 6, 2018 event, where the full Appendix III and Appendix IV constituent lists were tested. The Appendix IV constituents that were detected are shown below.

¹ Under §257.95(b), assessment monitoring requires an initial scan of Appendix IV constituents, followed under §257.95(d)(1) by semi-annual testing for Appendix III list plus detected Appendix IV constituents. To streamline the tracking of sampling requirements and results, and to align the federal and state sampling schedules, MP&W elects to test for full Appendix III and Appendix IV constituent lists during each sampling event, except for combined radium which has not been detected over a reporting limit.

MW-	4A	5B	6A	8	10	13	14A	15A	18A	21	22
Antimony									x		
Arsenic									x		
Barium	x	x	x	x	x	x	x	x	x	x	x
Cobalt					x	x					x
Fluoride						x					
Lithium						x					
Molybdenum				x		x					x
Selenium						x		x			

Table 3 provides a groundwater monitoring program summary (Appendix B), including:

- (1) The current monitoring program status,
- (2) Planned change in monitoring program status for the next sampling event,
- (3) Confirmed statistically significant increases (SSI) over background,
- (4) Statistically significant trends,
- (5) Statistically significant level (SSL) over a groundwater protection standard (GWPS), and
- (6) Upcoming sampling dates and constituents (as best as can be determined at this point in time).

The information shown in Table 3 shows that the concentrations of several constituents remain at statistically significant levels above background (i.e., SSI), but that all confidence interval concentrations are below the GWPS, that is, there were no SSLs determined.

Because there were no SSL's determined during 2018, the facility is required to continue in assessment monitoring in 2019, as shown in Table 3.

The GWPS values are shown in Table 4 and were established as the appropriate Maximum Contaminant Level (MCL) or Regional Screening Level (RSL)². Also shown in Table 4 is the background statistical limit.

1. SUMMARY

In brief narrative summary, the current-year review indicates:

1. Monitoring wells remain viable sampling points as they are physically intact, void of excessive sediment, and provide the anticipated recharge during sampling.
2. Horizontal and vertical groundwater flow gradients appear stable and consistent with historic observations. The primary groundwater flow path is lateral, with flow across the filled area traveling from the southeast toward the northwest (Figure 2).

² The RSL values under §257.95(h)(2) were set for cobalt, lithium and molybdenum in Federal Register Volume 83, No. 146 dated July 30, 2018. These four constituents do not have an established MCL.

3. Analytical results indicate the landfill's primary impact on groundwater quality is from Appendix III constituents, including calcium, TDS, boron and sulfate in the immediate area downgradient of the active landfill (MW-14A, MW-15A, and MW-18A) and vicinity of the sediment runoff control pond (MW-13 and MW-21). These are areas where CCR has been historically deposited and/or accumulated. All wells are within 50 feet of a waste fill perimeter or accumulation/deposition area.

Statistical analysis indicates that the concentrations of multiple constituents remain above background limits (see SSI on Table 3), however, during 2018 there were no Appendix IV constituents that exhibited a statistically significant level (SSL) above a groundwater protection standard (GWPS). As such, under Assessment Monitoring Program §257.95(f) this site must continue in assessment monitoring.

E. SUPPLEMENTAL INFORMATION – §257.90(e)(5)

The following information is provided to fill in context for the MP&W CCR facility.

Monitored Hydrogeologic Unit

For a full discussion of the GMP reference the document *Groundwater Monitoring System and Sampling and Analysis Program, CCR Landfill* (HR Green, Revised May 2, 2017, original May 18, 2016).

Of particular relevance herein is that the GMP wells monitor (1) water levels to determine horizontal and vertical groundwater flow paths, and (2) for downgradient groundwater quality impacts to the uppermost continuous aquifer beneath the site. The aquifer and gradients are discussed below.

Uppermost Continuous Aquifer:

As a whole, a deep un-weathered and un-oxidized clay-rich glacial till functions as a lower confining unit with field hydraulic conductivity values of less than 1×10^{-7} cm/sec. Over most of the site, this underlying low permeability glacial till confining unit is overlain by a sequence of weathered oxidized till, sand, and clayey silt (loess) which collectively constitute the uppermost continuous aquifer beneath the site. This aquifer exhibits hydraulic conductivity values as great as 1.7×10^{-4} cm/sec and which are two to three orders of magnitude greater than the underlying confining unit. Therefore, the assemblage of deposits generally at depths of less than 50 feet is interpreted to function as the uppermost continuous aquifer beneath the landfill. This is also the unit, within which the water table fluctuates, which means the uppermost continuous aquifer is one in the same hydrogeologic unit as the shallow water table aquifer. This uppermost continuous aquifer is the unit monitored by the GMP groundwater monitoring wells.

Groundwater Flow:

The pre-landfill groundwater flow direction in the uppermost aquifer was

dominantly horizontal from the southeast toward the northwest with natural convergence along an ephemeral stream that formerly drained the undeveloped site.

Under current conditions the dominant flow direction remains the same except that convergence is now to the runoff control pond located west of the landfill in the area of the original ephemeral stream. The current year water table contours and primary flow path directions are depicted on Figure 2.

The observed vertical flow components are recharge (downward) in the upland area of the southeast corner of the site (MW-8/9) and discharge (upward) in the lowland area along the drainage way in the northeast corner of the site (MW-10/11) (see Table 1).

State Monitoring Requirements

Monitoring at this facility is also conducted under the State of Iowa Department of Natural Resources in accordance with Sanitary Disposal Permit #70-SDP-06-82P and per the approved Hydrologic Monitoring System Plan (HMSP).

The state's monitoring and analysis requirements are not addressed further herein but can be found in the Annual Water Quality Report to Iowa DNR (submitted to DNR annually by January 31).

Regulatory Status

The facility is regulated by the Iowa Department of Natural Resources (IDNR) under [567] Iowa Administrative Code (IAC) Chapter 103 and by state Sanitary Disposal Project Permit, issued August 9, 2010, revised November 29, 2018, and with an expiration date of August 9, 2020.

The IDNR also regulates the site under the National Pollution Discharge Elimination System NPDES Permit #7000109 which is currently in process of permit renewal. MP&W is authorized to discharge storm water runoff from the sediment runoff pond and two groundwater cut-off drains. Quarterly monitoring of the designated Farm Pond outfall and annual reporting are completed by MP&W in accordance with this permit.

II. REFERENCES CITED

Green Environmental Services (GES), November 21, 1991. Coal Combustion Residue Landfill Development Plans and Supporting Documentation, Muscatine Power and Water; and Supplemental Plan Sheets 16 and 18 dated January 29, 1993.

Green Environmental Services (GES), October 25, 1991. Hydrogeologic Evaluation of the Muscatine Power and Water Coal Combustion Residue Landfill.

Green Environmental Services (GES), June, 1990. Hydrogeologic Evaluation Work Plan for the Muscatine Power and Water Coal Combustion Residue Landfill.

Groundwater Stats Consulting, October 11, 2018. Summary of statistical analysis used to establish baseline water quality, SSI and SSL. Includes the analysis of 11 sample events conducted from June 2016 through August 2018.

HR Green, January 8, 2019. Annual Water Quality Report, addressing State of Iowa [567] IAC Chapter 103 rule and landfill operating permit requirements.

HR Green, December 23, 2018. Annual Inspection Report, Muscatine Power & Water, CCR Landfill.

HR Green, December 19, 2018. Annual CCR Fugitive Dust Control Report, Muscatine Power & Water, CCR Landfill.

HR Green, December 5, 2018. CCR Fugitive Dust Prevention and Control Plan, Muscatine Power & Water, CCR Landfill (original October 19, 2015).

HR Green, June 2017. Procedure for Groundwater and Surface Water Sampling. (Updated November 2018.)

HR Green, October 17, 2016. Closure and Post-Closure Plan, Muscatine Power & Water, CCR Landfill.

HR Green, October 17, 2016. Run-On and Run-Off Control System Plan, Muscatine Power & Water, CCR Landfill.

HR Green, May 2, 2017. Groundwater Monitoring System and Sampling and Analysis Program, CCR Landfill (original May 18, 2016).

HR Green, January 17, 2012. CCR Landfill Cell Development – Phase II Expansion Plans, Muscatine Power and Water.

Iowa Administrative Code [567], Chapter 103 Sanitary Landfills: Coal Combustion Residue.

Iowa Department of Natural Resources (IDNR) Landfill Operating Permit No. 70-SDP-06-82P dated August 9, 2010 and revised November 29, 2018, Muscatine Power and Water.

Iowa Geological Survey, 2010. The Iowa State-Wide Trace Element Soil Sampling Project: Design and Implementation: Iowa Department of Natural Resources, Iowa Geological and Water Survey, Open File Report 10-1, June 2010.

Muscatine Power and Water. Federal *CCR Rule Compliance Data and Information*, publicly accessible Internet site at <https://www.mpw.org/utilities/electric/ccr-rule>.

Muscatine Power and Water, October 2, 2008, December 17, 2009, and March 30, 2010. Supplemental Information relating to landfill development.

U.S. Environmental Protection Agency (EPA), 2015. Published in Federal Register Volume 80, No. 74 published on April 17, 2015, *Final Rule 40 CFR Part 257 Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities*; and *Technical Amendments* published in Federal Register Volume 80, No. 127 on July 2, 2015 (correcting the effective date); and Volume 83, No. 146 on July 30, 2018 (revising groundwater protection standards for four constituents which do not have an established MCL).

U.S. Environmental Protection Agency (EPA), March 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance. Office of Resource Conservation and Recovery Program Implementation and Information Division, U.S. EPA, Washington, DC. EPA 530/R-09-007.

APPENDIX A

FIGURES

Figure 1: Location Map

Figure 2: Site Map

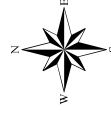


Figure 1
LOCATION MAP

CCR Landfill
Muscatine Power and Water

Legend

- Property Line (Approx.)
- Permitted Fill Area



0 500 Feet

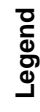
Projected Coordinate System:
NAD 1983 StatePlane Iowa_South



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Figure 2
SITE MAP

CCR Landfill
Muscatine Power and Water

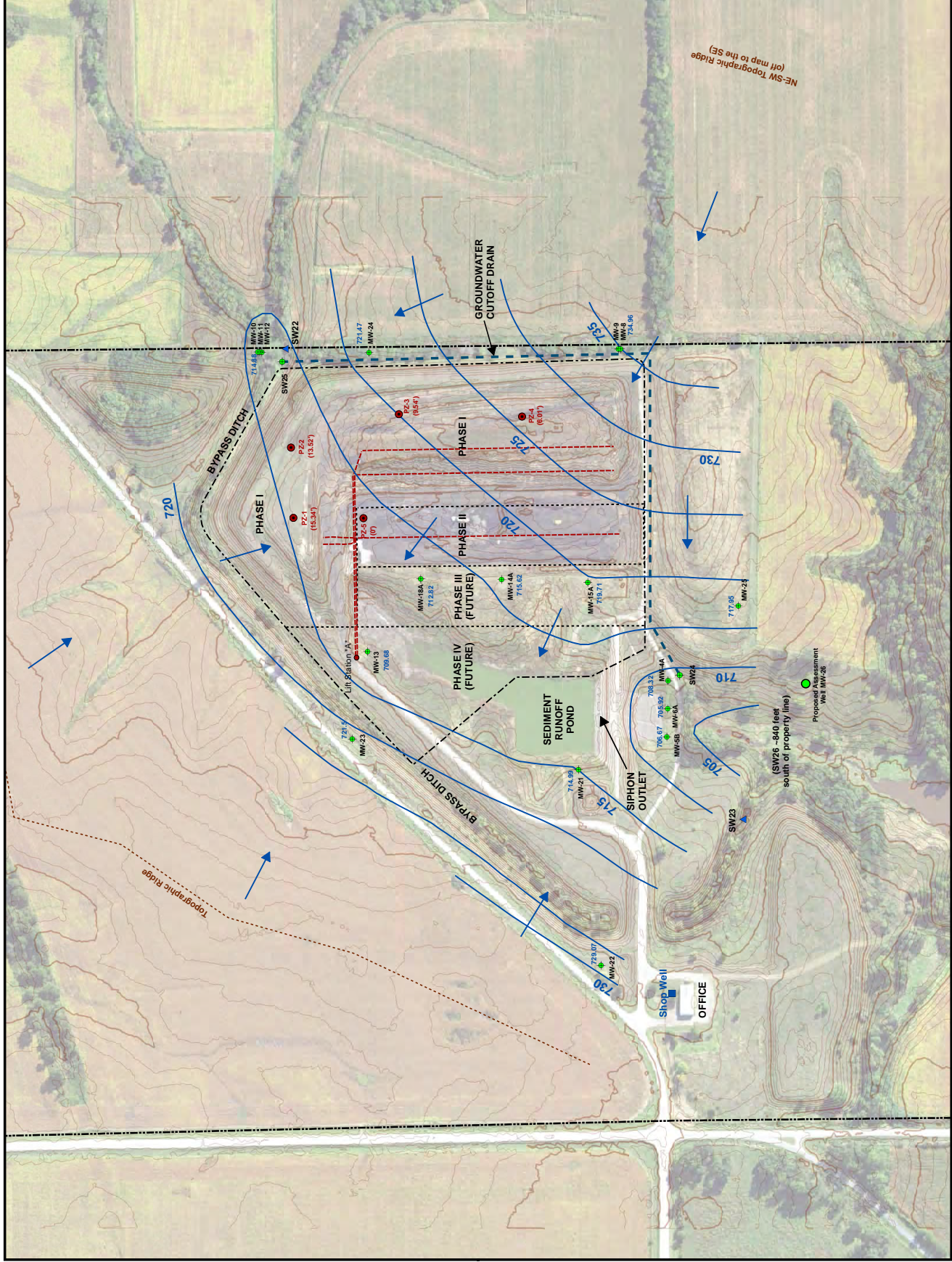


- ▲ Surface Water Points
 ◆ Groundwater Points
 ● Piezometers (Head, in feet)
 ■ Shop Well
 — Water Table (5/14/2018)
 - - - Leachate Collection System
 - - - Groundwater Cut-Off Drain
 [] Permitted Fill Area
 [] Phase Boundaries
 [] Property Line (Approx.)
 → Groundwater Flow Direction
 ● Proposed Assessment Well



300 Feet
0

Projected Coordinate System:
NAD 1983 StatePlane Iowa_South



APPENDIX B

TABLES

Table 1	Summary of Monitoring Wells and Piezometers
Table 2	Implementation Schedule
Table 3	Groundwater Monitoring Program Summary
Table 4	Groundwater Protection Standards (GWPS)

Table 1

**Summary of Monitoring Wells and Piezometers
2018 Groundwater Monitoring and Corrective Action Report
Muscatine Power & Water CCR Landfill
Permit No. #70-SDP-06-82P**

Well ID	State Plane ⁽¹⁾		WELL CONSTRUCTION ⁽²⁾						Function	Hydrogeologic Unit	WATER LEVELS (Feet, amsl) ⁽³⁾					
			Elevation		Well Depth	Screen Length	Screened Lithology									
	Northing	Easting	Top of Well Casing	Ground												
												Low	High	Vertical Gradient 8/2018 ⁽⁴⁾	8/28/2018	6/19/2018
PZ-1	511.728	2,269,506	751.05	749.00	38.75	1	CCR	Piezometer	CCR	727.78	730.4	N/A	N/A	N/A	727.64	
PZ-2	511.736	2,269,740	746.47	744.34	41.65	1	CCR	Piezometer	CCR	719.08	719.77	N/A	N/A	N/A	718.34	
PZ-3	511,377	2,269,851	761.14	758.99	40.95	1	CCR	Piezometer	CCR	730.24	731.63	N/A	N/A	N/A	729.73	
PZ-4	510,967	2,269,843	768.05	765.90	45.85	1	CCR	Piezometer	CCR	729.82	730.93	N/A	N/A	N/A	728.21	
PZ-5	511,495	2,269,505	729.63	727	10.00	1	CCR	Piezometer	CCR	DRY	DRY	N/A	N/A	N/A	DRY	
MW-4A	510,481	2,268,964	713.45	711.18	24.55	10	Clay, Silt	Monitoring	Uppermost Aquifer	705.73	710.01	N/A	705.54	N/A	708.32	708.34
MW-5B	510,485	2,268,777	709.10	706.73	25.30	10	Silt, Clay	Monitoring	Uppermost Aquifer	704.07	707.48	N/A	705.98	N/A	706.67	706.60
MW-6A	510,482	2,268,871	708.92	706.49	25.35	10	Silt, Sand	Monitoring	Uppermost Aquifer	704.47	706.82	N/A	705.55	N/A	705.92	705.90
MW-8	510,639	2,270,068	747.36	744.37	42.95	10	Till	Monitoring	Uppermost Aquifer	728.06	737.74	0.498	730.42	N/A	734.96	732.85
MW-9	510,646	2,270,068	747.12	744.40	58.74	10	Till	Piezometer	Uppermost Aquifer	721.96	729.75	N/A	N/A	N/A	727.10	N/A
MW-10	511,846	2,270,058	718.51	716.32	20.32	10	Silt, Till	Monitoring	Uppermost Aquifer	710.89	715.10	-0.033	712.78	N/A	714.88	715.40
MW-11	511,840	2,270,058	718.34	716.00	55.97	10	Till, Sand	Piezometer	Uppermost Aquifer	713.44	718.34	0.006	N/A	N/A	716.06	N/A
MW-12	511,833	2,270,057	717.75	715.40	86.42	5	Till	Piezometer	Lower Confining Unit	713.13	717.75	N/A	N/A	N/A	715.85	N/A
MW-13	511,481	2,269,061	717.63	715.44	20.00	10	Silt, Till, Sand	Monitoring	Uppermost Aquifer	709.35	719.13	N/A	708.55	N/A	709.68	711.36
MW-14A	511,035	2,269,301	729.00	726.19	20.50	10	Silt, Till, Clay	Monitoring	Uppermost Aquifer	712.59	717.55	N/A	715.24	N/A	715.62	713.29
MW-15A	510,748	2,269,291	729.99	727.12	20.50	10	Silt, Clay	Monitoring	Uppermost Aquifer	713.83	719.88	N/A	717.52	N/A	719.71	716.22
MW-18A	511,304	2,269,303	729.13	726.06	23.10	10	Clay, Silt	Monitoring	Uppermost Aquifer	711.92	714.82	N/A	712.17	N/A	712.82	711.63
MW-21	510,779	2,268,668	725.75	722.81	22.20	10	Silt, Clay	Monitoring	Uppermost Aquifer	713.16	721.01	N/A	714.03	N/A	714.99	715.26
MW-22 ⁽⁵⁾	510,704	2,268,017	744.27	741.13	41	10	Clay Till	Monitoring	Uppermost Aquifer	727.43	728.86	N/A	727.43	728.86	729.07	727.56
MW-23 ⁽⁵⁾	511,532	2,268,770	726.90	723.73	25	10	Clay Till	Assessment	Uppermost Aquifer	719.37	721.50	N/A	719.37	721.50	721.50	N/A
MW-24 ⁽⁵⁾	511,476	2,270,056	735.32	732.10	20	10	Clay Till	Assessment	Uppermost Aquifer	718.47	721.47	N/A	718.47	721.47	721.47	N/A
MW-25 ⁽⁵⁾	510,247	2,269,213	739.12	736.14	35	10	Clay Till	Assessment	Uppermost Aquifer	717.60	717.95	N/A	717.60	717.95	717.95	N/A

(1) State Plane coordinates from MP&W in email dated 1/20/16 and 6/28/18. MP&W has transitioned away from Site System coordinates-see 2017 AQR Table 1-1.

(2) DNR original well construction forms. Top of casings at piezometers re-surveyed May 2018.

(3) Period of record: 2002-2018 (except for the A-series wells which started in 2012). Current review uses May 14, 2018 (except June 2018 used at estimates for MW-23, MW-24, MW-25).

(4) Negative value is a discharge gradient; positive value is a recharge gradient. Well clusters are MW-8/MW-9 and MW-10/11/12.

(5) MW-22 installed February 20, 2018. MW-23 installed 5/15/2018. MW-24 installed June 5, 2018. MW-25 installed June 7, 2018. Wells MW-23, MW-24, and MW-25 are currently being utilized as assessment wells under the State of Iowa CCR rule.

Table 2

Implementation Schedule
2018 Groundwater Monitoring and Corrective Action Report
Muscatine Power & Water CCR Landfill
Permit No. #70-SDP-06-82P

Monitoring Well	Well Function	Number Of Samples Collected In Each Monitoring Program June 2016 through 2018					Dates Of Completed Sampling Events And Constituents Tested					Corrective Action
		Background	Detection	Assessment	Corrective Action	Establish Background Levels (Initial 8 Events)		Detection Monitoring	Resampling Events To Verify Initial SSI Over Background	Assessment Monitoring ⁽¹⁾		
						2016: Jun 6, Aug 15, Oct 10, Dec 12	2017: Feb 17, Apr 17, Jun 19, Aug 7,					
MW-4A	Downgradient	11	1	3	N/A	Appendix III & IV	Appendix III & IV	Appendix III		3/6/2018 6/19/2018 8/29/2018	None in 2018	
MW-5B	Downgradient	11	1	3	N/A	Appendix III & IV	Appendix III & IV	Appendix III	Chloride	Appendix III & IV	N/A	
MW-6A	Downgradient	11	1	3	N/A	Appendix III & IV	Appendix III & IV	Appendix III		Appendix III & IV	N/A	
MW-8	Upgradient	11	1	3	N/A	Appendix III & IV	Appendix III & IV	Appendix III		Appendix III & IV	N/A	
MW-10	Upgradient	11	1	3	N/A	Appendix III & IV	Appendix III & IV	Appendix III		Appendix III & IV	N/A	
MW-13	Downgradient	11	1	3	N/A	Appendix III & IV	Appendix III & IV	Appendix III	Boron, calcium, sulfate, TDS	Appendix III & IV	N/A	
MW-14A	Downgradient	11	1	3	N/A	Appendix III & IV	Appendix III & IV	Appendix III	Boron, calcium, chloride, sulfate, TDS	Appendix III & IV	N/A	
MW-15A	Downgradient	11	1	3	N/A	Appendix III & IV	Appendix III & IV	Appendix III	Boron, calcium, chloride, sulfate, TDS	Appendix III & IV	N/A	
MW-18A	Downgradient	11	1	3	N/A	Appendix III & IV	Appendix III & IV	Appendix III	Boron, calcium, chloride, sulfate, TDS	Appendix III & IV	N/A	
MW-21	Downgradient	11	1	3	N/A	Appendix III & IV	Appendix III & IV	Appendix III	Boron, pH	Appendix III & IV	N/A	
						2018: Mar 6, June 19, Aug 29						
MW-22 ⁽²⁾	Upgradient	3	1	3	N/A	Appendix III & IV	N/A	N/A	N/A	N/A	N/A	

(1) Assessment monitoring: the full Appendix III & IV constituent lists are tested, except for radium which is not tested because it was not flagged as an SSI. Radium is tested annually in all wells (March 2018).

(2) MW-22 installed in February 2018 as an additional background well.

(3) Additional assessment wells MW-23, MW-24 and MW-25 were installed in May/June 2018 under the State of Iowa CCR Rule. Incorporation of new data into this federal report will occur as federal rule-triggers apply.

Table 3

Groundwater Monitoring Program Summary
2018 Groundwater Monitoring and Corrective Action Report
Muscatine Power & Water CCR Landfill
Permit No. #70-SDP-06-82P

Monitoring Well	Current Monitoring Program Status	Planned Change in Monitoring Program Status For The Next Sampling Event	Confirmed Statistically Significant Increase (SSI) Over Background	Statistically Significant Trends	Statistically Significant Level (SSL) Over GWPS	Upcoming Sampling Dates And Constituents		
						Resample	Semi-Annual / Assessment Monitoring: March 2019	Semi-Annual Monitoring: September 2019
MW-4A	Assessment	None	None	None	None	N/A	Appendix III & IV	Appendix III & IV
MW-5B	Assessment	None	Chloride	None	None	N/A	Appendix III & IV	Appendix III & IV
MW-6A	Assessment	None	None	None	None	N/A	Appendix III & IV	Appendix III & IV
MW-8	Background	None	None	None	None	N/A	Appendix III & IV	Appendix III & IV
MW-10	Background	None	None	None	None	N/A	Appendix III & IV	Appendix III & IV
MW-13	Assessment	None	Boron	None	None	N/A	Appendix III & IV	Appendix III & IV
MW-14A	Assessment	None	Boron, calcium, chloride, sulfate, TDS	None	None	N/A	Appendix III & IV	Appendix III & IV
MW-15A	Assessment	None	Boron, calcium, sulfate, TDS	None	None	N/A	Appendix III & IV	Appendix III & IV
MW-18A	Assessment	None	Boron, calcium, sulfate, TDS	Downward: Boron, Calcium, Sulfate	None	N/A	Appendix III & IV	Appendix III & IV
MW-21	Assessment	None	Boron	None	None	N/A	Appendix III & IV	Appendix III & IV
MW-22	Background	None	None	None	None	N/A	Appendix III & IV	Appendix III & IV

Assessment monitoring program triggered upon receipt of confirmed (by resample) SSL on December 19, 2017 and continuing SSL in 2018.

To simplify the sampling program, MP&W elects to sample for Appendix III & IV constituents, except radium, during all events (as opposed to Appendix III + detected Appendix IV constituents).

SSL = Statistically Significant Increase above background

SSL = Statistically Significant Level above a groundwater protection standard (GWPS)

N/A = Not Applicable

Table 4

Groundwater Protection Standards
2018 Groundwater Monitoring and Corrective Action Report
Muscatine Power & Water CCR Landfill
Permit No. #70-SDP-06-82P

Constituent	Unit	MCL	RSL	Statistical Background Limit
Antimony	(mg/L)	0.006		0.001
Arsenic	(mg/L)	0.01		0.0037
Barium	(mg/L)	2		0.22
Beryllium	(mg/L)	0.004		0.001
Cadmium	(mg/L)	0.005		0.0005
Chromium	(mg/L)	0.1		0.005
Cobalt	(mg/L)	N/A	0.006	0.0015
Combined Radium	(pCi/L)	5		0.94
Fluoride	(mg/L)	4		0.83
Lead	(mg/L)	0.015		0.0005
Lithium	(mg/L)	N/A	0.04	0.01
Mercury	(mg/L)	0.002		0.0002
Molybdenum	(mg/L)	N/A	0.1	0.0057
Selenium	(mg/L)	0.05		0.005
Thallium	(mg/L)	0.002		0.001

All metals as Total recoverable.

MCL: Maximum Contaminant Level

RSL: Regional Screening Level

Statistical Background Limit: Groundwater Stats Consulting, 10/11/2018

APPENDIX C

SAMPLING DATA

- March 6, June 19, and August 28, 2018 Sampling Events
 - Laboratory analytical Reports
 - Ground water sampling forms
 - Low Flow Sampling Forms
- Summary Tabulations of Analytical Results

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Cedar Falls

704 Enterprise Drive

Cedar Falls, IA 50613

Tel: (319)277-2401

TestAmerica Job ID: 310-125501-1

Client Project/Site: Muscatine Power & Water CCR App. III/IV

For:

Muscatine Power & Water

1700 Dick Drake Way

PO BOX 899

Muscatine, Iowa 52761

Attn: Sam Bennett



Authorized for release by:

3/23/2018 1:25:39 PM

Shawn Hayes, Senior Project Manager

(319)229-8211

shawn.hayes@testamericainc.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-1

Job ID: 310-125501-1

Laboratory: TestAmerica Cedar Falls

Narrative

Job Narrative
310-125501-1

Comments

No additional comments.

Receipt

The samples were received on 3/9/2018 9:25 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 1.4° C and 1.6° C.

HPLC/IC

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Sample Summary

Client: Muscatine Power & Water

TestAmerica Job ID: 310-125501-1

Project/Site: Muscatine Power & Water CCR App. III/IV

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-125501-1	MW-08	Ground Water	03/06/18 10:15	03/09/18 09:25
310-125501-2	MW-10	Ground Water	03/05/18 12:00	03/09/18 09:25
310-125501-3	MW-4A	Ground Water	03/06/18 17:55	03/09/18 09:25
310-125501-4	MW-5B	Ground Water	03/06/18 15:35	03/09/18 09:25
310-125501-5	MW-6A	Ground Water	03/06/18 16:35	03/09/18 09:25
310-125501-6	MW-13	Ground Water	03/06/18 13:50	03/09/18 09:25
310-125501-7	MW-14A	Ground Water	03/07/18 10:10	03/09/18 09:25
310-125501-8	MW-15A	Ground Water	03/07/18 08:50	03/09/18 09:25
310-125501-9	MW-18A	Ground Water	03/07/18 11:30	03/09/18 09:25
310-125501-10	MW-21	Ground Water	03/06/18 12:35	03/09/18 09:25
310-125501-11	MW-22	Ground Water	03/06/18 08:50	03/09/18 09:25
310-125501-12	DUP-1	Ground Water	03/06/18 10:50	03/09/18 09:25

Detection Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-1

Client Sample ID: MW-08

Lab Sample ID: 310-125501-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	14.5		5.00		mg/L	5		9056A	Total/NA
Sulfate	87.3		5.00		mg/L	5		9056A	Total/NA
Barium	0.0617		0.00200		mg/L	1		6020A	Total/NA
Calcium	74.7		0.200		mg/L	1		6020A	Total/NA
Molybdenum	0.00220		0.00200		mg/L	1		6020A	Total/NA
Total Dissolved Solids	376		30.0		mg/L	1		SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	7.3	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-10

Lab Sample ID: 310-125501-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	51.4		5.00		mg/L	5		9056A	Total/NA
Barium	0.129		0.00200		mg/L	1		6020A	Total/NA
Calcium	77.3		0.200		mg/L	1		6020A	Total/NA
Cobalt	0.000627		0.000500		mg/L	1		6020A	Total/NA
Total Dissolved Solids	314		30.0		mg/L	1		SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	7.2	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-4A

Lab Sample ID: 310-125501-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	8.81		5.00		mg/L	5		9056A	Total/NA
Sulfate	162		5.00		mg/L	5		9056A	Total/NA
Barium	0.117		0.00200		mg/L	1		6020A	Total/NA
Boron	0.660		0.200		mg/L	1		6020A	Total/NA
Calcium	95.8		0.200		mg/L	1		6020A	Total/NA
Total Dissolved Solids	586		30.0		mg/L	1		SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	7.4	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-5B

Lab Sample ID: 310-125501-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	68.2		5.00		mg/L	5		9056A	Total/NA
Sulfate	122		5.00		mg/L	5		9056A	Total/NA
Barium	0.341		0.00200		mg/L	1		6020A	Total/NA
Calcium	134		0.200		mg/L	1		6020A	Total/NA
Total Dissolved Solids	620		30.0		mg/L	1		SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	7.2	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-6A

Lab Sample ID: 310-125501-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	5.33		5.00		mg/L	5		9056A	Total/NA
Barium	0.206		0.00200		mg/L	1		6020A	Total/NA
Calcium	74.1		0.200		mg/L	1		6020A	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Cedar Falls

Detection Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-1

Client Sample ID: MW-6A (Continued)

Lab Sample ID: 310-125501-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Dissolved Solids	292		30.0		mg/L	1		SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	7.3	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-13

Lab Sample ID: 310-125501-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	19.9		5.00		mg/L	5		9056A	Total/NA
Fluoride	2.08		0.500		mg/L	5		9056A	Total/NA
Sulfate	506		50.0		mg/L	50		9056A	Total/NA
Barium	0.132		0.00200		mg/L	1		6020A	Total/NA
Boron	21.7		4.00		mg/L	20		6020A	Total/NA
Calcium	149		0.200		mg/L	1		6020A	Total/NA
Cobalt	0.000964		0.000500		mg/L	1		6020A	Total/NA
Lithium	0.0122		0.0100		mg/L	1		6020A	Total/NA
Molybdenum	0.00732		0.00200		mg/L	1		6020A	Total/NA
Selenium	0.0195		0.00500		mg/L	1		6020A	Total/NA
Total Dissolved Solids	1120		60.0		mg/L	1		SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	7.3	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-14A

Lab Sample ID: 310-125501-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	37.4		5.00		mg/L	5		9056A	Total/NA
Sulfate	1110		50.0		mg/L	50		9056A	Total/NA
Barium	0.0285		0.00200		mg/L	1		6020A	Total/NA
Boron	11.0		2.00		mg/L	10		6020A	Total/NA
Calcium	278		0.200		mg/L	1		6020A	Total/NA
Total Dissolved Solids	1820		150		mg/L	1		SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	7.3	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-15A

Lab Sample ID: 310-125501-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	24.2		5.00		mg/L	5		9056A	Total/NA
Sulfate	824		20.0		mg/L	20		9056A	Total/NA
Barium	0.0352		0.00200		mg/L	1		6020A	Total/NA
Boron	9.80		2.00		mg/L	10		6020A	Total/NA
Calcium	229		0.200		mg/L	1		6020A	Total/NA
Selenium	0.00502		0.00500		mg/L	1		6020A	Total/NA
Total Dissolved Solids	1270		150		mg/L	1		SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	7.3	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-18A

Lab Sample ID: 310-125501-9

This Detection Summary does not include radiochemical test results.

TestAmerica Cedar Falls

Detection Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-1

Client Sample ID: MW-18A (Continued)

Lab Sample ID: 310-125501-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	27.1		5.00		mg/L	5		9056A	Total/NA
Sulfate	624		50.0		mg/L	50		9056A	Total/NA
Antimony	0.00195		0.00100		mg/L	1		6020A	Total/NA
Arsenic	0.00265		0.00200		mg/L	1		6020A	Total/NA
Barium	0.0281		0.00200		mg/L	1		6020A	Total/NA
Boron	8.81		1.00		mg/L	5		6020A	Total/NA
Calcium	191		0.200		mg/L	1		6020A	Total/NA
Total Dissolved Solids	1150		30.0		mg/L	1		SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
pH	7.2	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-21

Lab Sample ID: 310-125501-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	53.7		5.00		mg/L	5		9056A	Total/NA
Barium	0.0148		0.00200		mg/L	1		6020A	Total/NA
Boron	0.885		0.200		mg/L	1		6020A	Total/NA
Calcium	25.1		0.200		mg/L	1		6020A	Total/NA
Total Dissolved Solids	200		30.0		mg/L	1		SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
pH	6.8	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-22

Lab Sample ID: 310-125501-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	30.0		5.00		mg/L	5		9056A	Total/NA
Sulfate	123		5.00		mg/L	5		9056A	Total/NA
Barium	0.150		0.00200		mg/L	1		6020A	Total/NA
Calcium	69.8		0.200		mg/L	1		6020A	Total/NA
Cobalt	0.00142		0.000500		mg/L	1		6020A	Total/NA
Molybdenum	0.00568		0.00200		mg/L	1		6020A	Total/NA
Total Dissolved Solids	424		30.0		mg/L	1		SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
pH	7.4	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: DUP-1

Lab Sample ID: 310-125501-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	16.8		5.00		mg/L	5		9056A	Total/NA
Sulfate	88.7		5.00		mg/L	5		9056A	Total/NA
Barium	0.0558		0.00200		mg/L	1		6020A	Total/NA
Calcium	68.3		0.200		mg/L	1		6020A	Total/NA
Total Dissolved Solids	272		30.0		mg/L	1		SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
pH	7.3	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Cedar Falls

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-1

Client Sample ID: MW-08

Lab Sample ID: 310-125501-1

Date Collected: 03/06/18 10:15

Matrix: Ground Water

Date Received: 03/09/18 09:25

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	14.5		5.00		mg/L			03/13/18 15:19	5
Fluoride	<0.500		0.500		mg/L			03/13/18 15:19	5
Sulfate	87.3		5.00		mg/L			03/13/18 15:19	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		03/12/18 10:00	03/12/18 20:18	1
Arsenic	<0.00200		0.00200		mg/L		03/12/18 10:00	03/12/18 20:18	1
Barium	0.0617		0.00200		mg/L		03/12/18 10:00	03/12/18 20:18	1
Beryllium	<0.00100		0.00100		mg/L		03/12/18 10:00	03/13/18 15:07	1
Boron	<0.200		0.200		mg/L		03/12/18 10:00	03/13/18 15:07	1
Cadmium	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 20:18	1
Calcium	74.7		0.200		mg/L		03/12/18 10:00	03/13/18 15:07	1
Chromium	<0.00500		0.00500		mg/L		03/12/18 10:00	03/13/18 15:07	1
Cobalt	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 20:18	1
Lithium	<0.0100		0.0100		mg/L		03/12/18 10:00	03/12/18 20:18	1
Lead	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 20:18	1
Molybdenum	0.00220		0.00200		mg/L		03/12/18 10:00	03/13/18 15:07	1
Selenium	<0.00500		0.00500		mg/L		03/12/18 10:00	03/12/18 20:18	1
Thallium	<0.00100		0.00100		mg/L		03/12/18 10:00	03/12/18 20:18	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		03/12/18 09:49	03/13/18 11:42	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	376		30.0		mg/L			03/12/18 11:16	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.3	HF	0.1		SU			03/09/18 16:04	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-1

Client Sample ID: MW-10

Date Collected: 03/05/18 12:00

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-2

Matrix: Ground Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<5.00		5.00		mg/L			03/13/18 16:05	5
Fluoride	<0.500		0.500		mg/L			03/13/18 16:05	5
Sulfate	51.4		5.00		mg/L			03/13/18 16:05	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		03/12/18 10:00	03/12/18 20:21	1
Arsenic	<0.00200		0.00200		mg/L		03/12/18 10:00	03/12/18 20:21	1
Barium	0.129		0.00200		mg/L		03/12/18 10:00	03/12/18 20:21	1
Beryllium	<0.00100		0.00100		mg/L		03/12/18 10:00	03/13/18 15:10	1
Boron	<0.200		0.200		mg/L		03/12/18 10:00	03/13/18 15:10	1
Cadmium	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 20:21	1
Calcium	77.3		0.200		mg/L		03/12/18 10:00	03/13/18 15:10	1
Chromium	<0.00500		0.00500		mg/L		03/12/18 10:00	03/13/18 15:10	1
Cobalt	0.000627		0.000500		mg/L		03/12/18 10:00	03/12/18 20:21	1
Lithium	<0.0100		0.0100		mg/L		03/12/18 10:00	03/12/18 20:21	1
Lead	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 20:21	1
Molybdenum	<0.00200		0.00200		mg/L		03/12/18 10:00	03/13/18 15:10	1
Selenium	<0.00500		0.00500		mg/L		03/12/18 10:00	03/12/18 20:21	1
Thallium	<0.00100		0.00100		mg/L		03/12/18 10:00	03/12/18 20:21	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		03/12/18 09:49	03/13/18 11:47	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	314		30.0		mg/L			03/12/18 11:16	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.2	HF	0.1		SU			03/09/18 16:08	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-1

Client Sample ID: MW-4A

Lab Sample ID: 310-125501-3

Date Collected: 03/06/18 17:55

Matrix: Ground Water

Date Received: 03/09/18 09:25

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	8.81		5.00		mg/L			03/13/18 16:21	5
Fluoride	<0.500		0.500		mg/L			03/13/18 16:21	5
Sulfate	162		5.00		mg/L			03/13/18 16:21	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		03/12/18 10:00	03/12/18 20:24	1
Arsenic	<0.00200		0.00200		mg/L		03/12/18 10:00	03/12/18 20:24	1
Barium	0.117		0.00200		mg/L		03/12/18 10:00	03/12/18 20:24	1
Beryllium	<0.00100		0.00100		mg/L		03/12/18 10:00	03/13/18 15:13	1
Boron	0.660		0.200		mg/L		03/12/18 10:00	03/13/18 15:13	1
Cadmium	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 20:24	1
Calcium	95.8		0.200		mg/L		03/12/18 10:00	03/13/18 15:13	1
Chromium	<0.00500		0.00500		mg/L		03/12/18 10:00	03/13/18 15:13	1
Cobalt	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 20:24	1
Lithium	<0.0100		0.0100		mg/L		03/12/18 10:00	03/12/18 20:24	1
Lead	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 20:24	1
Molybdenum	<0.00200		0.00200		mg/L		03/12/18 10:00	03/13/18 15:13	1
Selenium	<0.00500		0.00500		mg/L		03/12/18 10:00	03/12/18 20:24	1
Thallium	<0.00100		0.00100		mg/L		03/12/18 10:00	03/12/18 20:24	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		03/12/18 09:49	03/13/18 11:49	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	586		30.0		mg/L			03/12/18 11:16	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.4	HF	0.1		SU			03/09/18 16:11	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-1

Client Sample ID: MW-5B

Lab Sample ID: 310-125501-4

Date Collected: 03/06/18 15:35

Matrix: Ground Water

Date Received: 03/09/18 09:25

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	68.2		5.00		mg/L			03/13/18 16:36	5
Fluoride	<0.500		0.500		mg/L			03/13/18 16:36	5
Sulfate	122		5.00		mg/L			03/13/18 16:36	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		03/12/18 10:00	03/12/18 20:27	1
Arsenic	<0.00200		0.00200		mg/L		03/12/18 10:00	03/12/18 20:27	1
Barium	0.341		0.00200		mg/L		03/12/18 10:00	03/12/18 20:27	1
Beryllium	<0.00100		0.00100		mg/L		03/12/18 10:00	03/13/18 15:25	1
Boron	<0.200		0.200		mg/L		03/12/18 10:00	03/13/18 15:25	1
Cadmium	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 20:27	1
Calcium	134		0.200		mg/L		03/12/18 10:00	03/13/18 15:25	1
Chromium	<0.00500		0.00500		mg/L		03/12/18 10:00	03/13/18 15:25	1
Cobalt	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 20:27	1
Lithium	<0.0100		0.0100		mg/L		03/12/18 10:00	03/12/18 20:27	1
Lead	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 20:27	1
Molybdenum	<0.00200		0.00200		mg/L		03/12/18 10:00	03/13/18 15:25	1
Selenium	<0.00500		0.00500		mg/L		03/12/18 10:00	03/12/18 20:27	1
Thallium	<0.00100		0.00100		mg/L		03/12/18 10:00	03/12/18 20:27	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		03/12/18 09:49	03/13/18 11:50	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	620		30.0		mg/L			03/12/18 11:16	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.2	HF	0.1		SU			03/09/18 16:12	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-1

Client Sample ID: MW-6A

Lab Sample ID: 310-125501-5

Date Collected: 03/06/18 16:35

Matrix: Ground Water

Date Received: 03/09/18 09:25

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	5.33		5.00		mg/L			03/13/18 17:22	5
Fluoride	<0.500		0.500		mg/L			03/13/18 17:22	5
Sulfate	<5.00		5.00		mg/L			03/13/18 17:22	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		03/12/18 10:00	03/12/18 20:30	1
Arsenic	<0.00200		0.00200		mg/L		03/12/18 10:00	03/12/18 20:30	1
Barium	0.206		0.00200		mg/L		03/12/18 10:00	03/12/18 20:30	1
Beryllium	<0.00100		0.00100		mg/L		03/12/18 10:00	03/13/18 15:28	1
Boron	<0.200		0.200		mg/L		03/12/18 10:00	03/13/18 15:28	1
Cadmium	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 20:30	1
Calcium	74.1		0.200		mg/L		03/12/18 10:00	03/13/18 15:28	1
Chromium	<0.00500		0.00500		mg/L		03/12/18 10:00	03/13/18 15:28	1
Cobalt	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 20:30	1
Lithium	<0.0100		0.0100		mg/L		03/12/18 10:00	03/12/18 20:30	1
Lead	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 20:30	1
Molybdenum	<0.00200		0.00200		mg/L		03/12/18 10:00	03/13/18 15:28	1
Selenium	<0.00500		0.00500		mg/L		03/12/18 10:00	03/12/18 20:30	1
Thallium	<0.00100		0.00100		mg/L		03/12/18 10:00	03/12/18 20:30	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		03/12/18 09:49	03/13/18 11:52	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	292		30.0		mg/L			03/12/18 11:16	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.3	HF	0.1		SU			03/09/18 16:13	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-1

Client Sample ID: MW-13

Date Collected: 03/06/18 13:50

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-6

Matrix: Ground Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	19.9		5.00		mg/L			03/13/18 17:53	5
Fluoride	2.08		0.500		mg/L			03/13/18 17:53	5
Sulfate	506		50.0		mg/L			03/13/18 17:38	50

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		03/12/18 10:00	03/12/18 20:33	1
Arsenic	<0.00200		0.00200		mg/L		03/12/18 10:00	03/12/18 20:33	1
Barium	0.132		0.00200		mg/L		03/12/18 10:00	03/12/18 20:33	1
Beryllium	<0.00100		0.00100		mg/L		03/12/18 10:00	03/13/18 15:31	1
Boron	21.7		4.00		mg/L		03/12/18 10:00	03/13/18 15:59	20
Cadmium	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 20:33	1
Calcium	149		0.200		mg/L		03/12/18 10:00	03/13/18 15:31	1
Chromium	<0.00500		0.00500		mg/L		03/12/18 10:00	03/13/18 15:31	1
Cobalt	0.000964		0.000500		mg/L		03/12/18 10:00	03/12/18 20:33	1
Lithium	0.0122		0.0100		mg/L		03/12/18 10:00	03/12/18 20:33	1
Lead	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 20:33	1
Molybdenum	0.00732		0.00200		mg/L		03/12/18 10:00	03/13/18 15:31	1
Selenium	0.0195		0.00500		mg/L		03/12/18 10:00	03/12/18 20:33	1
Thallium	<0.00100		0.00100		mg/L		03/12/18 10:00	03/12/18 20:33	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		03/12/18 09:49	03/13/18 11:53	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1120		60.0		mg/L			03/12/18 11:16	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.3	HF	0.1		SU			03/09/18 16:14	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-1

Client Sample ID: MW-14A

Lab Sample ID: 310-125501-7

Date Collected: 03/07/18 10:10

Matrix: Ground Water

Date Received: 03/09/18 09:25

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	37.4		5.00		mg/L			03/14/18 21:54	5
Fluoride	<0.500		0.500		mg/L			03/14/18 21:54	5
Sulfate	1110		50.0		mg/L			03/14/18 21:38	50

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		03/12/18 10:00	03/12/18 20:36	1
Arsenic	<0.00200		0.00200		mg/L		03/12/18 10:00	03/12/18 20:36	1
Barium	0.0285		0.00200		mg/L		03/12/18 10:00	03/12/18 20:36	1
Beryllium	<0.00100		0.00100		mg/L		03/12/18 10:00	03/13/18 15:34	1
Boron	11.0		2.00		mg/L		03/12/18 10:00	03/13/18 16:03	10
Cadmium	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 20:36	1
Calcium	278		0.200		mg/L		03/12/18 10:00	03/13/18 15:34	1
Chromium	<0.00500		0.00500		mg/L		03/12/18 10:00	03/13/18 15:34	1
Cobalt	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 20:36	1
Lithium	<0.0100		0.0100		mg/L		03/12/18 10:00	03/12/18 20:36	1
Lead	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 20:36	1
Molybdenum	<0.00200		0.00200		mg/L		03/12/18 10:00	03/13/18 15:34	1
Selenium	<0.00500		0.00500		mg/L		03/12/18 10:00	03/12/18 20:36	1
Thallium	<0.00100		0.00100		mg/L		03/12/18 10:00	03/12/18 20:36	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		03/12/18 09:49	03/13/18 11:55	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1820		150		mg/L			03/12/18 11:16	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.3	HF	0.1		SU			03/09/18 16:16	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-1

Client Sample ID: MW-15A

Lab Sample ID: 310-125501-8

Date Collected: 03/07/18 08:50

Matrix: Ground Water

Date Received: 03/09/18 09:25

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	24.2		5.00		mg/L			03/13/18 18:55	5
Fluoride	<0.500		0.500		mg/L			03/13/18 18:55	5
Sulfate	824		20.0		mg/L			03/13/18 18:39	20

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		03/12/18 10:00	03/12/18 20:39	1
Arsenic	<0.00200		0.00200		mg/L		03/12/18 10:00	03/12/18 20:39	1
Barium	0.0352		0.00200		mg/L		03/12/18 10:00	03/12/18 20:39	1
Beryllium	<0.00100		0.00100		mg/L		03/12/18 10:00	03/13/18 15:38	1
Boron	9.80		2.00		mg/L		03/12/18 10:00	03/13/18 16:15	10
Cadmium	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 20:39	1
Calcium	229		0.200		mg/L		03/12/18 10:00	03/13/18 15:38	1
Chromium	<0.00500		0.00500		mg/L		03/12/18 10:00	03/13/18 15:38	1
Cobalt	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 20:39	1
Lithium	<0.0100		0.0100		mg/L		03/12/18 10:00	03/12/18 20:39	1
Lead	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 20:39	1
Molybdenum	<0.00200		0.00200		mg/L		03/12/18 10:00	03/13/18 15:38	1
Selenium	0.00502		0.00500		mg/L		03/12/18 10:00	03/12/18 20:39	1
Thallium	<0.00100		0.00100		mg/L		03/12/18 10:00	03/12/18 20:39	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		03/12/18 09:49	03/13/18 11:56	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1270		150		mg/L			03/12/18 11:16	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.3	HF	0.1		SU			03/09/18 16:17	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-1

Client Sample ID: MW-18A

Lab Sample ID: 310-125501-9

Date Collected: 03/07/18 11:30

Matrix: Ground Water

Date Received: 03/09/18 09:25

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	27.1		5.00		mg/L			03/13/18 19:26	5
Fluoride	<0.500		0.500		mg/L			03/13/18 19:26	5
Sulfate	624		50.0		mg/L			03/13/18 19:10	50

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00195		0.00100		mg/L		03/12/18 10:00	03/12/18 20:55	1
Arsenic	0.00265		0.00200		mg/L		03/12/18 10:00	03/12/18 20:55	1
Barium	0.0281		0.00200		mg/L		03/12/18 10:00	03/12/18 20:55	1
Beryllium	<0.00100		0.00100		mg/L		03/12/18 10:00	03/12/18 20:55	1
Boron	8.81		1.00		mg/L		03/12/18 10:00	03/13/18 15:44	5
Cadmium	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 20:55	1
Calcium	191		0.200		mg/L		03/12/18 10:00	03/12/18 20:55	1
Chromium	<0.00500		0.00500		mg/L		03/12/18 10:00	03/12/18 20:55	1
Cobalt	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 20:55	1
Lithium	<0.0100		0.0100		mg/L		03/12/18 10:00	03/13/18 15:47	1
Lead	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 20:55	1
Molybdenum	<0.00200		0.00200		mg/L		03/12/18 10:00	03/12/18 20:55	1
Selenium	<0.00500		0.00500		mg/L		03/12/18 10:00	03/12/18 20:55	1
Thallium	<0.00100		0.00100		mg/L		03/12/18 10:00	03/12/18 20:55	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		03/12/18 09:49	03/13/18 11:58	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1150		30.0		mg/L			03/12/18 11:16	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.2	HF	0.1		SU			03/09/18 16:18	1

Client Sample Results

Client: Muscatine Power & Water

TestAmerica Job ID: 310-125501-1

Project/Site: Muscatine Power & Water CCR App. III/IV

Client Sample ID: MW-21

Lab Sample ID: 310-125501-10

Date Collected: 03/06/18 12:35

Matrix: Ground Water

Date Received: 03/09/18 09:25

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<5.00		5.00		mg/L			03/13/18 19:41	5
Fluoride	<0.500		0.500		mg/L			03/13/18 19:41	5
Sulfate	53.7		5.00		mg/L			03/13/18 19:41	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		03/12/18 10:00	03/12/18 20:58	1
Arsenic	<0.00200		0.00200		mg/L		03/12/18 10:00	03/12/18 20:58	1
Barium	0.0148		0.00200		mg/L		03/12/18 10:00	03/12/18 20:58	1
Beryllium	<0.00100		0.00100		mg/L		03/12/18 10:00	03/12/18 20:58	1
Boron	0.885		0.200		mg/L		03/12/18 10:00	03/13/18 16:21	1
Cadmium	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 20:58	1
Calcium	25.1		0.200		mg/L		03/12/18 10:00	03/12/18 20:58	1
Chromium	<0.00500		0.00500		mg/L		03/12/18 10:00	03/12/18 20:58	1
Cobalt	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 20:58	1
Lithium	<0.0100		0.0100		mg/L		03/12/18 10:00	03/13/18 16:21	1
Lead	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 20:58	1
Molybdenum	<0.00200		0.00200		mg/L		03/12/18 10:00	03/12/18 20:58	1
Selenium	<0.00500		0.00500		mg/L		03/12/18 10:00	03/12/18 20:58	1
Thallium	<0.00100		0.00100		mg/L		03/12/18 10:00	03/12/18 20:58	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		03/12/18 09:49	03/13/18 11:59	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	200		30.0		mg/L			03/12/18 11:16	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.8	HF	0.1		SU			03/09/18 16:24	1

Client Sample Results

Client: Muscatine Power & Water

TestAmerica Job ID: 310-125501-1

Project/Site: Muscatine Power & Water CCR App. III/IV

Client Sample ID: MW-22

Lab Sample ID: 310-125501-11

Date Collected: 03/06/18 08:50

Matrix: Ground Water

Date Received: 03/09/18 09:25

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	30.0		5.00		mg/L			03/13/18 20:46	5
Fluoride	<0.500		0.500		mg/L			03/13/18 20:46	5
Sulfate	123		5.00		mg/L			03/13/18 20:46	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		03/12/18 10:00	03/12/18 21:01	1
Arsenic	<0.00200		0.00200		mg/L		03/12/18 10:00	03/12/18 21:01	1
Barium	0.150		0.00200		mg/L		03/12/18 10:00	03/12/18 21:01	1
Beryllium	<0.00100		0.00100		mg/L		03/12/18 10:00	03/12/18 21:01	1
Boron	<0.200		0.200		mg/L		03/12/18 10:00	03/13/18 16:24	1
Cadmium	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 21:01	1
Calcium	69.8		0.200		mg/L		03/12/18 10:00	03/12/18 21:01	1
Chromium	<0.00500		0.00500		mg/L		03/12/18 10:00	03/12/18 21:01	1
Cobalt	0.00142		0.000500		mg/L		03/12/18 10:00	03/12/18 21:01	1
Lithium	<0.0100		0.0100		mg/L		03/12/18 10:00	03/13/18 16:24	1
Lead	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 21:01	1
Molybdenum	0.00568		0.00200		mg/L		03/12/18 10:00	03/12/18 21:01	1
Selenium	<0.00500		0.00500		mg/L		03/12/18 10:00	03/12/18 21:01	1
Thallium	<0.00100		0.00100		mg/L		03/12/18 10:00	03/12/18 21:01	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		03/12/18 09:49	03/13/18 12:01	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	424		30.0		mg/L			03/12/18 11:16	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.4	HF	0.1		SU			03/09/18 16:27	1

Client Sample Results

Client: Muscatine Power & Water

TestAmerica Job ID: 310-125501-1

Project/Site: Muscatine Power & Water CCR App. III/IV

Client Sample ID: DUP-1

Lab Sample ID: 310-125501-12

Date Collected: 03/06/18 10:50

Matrix: Ground Water

Date Received: 03/09/18 09:25

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	16.8		5.00		mg/L			03/13/18 21:01	5
Fluoride	<0.500		0.500		mg/L			03/13/18 21:01	5
Sulfate	88.7		5.00		mg/L			03/13/18 21:01	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		03/12/18 10:00	03/12/18 21:04	1
Arsenic	<0.00200		0.00200		mg/L		03/12/18 10:00	03/12/18 21:04	1
Barium	0.0558		0.00200		mg/L		03/12/18 10:00	03/12/18 21:04	1
Beryllium	<0.00100		0.00100		mg/L		03/12/18 10:00	03/12/18 21:04	1
Boron	<0.200		0.200		mg/L		03/12/18 10:00	03/13/18 16:27	1
Cadmium	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 21:04	1
Calcium	68.3		0.200		mg/L		03/12/18 10:00	03/12/18 21:04	1
Chromium	<0.00500		0.00500		mg/L		03/12/18 10:00	03/12/18 21:04	1
Cobalt	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 21:04	1
Lithium	<0.0100		0.0100		mg/L		03/12/18 10:00	03/13/18 16:27	1
Lead	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 21:04	1
Molybdenum	<0.00200		0.00200		mg/L		03/12/18 10:00	03/12/18 21:04	1
Selenium	<0.00500		0.00500		mg/L		03/12/18 10:00	03/12/18 21:04	1
Thallium	<0.00100		0.00100		mg/L		03/12/18 10:00	03/12/18 21:04	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		03/12/18 09:49	03/13/18 12:06	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	272		30.0		mg/L			03/12/18 11:16	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.3	HF	0.1		SU			03/09/18 16:28	1

Definitions/Glossary

Client: Muscatine Power & Water

TestAmerica Job ID: 310-125501-1

Project/Site: Muscatine Power & Water CCR App. III/IV

Qualifiers

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

QC Sample Results

Client: Muscatine Power & Water

TestAmerica Job ID: 310-125501-1

Project/Site: Muscatine Power & Water CCR App. III/IV

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-196721/3

Matrix: Water

Analysis Batch: 196721

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.00		1.00		mg/L			03/13/18 14:18	1
Fluoride	<0.100		0.100		mg/L			03/13/18 14:18	1
Sulfate	<1.00		1.00		mg/L			03/13/18 14:18	1

Lab Sample ID: LCS 310-196721/4

Matrix: Water

Analysis Batch: 196721

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	7.50	7.610		mg/L		101	90 - 110
Fluoride	1.50	1.604		mg/L		107	90 - 110
Sulfate	7.50	7.647		mg/L		102	90 - 110

Lab Sample ID: 310-125501-1 MS

Matrix: Ground Water

Analysis Batch: 196721

Client Sample ID: MW-08

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	14.5		25.0	39.58		mg/L		100	80 - 120
Fluoride	<0.500		5.00	5.800		mg/L		116	80 - 120
Sulfate	87.3		25.0	110.2		mg/L		92	80 - 120

Lab Sample ID: 310-125501-1 MSD

Matrix: Ground Water

Analysis Batch: 196721

Client Sample ID: MW-08

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	14.5		25.0	39.71		mg/L		101	80 - 120	0	15
Fluoride	<0.500		5.00	5.846		mg/L		117	80 - 120	1	15
Sulfate	87.3		25.0	110.4		mg/L		92	80 - 120	0	15

Lab Sample ID: MB 310-196973/3

Matrix: Water

Analysis Batch: 196973

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.00		1.00		mg/L			03/14/18 19:07	1
Fluoride	<0.100		0.100		mg/L			03/14/18 19:07	1
Sulfate	<1.00		1.00		mg/L			03/14/18 19:07	1

Lab Sample ID: LCS 310-196973/6

Matrix: Water

Analysis Batch: 196973

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	7.50	7.628		mg/L		102	90 - 110
Fluoride	1.50	1.603		mg/L		107	90 - 110
Sulfate	7.50	7.763		mg/L		104	90 - 110

TestAmerica Cedar Falls

QC Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-1

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 310-196268/1-A

Matrix: Water

Analysis Batch: 196485

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 196268

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		03/12/18 10:00	03/12/18 19:41	1
Arsenic	<0.00200		0.00200		mg/L		03/12/18 10:00	03/12/18 19:41	1
Barium	<0.00200		0.00200		mg/L		03/12/18 10:00	03/12/18 19:41	1
Cadmium	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 19:41	1
Cobalt	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 19:41	1
Lithium	<0.0100		0.0100		mg/L		03/12/18 10:00	03/12/18 19:41	1
Lead	<0.000500		0.000500		mg/L		03/12/18 10:00	03/12/18 19:41	1
Selenium	<0.00500		0.00500		mg/L		03/12/18 10:00	03/12/18 19:41	1
Thallium	<0.00100		0.00100		mg/L		03/12/18 10:00	03/12/18 19:41	1

Lab Sample ID: MB 310-196268/1-A

Matrix: Water

Analysis Batch: 196626

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 196268

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	<0.00100		0.00100		mg/L		03/12/18 10:00	03/13/18 14:45	1
Boron	<0.200		0.200		mg/L		03/12/18 10:00	03/13/18 14:45	1
Calcium	<0.200		0.200		mg/L		03/12/18 10:00	03/13/18 14:45	1
Chromium	<0.00500		0.00500		mg/L		03/12/18 10:00	03/13/18 14:45	1
Molybdenum	<0.00200		0.00200		mg/L		03/12/18 10:00	03/13/18 14:45	1

Lab Sample ID: LCS 310-196268/2-A

Matrix: Water

Analysis Batch: 196485

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 196268

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.0200	0.01901		mg/L		95	80 - 120
Arsenic	0.0400	0.03778		mg/L		94	80 - 120
Barium	0.0400	0.04019		mg/L		100	80 - 120
Cadmium	0.0200	0.02078		mg/L		104	80 - 120
Cobalt	0.0200	0.01963		mg/L		98	80 - 120
Lithium	0.100	0.09079		mg/L		91	80 - 120
Lead	0.0200	0.02020		mg/L		101	80 - 120
Selenium	0.0400	0.03597		mg/L		90	80 - 120
Thallium	0.0160	0.01645		mg/L		103	80 - 120

Lab Sample ID: LCS 310-196268/2-A

Matrix: Water

Analysis Batch: 196626

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 196268

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Beryllium	0.0200	0.02159		mg/L		108	80 - 120
Boron	0.880	0.8385		mg/L		95	80 - 120
Calcium	2.00	2.079		mg/L		104	80 - 120
Chromium	0.0400	0.04240		mg/L		106	80 - 120
Molybdenum	0.0400	0.04053		mg/L		101	80 - 120

TestAmerica Cedar Falls

QC Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: 310-125501-8 DU

Matrix: Ground Water

Analysis Batch: 196485

Client Sample ID: MW-15A

Prep Type: Total/NA

Prep Batch: 196268

Analyte	Sample	Sample	DU	DU	Unit	D	RPD	Limit
	Result	Qualifier	Result	Qualifier				
Antimony	<0.00100		<0.00100		mg/L		NC	20
Arsenic	<0.00200		<0.00200		mg/L		NC	20
Barium	0.0352		0.03659		mg/L		4	20
Cadmium	<0.000500		<0.000500		mg/L		NC	20
Cobalt	<0.000500		<0.000500		mg/L		NC	20
Lithium	<0.0100		<0.0100		mg/L		NC	20
Lead	<0.000500		<0.000500		mg/L		NC	20
Selenium	0.00502		0.005413		mg/L		8	20
Thallium	<0.00100		<0.00100		mg/L		NC	20

Lab Sample ID: 310-125501-8 DU

Matrix: Ground Water

Analysis Batch: 196626

Client Sample ID: MW-15A

Prep Type: Total/NA

Prep Batch: 196268

Analyte	Sample	Sample	DU	DU	Unit	D	RPD	Limit
	Result	Qualifier	Result	Qualifier				
Beryllium	<0.00100		<0.00100		mg/L		NC	20
Calcium	229		237.3		mg/L		4	20
Chromium	<0.00500		<0.00500		mg/L		NC	20
Molybdenum	<0.00200		<0.00200		mg/L		NC	20

Lab Sample ID: 310-125501-8 DU

Matrix: Ground Water

Analysis Batch: 196626

Client Sample ID: MW-15A

Prep Type: Total/NA

Prep Batch: 196268

Analyte	Sample	Sample	DU	DU	Unit	D	RPD	Limit
	Result	Qualifier	Result	Qualifier				
Boron	9.80		9.996		mg/L		2	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-196366/1-A

Matrix: Water

Analysis Batch: 196546

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 196366

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Mercury	<0.000200		0.000200		mg/L		03/12/18 09:49	03/13/18 11:31	1

Lab Sample ID: LCS 310-196366/2-A

Matrix: Water

Analysis Batch: 196546

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 196366

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	%Rec. Limits
		Result	Qualifier				
Mercury	0.00167	0.001702		mg/L		102	80 - 120

TestAmerica Cedar Falls

QC Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-1

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 310-196394/1

Matrix: Water

Analysis Batch: 196394

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<30.0		30.0		mg/L			03/12/18 11:16	1

Lab Sample ID: LCS 310-196394/2

Matrix: Water

Analysis Batch: 196394

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	1000	1012		mg/L		101	90 - 110

Lab Sample ID: 310-125501-1 DU

Matrix: Ground Water

Analysis Batch: 196394

Client Sample ID: MW-08

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	376		338.0		mg/L		11	24

Lab Sample ID: 310-125501-11 DU

Matrix: Ground Water

Analysis Batch: 196394

Client Sample ID: MW-22

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	424		424.0		mg/L		0	24

Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 310-196263/16

Matrix: Water

Analysis Batch: 196263

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.0		SU		100	98 - 102

Lab Sample ID: 310-125501-1 DU

Matrix: Ground Water

Analysis Batch: 196263

Client Sample ID: MW-08

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	7.3	HF	7.4		SU		0.7	20

Lab Sample ID: 310-125501-10 DU

Matrix: Ground Water

Analysis Batch: 196263

Client Sample ID: MW-21

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	6.8	HF	6.8		SU		0.3	20

TestAmerica Cedar Falls

QC Association Summary

Client: Muscatine Power & Water

TestAmerica Job ID: 310-125501-1

Project/Site: Muscatine Power & Water CCR App. III/IV

HPLC/IC

Analysis Batch: 196721

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-125501-1	MW-08	Total/NA	Ground Water	9056A	
310-125501-2	MW-10	Total/NA	Ground Water	9056A	
310-125501-3	MW-4A	Total/NA	Ground Water	9056A	
310-125501-4	MW-5B	Total/NA	Ground Water	9056A	
310-125501-5	MW-6A	Total/NA	Ground Water	9056A	
310-125501-6	MW-13	Total/NA	Ground Water	9056A	
310-125501-6	MW-13	Total/NA	Ground Water	9056A	
310-125501-8	MW-15A	Total/NA	Ground Water	9056A	
310-125501-8	MW-15A	Total/NA	Ground Water	9056A	
310-125501-9	MW-18A	Total/NA	Ground Water	9056A	
310-125501-9	MW-18A	Total/NA	Ground Water	9056A	
310-125501-10	MW-21	Total/NA	Ground Water	9056A	
310-125501-11	MW-22	Total/NA	Ground Water	9056A	
310-125501-12	DUP-1	Total/NA	Ground Water	9056A	
MB 310-196721/3	Method Blank	Total/NA	Water	9056A	
LCS 310-196721/4	Lab Control Sample	Total/NA	Water	9056A	
310-125501-1 MS	MW-08	Total/NA	Ground Water	9056A	
310-125501-1 MSD	MW-08	Total/NA	Ground Water	9056A	

Analysis Batch: 196973

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-125501-7	MW-14A	Total/NA	Ground Water	9056A	
310-125501-7	MW-14A	Total/NA	Ground Water	9056A	
MB 310-196973/3	Method Blank	Total/NA	Water	9056A	
LCS 310-196973/6	Lab Control Sample	Total/NA	Water	9056A	

Metals

Prep Batch: 196268

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-125501-1	MW-08	Total/NA	Ground Water	3010A	
310-125501-2	MW-10	Total/NA	Ground Water	3010A	
310-125501-3	MW-4A	Total/NA	Ground Water	3010A	
310-125501-4	MW-5B	Total/NA	Ground Water	3010A	
310-125501-5	MW-6A	Total/NA	Ground Water	3010A	
310-125501-6	MW-13	Total/NA	Ground Water	3010A	
310-125501-7	MW-14A	Total/NA	Ground Water	3010A	
310-125501-8	MW-15A	Total/NA	Ground Water	3010A	
310-125501-9	MW-18A	Total/NA	Ground Water	3010A	
310-125501-10	MW-21	Total/NA	Ground Water	3010A	
310-125501-11	MW-22	Total/NA	Ground Water	3010A	
310-125501-12	DUP-1	Total/NA	Ground Water	3010A	
MB 310-196268/1-A	Method Blank	Total/NA	Water	3010A	
LCS 310-196268/2-A	Lab Control Sample	Total/NA	Water	3010A	
310-125501-8 DU	MW-15A	Total/NA	Ground Water	3010A	

Prep Batch: 196366

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-125501-1	MW-08	Total/NA	Ground Water	7470A	
310-125501-2	MW-10	Total/NA	Ground Water	7470A	

TestAmerica Cedar Falls

QC Association Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-1

Metals (Continued)

Prep Batch: 196366 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-125501-3	MW-4A	Total/NA	Ground Water	7470A	
310-125501-4	MW-5B	Total/NA	Ground Water	7470A	
310-125501-5	MW-6A	Total/NA	Ground Water	7470A	
310-125501-6	MW-13	Total/NA	Ground Water	7470A	
310-125501-7	MW-14A	Total/NA	Ground Water	7470A	
310-125501-8	MW-15A	Total/NA	Ground Water	7470A	
310-125501-9	MW-18A	Total/NA	Ground Water	7470A	
310-125501-10	MW-21	Total/NA	Ground Water	7470A	
310-125501-11	MW-22	Total/NA	Ground Water	7470A	
310-125501-12	DUP-1	Total/NA	Ground Water	7470A	
MB 310-196366/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-196366/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 196485

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-125501-1	MW-08	Total/NA	Ground Water	6020A	196268
310-125501-2	MW-10	Total/NA	Ground Water	6020A	196268
310-125501-3	MW-4A	Total/NA	Ground Water	6020A	196268
310-125501-4	MW-5B	Total/NA	Ground Water	6020A	196268
310-125501-5	MW-6A	Total/NA	Ground Water	6020A	196268
310-125501-6	MW-13	Total/NA	Ground Water	6020A	196268
310-125501-7	MW-14A	Total/NA	Ground Water	6020A	196268
310-125501-8	MW-15A	Total/NA	Ground Water	6020A	196268
310-125501-9	MW-18A	Total/NA	Ground Water	6020A	196268
310-125501-10	MW-21	Total/NA	Ground Water	6020A	196268
310-125501-11	MW-22	Total/NA	Ground Water	6020A	196268
310-125501-12	DUP-1	Total/NA	Ground Water	6020A	196268
MB 310-196268/1-A	Method Blank	Total/NA	Water	6020A	196268
LCS 310-196268/2-A	Lab Control Sample	Total/NA	Water	6020A	196268
310-125501-8 DU	MW-15A	Total/NA	Ground Water	6020A	196268

Analysis Batch: 196546

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-125501-1	MW-08	Total/NA	Ground Water	7470A	196366
310-125501-2	MW-10	Total/NA	Ground Water	7470A	196366
310-125501-3	MW-4A	Total/NA	Ground Water	7470A	196366
310-125501-4	MW-5B	Total/NA	Ground Water	7470A	196366
310-125501-5	MW-6A	Total/NA	Ground Water	7470A	196366
310-125501-6	MW-13	Total/NA	Ground Water	7470A	196366
310-125501-7	MW-14A	Total/NA	Ground Water	7470A	196366
310-125501-8	MW-15A	Total/NA	Ground Water	7470A	196366
310-125501-9	MW-18A	Total/NA	Ground Water	7470A	196366
310-125501-10	MW-21	Total/NA	Ground Water	7470A	196366
310-125501-11	MW-22	Total/NA	Ground Water	7470A	196366
310-125501-12	DUP-1	Total/NA	Ground Water	7470A	196366
MB 310-196366/1-A	Method Blank	Total/NA	Water	7470A	196366
LCS 310-196366/2-A	Lab Control Sample	Total/NA	Water	7470A	196366

Analysis Batch: 196626

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-125501-1	MW-08	Total/NA	Ground Water	6020A	196268

TestAmerica Cedar Falls

QC Association Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-1

Metals (Continued)

Analysis Batch: 196626 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-125501-2	MW-10	Total/NA	Ground Water	6020A	196268
310-125501-3	MW-4A	Total/NA	Ground Water	6020A	196268
310-125501-4	MW-5B	Total/NA	Ground Water	6020A	196268
310-125501-5	MW-6A	Total/NA	Ground Water	6020A	196268
310-125501-6	MW-13	Total/NA	Ground Water	6020A	196268
310-125501-6	MW-13	Total/NA	Ground Water	6020A	196268
310-125501-7	MW-14A	Total/NA	Ground Water	6020A	196268
310-125501-7	MW-14A	Total/NA	Ground Water	6020A	196268
310-125501-8	MW-15A	Total/NA	Ground Water	6020A	196268
310-125501-8	MW-15A	Total/NA	Ground Water	6020A	196268
310-125501-9	MW-18A	Total/NA	Ground Water	6020A	196268
310-125501-9	MW-18A	Total/NA	Ground Water	6020A	196268
310-125501-10	MW-21	Total/NA	Ground Water	6020A	196268
310-125501-11	MW-22	Total/NA	Ground Water	6020A	196268
310-125501-12	DUP-1	Total/NA	Ground Water	6020A	196268
MB 310-196268/1-A	Method Blank	Total/NA	Water	6020A	196268
LCS 310-196268/2-A	Lab Control Sample	Total/NA	Water	6020A	196268
310-125501-8 DU	MW-15A	Total/NA	Ground Water	6020A	196268
310-125501-8 DU	MW-15A	Total/NA	Ground Water	6020A	196268

General Chemistry

Analysis Batch: 196263

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-125501-1	MW-08	Total/NA	Ground Water	SM 4500 H+ B	
310-125501-2	MW-10	Total/NA	Ground Water	SM 4500 H+ B	
310-125501-3	MW-4A	Total/NA	Ground Water	SM 4500 H+ B	
310-125501-4	MW-5B	Total/NA	Ground Water	SM 4500 H+ B	
310-125501-5	MW-6A	Total/NA	Ground Water	SM 4500 H+ B	
310-125501-6	MW-13	Total/NA	Ground Water	SM 4500 H+ B	
310-125501-7	MW-14A	Total/NA	Ground Water	SM 4500 H+ B	
310-125501-8	MW-15A	Total/NA	Ground Water	SM 4500 H+ B	
310-125501-9	MW-18A	Total/NA	Ground Water	SM 4500 H+ B	
310-125501-10	MW-21	Total/NA	Ground Water	SM 4500 H+ B	
310-125501-11	MW-22	Total/NA	Ground Water	SM 4500 H+ B	
310-125501-12	DUP-1	Total/NA	Ground Water	SM 4500 H+ B	
LCS 310-196263/16	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
310-125501-1 DU	MW-08	Total/NA	Ground Water	SM 4500 H+ B	
310-125501-10 DU	MW-21	Total/NA	Ground Water	SM 4500 H+ B	

Analysis Batch: 196394

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-125501-1	MW-08	Total/NA	Ground Water	SM 2540C	
310-125501-2	MW-10	Total/NA	Ground Water	SM 2540C	
310-125501-3	MW-4A	Total/NA	Ground Water	SM 2540C	
310-125501-4	MW-5B	Total/NA	Ground Water	SM 2540C	
310-125501-5	MW-6A	Total/NA	Ground Water	SM 2540C	
310-125501-6	MW-13	Total/NA	Ground Water	SM 2540C	
310-125501-7	MW-14A	Total/NA	Ground Water	SM 2540C	
310-125501-8	MW-15A	Total/NA	Ground Water	SM 2540C	

TestAmerica Cedar Falls

QC Association Summary

Client: Muscatine Power & Water

TestAmerica Job ID: 310-125501-1

Project/Site: Muscatine Power & Water CCR App. III/IV

General Chemistry (Continued)

Analysis Batch: 196394 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-125501-9	MW-18A	Total/NA	Ground Water	SM 2540C	
310-125501-10	MW-21	Total/NA	Ground Water	SM 2540C	
310-125501-11	MW-22	Total/NA	Ground Water	SM 2540C	
310-125501-12	DUP-1	Total/NA	Ground Water	SM 2540C	
MB 310-196394/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-196394/2	Lab Control Sample	Total/NA	Water	SM 2540C	
310-125501-1 DU	MW-08	Total/NA	Ground Water	SM 2540C	
310-125501-11 DU	MW-22	Total/NA	Ground Water	SM 2540C	

Lab Chronicle

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-1

Client Sample ID: MW-08

Date Collected: 03/06/18 10:15

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-1

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	196721	03/13/18 15:19	SAD	TAL CF
Total/NA	Prep	3010A			196268	03/12/18 10:00	CJT	TAL CF
Total/NA	Analysis	6020A		1	196485	03/12/18 20:18	SAD	TAL CF
Total/NA	Prep	3010A			196268	03/12/18 10:00	CJT	TAL CF
Total/NA	Analysis	6020A		1	196626	03/13/18 15:07	SAD	TAL CF
Total/NA	Prep	7470A			196366	03/12/18 09:49	CJT	TAL CF
Total/NA	Analysis	7470A		1	196546	03/13/18 11:42	CJT	TAL CF
Total/NA	Analysis	SM 2540C		1	196394	03/12/18 11:16	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	196263	03/09/18 16:04	JWG	TAL CF

Client Sample ID: MW-10

Date Collected: 03/05/18 12:00

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-2

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	196721	03/13/18 16:05	SAD	TAL CF
Total/NA	Prep	3010A			196268	03/12/18 10:00	CJT	TAL CF
Total/NA	Analysis	6020A		1	196485	03/12/18 20:21	SAD	TAL CF
Total/NA	Prep	3010A			196268	03/12/18 10:00	CJT	TAL CF
Total/NA	Analysis	6020A		1	196626	03/13/18 15:10	SAD	TAL CF
Total/NA	Prep	7470A			196366	03/12/18 09:49	CJT	TAL CF
Total/NA	Analysis	7470A		1	196546	03/13/18 11:47	CJT	TAL CF
Total/NA	Analysis	SM 2540C		1	196394	03/12/18 11:16	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	196263	03/09/18 16:08	JWG	TAL CF

Client Sample ID: MW-4A

Date Collected: 03/06/18 17:55

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-3

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	196721	03/13/18 16:21	SAD	TAL CF
Total/NA	Prep	3010A			196268	03/12/18 10:00	CJT	TAL CF
Total/NA	Analysis	6020A		1	196485	03/12/18 20:24	SAD	TAL CF
Total/NA	Prep	3010A			196268	03/12/18 10:00	CJT	TAL CF
Total/NA	Analysis	6020A		1	196626	03/13/18 15:13	SAD	TAL CF
Total/NA	Prep	7470A			196366	03/12/18 09:49	CJT	TAL CF
Total/NA	Analysis	7470A		1	196546	03/13/18 11:49	CJT	TAL CF
Total/NA	Analysis	SM 2540C		1	196394	03/12/18 11:16	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	196263	03/09/18 16:11	JWG	TAL CF

TestAmerica Cedar Falls

Lab Chronicle

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-1

Client Sample ID: MW-5B

Date Collected: 03/06/18 15:35

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-4

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	196721	03/13/18 16:36	SAD	TAL CF
Total/NA	Prep	3010A			196268	03/12/18 10:00	CJT	TAL CF
Total/NA	Analysis	6020A		1	196485	03/12/18 20:27	SAD	TAL CF
Total/NA	Prep	3010A			196268	03/12/18 10:00	CJT	TAL CF
Total/NA	Analysis	6020A		1	196626	03/13/18 15:25	SAD	TAL CF
Total/NA	Prep	7470A			196366	03/12/18 09:49	CJT	TAL CF
Total/NA	Analysis	7470A		1	196546	03/13/18 11:50	CJT	TAL CF
Total/NA	Analysis	SM 2540C		1	196394	03/12/18 11:16	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	196263	03/09/18 16:12	JWG	TAL CF

Client Sample ID: MW-6A

Date Collected: 03/06/18 16:35

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-5

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	196721	03/13/18 17:22	SAD	TAL CF
Total/NA	Prep	3010A			196268	03/12/18 10:00	CJT	TAL CF
Total/NA	Analysis	6020A		1	196485	03/12/18 20:30	SAD	TAL CF
Total/NA	Prep	3010A			196268	03/12/18 10:00	CJT	TAL CF
Total/NA	Analysis	6020A		1	196626	03/13/18 15:28	SAD	TAL CF
Total/NA	Prep	7470A			196366	03/12/18 09:49	CJT	TAL CF
Total/NA	Analysis	7470A		1	196546	03/13/18 11:52	CJT	TAL CF
Total/NA	Analysis	SM 2540C		1	196394	03/12/18 11:16	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	196263	03/09/18 16:13	JWG	TAL CF

Client Sample ID: MW-13

Date Collected: 03/06/18 13:50

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-6

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		50	196721	03/13/18 17:38	SAD	TAL CF
Total/NA	Analysis	9056A		5	196721	03/13/18 17:53	SAD	TAL CF
Total/NA	Prep	3010A			196268	03/12/18 10:00	CJT	TAL CF
Total/NA	Analysis	6020A		1	196485	03/12/18 20:33	SAD	TAL CF
Total/NA	Prep	3010A			196268	03/12/18 10:00	CJT	TAL CF
Total/NA	Analysis	6020A		1	196626	03/13/18 15:31	SAD	TAL CF
Total/NA	Prep	3010A			196268	03/12/18 10:00	CJT	TAL CF
Total/NA	Analysis	6020A		20	196626	03/13/18 15:59	SAD	TAL CF
Total/NA	Prep	7470A			196366	03/12/18 09:49	CJT	TAL CF
Total/NA	Analysis	7470A		1	196546	03/13/18 11:53	CJT	TAL CF
Total/NA	Analysis	SM 2540C		1	196394	03/12/18 11:16	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	196263	03/09/18 16:14	JWG	TAL CF

TestAmerica Cedar Falls

Lab Chronicle

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-1

Client Sample ID: MW-14A

Date Collected: 03/07/18 10:10

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-7

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		50	196973	03/14/18 21:38	SAD	TAL CF
Total/NA	Analysis	9056A		5	196973	03/14/18 21:54	SAD	TAL CF
Total/NA	Prep	3010A			196268	03/12/18 10:00	CJT	TAL CF
Total/NA	Analysis	6020A		1	196485	03/12/18 20:36	SAD	TAL CF
Total/NA	Prep	3010A			196268	03/12/18 10:00	CJT	TAL CF
Total/NA	Analysis	6020A		1	196626	03/13/18 15:34	SAD	TAL CF
Total/NA	Prep	3010A			196268	03/12/18 10:00	CJT	TAL CF
Total/NA	Analysis	6020A		10	196626	03/13/18 16:03	SAD	TAL CF
Total/NA	Prep	7470A			196366	03/12/18 09:49	CJT	TAL CF
Total/NA	Analysis	7470A		1	196546	03/13/18 11:55	CJT	TAL CF
Total/NA	Analysis	SM 2540C		1	196394	03/12/18 11:16	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	196263	03/09/18 16:16	JWG	TAL CF

Client Sample ID: MW-15A

Date Collected: 03/07/18 08:50

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-8

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		20	196721	03/13/18 18:39	SAD	TAL CF
Total/NA	Analysis	9056A		5	196721	03/13/18 18:55	SAD	TAL CF
Total/NA	Prep	3010A			196268	03/12/18 10:00	CJT	TAL CF
Total/NA	Analysis	6020A		1	196485	03/12/18 20:39	SAD	TAL CF
Total/NA	Prep	3010A			196268	03/12/18 10:00	CJT	TAL CF
Total/NA	Analysis	6020A		1	196626	03/13/18 15:38	SAD	TAL CF
Total/NA	Prep	3010A			196268	03/12/18 10:00	CJT	TAL CF
Total/NA	Analysis	6020A		10	196626	03/13/18 16:15	SAD	TAL CF
Total/NA	Prep	7470A			196366	03/12/18 09:49	CJT	TAL CF
Total/NA	Analysis	7470A		1	196546	03/13/18 11:56	CJT	TAL CF
Total/NA	Analysis	SM 2540C		1	196394	03/12/18 11:16	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	196263	03/09/18 16:17	JWG	TAL CF

Client Sample ID: MW-18A

Date Collected: 03/07/18 11:30

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-9

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		50	196721	03/13/18 19:10	SAD	TAL CF
Total/NA	Analysis	9056A		5	196721	03/13/18 19:26	SAD	TAL CF
Total/NA	Prep	3010A			196268	03/12/18 10:00	CJT	TAL CF
Total/NA	Analysis	6020A		1	196485	03/12/18 20:55	SAD	TAL CF
Total/NA	Prep	3010A			196268	03/12/18 10:00	CJT	TAL CF
Total/NA	Analysis	6020A		5	196626	03/13/18 15:44	SAD	TAL CF

TestAmerica Cedar Falls

Lab Chronicle

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-1

Client Sample ID: MW-18A

Date Collected: 03/07/18 11:30

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-9

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			196268	03/12/18 10:00	CJT	TAL CF
Total/NA	Analysis	6020A		1	196626	03/13/18 15:47	SAD	TAL CF
Total/NA	Prep	7470A			196366	03/12/18 09:49	CJT	TAL CF
Total/NA	Analysis	7470A		1	196546	03/13/18 11:58	CJT	TAL CF
Total/NA	Analysis	SM 2540C		1	196394	03/12/18 11:16	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	196263	03/09/18 16:18	JWG	TAL CF

Client Sample ID: MW-21

Date Collected: 03/06/18 12:35

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-10

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	196721	03/13/18 19:41	SAD	TAL CF
Total/NA	Prep	3010A			196268	03/12/18 10:00	CJT	TAL CF
Total/NA	Analysis	6020A		1	196485	03/12/18 20:58	SAD	TAL CF
Total/NA	Prep	3010A			196268	03/12/18 10:00	CJT	TAL CF
Total/NA	Analysis	6020A		1	196626	03/13/18 16:21	SAD	TAL CF
Total/NA	Prep	7470A			196366	03/12/18 09:49	CJT	TAL CF
Total/NA	Analysis	7470A		1	196546	03/13/18 11:59	CJT	TAL CF
Total/NA	Analysis	SM 2540C		1	196394	03/12/18 11:16	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	196263	03/09/18 16:24	JWG	TAL CF

Client Sample ID: MW-22

Date Collected: 03/06/18 08:50

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-11

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	196721	03/13/18 20:46	SAD	TAL CF
Total/NA	Prep	3010A			196268	03/12/18 10:00	CJT	TAL CF
Total/NA	Analysis	6020A		1	196485	03/12/18 21:01	SAD	TAL CF
Total/NA	Prep	3010A			196268	03/12/18 10:00	CJT	TAL CF
Total/NA	Analysis	6020A		1	196626	03/13/18 16:24	SAD	TAL CF
Total/NA	Prep	7470A			196366	03/12/18 09:49	CJT	TAL CF
Total/NA	Analysis	7470A		1	196546	03/13/18 12:01	CJT	TAL CF
Total/NA	Analysis	SM 2540C		1	196394	03/12/18 11:16	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	196263	03/09/18 16:27	JWG	TAL CF

TestAmerica Cedar Falls

Lab Chronicle

Client: Muscatine Power & Water

TestAmerica Job ID: 310-125501-1

Project/Site: Muscatine Power & Water CCR App. III/IV

Client Sample ID: DUP-1

Lab Sample ID: 310-125501-12

Date Collected: 03/06/18 10:50

Matrix: Ground Water

Date Received: 03/09/18 09:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	196721	03/13/18 21:01	SAD	TAL CF
Total/NA	Prep	3010A			196268	03/12/18 10:00	CJT	TAL CF
Total/NA	Analysis	6020A		1	196485	03/12/18 21:04	SAD	TAL CF
Total/NA	Prep	3010A			196268	03/12/18 10:00	CJT	TAL CF
Total/NA	Analysis	6020A		1	196626	03/13/18 16:27	SAD	TAL CF
Total/NA	Prep	7470A			196366	03/12/18 09:49	CJT	TAL CF
Total/NA	Analysis	7470A		1	196546	03/13/18 12:06	CJT	TAL CF
Total/NA	Analysis	SM 2540C		1	196394	03/12/18 11:16	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	196263	03/09/18 16:28	JWG	TAL CF

Laboratory References:

TAL CF = TestAmerica Cedar Falls, 704 Enterprise Drive, Cedar Falls, IA 50613, TEL (319)277-2401

Accreditation/Certification Summary

Client: Muscatine Power & Water

TestAmerica Job ID: 310-125501-1

Project/Site: Muscatine Power & Water CCR App. III/IV

Laboratory: TestAmerica Cedar Falls

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
AIHA-LAP, LLC	IHLAP		101044	11-01-18
Georgia	State Program	4	IA100001 (OR)	09-29-18
Illinois	NELAP	5	200024	11-29-18
Iowa	State Program	7	007	12-01-19
Kansas	NELAP	7	E-10341	01-31-19
Minnesota	NELAP	5	019-999-319	12-31-18
Minnesota (Petrofund)	State Program	1	3349	08-22-18
North Dakota	State Program	8	R-186	09-29-18
Oregon	NELAP	10	IA100001	09-29-18

Method Summary

Client: Muscatine Power & Water

TestAmerica Job ID: 310-125501-1

Project/Site: Muscatine Power & Water CCR App. III/IV

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL CF
6020A	Metals (ICP/MS)	SW846	TAL CF
7470A	Mercury (CVAA)	SW846	TAL CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CF
SM 4500 H+ B	pH	SM	TAL CF

Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CF = TestAmerica Cedar Falls, 704 Enterprise Drive, Cedar Falls, IA 50613, TEL (319)277-2401



Cooler/Sample Receipt and Temperature Log Form

Client Information			
Client: <u>Muscataine River</u>			
City/State: <u>Muscataine, IA</u>		Project: <u>CCR</u>	
Receipt Information			
Date/Time Received: <u>3/09/18 9:25</u>		Received By: <u>CB</u>	
Delivery Type: <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input type="checkbox"/> TA Courier <input type="checkbox"/> TA Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
Condition of Cooler/Containers			
Sample(s) received in Cooler?		If yes: Cooler ID:	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Multiple Coolers?		If yes: Cooler # <u>2</u> of <u>2</u>	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Cooler Custody Seals Present?		If yes: Cooler custody seals intact?	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?		If yes: Sample custody seals intact?	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?		If yes: Which VOA samples are in cooler? ↓	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Temperature Record			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID: <u>J</u>		Correction Factor (°C): <u>+0.1</u>	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): <u>1.5</u>		Corrected Temp (°C): <u>1.6</u>	
• Sample Container Temperature			
Container type(s) used:			
Uncorrected Temp (°C):		Corrected Temp (°C):	
Exceptions Noted			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			

Cooler/Sample Receipt and Temperature Log Form

Client Information			
Client: <u>Muscataine Power</u>			
City/State: <u>Muscataine, IA</u>		Project: <u>CCR</u>	
Receipt Information			
Date/Time Received: <u>3/09/18 9:25</u>		Received By: <u>ZB</u>	
Delivery Type: <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input type="checkbox"/> TA Courier <input type="checkbox"/> TA Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
Condition of Cooler/Containers			
Sample(s) received in Cooler?		If yes: Cooler ID:	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Multiple Coolers?		If yes: Cooler # <u>1</u> of <u>2</u>	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Cooler Custody Seals Present?		If yes: Cooler custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Sample Custody Seals Present?		If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Trip Blank Present?		If yes: Which VOA samples are in cooler? ↓	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Temperature Record			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID: <u>J</u>		Correction Factor (°C): <u>+0.1</u>	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): <u>1.3</u>		Corrected Temp (°C): <u>1.4</u>	
• Sample Container Temperature			
Container type(s) used:			
Uncorrected Temp (°C):		Corrected Temp (°C):	
Exceptions Noted			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			

TestAmerica Cedar Falls
704 Enterprise Drive
Cedar Falls, IA 50613
Phone (319) 277-2401 Fax (319) 277-2425

Chain of Custody Record

TestAmerica
1810 WPA DRIVE, CEDAR FALLS, IOWA 50613

Client Information Client Contact: Sam Bennett MP&W and Greg Brennan (HR Green) Company: Muscatine Power & Water Address: 1700 Dick Drake Way City: Muscatine State, Zip: IA, 52761 Phone: 563-262-3583 Email: sbennett@mpw.org and gbrennan@hrgreen.com Project Name: Muscatine Power & Water CCR App. III/IV Site: Iowa		Lab PM: Hayes, Shawn M E-Mail: shawn.hayes@testamericainc.com Carrier Tracking No(s): Job #:		COC No: Page: Job #:	
Due Date Requested: TAT Requested (days): PO #: 181144 WO #:		Analysis Requested Perform MS/MSD (Yes or No) <input checked="" type="checkbox"/> Field Filtered Sample (Yes or No) <input checked="" type="checkbox"/> 9315_Ra226, 9320_Ra228, Combined Ra226 and Ra228 <input checked="" type="checkbox"/> 6020A CCR Metals List, 7470A Mercury <input checked="" type="checkbox"/> 2540C TDS, SM4500, H+ pH <input checked="" type="checkbox"/> 906A Chloride, Fluoride, Sulfate <input checked="" type="checkbox"/>			
Sample Identification MW-08 MW-10 MW-4A MW-5B MW-6A MW-13 MW-14A MW-15A MW-18A MW-21 MW-22		Sample Date 3-6-18 3-5-18 3-6-18 3-6-18 3-6-18 3-7-18 3-7-18 3-7-18 3-6-18 3-6-18		Sample Time 1015 1200 1755 1535 1635 1350 1010 0950 1130 1235 0950	
Matrix (Residue, Suspended, Overhead, BT-Tissue, Acid) GW GW GW GW GW GW GW GW GW GW		Preservation Code: GW GW GW GW GW GW GW GW GW GW		Total Number of Containers X X X X X X X X X X X	
Special Instructions/Note: Cooler 1010 Cooler 1010		Special Instructions/Note: Cooler 1010 Cooler 1010			
Possible Hazard Identification <input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological Deliverable Requested: I, II, III, IV, Other (specify)					
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months					
Special Instructions/QC Requirements:					
Empty Kit Relinquished by: Sam Bennett Relinquished by: Sam Bennett Relinquished by: Relinquished by:		Date: 03-08-18 0730 Date: 03-08-18 0730 Date: 03-08-18 0730 Date: 03-08-18 0730		Method of Shipment: Received by: [Signature] Date/Time: 03/18/18 0925 Company: [Signature] Date/Time: 03/18/18 0925 Company: [Signature] Date/Time: 03/18/18 0925 Company: [Signature]	
Custody Seals Intact: Δ Yes Δ No Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:			

Chain of Custody Record

Client Information Client Contact: Sam Bennett MP&W and Greg Brennan (HR Green) Company: Muscatine Power & Water Address: 1700 Dick Drake Way City: Muscatine State/Zip: IA, 52761 Phone: 563-762-3583 Email: sbennett@mpw.org and gbrennan@hrgreen.com Project Name: Muscatine Power & Water CCR App. III/IV Site: Iowa		Sampler: Sam Bennett Lab PM: E-Mail: shawn.hayes@testamericainc.com Phone: 563-762-3583 E-Mail: shawn.hayes@testamericainc.com		Carrier Tracking No(s): Lab PM: E-Mail: shawn.hayes@testamericainc.com Phone: 563-762-3583 E-Mail: shawn.hayes@testamericainc.com		COC No: Page: Job #					
Due Date Requested: Nov 1 TAT TAT Requested (days): PO #: 181144 WO #: TestAmerica Project #: 31007856		Analysis Requested									
Sample Identification: Dup-1 (col 2 of 2)		Sample Date: 3-6-18		Sample Time: 1050		Sample Type (C=Comp, G=grab): G		Matrix (W=water, S=solid, O=other): GW		Preservation Code:	
MW-10 MW-4A MW-5B MW-6A MW-13 MW-14A MW-15A MW-18A MW-21 MW-22		3-6-18 1050 G GW GW GW GW GW GW GW GW		X X X X X X X X X X		D N N N N N N N N N		9315_Ra226, 9320_Ra228, Combined Ra226 and Ra228 6020A CCR Metals List, 7470A Mercury 2540C TDS, SM4500_H+ pH 9056A Chloride, Fluoride, Sulfate		Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - TB J - DI Water K - EDTA L - EDA Other: M - Hexane N - None O - AsNaO2 P - Na2OAS Q - Na2SO3 R - Na2SO4 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - ph 4.5 Z - other (specify)	
Special Instructions/Note:		Total Number of Containers:									
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months											
Special Instructions/QC Requirements:											
Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:		Received by:			
Relinquished by: Sam Bennett		Date/Time: 3-8-18 0730		Company:		Date/Time: 3/9/18 0925		Company:			
Relinquished by:		Date/Time:		Company:		Date/Time:		Company:			
Relinquished by:		Date/Time:		Company:		Date/Time:		Company:			
Custody Seals Intact:		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:		Cooler Temperature(s) °C and Other Remarks:					

Temperature readings: _____

<u>Client Sample ID</u>	<u>Lab ID</u>	<u>Container Type</u>	<u>Container pH</u>	<u>Preservative Added (mls)</u>	<u>Lot #</u>
MW-08	310-125501-A-1	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-08	310-125501-C-1	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-08	310-125501-D-1	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-10	310-125501-A-2	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-10	310-125501-C-2	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-10	310-125501-D-2	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-4A	310-125501-A-3	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-4A	310-125501-C-3	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-4A	310-125501-D-3	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-5B	310-125501-A-4	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-5B	310-125501-C-4	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-5B	310-125501-D-4	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-6A	310-125501-A-5	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-6A	310-125501-C-5	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-6A	310-125501-D-5	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-13	310-125501-A-6	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-13	310-125501-C-6	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-13	310-125501-D-6	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-14A	310-125501-A-7	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-14A	310-125501-C-7	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-14A	310-125501-D-7	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-15A	310-125501-A-8	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-15A	310-125501-C-8	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-15A	310-125501-D-8	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-18A	310-125501-A-9	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-18A	310-125501-C-9	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-18A	310-125501-D-9	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-21	310-125501-A-10	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-21	310-125501-C-10	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-21	310-125501-D-10	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-22	310-125501-A-11	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-22	310-125501-C-11	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-22	310-125501-D-11	Plastic 1 liter - Nitric Acid	<2	_____	_____
DUP-1	310-125501-A-12	Plastic 250ml - with Nitric Acid	<2	_____	_____
DUP-1	310-125501-C-12	Plastic 1 liter - Nitric Acid	<2	_____	_____
DUP-1	310-125501-D-12	Plastic 1 liter - Nitric Acid	<2	_____	_____

Login Sample Receipt Checklist

Client: Muscatine Power & Water

Job Number: 310-125501-1

Login Number: 125501

List Source: TestAmerica Cedar Falls

List Number: 1

Creator: Homolar, Dana J

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Cedar Falls
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319)277-2401

TestAmerica Job ID: 310-125501-2

Client Project/Site: Muscatine Power & Water CCR App. III/IV

For:

Muscatine Power & Water
1700 Dick Drake Way
PO BOX 899
Muscatine, Iowa 52761

Attn: Sam Bennett



Authorized for release by:
4/4/2018 5:05:17 PM

Shawn Hayes, Senior Project Manager
(319)229-8211
shawn.hayes@testamericainc.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-2

Job ID: 310-125501-2

Laboratory: TestAmerica Cedar Falls

Narrative

Job Narrative
310-125501-2

Comments

No additional comments.

Receipt

The samples were received on 3/9/2018 9:25 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 1.4° C and 1.6° C.

RAD

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Sample Summary

Client: Muscatine Power & Water

TestAmerica Job ID: 310-125501-2

Project/Site: Muscatine Power & Water CCR App. III/IV

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-125501-1	MW-08	Ground Water	03/06/18 10:15	03/09/18 09:25
310-125501-2	MW-10	Ground Water	03/05/18 12:00	03/09/18 09:25
310-125501-3	MW-4A	Ground Water	03/06/18 17:55	03/09/18 09:25
310-125501-4	MW-5B	Ground Water	03/06/18 15:35	03/09/18 09:25
310-125501-5	MW-6A	Ground Water	03/06/18 16:35	03/09/18 09:25
310-125501-6	MW-13	Ground Water	03/06/18 13:50	03/09/18 09:25
310-125501-7	MW-14A	Ground Water	03/07/18 10:10	03/09/18 09:25
310-125501-8	MW-15A	Ground Water	03/07/18 08:50	03/09/18 09:25
310-125501-9	MW-18A	Ground Water	03/07/18 11:30	03/09/18 09:25
310-125501-10	MW-21	Ground Water	03/06/18 12:35	03/09/18 09:25
310-125501-11	MW-22	Ground Water	03/06/18 08:50	03/09/18 09:25
310-125501-12	DUP-1	Ground Water	03/06/18 10:50	03/09/18 09:25

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-2

Client Sample ID: MW-08

Date Collected: 03/06/18 10:15

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-1

Matrix: Ground Water

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0220	U	0.0361	0.0362	1.00	0.0641	pCi/L	03/12/18 11:58	04/04/18 08:38	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.2		40 - 110					03/12/18 11:58	04/04/18 08:38	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.646		0.260	0.267	1.00	0.365	pCi/L	03/12/18 12:27	03/22/18 14:31	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.2		40 - 110					03/12/18 12:27	03/22/18 14:31	1
Y Carrier	91.2		40 - 110					03/12/18 12:27	03/22/18 14:31	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.668		0.262	0.269	5.00	0.365	pCi/L		04/04/18 16:12	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-2

Client Sample ID: MW-10

Date Collected: 03/05/18 12:00

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-2

Matrix: Ground Water

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.188		0.0835	0.0851	1.00	0.0754	pCi/L	03/12/18 11:58	04/04/18 08:38	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.5		40 - 110					03/12/18 11:58	04/04/18 08:38	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0884	U	0.212	0.212	1.00	0.364	pCi/L	03/12/18 12:27	03/22/18 14:31	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.5		40 - 110					03/12/18 12:27	03/22/18 14:31	1
Y Carrier	92.0		40 - 110					03/12/18 12:27	03/22/18 14:31	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.276	U	0.228	0.228	5.00	0.364	pCi/L		04/04/18 16:12	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-2

Client Sample ID: MW-4A

Date Collected: 03/06/18 17:55

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-3

Matrix: Ground Water

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.111		0.0688	0.0695	1.00	0.0904	pCi/L	03/12/18 11:58	04/04/18 08:39	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.3		40 - 110					03/12/18 11:58	04/04/18 08:39	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.339	U	0.230	0.232	1.00	0.357	pCi/L	03/12/18 12:27	03/22/18 14:31	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.3		40 - 110					03/12/18 12:27	03/22/18 14:31	1
Y Carrier	92.0		40 - 110					03/12/18 12:27	03/22/18 14:31	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.450		0.240	0.242	5.00	0.357	pCi/L		04/04/18 16:12	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-2

Client Sample ID: MW-5B

Date Collected: 03/06/18 15:35

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-4

Matrix: Ground Water

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.349		0.104	0.108	1.00	0.0799	pCi/L	03/12/18 11:58	04/04/18 08:39	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.0		40 - 110					03/12/18 11:58	04/04/18 08:39	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.610		0.322	0.327	1.00	0.489	pCi/L	03/12/18 12:27	03/22/18 14:31	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.0		40 - 110					03/12/18 12:27	03/22/18 14:31	1
Y Carrier	88.6		40 - 110					03/12/18 12:27	03/22/18 14:31	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.959		0.338	0.344	5.00	0.489	pCi/L		04/04/18 16:12	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-2

Client Sample ID: MW-6A

Date Collected: 03/06/18 16:35

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-5

Matrix: Ground Water

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.179		0.0776	0.0792	1.00	0.0790	pCi/L	03/12/18 11:58	04/04/18 08:39	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.3		40 - 110					03/12/18 11:58	04/04/18 08:39	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.439		0.260	0.263	1.00	0.398	pCi/L	03/12/18 12:27	03/22/18 14:32	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.3		40 - 110					03/12/18 12:27	03/22/18 14:32	1
Y Carrier	92.0		40 - 110					03/12/18 12:27	03/22/18 14:32	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.618		0.271	0.275	5.00	0.398	pCi/L		04/04/18 16:12	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-2

Client Sample ID: MW-13

Date Collected: 03/06/18 13:50

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-6

Matrix: Ground Water

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.120		0.0695	0.0703	1.00	0.0844	pCi/L	03/12/18 11:58	04/04/18 08:39	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.6		40 - 110					03/12/18 11:58	04/04/18 08:39	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.665		0.271	0.278	1.00	0.383	pCi/L	03/12/18 12:27	03/22/18 14:32	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.6		40 - 110					03/12/18 12:27	03/22/18 14:32	1
Y Carrier	92.3		40 - 110					03/12/18 12:27	03/22/18 14:32	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.785		0.280	0.287	5.00	0.383	pCi/L		04/04/18 16:12	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-2

Client Sample ID: MW-14A

Date Collected: 03/07/18 10:10

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-7

Matrix: Ground Water

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0335	U	0.0435	0.0436	1.00	0.0718	pCi/L	03/12/18 11:58	04/04/18 08:39	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.0		40 - 110					03/12/18 11:58	04/04/18 08:39	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.224	U	0.238	0.239	1.00	0.390	pCi/L	03/12/18 12:27	03/22/18 14:32	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.0		40 - 110					03/12/18 12:27	03/22/18 14:32	1
Y Carrier	92.7		40 - 110					03/12/18 12:27	03/22/18 14:32	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.258	U	0.242	0.243	5.00	0.390	pCi/L		04/04/18 16:12	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-2

Client Sample ID: MW-15A

Date Collected: 03/07/18 08:50

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-8

Matrix: Ground Water

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0518	U	0.0526	0.0528	1.00	0.0814	pCi/L	03/12/18 11:58	04/04/18 08:39	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.6		40 - 110					03/12/18 11:58	04/04/18 08:39	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0715	U	0.193	0.193	1.00	0.335	pCi/L	03/12/18 12:27	03/22/18 14:32	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.6		40 - 110					03/12/18 12:27	03/22/18 14:32	1
Y Carrier	92.3		40 - 110					03/12/18 12:27	03/22/18 14:32	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.123	U	0.200	0.200	5.00	0.335	pCi/L		04/04/18 16:12	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-2

Client Sample ID: MW-18A

Date Collected: 03/07/18 11:30

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-9

Matrix: Ground Water

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0456	U	0.0595	0.0596	1.00	0.0993	pCi/L	03/12/18 11:58	04/04/18 08:39	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.0		40 - 110					03/12/18 11:58	04/04/18 08:39	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.339	U	0.247	0.249	1.00	0.388	pCi/L	03/12/18 12:27	03/22/18 14:33	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.0		40 - 110					03/12/18 12:27	03/22/18 14:33	1
Y Carrier	91.6		40 - 110					03/12/18 12:27	03/22/18 14:33	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.384	U	0.254	0.256	5.00	0.388	pCi/L		04/04/18 16:12	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-2

Client Sample ID: MW-21

Date Collected: 03/06/18 12:35

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-10

Matrix: Ground Water

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0141	U	0.0464	0.0464	1.00	0.0894	pCi/L	03/12/18 11:58	04/04/18 08:40	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	91.4		40 - 110					03/12/18 11:58	04/04/18 08:40	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.344	U	0.229	0.231	1.00	0.353	pCi/L	03/12/18 12:27	03/22/18 14:33	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	91.4		40 - 110					03/12/18 12:27	03/22/18 14:33	1
Y Carrier	92.3		40 - 110					03/12/18 12:27	03/22/18 14:33	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.358		0.234	0.236	5.00	0.353	pCi/L		04/04/18 16:12	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-2

Client Sample ID: MW-22

Date Collected: 03/06/18 08:50

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-11

Matrix: Ground Water

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.122		0.0702	0.0710	1.00	0.0843	pCi/L	03/12/18 11:58	04/04/18 08:40	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.3		40 - 110					03/12/18 11:58	04/04/18 08:40	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.135	U	0.236	0.237	1.00	0.400	pCi/L	03/12/18 12:27	03/22/18 14:33	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.3		40 - 110					03/12/18 12:27	03/22/18 14:33	1
Y Carrier	91.6		40 - 110					03/12/18 12:27	03/22/18 14:33	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.257	U	0.246	0.247	5.00	0.400	pCi/L		04/04/18 16:12	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-2

Client Sample ID: DUP-1

Date Collected: 03/06/18 10:50

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-12

Matrix: Ground Water

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0400	U	0.0452	0.0454	1.00	0.0715	pCi/L	03/12/18 11:58	04/04/18 08:40	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.9		40 - 110					03/12/18 11:58	04/04/18 08:40	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.331	U	0.221	0.223	1.00	0.340	pCi/L	03/12/18 12:27	03/22/18 14:33	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.9		40 - 110					03/12/18 12:27	03/22/18 14:33	1
Y Carrier	91.2		40 - 110					03/12/18 12:27	03/22/18 14:33	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.371		0.226	0.228	5.00	0.340	pCi/L		04/04/18 16:12	1

Definitions/Glossary

Client: Muscatine Power & Water

Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-2

Qualifiers

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

QC Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-2

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-355069/1-A

Matrix: Water

Analysis Batch: 358768

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 355069

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.02004	U	0.0272	0.0273	1.00	0.0768	pCi/L	03/12/18 11:58	04/04/18 08:37	1
Carrier	MB %Yield	MB Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	97.9		40 - 110					03/12/18 11:58	04/04/18 08:37	1

Lab Sample ID: LCS 160-355069/2-A

Matrix: Water

Analysis Batch: 358768

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 355069

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.8	11.24		1.14	1.00	0.0608	pCi/L	95	68 - 137
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	98.8		40 - 110						

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-355073/1-A

Matrix: Water

Analysis Batch: 356986

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 355073

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.3229	U	0.230	0.232	1.00	0.360	pCi/L	03/12/18 12:27	03/22/18 14:30	1
Carrier	MB %Yield	MB Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	97.9		40 - 110					03/12/18 12:27	03/22/18 14:30	1
Y Carrier	89.3		40 - 110					03/12/18 12:27	03/22/18 14:30	1

Lab Sample ID: LCS 160-355073/2-A

Matrix: Water

Analysis Batch: 356986

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 355073

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	8.46	8.547		0.996	1.00	0.345	pCi/L	101	56 - 140
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	98.8		40 - 110						
Y Carrier	90.8		40 - 110						

TestAmerica Cedar Falls

QC Association Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-2

Rad

Prep Batch: 355069

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-125501-1	MW-08	Total/NA	Ground Water	PrecSep-21	
310-125501-2	MW-10	Total/NA	Ground Water	PrecSep-21	
310-125501-3	MW-4A	Total/NA	Ground Water	PrecSep-21	
310-125501-4	MW-5B	Total/NA	Ground Water	PrecSep-21	
310-125501-5	MW-6A	Total/NA	Ground Water	PrecSep-21	
310-125501-6	MW-13	Total/NA	Ground Water	PrecSep-21	
310-125501-7	MW-14A	Total/NA	Ground Water	PrecSep-21	
310-125501-8	MW-15A	Total/NA	Ground Water	PrecSep-21	
310-125501-9	MW-18A	Total/NA	Ground Water	PrecSep-21	
310-125501-10	MW-21	Total/NA	Ground Water	PrecSep-21	
310-125501-11	MW-22	Total/NA	Ground Water	PrecSep-21	
310-125501-12	DUP-1	Total/NA	Ground Water	PrecSep-21	
MB 160-355069/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-355069/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 355073

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-125501-1	MW-08	Total/NA	Ground Water	PrecSep_0	
310-125501-2	MW-10	Total/NA	Ground Water	PrecSep_0	
310-125501-3	MW-4A	Total/NA	Ground Water	PrecSep_0	
310-125501-4	MW-5B	Total/NA	Ground Water	PrecSep_0	
310-125501-5	MW-6A	Total/NA	Ground Water	PrecSep_0	
310-125501-6	MW-13	Total/NA	Ground Water	PrecSep_0	
310-125501-7	MW-14A	Total/NA	Ground Water	PrecSep_0	
310-125501-8	MW-15A	Total/NA	Ground Water	PrecSep_0	
310-125501-9	MW-18A	Total/NA	Ground Water	PrecSep_0	
310-125501-10	MW-21	Total/NA	Ground Water	PrecSep_0	
310-125501-11	MW-22	Total/NA	Ground Water	PrecSep_0	
310-125501-12	DUP-1	Total/NA	Ground Water	PrecSep_0	
MB 160-355073/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-355073/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Lab Chronicle

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-2

Client Sample ID: MW-08

Date Collected: 03/06/18 10:15

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-1

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			355069	03/12/18 11:58	MBC	TAL SL
Total/NA	Analysis	9315		1	358768	04/04/18 08:38	RTM	TAL SL
Total/NA	Prep	PrecSep_0			355073	03/12/18 12:27	MBC	TAL SL
Total/NA	Analysis	9320		1	356986	03/22/18 14:31	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	358991	04/04/18 16:12	RTM	TAL SL

Client Sample ID: MW-10

Date Collected: 03/05/18 12:00

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-2

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			355069	03/12/18 11:58	MBC	TAL SL
Total/NA	Analysis	9315		1	358768	04/04/18 08:38	RTM	TAL SL
Total/NA	Prep	PrecSep_0			355073	03/12/18 12:27	MBC	TAL SL
Total/NA	Analysis	9320		1	356986	03/22/18 14:31	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	358991	04/04/18 16:12	RTM	TAL SL

Client Sample ID: MW-4A

Date Collected: 03/06/18 17:55

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-3

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			355069	03/12/18 11:58	MBC	TAL SL
Total/NA	Analysis	9315		1	358768	04/04/18 08:39	RTM	TAL SL
Total/NA	Prep	PrecSep_0			355073	03/12/18 12:27	MBC	TAL SL
Total/NA	Analysis	9320		1	356986	03/22/18 14:31	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	358991	04/04/18 16:12	RTM	TAL SL

Client Sample ID: MW-5B

Date Collected: 03/06/18 15:35

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-4

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			355069	03/12/18 11:58	MBC	TAL SL
Total/NA	Analysis	9315		1	358768	04/04/18 08:39	RTM	TAL SL
Total/NA	Prep	PrecSep_0			355073	03/12/18 12:27	MBC	TAL SL
Total/NA	Analysis	9320		1	356986	03/22/18 14:31	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	358991	04/04/18 16:12	RTM	TAL SL

TestAmerica Cedar Falls

Lab Chronicle

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-2

Client Sample ID: MW-6A

Date Collected: 03/06/18 16:35

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-5

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			355069	03/12/18 11:58	MBC	TAL SL
Total/NA	Analysis	9315		1	358768	04/04/18 08:39	RTM	TAL SL
Total/NA	Prep	PrecSep_0			355073	03/12/18 12:27	MBC	TAL SL
Total/NA	Analysis	9320		1	356986	03/22/18 14:32	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	358991	04/04/18 16:12	RTM	TAL SL

Client Sample ID: MW-13

Date Collected: 03/06/18 13:50

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-6

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			355069	03/12/18 11:58	MBC	TAL SL
Total/NA	Analysis	9315		1	358768	04/04/18 08:39	RTM	TAL SL
Total/NA	Prep	PrecSep_0			355073	03/12/18 12:27	MBC	TAL SL
Total/NA	Analysis	9320		1	356986	03/22/18 14:32	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	358991	04/04/18 16:12	RTM	TAL SL

Client Sample ID: MW-14A

Date Collected: 03/07/18 10:10

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-7

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			355069	03/12/18 11:58	MBC	TAL SL
Total/NA	Analysis	9315		1	358768	04/04/18 08:39	RTM	TAL SL
Total/NA	Prep	PrecSep_0			355073	03/12/18 12:27	MBC	TAL SL
Total/NA	Analysis	9320		1	356986	03/22/18 14:32	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	358991	04/04/18 16:12	RTM	TAL SL

Client Sample ID: MW-15A

Date Collected: 03/07/18 08:50

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-8

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			355069	03/12/18 11:58	MBC	TAL SL
Total/NA	Analysis	9315		1	358768	04/04/18 08:39	RTM	TAL SL
Total/NA	Prep	PrecSep_0			355073	03/12/18 12:27	MBC	TAL SL
Total/NA	Analysis	9320		1	356986	03/22/18 14:32	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	358991	04/04/18 16:12	RTM	TAL SL

TestAmerica Cedar Falls

Lab Chronicle

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-2

Client Sample ID: MW-18A

Date Collected: 03/07/18 11:30

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-9

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			355069	03/12/18 11:58	MBC	TAL SL
Total/NA	Analysis	9315		1	358768	04/04/18 08:39	RTM	TAL SL
Total/NA	Prep	PrecSep_0			355073	03/12/18 12:27	MBC	TAL SL
Total/NA	Analysis	9320		1	356986	03/22/18 14:33	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	358991	04/04/18 16:12	RTM	TAL SL

Client Sample ID: MW-21

Date Collected: 03/06/18 12:35

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-10

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			355069	03/12/18 11:58	MBC	TAL SL
Total/NA	Analysis	9315		1	358768	04/04/18 08:40	RTM	TAL SL
Total/NA	Prep	PrecSep_0			355073	03/12/18 12:27	MBC	TAL SL
Total/NA	Analysis	9320		1	356986	03/22/18 14:33	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	358991	04/04/18 16:12	RTM	TAL SL

Client Sample ID: MW-22

Date Collected: 03/06/18 08:50

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-11

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			355069	03/12/18 11:58	MBC	TAL SL
Total/NA	Analysis	9315		1	358768	04/04/18 08:40	RTM	TAL SL
Total/NA	Prep	PrecSep_0			355073	03/12/18 12:27	MBC	TAL SL
Total/NA	Analysis	9320		1	356986	03/22/18 14:33	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	358991	04/04/18 16:12	RTM	TAL SL

Client Sample ID: DUP-1

Date Collected: 03/06/18 10:50

Date Received: 03/09/18 09:25

Lab Sample ID: 310-125501-12

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			355069	03/12/18 11:58	MBC	TAL SL
Total/NA	Analysis	9315		1	358768	04/04/18 08:40	RTM	TAL SL
Total/NA	Prep	PrecSep_0			355073	03/12/18 12:27	MBC	TAL SL
Total/NA	Analysis	9320		1	356986	03/22/18 14:33	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	358991	04/04/18 16:12	RTM	TAL SL

Laboratory References:

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

TestAmerica Cedar Falls

Accreditation/Certification Summary

Client: Muscatine Power & Water

TestAmerica Job ID: 310-125501-2

Project/Site: Muscatine Power & Water CCR App. III/IV

Laboratory: TestAmerica Cedar Falls

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
AIHA-LAP, LLC	IHLAP		101044	11-01-18
Georgia	State Program	4	IA100001 (OR)	09-29-18
Illinois	NELAP	5	200024	11-29-18
Iowa	State Program	7	007	12-01-19
Kansas	NELAP	7	E-10341	01-31-19
Minnesota	NELAP	5	019-999-319	12-31-18
Minnesota (Petrofund)	State Program	1	3349	08-22-18
North Dakota	State Program	8	R-186	09-29-18
Oregon	NELAP	10	IA100001	09-29-18

Laboratory: TestAmerica St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska	State Program	10	MO00054	06-30-18
Arizona	State Program	9	AZ0813	12-08-18
California	State Program	9	2886	03-31-18 *
Connecticut	State Program	1	PH-0241	03-31-19
Florida	NELAP	4	E87689	06-30-18
Illinois	NELAP	5	200023	11-30-18
Iowa	State Program	7	373	12-01-18
Kansas	NELAP	7	E-10236	10-31-18
Kentucky (DW)	State Program	4	90125	12-31-18
L-A-B	DoD ELAP		L2305	04-06-19
Louisiana	NELAP	6	04080	06-30-18
Louisiana (DW)	NELAP	6	LA180017	12-31-18
Maryland	State Program	3	310	09-30-18
Missouri	State Program	7	780	06-30-18
Nevada	State Program	9	MO000542018-1	07-31-18
New Jersey	NELAP	2	MO002	06-30-18 *
New York	NELAP	2	11616	03-31-19
North Dakota	State Program	8	R207	06-30-18
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-18
Pennsylvania	NELAP	3	68-00540	02-28-19
South Carolina	State Program	4	85002001	06-30-18
Texas	NELAP	6	T104704193-17-11	07-31-18
US Fish & Wildlife	Federal		058448	08-31-18
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542016-8	07-31-18
Virginia	NELAP	3	460230	06-14-18
Washington	State Program	10	C592	08-30-18
West Virginia DEP	State Program	3	381	08-31-18 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica Cedar Falls

Method Summary

Client: Muscatine Power & Water

TestAmerica Job ID: 310-125501-2

Project/Site: Muscatine Power & Water CCR App. III/IV

Method	Method Description	Protocol	Laboratory
9315	Radium-226 (GFPC)	SW846	TAL SL
9320	Radium-228 (GFPC)	SW846	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566



Cooler/Sample Receipt and Temperature Log Form

Client Information			
Client: <u>Muscataine River</u>			
City/State: <u>Muscataine, IA</u>		Project: <u>CCR</u>	
Receipt Information			
Date/Time Received: <u>3/09/18 9:25</u>		Received By: <u>CB</u>	
Delivery Type: <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input type="checkbox"/> TA Courier <input type="checkbox"/> TA Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
Condition of Cooler/Containers			
Sample(s) received in Cooler?		If yes: Cooler ID:	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Multiple Coolers?		If yes: Cooler # <u>2</u> of <u>2</u>	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Cooler Custody Seals Present?		If yes: Cooler custody seals intact?	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?		If yes: Sample custody seals intact?	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?		If yes: Which VOA samples are in cooler?	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		↓	
Temperature Record			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID: <u>J</u>		Correction Factor (°C): <u>+0.1</u>	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): <u>1.5</u>		Corrected Temp (°C): <u>1.6</u>	
• Sample Container Temperature			
Container type(s) used:			
Uncorrected Temp (°C):		Corrected Temp (°C):	
Exceptions Noted			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			

Cooler/Sample Receipt and Temperature Log Form

Client Information			
Client: <u>Muscataine Power</u>			
City/State: <u>Muscataine, IA</u>		Project: <u>CCR</u>	
Receipt Information			
Date/Time Received: <u>3/09/18 9:25</u>		Received By: <u>ZB</u>	
Delivery Type: <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input type="checkbox"/> TA Courier <input type="checkbox"/> TA Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
Condition of Cooler/Containers			
Sample(s) received in Cooler?		If yes: Cooler ID:	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Multiple Coolers?		If yes: Cooler # <u>1</u> of <u>2</u>	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Cooler Custody Seals Present?		If yes: Cooler custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Sample Custody Seals Present?		If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Trip Blank Present?		If yes: Which VOA samples are in cooler? ↓	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Temperature Record			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID: <u>J</u>		Correction Factor (°C): <u>+0.1</u>	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): <u>1.3</u>		Corrected Temp (°C): <u>1.4</u>	
• Sample Container Temperature			
Container type(s) used:			
Uncorrected Temp (°C):		Corrected Temp (°C):	
Exceptions Noted			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			

TestAmerica Cedar Falls
704 Enterprise Drive
Cedar Falls, IA 50613
Phone (319) 277-2401 Fax (319) 277-2425

Chain of Custody Record

TestAmerica
1810 WPA DRIVE, CEDAR FALLS, IOWA 50613

Client Information Client Contact: Sam Bennett MP&W and Greg Brennan (HR Green) Company: Muscatine Power & Water Address: 1700 Dick Drake Way City: Muscatine State, Zip: IA, 52761 Phone: 563-262-3583 Email: sbennett@mpw.org and gbrennan@hrgreen.com Project Name: Muscatine Power & Water CCR App. III/IV Site: Iowa		Lab PM: Hayes, Shawn M E-Mail: shawn.hayes@testamericainc.com Phone: 563-262-3583 Due Date Requested: TAT Requested (days): PO #: 181144 WO #: 31007856 TestAmerica Project #: 31007856		Carrier Tracking No(s): Job #:		COC No: Page: Job #:	
Analysis Requested Perform MS/MSD (Yes or No) <input checked="" type="checkbox"/> Field Filtered Sample (Yes or No) <input checked="" type="checkbox"/> 9315_Ra226, 9320_Ra228, Combined Ra226 and Ra228 <input checked="" type="checkbox"/> 6020A_CCR Metals List, 7470A_Mercury <input checked="" type="checkbox"/> 2540C_TDS, SM4500_H+ pH <input checked="" type="checkbox"/> 9065A_Chloride, Fluoride, Sulfate <input checked="" type="checkbox"/>		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 Other: M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2SO3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)		Total Number of containers:		Special Instructions/Note:	
Sample Identification	Sample Date	Sample Time	Sample Type (G=grab, G=grab)	Matrix (Residue, Suspended, Overhead)	Preservation Code		
MW-08	3-6-18	1015	G	GW	N		
MW-10	3-5-18	1200	G	GW	X		
MW-4A	3-6-18	1755	G	GW	X		
MW-5B	3-6-18	1535	G	GW	X		
MW-6A	3-6-18	1635	G	GW	X		
MW-13	3-6-18	1350	G	GW	X		
MW-14A	3-7-18	1010	G	GW	X		
MW-15A	3-7-18	0950	G	GW	X		
MW-18A	3-7-18	1130	G	GW	X		
MW-21	3-6-18	1235	G	GW	X		
MW-22	3-6-18	0950	G	GW	X		
Possible Hazard Identification <input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological Deliverable Requested: I, II, III, IV, Other (specify)							
Special Instructions/QC Requirements: <input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months							
Empty Kit Relinquished by:		Date:		Method of Shipment:		Date/Time:	
Relinquished by: Sam Bennett		Date/Time: 03-08-18 0730		Relinquished by:		Date/Time:	
Relinquished by:		Date/Time:		Relinquished by:		Date/Time:	
Relinquished by:		Date/Time:		Relinquished by:		Date/Time:	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:		Company:	

Chain of Custody Record



Client Information					
Sample: Sam Bennett - Mole/Horseshoe Hayes, Shawn M		Lab PM:		Carrier Tracking No(s)	
Phone: 563-762-3583		E-Mail: shawn.hayes@testaminc.com			
Company: Muscatine Power & Water					
Address: 1700 Dick Drake Way					
City: Muscatine					
State: IA, Zip: 52761					
Phone: 563-762-3583					
Email: sam.bennett@mpw.org and gbrennan@hrgreen.com					
Project Name: Muscatine Power & Water CCR App. III/IV					
Site: Iowa					
Due Date Requested: Nov 1 TAT					
TAT Requested (days):					
PO #: 181144					
WO #:					
TestAmerica Project #: 31007856					
Sample Identification					
MW-10		Dup-1 cooler 2 of 2		Matrix (W=water, S=solid, O=oils/sludges, A=air)	
MW-4A				Preservation Code:	
MW-5B				Sample Type (C=comp, G=grab)	
MW-6A				Sample Time	
MW-13				Sample Date	
MW-14A				Field Filtered Sample (Yes or No)	
MW-15A				Perform MS/MSD (Yes or No)	
MW-18A				9315_Ra226, 9320_Ra228, Combined Ra226 and Ra228	
MW-21				6020A CCR Metals List, 7470A Mercury	
MW-22				2540C TDS, 5M4600_H+ pH	
				9056A Chloride, Fluoride, Sulfate	
				Total Number of containers	
				Special Instructions/Note:	
Possible Hazard Identification <input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological					
Deliverable Requested: I, II, III, IV, Other (specify)					
Empty Kit Relinquished by: Sam Bennett					
Relinquished by: Date/Time: 3-8-18 0730 Company: HCE					
Relinquished by: Date/Time: Company:					
Relinquished by: Date/Time: Company:					
Custody Seal No.: A Yes A No					

Temperature readings: _____

<u>Client Sample ID</u>	<u>Lab ID</u>	<u>Container Type</u>	<u>Container pH</u>	<u>Preservative Added (mls)</u>	<u>Lot #</u>
MW-08	310-125501-A-1	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-08	310-125501-C-1	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-08	310-125501-D-1	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-10	310-125501-A-2	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-10	310-125501-C-2	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-10	310-125501-D-2	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-4A	310-125501-A-3	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-4A	310-125501-C-3	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-4A	310-125501-D-3	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-5B	310-125501-A-4	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-5B	310-125501-C-4	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-5B	310-125501-D-4	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-6A	310-125501-A-5	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-6A	310-125501-C-5	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-6A	310-125501-D-5	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-13	310-125501-A-6	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-13	310-125501-C-6	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-13	310-125501-D-6	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-14A	310-125501-A-7	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-14A	310-125501-C-7	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-14A	310-125501-D-7	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-15A	310-125501-A-8	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-15A	310-125501-C-8	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-15A	310-125501-D-8	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-18A	310-125501-A-9	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-18A	310-125501-C-9	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-18A	310-125501-D-9	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-21	310-125501-A-10	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-21	310-125501-C-10	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-21	310-125501-D-10	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-22	310-125501-A-11	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-22	310-125501-C-11	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-22	310-125501-D-11	Plastic 1 liter - Nitric Acid	<2	_____	_____
DUP-1	310-125501-A-12	Plastic 250ml - with Nitric Acid	<2	_____	_____
DUP-1	310-125501-C-12	Plastic 1 liter - Nitric Acid	<2	_____	_____
DUP-1	310-125501-D-12	Plastic 1 liter - Nitric Acid	<2	_____	_____

Login Sample Receipt Checklist

Client: Muscatine Power & Water

Job Number: 310-125501-2

Login Number: 125501

List Source: TestAmerica Cedar Falls

List Number: 1

Creator: Homolar, Dana J

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Muscatine Power & Water

Job Number: 310-125501-2

Login Number: 125501

List Number: 2

Creator: Clarke, Jill C

List Source: TestAmerica St. Louis

List Creation: 03/10/18 12:28 PM

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	20.0, 20.0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Tracer/Carrier Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-2

Method: 9315 - Radium-226 (GFPC)

Matrix: Ground Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	
310-125501-1	MW-08	93.2	
310-125501-2	MW-10	93.5	
310-125501-3	MW-4A	95.3	
310-125501-4	MW-5B	92.0	
310-125501-5	MW-6A	95.3	
310-125501-6	MW-13	90.6	
310-125501-7	MW-14A	95.0	
310-125501-8	MW-15A	95.6	
310-125501-9	MW-18A	92.0	
310-125501-10	MW-21	91.4	
310-125501-11	MW-22	87.3	
310-125501-12	DUP-1	92.9	

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Method: 9315 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	
LCS 160-355069/2-A	Lab Control Sample	98.8	
MB 160-355069/1-A	Method Blank	97.9	

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Method: 9320 - Radium-228 (GFPC)

Matrix: Ground Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	Y Carrier (40-110)
310-125501-1	MW-08	93.2	91.2
310-125501-2	MW-10	93.5	92.0
310-125501-3	MW-4A	95.3	92.0
310-125501-4	MW-5B	92.0	88.6
310-125501-5	MW-6A	95.3	92.0
310-125501-6	MW-13	90.6	92.3
310-125501-7	MW-14A	95.0	92.7
310-125501-8	MW-15A	95.6	92.3
310-125501-9	MW-18A	92.0	91.6
310-125501-10	MW-21	91.4	92.3
310-125501-11	MW-22	87.3	91.6
310-125501-12	DUP-1	92.9	91.2

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Y Carrier = Y Carrier

TestAmerica Cedar Falls

Tracer/Carrier Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR App. III/IV

TestAmerica Job ID: 310-125501-2

Method: 9320 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	Y Carrier (40-110)
LCS 160-355073/2-A	Lab Control Sample	98.8	90.8
MB 160-355073/1-A	Method Blank	97.9	89.3

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Y Carrier = Y Carrier

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water	Permit No. 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-4A	
Upgradient	Downgradient ^X
Name of person sampling Neil Hoskins	

A. MONITORING WELL/PIEZOMETER CONDITIONS	
Well/Piezometer Properly Capped? (please check)	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
If no, explain	
Standing Water or Litter? (please check)	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
If yes, explain	

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)			
Elevation:			
Top of inner well casing 713.45	Ground Elevation 711.18		
Depth of Well 24.55	Inside Casing Diameter (in inches) 2"		
Equipment Used Slope Indicator Co. Water level indicator Model 51453			
Groundwater Level (± 0.01 foot below top of inner casing, MSL):			
	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	3/6/18 17:00	5.11	708.34
*After Purging	3/6/18 17:55	5.7	707.75
*Before Purging			

*C. WELL PURGING	
Quantity of Water Removed from Well (gallons) 1.19	
No. of Well Volumes (based on current water level) 0.37	
Was well pumped/bailed dry? No	
Equipment used:	
Bailer type	Dedicated Bailer?
Pump type Peristaltic	Dedicated Pump? Yes
If not dedicated, method of cleaning	

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.
 Questions? Call or Email: Nina Koger Environmental Engineer Sr., 515-725-8309, nina.koger@dnr.iowa.gov

D. FIELD MEASUREMENT*Weather Conditions** Overcast, 33.8oF, WNW wind @ 8-10mph, 29.81" rising**Field Measurements (after stabilization):****Temperature** 6.36**Units** C**Equipment Used** Horiba U-50**pH** 7.36**Equipment Used** Horiba U-50**Specific Conductance** 0.890**Units** mS/m**Equipment Used** Horiba U-50**Comments****CERTIFICATION**

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature**Date****Telephone** 563-262-3582**Fax****Email** neil.hoskins@mpw.org**NOTE:** Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water	Permit No. 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-5B	
Upgradient	Downgradient ^X
Name of person sampling Neil Hoskins	

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check)	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
If no, explain	
Standing Water or Litter? (please check)	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
If yes, explain	

B. GROUNDWATER ELEVATION MEASUREMENT (\pm 0.01 foot, MSL)

Elevation:

Top of inner well casing 709.10	Ground Elevation 706.73
Depth of Well 25.30	Inside Casing Diameter (in inches) 2"
Equipment Used Slope Indicator Co. Water level indicator Model 51453	
Groundwater Level (\pm 0.01 foot below top of inner casing, MSL):	
	Date/Time Depth to Groundwater Groundwater Elevation
Before Purging	3/6/18 14:30 2.5 706.6
*After Purging	3/6/18 15:35 3.45 705.65
*Before Purging	

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 1.72	
No. of Well Volumes (based on current water level) 0.46	
Was well pumped/bailed dry? No	
Equipment used:	
Bailer type	Dedicated Bailer?
Pump type Peristaltic	Dedicated Pump? Yes
If not dedicated, method of cleaning	

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Questions? Call or Email: Nina Koger Environmental Engineer Sr., 515-725-8309, nina.koger@dnr.iowa.gov

D. FIELD MEASUREMENT*Weather Conditions** Light snow, 33.8oF, WNW 8-10mph wind , 29.74" rising**Field Measurements (after stabilization):****Temperature** 7.08**Units** °C**Equipment Used** Horiba U-50**pH** 7.23**Equipment Used** Horiba U-50**Specific Conductance** 1.09**Units** mS/m**Equipment Used** Horiba U-50**Comments****CERTIFICATION**

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature**Date****Telephone** 563-262-3582**Fax****Email** neil.hoskins@mpw.org**NOTE:** Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water	Permit No. 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-6A	
Upgradient	Downgradient ^X
Name of person sampling Neil Hoskins	

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check)	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
If no, explain	
Standing Water or Litter? (please check)	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
If yes, explain	

B. GROUNDWATER ELEVATION MEASUREMENT (\pm 0.01 foot, MSL)

Elevation:

Top of inner well casing 708.92	Ground Elevation 706.49		
Depth of Well 25.35	Inside Casing Diameter (in inches) 2"		
Equipment Used Slope Indicator Co. Water level indicator Model 51453			
Groundwater Level (\pm 0.01 foot below top of inner casing, MSL):			
	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	3/6/18 16:10	3.02	705.9
*After Purging	3/6/18 16:35	3.31	705.61
*Before Purging			

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 0.66	
No. of Well Volumes (based on current water level) 0.18	
Was well pumped/bailed dry? No	
Equipment used:	
Bailer type	Dedicated Bailer?
Pump type Peristaltic	Dedicated Pump? Yes
If not dedicated, method of cleaning	

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.
Questions? Call or Email: Nina Koger Environmental Engineer Sr., 515-725-8309, nina.koger@dnr.iowa.gov

D. FIELD MEASUREMENT*Weather Conditions** Light snow, 33.8oF, NW 10mpw , 29.76" rising**Field Measurements (after stabilization):****Temperature** 7.40**Units** C**Equipment Used** Horiba U-50**pH** 7.40**Equipment Used** Horiba U-50**Specific Conductance** 0.616**Units** mS/m**Equipment Used** Horiba U-50**Comments****CERTIFICATION**

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature**Date****Telephone** 563-262-3583**Fax****Email** sbennett@mpw.org**NOTE:** Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.
Questions? Call or Email: Nina Koger Environmental Engineer Sr., 515-725-8309, nina.koger@dnr.iowa.gov

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water	Permit No. 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-08	
Upgradient ^X	Downgradient
Name of person sampling Neil Hoskins	

A. MONITORING WELL/PIEZOMETER CONDITIONS	
Well/Piezometer Properly Capped? (please check)	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
If no, explain	
Standing Water or Litter? (please check)	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
If yes, explain	

B. GROUNDWATER ELEVATION MEASUREMENT (\pm 0.01 foot, MSL)			
Elevation:			
Top of inner well casing 747.36	Ground Elevation 744.37		
Depth of Well 42.95	Inside Casing Diameter (in inches) 2"		
Equipment Used Slope Indicator Co. Water level indicator Model 51453			
Groundwater Level (\pm 0.01 foot below top of inner casing, MSL):			
	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	3/6/18 09:45	14.51	732.85
*After Purging	3/6/18 10:15	17.42	729.94
*Before Purging			

*C. WELL PURGING	
Quantity of Water Removed from Well (gallons) 0.79	
No. of Well Volumes (based on current water level) 0.17	
Was well pumped/bailed dry? No	
Equipment used:	
Bailer type	Dedicated Bailer?
Pump type Peristaltic	Dedicated Pump? Yes
If not dedicated, method of cleaning	

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Questions? Call or Email: Nina Koger Environmental Engineer Sr., 515-725-8309, nina.koger@dnr.iowa.gov

D. FIELD MEASUREMENT*Weather Conditions** Partly Cloudy, 33.8oF, W wind @ 8-12mph, 29.65" steady**Field Measurements (after stabilization):****Temperature** 7.13 **Units** C**Equipment Used** Horiba U-50**pH** 7.30**Equipment Used** Horiba U-50**Specific Conductance** 0.714 **Units** mS/m**Equipment Used** Horiba U-50**Comments****CERTIFICATION**

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature**Date**

4/11/18

Telephone 563-262-3583**Fax****Email** sbennett@mpw.org**NOTE:** Attach Laboratory Report and 8 1/2" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.
Questions? Call or Email: Nina Koger Environmental Engineer Sr., 515-725-8309, nina.koger@dnr.iowa.gov

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water	Permit No. 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-10	
Upgradient ^X	Downgradient
Name of person sampling Neil Hoskins	

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check)	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
If no, explain	
Standing Water or Litter? (please check)	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
If yes, explain	

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)

Elevation:

Top of inner well casing 718.51	Ground Elevation 716.32
Depth of Well 20.32	Inside Casing Diameter (in inches) 2"
Equipment Used Slope Indicator Co. Water level indicator Model 51453	

Groundwater Level (± 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	3/5/18 11:15	3.11	715.4
*After Purging	3/5/18 12:00	3.09	715.42
*Before Purging			

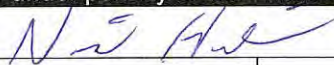
*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 1.16	
No. of Well Volumes (based on current water level) 0.41	
Was well pumped/bailed dry? No	
Equipment used:	
Bailer type	Dedicated Bailer?
Pump type Peristaltic	Dedicated Pump? Yes
If not dedicated, method of cleaning	

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.
Questions? Call or Email: Nina Koger Environmental Engineer Sr., 515-725-8309, nina.koger@dnr.iowa.gov

D. FIELD MEASUREMENT*Weather Conditions** Cloudy, 37.4oF, ESE wind @ 17-20mph, 29.76" falling**Field Measurements (after stabilization):****Temperature** 7.88**Units** C**Equipment Used** Horiba U-50**pH** 7.04**Equipment Used** Horiba U-50**Specific Conductance** 0.708**Units** mS/m**Equipment Used** Horiba U-50**Comments****CERTIFICATION**

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature**Date**

4/11/18

Telephone

563-262-3583

Fax**Email**

neil.hoskins@mpw.org

NOTE: Attach Laboratory Report and 8 1/2" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.
Questions? Call or Email: Nina Koger Environmental Engineer Sr., 515-725-8309, nina.koger@dnr.iowa.gov

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water	Permit No. 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-13	
Upgradient	Downgradient ^X
Name of person sampling Neil Hoskins	

A. MONITORING WELL/PIEZOMETER CONDITIONS	
Well/Piezometer Properly Capped? (please check)	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
If no, explain	
Standing Water or Litter? (please check)	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
If yes, explain	

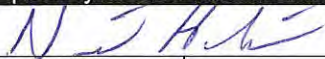
B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)			
Elevation:			
Top of inner well casing 717.63	Ground Elevation 715.44		
Depth of Well 20.00	Inside Casing Diameter (in inches) 2"		
Equipment Used Slope Indicator Co. Water level indicator Model 51453			
Groundwater Level (± 0.01 foot below top of inner casing, MSL):			
	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	3/6/18 13:20	6.27	711.36
*After Purging	3/6/18 13:50	6.90	710.73
*Before Purging			

*C. WELL PURGING	
Quantity of Water Removed from Well (gallons) 0.79	
No. of Well Volumes (based on current water level) 0.35	
Was well pumped/bailed dry? No	
Equipment used:	
Bailer type	Dedicated Bailer?
Pump type Peristaltic	Dedicated Pump? Yes
If not dedicated, method of cleaning	

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.
 Questions? Call or Email: Nina Koger Environmental Engineer Sr., 515-725-8309, nina.koger@dnr.iowa.gov

D. FIELD MEASUREMENT*Weather Conditions** Light snow, 33.8oF, W wind @ 4-6 mph, 29.69" rising**Field Measurements (after stabilization):****Temperature** 7.72**Units** C**Equipment Used** Horiba U-50**pH** 7.29**Equipment Used** Horiba U-50**Specific Conductance** 1.31**Units** mS/m**Equipment Used** Horiba U-50**Comments****CERTIFICATION**

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature**Date**

4/11/18

Telephone 563-262-3583**Fax****Email** sbennett@mpw.org**NOTE:** Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water	Permit No. 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-14A	
Upgradient	Downgradient ^X
Name of person sampling Neil Hoskins	

A. MONITORING WELL/PIEZOMETER CONDITIONS	
Well/Piezometer Properly Capped? (please check)	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
If no, explain	
Standing Water or Litter? (please check)	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
If yes, explain	

B. GROUNDWATER ELEVATION MEASUREMENT (\pm 0.01 foot, MSL)			
Elevation:			
Top of inner well casing 729.00	Ground Elevation 726.19		
Depth of Well 20.50	Inside Casing Diameter (in inches) 2"		
Equipment Used Slope Indicator Co. Water level indicator Model 51453			
Groundwater Level (\pm 0.01 foot below top of inner casing, MSL):			
	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	3/7/18 09:40	15.71	713.29
*After Purging	3/7/18 10:10	17.07	711.93
*Before Purging			

*C. WELL PURGING	
Quantity of Water Removed from Well (gallons) 0.79	
No. of Well Volumes (based on current water level) 1.01	
Was well pumped/bailed dry? No	
Equipment used:	
Bailer type	Dedicated Bailer?
Pump type Peristaltic	Dedicated Pump? Yes
If not dedicated, method of cleaning	

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.
 Questions? Call or Email: Nina Koger Environmental Engineer Sr., 515-725-8309, nina.koger@dnr.iowa.gov

D. FIELD MEASUREMENT*Weather Conditions** Partly Cloudy, 32.0oF, W wind @ 15-18 mph, 30.08" steady**Field Measurements (after stabilization):****Temperature** 8.74**Units** C**Equipment Used** Horiba U-50**pH** 7.35**Equipment Used** Horiba U-50**Specific Conductance** 2.18**Units** mS/m**Equipment Used** Horiba U-50**Comments****CERTIFICATION**

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature**Date****Telephone** 563-262-3582**Fax****Email** neil.hoskins@mpw.org**NOTE:** Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water	Permit No. 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-15A	
Upgradient	Downgradient ^X
Name of person sampling Neil Hoskins	

A. MONITORING WELL/PIEZOMETER CONDITIONS	
Well/Piezometer Properly Capped? (please check)	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
If no, explain	
Standing Water or Litter? (please check)	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
If yes, explain	

B. GROUNDWATER ELEVATION MEASUREMENT (\pm 0.01 foot, MSL)			
Elevation:			
Top of inner well casing ^{729.99}	Ground Elevation ^{727.12}		
Depth of Well ^{20.50}	Inside Casing Diameter (in inches) ^{2"}		
Equipment Used Slope Indicator Co. Water level indicator Model 51453			
Groundwater Level (\pm 0.01 foot below top of inner casing, MSL):			
	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	3/7/18 08:40	13.7	716.22
*After Purging	3/7/18 09:50	17.27	712.72
*Before Purging			

*C. WELL PURGING	
Quantity of Water Removed from Well (gallons) ^{1.85}	
No. of Well Volumes (based on current water level) ^{1.68}	
Was well pumped/bailed dry? ^{No}	
Equipment used:	
Bailer type	Dedicated Bailer?
Pump type ^{Peristaltic}	Dedicated Pump? ^{Yes}
If not dedicated, method of cleaning	

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Questions? Call or Email: Nina Koger Environmental Engineer Sr., 515-725-8309, nina.koger@dnr.iowa.gov

D. FIELD MEASUREMENT*Weather Conditions** Mostly Cloudy, 28.4oF, NW wind @ 15mph, 30.09" steady**Field Measurements (after stabilization):****Temperature** 6.92**Units** C**Equipment Used** Horiba U-50**pH** 7.24**Equipment Used** Horiba U-50**Specific Conductance** 1.83**Units** mS/m**Equipment Used** Horiba U-50**Comments****CERTIFICATION**

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature**Date****Telephone** 563-262-3582**Fax****Email** neil.hoskins@mpw.org**NOTE:** Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water	Permit No. 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-18A	
Upgradient	Downgradient ^X
Name of person sampling Neil Hoskins	

A. MONITORING WELL/PIEZOMETER CONDITIONS	
Well/Piezometer Properly Capped? (please check)	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
If no, explain	
Standing Water or Litter? (please check)	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
If yes, explain	

B. GROUNDWATER ELEVATION MEASUREMENT (\pm 0.01 foot, MSL)			
Elevation:			
Top of inner well casing ^{729.13}	Ground Elevation ^{726.06}		
Depth of Well ^{23.10}	Inside Casing Diameter (in inches) ^{2"}		
Equipment Used Slope Indicator Co. Water level indicator Model 51453			
Groundwater Level (\pm 0.01 foot below top of inner casing, MSL):			
	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	3/7/18 10:50	17.50	711.63
*After Purging	3/7/18 11:30	19.00	710.13
*Before Purging			

*C. WELL PURGING	
Quantity of Water Removed from Well (gallons) ^{1.06}	
No. of Well Volumes (based on current water level) ^{1.16}	
Was well pumped/bailed dry? ^{No}	
Equipment used:	
Bailer type	Dedicated Bailer?
Pump type ^{Peristaltic}	Dedicated Pump? ^{Yes}
If not dedicated, method of cleaning	

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.
Questions? Call or Email: Nina Koger Environmental Engineer Sr., 515-725-8309, nina.koger@dnr.iowa.gov

D. FIELD MEASUREMENT*Weather Conditions** Partly Cloudy, 33.8oF, W wind @ 17mph, 30.08" steady**Field Measurements (after stabilization):****Temperature** 8.32**Units** °C**Equipment Used** Horiba U-50**pH** 7.28**Equipment Used** Horiba U-50**Specific Conductance** 1.59**Units** mS/m**Equipment Used** Horiba U-50**Comments****CERTIFICATION**

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature**Date****Telephone** 563-262-3582**Fax****Email** neil.hoskins@mpw.org**NOTE:** Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.
Questions? Call or Email: Nina Koger Environmental Engineer Sr., 515-725-8309, nina.koger@dnr.iowa.gov

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water	Permit No. 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-21	
Upgradient	Downgradient <input checked="" type="checkbox"/> X
Name of person sampling Neil Hoskins	

A. MONITORING WELL/PIEZOMETER CONDITIONS	
Well/Piezometer Properly Capped? (please check)	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
If no, explain	
Standing Water or Litter? (please check)	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
If yes, explain	

B. GROUNDWATER ELEVATION MEASUREMENT (\pm 0.01 foot, MSL)			
Elevation:			
Top of inner well casing 725.75	Ground Elevation 722.81		
Depth of Well 22.20	Inside Casing Diameter (in inches) 2"		
Equipment Used Slope Indicator Co. Water level indicator Model 51453			
Groundwater Level (\pm 0.01 foot below top of inner casing, MSL):			
	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	3/6/18 10:50	10.49	715.26
*After Purging	3/6/18 12:35	10.89	714.86
*Before Purging			

*C. WELL PURGING	
Quantity of Water Removed from Well (gallons) 1.19	
No. of Well Volumes (based on current water level) 0.62	
Was well pumped/bailed dry? No	
Equipment used:	
Bailer type	Dedicated Bailer?
Pump type Peristaltic	Dedicated Pump? Yes
If not dedicated, method of cleaning	

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.
 Questions? Call or Email: Nina Koger Environmental Engineer Sr., 515-725-8309, nina.koger@dnr.iowa.gov

D. FIELD MEASUREMENT*Weather Conditions** Light snow, 33.8oF, NW wind @ 4-6 mph, 29.67" steady**Field Measurements (after stabilization):****Temperature** 6.65**Units** C**Equipment Used** Horiba U-50**pH** 6.76**Equipment Used** Horiba U-50**Specific Conductance** 0.333**Units** mS/m**Equipment Used** Horiba U-50**Comments****CERTIFICATION**

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature**Date****Telephone** 563-262-3582**Fax****Email** neil.hoskins@mpw.org**NOTE:** Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water	Permit No. 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-22	
Upgradient	Downgradient ^X
Name of person sampling Neil Hoskins	

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check)	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
If no, explain	
Standing Water or Litter? (please check)	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
If yes, explain	

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)

Elevation:

Top of inner well casing ^{744.75}	Ground Elevation ^{742.00}
Depth of Well ^{43.33}	Inside Casing Diameter (in inches) ^{2"}
Equipment Used Slope Indicator Co. Water level indicator Model 51453	

Groundwater Level (± 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	3/6/18 08:05	17.19	727.56
*After Purging	3/6/18 08:50	22.30	722.45
*Before Purging			

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) ^{1.32}	
No. of Well Volumes (based on current water level) ^{0.31}	
Was well pumped/bailed dry? ^{No}	
Equipment used:	
Bailer type	Dedicated Bailer?
Pump type ^{Peristaltic}	Dedicated Pump? ^{Yes}
If not dedicated, method of cleaning	

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.
Questions? Call or Email: Nina Koger Environmental Engineer Sr., 515-725-8309, nina.koger@dnr.iowa.gov

D. FIELD MEASUREMENT*Weather Conditions** Overcast, 35.6oF, WSW wind @ 10-12 mph, 29.62" steady**Field Measurements (after stabilization):****Temperature** 7.57 **Units** C**Equipment Used** Horiba U-50**pH** 7.36**Equipment Used** Horiba U-50**Specific Conductance** 0.741 **Units** mS/m**Equipment Used** Horiba U-50**Comments****CERTIFICATION**

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature**Date****Telephone** 563-262-3582**Fax****Email** neil.hoskins@mpw.org**NOTE:** Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.
Questions? Call or Email: Nina Koger Environmental Engineer Sr., 515-725-8309, nina.koger@dnr.iowa.gov

LOW FLOW SAMPLING FORM

DATE	3/6/2018	WELL ID	MW-5B	SAMPLE DATE / TIME	3/6/2018 15:35
SITE	Muscataine Power & Water	DTW	2.50		
PROJECT #		WELL DEPTH	25.30	DEPTH TO INTAKE	25'
WEATHER	35°F, 6-10mph WNW, 29.73 rising	PUMP TYPE	GeoTech Peristaltic		

[illegible]

0.5-5.0 min 200-500 ml

⋮

minimize

...

 ± 0.1 $\pm 10\text{ mV}$

+/- 3%

+/- 10%

+/- 10%

Limits

1

1

1

1

LOW FLOW SAMPLING FORM

DATE	3/6/2018	WELL ID	MW-6A	SAMPLE DATE / TIME	3/6/2018 16:35
SITE	Muscataine Power & Water	DTW	3.02		
PROJECT #		WELL DEPTH	25.35	NOTE	
WEATHER		PUMP TYPE	GeoTech Peristaltic		
				DEPTH TO INTAKE	20'

[illegible]

0.5-5.0 min 200-500 ml

minimize

111

 ± 0.1

+/-10 mV

+/- 3%

+/- 10%

+/- 10%

Limits

or ± 0.2 mg.

or ± 0.2 mg.

LOW FLOW SAMPLING FORM

DATE	3/6/2018	WELL ID	MW-08	SAMPLE DATE / TIME	3/6/2018 10:15
SITE	Muscataine Power & Water	DTW	14.51		
PROJECT #		WELL DEPTH	42.95	DEPTH TO INTAKE	38'
WEATHER		PUMP TYPE	GeoTech Peristaltic		

[illegible]

0.5-5.0 min	200-500 ml	---	minimize	---	+/- 0.1	+/-10 mV	+/- 3%	+/- 10%	+/- 10%	or +/-0.2 mg
-------------	------------	-----	----------	-----	---------	----------	--------	---------	---------	--------------

LOW FLOW SAMPLING FORM

DATE	3/5/2018	WELL ID	MW-10	SAMPLE DATE / TIME	3/5/2018 12:00
SITE	Muscataine Power & Water	DW	3.11	NOTE	
PROJECT #		WELL DEPTH	20.32		
WEATHER		PUMP TYPE	GeoTech Peristaltic	DEPTH TO INTAKE	15.5'

[illegible]

0.5-5.0 min 200-500 ml

...

minimize

...

 ± 0.1 $\pm 10\text{ mV}$

+/- 3%

+/- 10%

+/- 10%

Limits

10

1000

or ± 0.2 mg.

or ± 0.2 mg.

LOW FLOW SAMPLING FORM

DATE	3/7/2018	WELL ID	MW-14A	SAMPLE DATE / TIME	3/7/2018 10:10
SITE	Muscantine Power & Water	DTW	15.71		
PROJECT #		WELL DEPTH	20.50	NOTE	
WEATHER		PUMP TYPE	GeoTech Peristaltic		
				DEPTH TO INTAKE	15.5'

[illegible]

0.5-5.0 min 200-500 ml

minimize

 $\pm 10 \text{ mV}$

+/- 3%

+/- 10%

+/- 10%

Limits

or ± 0.2 mg.

LOW FLOW SAMPLING FORM

DATE	3/7/2018	WELL ID	MW-15A	SAMPLE DATE / TIME	3/7/2018 8:50
SITE	Muscataine Power & Water	DTW	13.77		
PROJECT #		WELL DEPTH	20.50	NOTE	
WEATHER		PUMP TYPE	GeoTech Peristaltic		
				DEPTH TO INTAKE	15'

[illegible]

Limits

LOW FLOW SAMPLING FORM

[illegible]

LOW FLOW SAMPLING FORM

DATE	3/6/2018	WELL ID	MW-22	SAMPLE DATE / TIME	3/6/2018 8:50
SITE	Muscataine Power & Water	DTW	17.19	NOTE	
PROJECT #		WELL DEPTH	43.33		
WEATHER	35°F, 12mph WSW, 29.62 steady	PUMP TYPE	GeoTech Peristaltic	DEPTH TO INTAKE	38'

[illegible]

0.5-5.0 min	200-500 ml	---	minimize	---	+/-0.1	+/-10 mV	+/-3%	+/-10%	+/-10%	Limits or +/-0.2 mg.
-------------	------------	-----	----------	-----	--------	----------	-------	--------	--------	-------------------------

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Cedar Falls
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319)277-2401

TestAmerica Job ID: 310-133152-1

Client Project/Site: Muscatine Power & Water CCR

For:

Muscatine Power & Water
1700 Dick Drake Way
PO BOX 899
Muscatine, Iowa 52761

Attn: Sam Bennett



Authorized for release by:
7/16/2018 10:31:45 AM

Shawn Hayes, Senior Project Manager
(319)229-8211
shawn.hayes@testamericainc.com

LINKS

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Have a Question?



Visit us at:
www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-1

Job ID: 310-133152-1

Laboratory: TestAmerica Cedar Falls

Narrative

Job Narrative
310-133152-1

Comments

No additional comments.

Receipt

The samples were received on 6/22/2018 8:55 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.2° C.

HPLC/IC

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Sample Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-133152-1	MW-08	Ground Water	06/19/18 16:20	06/22/18 08:55
310-133152-2	MW-10	Ground Water	06/19/18 09:15	06/22/18 08:55
310-133152-3	MW-21	Ground Water	06/19/18 20:10	06/22/18 08:55
310-133152-4	MW-22	Ground Water	06/19/18 17:55	06/22/18 08:55
310-133152-5	MW-23	Ground Water	06/20/18 11:00	06/22/18 08:55
310-133152-6	MW-24	Ground Water	06/20/18 09:15	06/22/18 08:55
310-133152-7	MW-25	Ground Water	06/19/18 10:45	06/22/18 08:55
310-133152-8	Duplicate	Ground Water	06/19/18 12:00	06/22/18 08:55

Detection Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-1

Client Sample ID: MW-08

Lab Sample ID: 310-133152-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Chloride	14.9		5.00		mg/L	5			9056A	Total/NA
Fluoride	0.826		0.500		mg/L	5			9056A	Total/NA
Sulfate	136		5.00		mg/L	5			9056A	Total/NA
Barium	0.0761		0.00200		mg/L	1			6020A	Total/NA
Calcium	115		0.200		mg/L	1			6020A	Total/NA
Total Dissolved Solids	502		30.0		mg/L	1			SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil	Fac	D	Method	Prep Type
pH	7.3	HF	0.1		SU	1			SM 4500 H+ B	Total/NA

Client Sample ID: MW-10

Lab Sample ID: 310-133152-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Sulfate	37.3		5.00		mg/L	5			9056A	Total/NA
Arsenic	0.00211		0.00200		mg/L	1			6020A	Total/NA
Barium	0.162		0.00200		mg/L	1			6020A	Total/NA
Calcium	88.5		0.200		mg/L	1			6020A	Total/NA
Cobalt	0.00107		0.000500		mg/L	1			6020A	Total/NA
Total Dissolved Solids	396		30.0		mg/L	1			SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil	Fac	D	Method	Prep Type
pH	7.2	HF	0.1		SU	1			SM 4500 H+ B	Total/NA

Client Sample ID: MW-21

Lab Sample ID: 310-133152-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Chloride	10.9		5.00		mg/L	5			9056A	Total/NA
Sulfate	489		20.0		mg/L	20			9056A	Total/NA
Barium	0.0515		0.00200		mg/L	1			6020A	Total/NA
Boron	6.84		1.00		mg/L	5			6020A	Total/NA
Calcium	159		0.200		mg/L	1			6020A	Total/NA
Chromium	0.00726		0.00500		mg/L	1			6020A	Total/NA
Lead	0.000633		0.000500		mg/L	1			6020A	Total/NA
Lithium	0.0189		0.0100		mg/L	1			6020A	Total/NA
Molybdenum	0.00383		0.00200		mg/L	1			6020A	Total/NA
Selenium	0.00939		0.00500		mg/L	1			6020A	Total/NA
Total Dissolved Solids	952		60.0		mg/L	1			SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil	Fac	D	Method	Prep Type
pH	6.9	HF	0.1		SU	1			SM 4500 H+ B	Total/NA

Client Sample ID: MW-22

Lab Sample ID: 310-133152-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Chloride	27.2		5.00		mg/L	5			9056A	Total/NA
Sulfate	134		5.00		mg/L	5			9056A	Total/NA
Arsenic	0.00245		0.00200		mg/L	1			6020A	Total/NA
Barium	0.184		0.00200		mg/L	1			6020A	Total/NA
Calcium	91.5		0.200		mg/L	1			6020A	Total/NA
Cobalt	0.00129		0.000500		mg/L	1			6020A	Total/NA
Molybdenum	0.00423		0.00200		mg/L	1			6020A	Total/NA
Total Dissolved Solids	434		30.0		mg/L	1			SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Cedar Falls

Detection Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-1

Client Sample ID: MW-22 (Continued)

Lab Sample ID: 310-133152-4

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	7.4	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-23

Lab Sample ID: 310-133152-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	15.9		5.00		mg/L	5		9056A	Total/NA
Sulfate	38.4		5.00		mg/L	5		9056A	Total/NA
Barium	0.106		0.00200		mg/L	1		6020A	Total/NA
Calcium	70.5		0.200		mg/L	1		6020A	Total/NA
Cobalt	0.00161		0.000500		mg/L	1		6020A	Total/NA
Lead	0.00151		0.000500		mg/L	1		6020A	Total/NA
Molybdenum	0.00822		0.00200		mg/L	1		6020A	Total/NA
Total Dissolved Solids	384		30.0		mg/L	1		SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	7.7	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-24

Lab Sample ID: 310-133152-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	19.9		5.00		mg/L	5		9056A	Total/NA
Fluoride	0.653		0.500		mg/L	5		9056A	Total/NA
Sulfate	101		5.00		mg/L	5		9056A	Total/NA
Barium	0.0695		0.00200		mg/L	1		6020A	Total/NA
Calcium	88.0		0.200		mg/L	1		6020A	Total/NA
Molybdenum	0.00447		0.00200		mg/L	1		6020A	Total/NA
Total Dissolved Solids	474		30.0		mg/L	1		SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	7.5	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-25

Lab Sample ID: 310-133152-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	11.4		5.00		mg/L	5		9056A	Total/NA
Fluoride	0.551		0.500		mg/L	5		9056A	Total/NA
Sulfate	382		20.0		mg/L	20		9056A	Total/NA
Barium	0.0828		0.00200		mg/L	1		6020A	Total/NA
Boron	14.0		2.00		mg/L	10		6020A	Total/NA
Calcium	171		0.200		mg/L	1		6020A	Total/NA
Molybdenum	0.00279		0.00200		mg/L	1		6020A	Total/NA
Total Dissolved Solids	962		30.0		mg/L	1		SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	7.5	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: Duplicate

Lab Sample ID: 310-133152-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	27.5		5.00		mg/L	5		9056A	Total/NA
Fluoride	0.628		0.500		mg/L	5		9056A	Total/NA
Sulfate	135		5.00		mg/L	5		9056A	Total/NA
Arsenic	0.00234		0.00200		mg/L	1		6020A	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Cedar Falls

Detection Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-1

Client Sample ID: Duplicate (Continued)

Lab Sample ID: 310-133152-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Barium	0.182		0.00200		mg/L		1		6020A	Total/NA
Calcium	93.2		0.200		mg/L		1		6020A	Total/NA
Cobalt	0.00142		0.000500		mg/L		1		6020A	Total/NA
Molybdenum	0.00426		0.00200		mg/L		1		6020A	Total/NA
Total Dissolved Solids	416		30.0		mg/L		1		SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil	Fac	D	Method	Prep Type
pH	7.5	HF	0.1		SU		1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Cedar Falls

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-1

Client Sample ID: MW-08

Date Collected: 06/19/18 16:20

Date Received: 06/22/18 08:55

Lab Sample ID: 310-133152-1

Matrix: Ground Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	14.9		5.00		mg/L			07/02/18 12:37	5
Fluoride	0.826		0.500		mg/L			07/02/18 12:37	5
Sulfate	136		5.00		mg/L			07/02/18 12:37	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		06/25/18 08:53	06/28/18 20:05	1
Arsenic	<0.00200		0.00200		mg/L		06/25/18 08:53	06/28/18 20:05	1
Barium	0.0761		0.00200		mg/L		06/25/18 08:53	06/28/18 20:05	1
Beryllium	<0.00100		0.00100		mg/L		06/25/18 08:53	06/28/18 20:05	1
Boron	<0.200		0.200		mg/L		06/25/18 08:53	06/29/18 11:46	1
Cadmium	<0.000500		0.000500		mg/L		06/25/18 08:53	06/28/18 20:05	1
Calcium	115		0.200		mg/L		06/25/18 08:53	06/28/18 20:05	1
Chromium	<0.00500		0.00500		mg/L		06/25/18 08:53	06/28/18 20:05	1
Cobalt	<0.000500		0.000500		mg/L		06/25/18 08:53	06/28/18 20:05	1
Lead	<0.000500		0.000500		mg/L		06/25/18 08:53	06/28/18 20:05	1
Lithium	<0.0100		0.0100		mg/L		06/25/18 08:53	06/29/18 11:46	1
Molybdenum	<0.00200		0.00200		mg/L		06/25/18 08:53	06/28/18 20:05	1
Selenium	<0.00500		0.00500		mg/L		06/25/18 08:53	06/28/18 20:05	1
Thallium	<0.00100		0.00100		mg/L		06/25/18 08:53	06/29/18 11:46	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		06/28/18 07:58	06/29/18 10:03	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	502		30.0		mg/L			06/25/18 15:31	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.3	HF	0.1		SU			06/22/18 19:55	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-1

Client Sample ID: MW-10

Date Collected: 06/19/18 09:15

Date Received: 06/22/18 08:55

Lab Sample ID: 310-133152-2

Matrix: Ground Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<5.00		5.00		mg/L	-		07/02/18 12:54	5
Fluoride	<0.500		0.500		mg/L	-		07/02/18 12:54	5
Sulfate	37.3		5.00		mg/L	-		07/02/18 12:54	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L	-	06/25/18 08:53	06/28/18 20:08	1
Arsenic	0.00211		0.00200		mg/L	-	06/25/18 08:53	06/28/18 20:08	1
Barium	0.162		0.00200		mg/L	-	06/25/18 08:53	06/28/18 20:08	1
Beryllium	<0.00100		0.00100		mg/L	-	06/25/18 08:53	06/28/18 20:08	1
Boron	<0.200		0.200		mg/L	-	06/25/18 08:53	06/29/18 11:49	1
Cadmium	<0.000500		0.000500		mg/L	-	06/25/18 08:53	06/28/18 20:08	1
Calcium	88.5		0.200		mg/L	-	06/25/18 08:53	06/28/18 20:08	1
Chromium	<0.00500		0.00500		mg/L	-	06/25/18 08:53	06/28/18 20:08	1
Cobalt	0.00107		0.000500		mg/L	-	06/25/18 08:53	06/28/18 20:08	1
Lead	<0.000500		0.000500		mg/L	-	06/25/18 08:53	06/28/18 20:08	1
Lithium	<0.0100		0.0100		mg/L	-	06/25/18 08:53	06/29/18 11:49	1
Molybdenum	<0.00200		0.00200		mg/L	-	06/25/18 08:53	06/28/18 20:08	1
Selenium	<0.00500		0.00500		mg/L	-	06/25/18 08:53	06/28/18 20:08	1
Thallium	<0.00100		0.00100		mg/L	-	06/25/18 08:53	06/29/18 11:49	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L	-	06/28/18 07:58	06/29/18 10:04	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	396		30.0		mg/L	-		06/25/18 15:31	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.2	HF	0.1		SU	-		06/22/18 19:57	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-1

Client Sample ID: MW-21

Date Collected: 06/19/18 20:10

Date Received: 06/22/18 08:55

Lab Sample ID: 310-133152-3

Matrix: Ground Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	10.9		5.00		mg/L			07/02/18 13:47	5
Fluoride	<0.500		0.500		mg/L			07/02/18 13:47	5
Sulfate	489		20.0		mg/L			07/02/18 16:06	20

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		06/25/18 08:53	06/28/18 20:21	1
Arsenic	<0.00200		0.00200		mg/L		06/25/18 08:53	06/28/18 20:21	1
Barium	0.0515		0.00200		mg/L		06/25/18 08:53	06/28/18 20:21	1
Beryllium	<0.00100		0.00100		mg/L		06/25/18 08:53	06/28/18 20:21	1
Boron	6.84		1.00		mg/L		06/25/18 08:53	06/29/18 11:52	5
Cadmium	<0.000500		0.000500		mg/L		06/25/18 08:53	06/28/18 20:21	1
Calcium	159		0.200		mg/L		06/25/18 08:53	06/28/18 20:21	1
Chromium	0.00726		0.00500		mg/L		06/25/18 08:53	06/28/18 20:21	1
Cobalt	<0.000500		0.000500		mg/L		06/25/18 08:53	06/28/18 20:21	1
Lead	0.000633		0.000500		mg/L		06/25/18 08:53	06/28/18 20:21	1
Lithium	0.0189		0.0100		mg/L		06/25/18 08:53	06/28/18 20:21	1
Molybdenum	0.00383		0.00200		mg/L		06/25/18 08:53	06/28/18 20:21	1
Selenium	0.00939		0.00500		mg/L		06/25/18 08:53	06/28/18 20:21	1
Thallium	<0.00100		0.00100		mg/L		06/25/18 08:53	06/28/18 20:21	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		06/28/18 07:58	06/29/18 10:06	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	952		60.0		mg/L			06/25/18 15:31	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.9	HF	0.1		SU			06/22/18 19:59	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-1

Client Sample ID: MW-22

Date Collected: 06/19/18 17:55

Date Received: 06/22/18 08:55

Lab Sample ID: 310-133152-4

Matrix: Ground Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	27.2		5.00		mg/L			07/02/18 14:04	5
Fluoride	<0.500		0.500		mg/L			07/02/18 14:04	5
Sulfate	134		5.00		mg/L			07/02/18 14:04	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		06/25/18 08:53	06/28/18 20:24	1
Arsenic	0.00245		0.00200		mg/L		06/25/18 08:53	06/28/18 20:24	1
Barium	0.184		0.00200		mg/L		06/25/18 08:53	06/28/18 20:24	1
Beryllium	<0.00100		0.00100		mg/L		06/25/18 08:53	06/28/18 20:24	1
Boron	<0.200		0.200		mg/L		06/25/18 08:53	06/29/18 12:05	1
Cadmium	<0.000500		0.000500		mg/L		06/25/18 08:53	06/28/18 20:24	1
Calcium	91.5		0.200		mg/L		06/25/18 08:53	06/28/18 20:24	1
Chromium	<0.00500		0.00500		mg/L		06/25/18 08:53	06/28/18 20:24	1
Cobalt	0.00129		0.000500		mg/L		06/25/18 08:53	06/28/18 20:24	1
Lead	<0.000500		0.000500		mg/L		06/25/18 08:53	06/28/18 20:24	1
Lithium	<0.0100		0.0100		mg/L		06/25/18 08:53	06/28/18 20:24	1
Molybdenum	0.00423		0.00200		mg/L		06/25/18 08:53	06/28/18 20:24	1
Selenium	<0.00500		0.00500		mg/L		06/25/18 08:53	06/28/18 20:24	1
Thallium	<0.00100		0.00100		mg/L		06/25/18 08:53	06/28/18 20:24	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		06/28/18 07:58	06/29/18 10:07	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	434		30.0		mg/L			06/25/18 15:31	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.4	HF	0.1		SU			06/22/18 20:02	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-1

Client Sample ID: MW-23

Date Collected: 06/20/18 11:00

Date Received: 06/22/18 08:55

Lab Sample ID: 310-133152-5

Matrix: Ground Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	15.9		5.00		mg/L			07/02/18 14:22	5
Fluoride	<0.500		0.500		mg/L			07/02/18 14:22	5
Sulfate	38.4		5.00		mg/L			07/02/18 14:22	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		06/25/18 08:53	06/28/18 20:27	1
Arsenic	<0.00200		0.00200		mg/L		06/25/18 08:53	06/28/18 20:27	1
Barium	0.106		0.00200		mg/L		06/25/18 08:53	06/28/18 20:27	1
Beryllium	<0.00100		0.00100		mg/L		06/25/18 08:53	06/29/18 12:08	1
Boron	<0.200		0.200		mg/L		06/25/18 08:53	06/29/18 12:08	1
Cadmium	<0.000500		0.000500		mg/L		06/25/18 08:53	06/28/18 20:27	1
Calcium	70.5		0.200		mg/L		06/25/18 08:53	06/29/18 12:08	1
Chromium	<0.00500		0.00500		mg/L		06/25/18 08:53	06/28/18 20:27	1
Cobalt	0.00161		0.000500		mg/L		06/25/18 08:53	06/28/18 20:27	1
Lead	0.00151		0.000500		mg/L		06/25/18 08:53	06/28/18 20:27	1
Lithium	<0.0100		0.0100		mg/L		06/25/18 08:53	06/28/18 20:27	1
Molybdenum	0.00822		0.00200		mg/L		06/25/18 08:53	06/28/18 20:27	1
Selenium	<0.00500		0.00500		mg/L		06/25/18 08:53	06/28/18 20:27	1
Thallium	<0.00100		0.00100		mg/L		06/25/18 08:53	06/28/18 20:27	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		06/28/18 07:58	06/29/18 10:09	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	384		30.0		mg/L			06/25/18 15:31	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.7	HF	0.1		SU			06/22/18 20:04	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-1

Client Sample ID: MW-24

Date Collected: 06/20/18 09:15

Date Received: 06/22/18 08:55

Lab Sample ID: 310-133152-6

Matrix: Ground Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	19.9		5.00		mg/L			07/02/18 14:39	5
Fluoride	0.653		0.500		mg/L			07/02/18 14:39	5
Sulfate	101		5.00		mg/L			07/02/18 14:39	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		06/25/18 08:53	06/28/18 20:30	1
Arsenic	<0.00200		0.00200		mg/L		06/25/18 08:53	06/28/18 20:30	1
Barium	0.0695		0.00200		mg/L		06/25/18 08:53	06/28/18 20:30	1
Beryllium	<0.00100		0.00100		mg/L		06/25/18 08:53	06/29/18 12:11	1
Boron	<0.200		0.200		mg/L		06/25/18 08:53	06/29/18 12:11	1
Cadmium	<0.000500		0.000500		mg/L		06/25/18 08:53	06/28/18 20:30	1
Calcium	88.0		0.200		mg/L		06/25/18 08:53	06/29/18 12:11	1
Chromium	<0.00500		0.00500		mg/L		06/25/18 08:53	06/28/18 20:30	1
Cobalt	<0.000500		0.000500		mg/L		06/25/18 08:53	06/28/18 20:30	1
Lead	<0.000500		0.000500		mg/L		06/25/18 08:53	06/28/18 20:30	1
Lithium	<0.0100		0.0100		mg/L		06/25/18 08:53	06/28/18 20:30	1
Molybdenum	0.00447		0.00200		mg/L		06/25/18 08:53	06/28/18 20:30	1
Selenium	<0.00500		0.00500		mg/L		06/25/18 08:53	06/28/18 20:30	1
Thallium	<0.00100		0.00100		mg/L		06/25/18 08:53	06/28/18 20:30	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		06/28/18 07:58	06/29/18 10:11	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	474		30.0		mg/L			06/25/18 15:31	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.5	HF	0.1		SU			06/22/18 20:05	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-1

Client Sample ID: MW-25

Date Collected: 06/19/18 10:45

Date Received: 06/22/18 08:55

Lab Sample ID: 310-133152-7

Matrix: Ground Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	11.4		5.00		mg/L			07/02/18 14:57	5
Fluoride	0.551		0.500		mg/L			07/02/18 14:57	5
Sulfate	382		20.0		mg/L			07/05/18 13:00	20

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		06/25/18 08:53	06/28/18 20:34	1
Arsenic	<0.00200		0.00200		mg/L		06/25/18 08:53	06/28/18 20:34	1
Barium	0.0828		0.00200		mg/L		06/25/18 08:53	06/28/18 20:34	1
Beryllium	<0.00100		0.00100		mg/L		06/25/18 08:53	06/28/18 20:34	1
Boron	14.0		2.00		mg/L		06/25/18 08:53	06/29/18 12:14	10
Cadmium	<0.000500		0.000500		mg/L		06/25/18 08:53	06/28/18 20:34	1
Calcium	171		0.200		mg/L		06/25/18 08:53	06/28/18 20:34	1
Chromium	<0.00500		0.00500		mg/L		06/25/18 08:53	06/28/18 20:34	1
Cobalt	<0.000500		0.000500		mg/L		06/25/18 08:53	06/28/18 20:34	1
Lead	<0.000500		0.000500		mg/L		06/25/18 08:53	06/28/18 20:34	1
Lithium	<0.0100		0.0100		mg/L		06/25/18 08:53	06/28/18 20:34	1
Molybdenum	0.00279		0.00200		mg/L		06/25/18 08:53	06/28/18 20:34	1
Selenium	<0.00500		0.00500		mg/L		06/25/18 08:53	06/28/18 20:34	1
Thallium	<0.00100		0.00100		mg/L		06/25/18 08:53	06/28/18 20:34	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		06/28/18 07:58	06/29/18 10:12	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	962		30.0		mg/L			06/25/18 15:31	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.5	HF	0.1		SU			06/22/18 20:08	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-1

Client Sample ID: Duplicate

Date Collected: 06/19/18 12:00

Date Received: 06/22/18 08:55

Lab Sample ID: 310-133152-8

Matrix: Ground Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	27.5		5.00		mg/L	-		07/02/18 15:14	5
Fluoride	0.628		0.500		mg/L	-		07/02/18 15:14	5
Sulfate	135		5.00		mg/L	-		07/02/18 15:14	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L	-	06/25/18 08:53	06/28/18 20:37	1
Arsenic	0.00234		0.00200		mg/L	-	06/25/18 08:53	06/28/18 20:37	1
Barium	0.182		0.00200		mg/L	-	06/25/18 08:53	06/28/18 20:37	1
Beryllium	<0.00100		0.00100		mg/L	-	06/25/18 08:53	06/28/18 20:37	1
Boron	<0.200		0.200		mg/L	-	06/25/18 08:53	06/29/18 12:18	1
Cadmium	<0.000500		0.000500		mg/L	-	06/25/18 08:53	06/28/18 20:37	1
Calcium	93.2		0.200		mg/L	-	06/25/18 08:53	06/28/18 20:37	1
Chromium	<0.00500		0.00500		mg/L	-	06/25/18 08:53	06/28/18 20:37	1
Cobalt	0.00142		0.000500		mg/L	-	06/25/18 08:53	06/28/18 20:37	1
Lead	<0.000500		0.000500		mg/L	-	06/25/18 08:53	06/28/18 20:37	1
Lithium	<0.0100		0.0100		mg/L	-	06/25/18 08:53	06/28/18 20:37	1
Molybdenum	0.00426		0.00200		mg/L	-	06/25/18 08:53	06/28/18 20:37	1
Selenium	<0.00500		0.00500		mg/L	-	06/25/18 08:53	06/28/18 20:37	1
Thallium	<0.00100		0.00100		mg/L	-	06/25/18 08:53	06/28/18 20:37	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L	-	06/28/18 07:58	06/29/18 10:14	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	416		30.0		mg/L	-		06/25/18 15:31	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.5	HF	0.1		SU	-		06/22/18 20:09	1

Definitions/Glossary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-1

Qualifiers

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

QC Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-208454/3

Matrix: Water

Analysis Batch: 208454

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.00		1.00		mg/L			07/02/18 10:17	1
Fluoride	<0.100		0.100		mg/L			07/02/18 10:17	1
Sulfate	<1.00		1.00		mg/L			07/02/18 10:17	1

Lab Sample ID: LCS 310-208454/4

Matrix: Water

Analysis Batch: 208454

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	7.50	7.353		mg/L		98	90 - 110
Fluoride	1.50	1.530		mg/L		102	90 - 110
Sulfate	7.50	7.581		mg/L		101	90 - 110

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 310-207524/1-A

Matrix: Water

Analysis Batch: 208061

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 207524

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		06/25/18 08:53	06/28/18 19:00	1
Arsenic	<0.00200		0.00200		mg/L		06/25/18 08:53	06/28/18 19:00	1
Barium	<0.00200		0.00200		mg/L		06/25/18 08:53	06/28/18 19:00	1
Beryllium	<0.00100		0.00100		mg/L		06/25/18 08:53	06/28/18 19:00	1
Cadmium	<0.000500		0.000500		mg/L		06/25/18 08:53	06/28/18 19:00	1
Calcium	<0.200		0.200		mg/L		06/25/18 08:53	06/28/18 19:00	1
Chromium	<0.00500		0.00500		mg/L		06/25/18 08:53	06/28/18 19:00	1
Cobalt	<0.000500		0.000500		mg/L		06/25/18 08:53	06/28/18 19:00	1
Lead	<0.000500		0.000500		mg/L		06/25/18 08:53	06/28/18 19:00	1
Molybdenum	<0.00200		0.00200		mg/L		06/25/18 08:53	06/28/18 19:00	1
Selenium	<0.00500		0.00500		mg/L		06/25/18 08:53	06/28/18 19:00	1

Lab Sample ID: MB 310-207524/1-A

Matrix: Water

Analysis Batch: 208163

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 207524

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	<0.200		0.200		mg/L		06/25/18 08:53	06/29/18 11:27	1
Lithium	<0.0100		0.0100		mg/L		06/25/18 08:53	06/29/18 11:27	1
Thallium	<0.00100		0.00100		mg/L		06/25/18 08:53	06/29/18 11:27	1

Lab Sample ID: LCS 310-207524/2-A

Matrix: Water

Analysis Batch: 208061

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 207524

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.0200	0.01923		mg/L		96	80 - 120
Arsenic	0.0400	0.03721		mg/L		93	80 - 120
Barium	0.0400	0.03981		mg/L		100	80 - 120

TestAmerica Cedar Falls

QC Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 310-207524/2-A

Matrix: Water

Analysis Batch: 208061

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 207524

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Beryllium	0.0200	0.02181		mg/L		109	80 - 120
Cadmium	0.0200	0.02136		mg/L		107	80 - 120
Calcium	2.00	2.152		mg/L		108	80 - 120
Chromium	0.0400	0.04163		mg/L		104	80 - 120
Cobalt	0.0200	0.02001		mg/L		100	80 - 120
Lead	0.0200	0.02033		mg/L		102	80 - 120
Molybdenum	0.0400	0.04045		mg/L		101	80 - 120
Selenium	0.0400	0.03640		mg/L		91	80 - 120

Lab Sample ID: LCS 310-207524/2-A

Matrix: Water

Analysis Batch: 208163

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 207524

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	0.880	0.8645		mg/L		98	80 - 120
Lithium	0.100	0.08955		mg/L		90	80 - 120
Thallium	0.0160	0.01652		mg/L		103	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-207919/1-A

Matrix: Water

Analysis Batch: 208120

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 207919

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		06/28/18 07:57	06/29/18 09:44	1

Lab Sample ID: LCS 310-207919/2-A

Matrix: Water

Analysis Batch: 208120

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 207919

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.00167	0.001595		mg/L		96	80 - 120

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 310-207597/1

Matrix: Water

Analysis Batch: 207597

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<30.0		30.0		mg/L			06/25/18 15:31	1

Lab Sample ID: LCS 310-207597/2

Matrix: Water

Analysis Batch: 207597

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	1000	972.0		mg/L		97	90 - 110

TestAmerica Cedar Falls

QC Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-1

Lab Sample ID: 310-133152-1 DU

Matrix: Ground Water

Analysis Batch: 207597

Client Sample ID: MW-08

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Total Dissolved Solids	502		512.0		mg/L		2	24

Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 310-207405/1

Matrix: Water

Analysis Batch: 207405

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.0		SU		100	98 - 102

Lab Sample ID: 310-133152-1 DU

Matrix: Ground Water

Analysis Batch: 207405

Client Sample ID: MW-08

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
pH	7.3	HF	7.2		SU		1	20

QC Association Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-1

HPLC/IC

Analysis Batch: 208454

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-133152-1	MW-08	Total/NA	Ground Water	9056A	
310-133152-2	MW-10	Total/NA	Ground Water	9056A	
310-133152-3	MW-21	Total/NA	Ground Water	9056A	
310-133152-3	MW-21	Total/NA	Ground Water	9056A	
310-133152-4	MW-22	Total/NA	Ground Water	9056A	
310-133152-5	MW-23	Total/NA	Ground Water	9056A	
310-133152-6	MW-24	Total/NA	Ground Water	9056A	
310-133152-7	MW-25	Total/NA	Ground Water	9056A	
310-133152-7	MW-25	Total/NA	Ground Water	9056A	
310-133152-8	Duplicate	Total/NA	Ground Water	9056A	
MB 310-208454/3	Method Blank	Total/NA	Water	9056A	
LCS 310-208454/4	Lab Control Sample	Total/NA	Water	9056A	

Metals

Prep Batch: 207524

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-133152-1	MW-08	Total/NA	Ground Water	3010A	
310-133152-2	MW-10	Total/NA	Ground Water	3010A	
310-133152-3	MW-21	Total/NA	Ground Water	3010A	
310-133152-4	MW-22	Total/NA	Ground Water	3010A	
310-133152-5	MW-23	Total/NA	Ground Water	3010A	
310-133152-6	MW-24	Total/NA	Ground Water	3010A	
310-133152-7	MW-25	Total/NA	Ground Water	3010A	
310-133152-8	Duplicate	Total/NA	Ground Water	3010A	
MB 310-207524/1-A	Method Blank	Total/NA	Water	3010A	
LCS 310-207524/2-A	Lab Control Sample	Total/NA	Water	3010A	

Prep Batch: 207919

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-133152-1	MW-08	Total/NA	Ground Water	7470A	
310-133152-2	MW-10	Total/NA	Ground Water	7470A	
310-133152-3	MW-21	Total/NA	Ground Water	7470A	
310-133152-4	MW-22	Total/NA	Ground Water	7470A	
310-133152-5	MW-23	Total/NA	Ground Water	7470A	
310-133152-6	MW-24	Total/NA	Ground Water	7470A	
310-133152-7	MW-25	Total/NA	Ground Water	7470A	
310-133152-8	Duplicate	Total/NA	Ground Water	7470A	
MB 310-207919/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-207919/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 208061

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-133152-1	MW-08	Total/NA	Ground Water	6020A	207524
310-133152-2	MW-10	Total/NA	Ground Water	6020A	207524
310-133152-3	MW-21	Total/NA	Ground Water	6020A	207524
310-133152-4	MW-22	Total/NA	Ground Water	6020A	207524
310-133152-5	MW-23	Total/NA	Ground Water	6020A	207524
310-133152-6	MW-24	Total/NA	Ground Water	6020A	207524
310-133152-7	MW-25	Total/NA	Ground Water	6020A	207524

TestAmerica Cedar Falls

QC Association Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-1

Metals (Continued)

Analysis Batch: 208061 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-133152-8	Duplicate	Total/NA	Ground Water	6020A	207524
MB 310-207524/1-A	Method Blank	Total/NA	Water	6020A	207524
LCS 310-207524/2-A	Lab Control Sample	Total/NA	Water	6020A	207524

Analysis Batch: 208120

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-133152-1	MW-08	Total/NA	Ground Water	7470A	207919
310-133152-2	MW-10	Total/NA	Ground Water	7470A	207919
310-133152-3	MW-21	Total/NA	Ground Water	7470A	207919
310-133152-4	MW-22	Total/NA	Ground Water	7470A	207919
310-133152-5	MW-23	Total/NA	Ground Water	7470A	207919
310-133152-6	MW-24	Total/NA	Ground Water	7470A	207919
310-133152-7	MW-25	Total/NA	Ground Water	7470A	207919
310-133152-8	Duplicate	Total/NA	Ground Water	7470A	207919
MB 310-207919/1-A	Method Blank	Total/NA	Water	7470A	207919
LCS 310-207919/2-A	Lab Control Sample	Total/NA	Water	7470A	207919

Analysis Batch: 208163

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-133152-1	MW-08	Total/NA	Ground Water	6020A	207524
310-133152-2	MW-10	Total/NA	Ground Water	6020A	207524
310-133152-3	MW-21	Total/NA	Ground Water	6020A	207524
310-133152-4	MW-22	Total/NA	Ground Water	6020A	207524
310-133152-5	MW-23	Total/NA	Ground Water	6020A	207524
310-133152-6	MW-24	Total/NA	Ground Water	6020A	207524
310-133152-7	MW-25	Total/NA	Ground Water	6020A	207524
310-133152-8	Duplicate	Total/NA	Ground Water	6020A	207524
MB 310-207524/1-A	Method Blank	Total/NA	Water	6020A	207524
LCS 310-207524/2-A	Lab Control Sample	Total/NA	Water	6020A	207524

General Chemistry

Analysis Batch: 207405

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-133152-1	MW-08	Total/NA	Ground Water	SM 4500 H+ B	
310-133152-2	MW-10	Total/NA	Ground Water	SM 4500 H+ B	
310-133152-3	MW-21	Total/NA	Ground Water	SM 4500 H+ B	
310-133152-4	MW-22	Total/NA	Ground Water	SM 4500 H+ B	
310-133152-5	MW-23	Total/NA	Ground Water	SM 4500 H+ B	
310-133152-6	MW-24	Total/NA	Ground Water	SM 4500 H+ B	
310-133152-7	MW-25	Total/NA	Ground Water	SM 4500 H+ B	
310-133152-8	Duplicate	Total/NA	Ground Water	SM 4500 H+ B	
LCS 310-207405/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
310-133152-1 DU	MW-08	Total/NA	Ground Water	SM 4500 H+ B	

Analysis Batch: 207597

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-133152-1	MW-08	Total/NA	Ground Water	SM 2540C	
310-133152-2	MW-10	Total/NA	Ground Water	SM 2540C	
310-133152-3	MW-21	Total/NA	Ground Water	SM 2540C	

TestAmerica Cedar Falls

QC Association Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-1

General Chemistry (Continued)

Analysis Batch: 207597 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-133152-4	MW-22	Total/NA	Ground Water	SM 2540C	
310-133152-5	MW-23	Total/NA	Ground Water	SM 2540C	
310-133152-6	MW-24	Total/NA	Ground Water	SM 2540C	
310-133152-7	MW-25	Total/NA	Ground Water	SM 2540C	
310-133152-8	Duplicate	Total/NA	Ground Water	SM 2540C	
MB 310-207597/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-207597/2	Lab Control Sample	Total/NA	Water	SM 2540C	
310-133152-1 DU	MW-08	Total/NA	Ground Water	SM 2540C	

Lab Chronicle

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-1

Client Sample ID: MW-08

Date Collected: 06/19/18 16:20

Date Received: 06/22/18 08:55

Lab Sample ID: 310-133152-1

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	208454	07/02/18 12:37	CJT	TAL CF
Total/NA	Prep	3010A			207524	06/25/18 08:53	JNR	TAL CF
Total/NA	Analysis	6020A		1	208061	06/28/18 20:05	SAD	TAL CF
Total/NA	Prep	3010A			207524	06/25/18 08:53	JNR	TAL CF
Total/NA	Analysis	6020A		1	208163	06/29/18 11:46	SAD	TAL CF
Total/NA	Prep	7470A			207919	06/28/18 07:58	JNR	TAL CF
Total/NA	Analysis	7470A		1	208120	06/29/18 10:03	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	207597	06/25/18 15:31	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	207405	06/22/18 19:55	BER	TAL CF

Client Sample ID: MW-10

Date Collected: 06/19/18 09:15

Date Received: 06/22/18 08:55

Lab Sample ID: 310-133152-2

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	208454	07/02/18 12:54	CJT	TAL CF
Total/NA	Prep	3010A			207524	06/25/18 08:53	JNR	TAL CF
Total/NA	Analysis	6020A		1	208061	06/28/18 20:08	SAD	TAL CF
Total/NA	Prep	3010A			207524	06/25/18 08:53	JNR	TAL CF
Total/NA	Analysis	6020A		1	208163	06/29/18 11:49	SAD	TAL CF
Total/NA	Prep	7470A			207919	06/28/18 07:58	JNR	TAL CF
Total/NA	Analysis	7470A		1	208120	06/29/18 10:04	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	207597	06/25/18 15:31	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	207405	06/22/18 19:57	BER	TAL CF

Client Sample ID: MW-21

Date Collected: 06/19/18 20:10

Date Received: 06/22/18 08:55

Lab Sample ID: 310-133152-3

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	208454	07/02/18 13:47	CJT	TAL CF
Total/NA	Analysis	9056A		20	208454	07/02/18 16:06	CJT	TAL CF
Total/NA	Prep	3010A			207524	06/25/18 08:53	JNR	TAL CF
Total/NA	Analysis	6020A		1	208061	06/28/18 20:21	SAD	TAL CF
Total/NA	Prep	3010A			207524	06/25/18 08:53	JNR	TAL CF
Total/NA	Analysis	6020A		5	208163	06/29/18 11:52	SAD	TAL CF
Total/NA	Prep	7470A			207919	06/28/18 07:58	JNR	TAL CF
Total/NA	Analysis	7470A		1	208120	06/29/18 10:06	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	207597	06/25/18 15:31	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	207405	06/22/18 19:59	BER	TAL CF

TestAmerica Cedar Falls

Lab Chronicle

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-1

Client Sample ID: MW-22

Date Collected: 06/19/18 17:55

Date Received: 06/22/18 08:55

Lab Sample ID: 310-133152-4

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	208454	07/02/18 14:04	CJT	TAL CF
Total/NA	Prep	3010A			207524	06/25/18 08:53	JNR	TAL CF
Total/NA	Analysis	6020A		1	208061	06/28/18 20:24	SAD	TAL CF
Total/NA	Prep	3010A			207524	06/25/18 08:53	JNR	TAL CF
Total/NA	Analysis	6020A		1	208163	06/29/18 12:05	SAD	TAL CF
Total/NA	Prep	7470A			207919	06/28/18 07:58	JNR	TAL CF
Total/NA	Analysis	7470A		1	208120	06/29/18 10:07	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	207597	06/25/18 15:31	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	207405	06/22/18 20:02	BER	TAL CF

Client Sample ID: MW-23

Date Collected: 06/20/18 11:00

Date Received: 06/22/18 08:55

Lab Sample ID: 310-133152-5

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	208454	07/02/18 14:22	CJT	TAL CF
Total/NA	Prep	3010A			207524	06/25/18 08:53	JNR	TAL CF
Total/NA	Analysis	6020A		1	208061	06/28/18 20:27	SAD	TAL CF
Total/NA	Prep	3010A			207524	06/25/18 08:53	JNR	TAL CF
Total/NA	Analysis	6020A		1	208163	06/29/18 12:08	SAD	TAL CF
Total/NA	Prep	7470A			207919	06/28/18 07:58	JNR	TAL CF
Total/NA	Analysis	7470A		1	208120	06/29/18 10:09	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	207597	06/25/18 15:31	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	207405	06/22/18 20:04	BER	TAL CF

Client Sample ID: MW-24

Date Collected: 06/20/18 09:15

Date Received: 06/22/18 08:55

Lab Sample ID: 310-133152-6

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	208454	07/02/18 14:39	CJT	TAL CF
Total/NA	Prep	3010A			207524	06/25/18 08:53	JNR	TAL CF
Total/NA	Analysis	6020A		1	208061	06/28/18 20:30	SAD	TAL CF
Total/NA	Prep	3010A			207524	06/25/18 08:53	JNR	TAL CF
Total/NA	Analysis	6020A		1	208163	06/29/18 12:11	SAD	TAL CF
Total/NA	Prep	7470A			207919	06/28/18 07:58	JNR	TAL CF
Total/NA	Analysis	7470A		1	208120	06/29/18 10:11	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	207597	06/25/18 15:31	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	207405	06/22/18 20:05	BER	TAL CF

TestAmerica Cedar Falls

Lab Chronicle

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-1

Client Sample ID: MW-25

Date Collected: 06/19/18 10:45

Date Received: 06/22/18 08:55

Lab Sample ID: 310-133152-7

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	208454	07/02/18 14:57	CJT	TAL CF
Total/NA	Analysis	9056A		20	208454	07/05/18 13:00	CJT	TAL CF
Total/NA	Prep	3010A			207524	06/25/18 08:53	JNR	TAL CF
Total/NA	Analysis	6020A		1	208061	06/28/18 20:34	SAD	TAL CF
Total/NA	Prep	3010A			207524	06/25/18 08:53	JNR	TAL CF
Total/NA	Analysis	6020A		10	208163	06/29/18 12:14	SAD	TAL CF
Total/NA	Prep	7470A			207919	06/28/18 07:58	JNR	TAL CF
Total/NA	Analysis	7470A		1	208120	06/29/18 10:12	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	207597	06/25/18 15:31	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	207405	06/22/18 20:08	BER	TAL CF

Client Sample ID: Duplicate

Date Collected: 06/19/18 12:00

Date Received: 06/22/18 08:55

Lab Sample ID: 310-133152-8

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	208454	07/02/18 15:14	CJT	TAL CF
Total/NA	Prep	3010A			207524	06/25/18 08:53	JNR	TAL CF
Total/NA	Analysis	6020A		1	208061	06/28/18 20:37	SAD	TAL CF
Total/NA	Prep	3010A			207524	06/25/18 08:53	JNR	TAL CF
Total/NA	Analysis	6020A		1	208163	06/29/18 12:18	SAD	TAL CF
Total/NA	Prep	7470A			207919	06/28/18 07:58	JNR	TAL CF
Total/NA	Analysis	7470A		1	208120	06/29/18 10:14	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	207597	06/25/18 15:31	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	207405	06/22/18 20:09	BER	TAL CF

Laboratory References:

TAL CF = TestAmerica Cedar Falls, 704 Enterprise Drive, Cedar Falls, IA 50613, TEL (319)277-2401

Accreditation/Certification Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-1

Laboratory: TestAmerica Cedar Falls

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
AIHA-LAP, LLC	IHLAP		101044	11-01-18
Georgia	State Program	4	IA100001 (OR)	09-29-18
Illinois	NELAP	5	200024	11-29-18
Iowa	State Program	7	007	12-01-19
Kansas	NELAP	7	E-10341	01-31-19
Minnesota	NELAP	5	019-999-319	12-31-18
Minnesota (Petrofund)	State Program	1	3349	08-22-18
North Dakota	State Program	8	R-186	09-29-18
Oregon	NELAP	10	IA100001	09-29-18

Method Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL CF
6020A	Metals (ICP/MS)	SW846	TAL CF
7470A	Mercury (CVAA)	SW846	TAL CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CF
SM 4500 H+ B	pH	SM	TAL CF
3010A	Preparation, Total Metals	SW846	TAL CF
7470A	Preparation, Mercury	SW846	TAL CF

Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CF = TestAmerica Cedar Falls, 704 Enterprise Drive, Cedar Falls, IA 50613, TEL (319)277-2401



Cooler/Sample Receipt and Temperature Log Form

Client Information			
Client: <u>MUSCAthe River & water</u>			
City/State: <u>MUSCAthe IA</u>		Project: <u>MUSCAthe River</u>	
Receipt Information			
Date/Time Received: <u>4/22/18</u> <u>055</u>		Received By: <u>HM</u>	
Delivery Type: <input checked="" type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input type="checkbox"/> TA Courier <input type="checkbox"/> TA Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
Condition of Cooler/Containers			
Sample(s) received in Cooler?		If yes: Cooler ID:	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Multiple Coolers?		If yes: Cooler # _____ of _____	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Cooler Custody Seals Present?		If yes: Cooler custody seals intact?	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?		If yes: Sample custody seals intact?	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?		If yes: Which VOA samples are in cooler? ↓	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Temperature Record			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID: <u>H</u>		Correction Factor (°C): <u>+0.0</u>	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): <u>0.2</u>		Corrected Temp (°C): <u>0.2</u>	
• Sample Container Temperature			
Container type(s) used:			
Uncorrected Temp (°C):		Corrected Temp (°C):	
Exceptions Noted			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			

TestAmerica Cedar Falls

704 Enterprise Drive
Cedar Falls, IA 50613
Phone (319) 277-2401 Fax (319) 277-2425

Chain of Custody Record

TestAmerica

704 ENTERPRISE DRIVE CEDAR FALLS, IA 50613

Client Information Client Contact: Sam Bennett MP&W and Greg Brennan (HR Green) Address: 1700 Dick Drake Way City: Muscatine State, Zip: IA, 52761 Phone: 170044-18327 Email: sbennett@mpw.org and gbrennan@hrgreen.com Project Name: Muscatine Power & Water CCR Landfill Site: Iowa		Sampler: <u>Shawn Bennett</u> Lab POC: Hayes, Shawn M E-Mail: shawn.hayes@testamericainc.com Phone:		Carrier Tracking No(s): Job #:		COC No: Page:	
Analysis Requested Due Date Requested: <u>by 7/14/18</u> TAT Requested (days): PO #: 170044-18327 WO #:		Field Filtered Sample (Yes or No) <input checked="" type="checkbox"/> Perform MS/MSD (Yes or No) <input checked="" type="checkbox"/> 9315_Ra226, 9320_Ra228, Combined Ra226 and Ra228 6026A CCR List, 7470A Mercury 2540C TDS, SM4500 H+ pH 9056A Chloride, Fluoride, Sulfate		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 Other:		Special Instructions/Note: Total Number of Containers: <u>1</u>	
Sample Identification MW-4A MW-5B MW-6A MW-8 MW-10 MW-13 MW-16A MW-16B MW-18A MW-21 MW-22		Sample Date 6-19-18 6-19-18 6-20-18 6-20-18 6-21-18 6-21-18 6-21-18 6-21-18 6-21-18 6-21-18		Sample Type (C=Comp, G=grab) Matrix (W=Water, S=Sediment, O=Other) Preservation Code:		Special Instructions/Note: Total Number of Containers: <u>1</u>	
Possible Hazard Identification <input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological Deliverable Requested: I, II, III, IV, Other (specify)		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months		Special Instructions/QC Requirements:		Method of Shipment:	
Empty Kit Relinquished by:		Date:		Time:		Received by:	
Relinquished by: <u>Shawn Bennett</u>		Date/Time: <u>6/21/18 0800</u>		Company:		Date/Time:	
Relinquished by: <u>Shawn Bennett</u>		Date/Time: <u>6/21/18 0835</u>		Company:		Date/Time:	
Relinquished by:		Date/Time:		Company:		Date/Time:	
Custody Seals Intact: <u>Δ Yes Δ No</u>		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:		Company:	

TestAmerica Cedar Falls

704 Enterprise Drive
Cedar Falls, IA 50613
Phone (319) 277-2401 Fax (319) 277-2425

Chain of Custody Record

TestAmerica

THE TESTER IS RESPONSIBLE FOR THE

Client Information Company: Muscaline Power & Water Address: 1700 Dick Drake Way City: Muscatine State, Zip: IA, 52761 Phone: Email: sbennett@mpw.org and gbrennan@hrgreen.com Project Name: Muscaline Power & Water CCR Landfill Site: Iowa		Lab PM: Hayes, Shawn M E-Mail: shawn.hayes@testamericainc.com Carrier Tracking No(s): Job #:		COC No: Page: Job #:	
Analysis Requested Due Date Requested: 6/7/18 TAT Requested (days): PO # 185307 WO #: TestAmerica Project #: 31007856 Event: Federal List		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 Other: M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)			
Sample Identification MW-23 MW-24 MW-25 Duplicate		Sample Date 6-20-18 6-20-18 6-19-18 6-19-18		Sample Time 1100 0915 1045 1200	
Sample Type (C=comp, G=grab) Matrix (W=water, S=solid, O=other, B=BT-TSAA, J=Jab)		Field Filtered Sample (Yes or No) Perform MS/MSD (Yes or No) 8315, Ra226, 9320, Ra228, Combined Ra226 and Ra228 6020A CCR List, 7470A Mercury 2540C TDS, 564500, H+ pH 9056A Chloride, Fluoride, Sulfate			
Sample Date 6-20-18 6-20-18 6-19-18 6-19-18		Total Number of Containers Special Instructions/Note:			
Possible Hazard Identification <input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For Months			
Deliverable Requested: I, II, III, IV, Other (specify)		Special Instructions/OC Requirements:			
Empty Kit Relinquished by: Sam Bennett Relinquished by: Neil Hulse		Date: 6/21/18 0800 Date: 6/21/18 0831 Date:			
Relinquished by:		Method of Shipment:			
Relinquished by:		Received by:			
Relinquished by:		Received by:			
Relinquished by:		Received by:			
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Cooler Temperature(s) °C and Other Remarks:			

Temperature readings: _____

<u>Client Sample ID</u>	<u>Lab ID</u>	<u>Container Type</u>	<u>Container pH</u>	<u>Preservative Added (mls)</u>	<u>Lot #</u>
MW-08	310-133152-A-1	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-10	310-133152-A-2	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-21	310-133152-A-3	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-22	310-133152-A-4	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-22	310-133152-C-4	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-22	310-133152-D-4	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-23	310-133152-A-5	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-23	310-133152-C-5	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-23	310-133152-D-5	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-24	310-133152-A-6	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-24	310-133152-C-6	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-24	310-133152-D-6	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-25	310-133152-A-7	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-25	310-133152-C-7	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-25	310-133152-D-7	Plastic 1 liter - Nitric Acid	<2	_____	_____
Duplicate	310-133152-A-8	Plastic 250ml - with Nitric Acid	<2	_____	_____
Duplicate	310-133152-C-8	Plastic 1 liter - Nitric Acid	<2	_____	_____
Duplicate	310-133152-D-8	Plastic 1 liter - Nitric Acid	<2	_____	_____

Login Sample Receipt Checklist

Client: Muscatine Power & Water

Job Number: 310-133152-1

Login Number: 133152

List Source: TestAmerica Cedar Falls

List Number: 1

Creator: Hummel, Matt R

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Cedar Falls

704 Enterprise Drive

Cedar Falls, IA 50613

Tel: (319)277-2401

TestAmerica Job ID: 310-133278-1

Client Project/Site: Muscatine Power & Water CCR Landfill

For:

Muscatine Power & Water

1700 Dick Drake Way

PO BOX 899

Muscatine, Iowa 52761

Attn: Sam Bennett



Authorized for release by:

7/16/2018 10:09:13 AM

Shawn Hayes, Senior Project Manager

(319)229-8211

shawn.hayes@testamericainc.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR Landfill

TestAmerica Job ID: 310-133278-1

Job ID: 310-133278-1

Laboratory: TestAmerica Cedar Falls

Narrative

Job Narrative
310-133278-1

Comments

No additional comments.

Receipt

The samples were received on 6/26/2018 9:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.1° C.

HPLC/IC

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Sample Summary

Client: Muscatine Power & Water

TestAmerica Job ID: 310-133278-1

Project/Site: Muscatine Power & Water CCR Landfill

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-133278-1	MW-4A	Ground Water	06/21/18 08:05	06/26/18 09:15
310-133278-2	MW-5B	Ground Water	06/21/18 09:45	06/26/18 09:15
310-133278-3	MW-6A	Ground Water	06/21/18 08:50	06/26/18 09:15
310-133278-4	MW-13	Ground Water	06/20/18 17:20	06/26/18 09:15
310-133278-5	MW-14A	Ground Water	06/20/18 14:25	06/26/18 09:15
310-133278-6	MW-15A	Ground Water	06/20/18 13:00	06/26/18 09:15
310-133278-7	MW-18A	Ground Water	06/20/18 15:15	06/26/18 09:15

Detection Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR Landfill

TestAmerica Job ID: 310-133278-1

Client Sample ID: MW-4A

Lab Sample ID: 310-133278-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Chloride	15.3		5.00		mg/L	5			9056A	Total/NA
Sulfate	51.3		5.00		mg/L	5			9056A	Total/NA
Barium	0.144		0.00200		mg/L	1			6020A	Total/NA
Calcium	91.4		0.200		mg/L	1			6020A	Total/NA
Total Dissolved Solids	440		30.0		mg/L	1			SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil	Fac	D	Method	Prep Type
pH	7.5	HF	0.1		SU	1			SM 4500 H+ B	Total/NA

Client Sample ID: MW-5B

Lab Sample ID: 310-133278-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Chloride	65.0		5.00		mg/L	5			9056A	Total/NA
Sulfate	119		5.00		mg/L	5			9056A	Total/NA
Barium	0.336		0.00200		mg/L	1			6020A	Total/NA
Calcium	147		0.200		mg/L	1			6020A	Total/NA
Total Dissolved Solids	828		30.0		mg/L	1			SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil	Fac	D	Method	Prep Type
pH	7.3	HF	0.1		SU	1			SM 4500 H+ B	Total/NA

Client Sample ID: MW-6A

Lab Sample ID: 310-133278-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Barium	0.222		0.00200		mg/L	1			6020A	Total/NA
Calcium	80.1		0.200		mg/L	1			6020A	Total/NA
Total Dissolved Solids	368		30.0		mg/L	1			SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil	Fac	D	Method	Prep Type
pH	7.6	HF	0.1		SU	1			SM 4500 H+ B	Total/NA

Client Sample ID: MW-13

Lab Sample ID: 310-133278-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Chloride	5.84		5.00		mg/L	5			9056A	Total/NA
Fluoride	0.528		0.500		mg/L	5			9056A	Total/NA
Sulfate	62.1		5.00		mg/L	5			9056A	Total/NA
Barium	0.118		0.00200		mg/L	1			6020A	Total/NA
Boron	1.34		0.200		mg/L	1			6020A	Total/NA
Calcium	89.5		0.200		mg/L	1			6020A	Total/NA
Molybdenum	0.00296		0.00200		mg/L	1			6020A	Total/NA
Total Dissolved Solids	472		30.0		mg/L	1			SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil	Fac	D	Method	Prep Type
pH	7.5	HF	0.1		SU	1			SM 4500 H+ B	Total/NA

Client Sample ID: MW-14A

Lab Sample ID: 310-133278-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Chloride	29.0		5.00		mg/L	5			9056A	Total/NA
Fluoride	0.684		0.500		mg/L	5			9056A	Total/NA
Sulfate	1090		50.0		mg/L	50			9056A	Total/NA
Barium	0.0314		0.00200		mg/L	1			6020A	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Cedar Falls

Detection Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR Landfill

TestAmerica Job ID: 310-133278-1

Client Sample ID: MW-14A (Continued)

Lab Sample ID: 310-133278-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Boron	15.0		2.00		mg/L	10			6020A	Total/NA
Calcium	297		0.200		mg/L	1			6020A	Total/NA
Selenium	0.00739		0.00500		mg/L	1			6020A	Total/NA
Total Dissolved Solids	1800		30.0		mg/L	1			SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil	Fac	D	Method	Prep Type
pH	7.8	HF	0.1		SU	1			SM 4500 H+ B	Total/NA

Client Sample ID: MW-15A

Lab Sample ID: 310-133278-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Sulfate	210		5.00		mg/L	5			9056A	Total/NA
Barium	0.0338		0.00200		mg/L	1			6020A	Total/NA
Boron	10.5		2.00		mg/L	10			6020A	Total/NA
Calcium	102		0.200		mg/L	1			6020A	Total/NA
Total Dissolved Solids	676		30.0		mg/L	1			SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil	Fac	D	Method	Prep Type
pH	7.6	HF	0.1		SU	1			SM 4500 H+ B	Total/NA

Client Sample ID: MW-18A

Lab Sample ID: 310-133278-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Chloride	25.6		5.00		mg/L	5			9056A	Total/NA
Sulfate	709		50.0		mg/L	50			9056A	Total/NA
Barium	0.0352		0.00200		mg/L	1			6020A	Total/NA
Boron	13.3		2.00		mg/L	10			6020A	Total/NA
Calcium	264		0.200		mg/L	1			6020A	Total/NA
Total Dissolved Solids	1890		150		mg/L	1			SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil	Fac	D	Method	Prep Type
pH	7.3	HF	0.1		SU	1			SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Cedar Falls

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR Landfill

TestAmerica Job ID: 310-133278-1

Client Sample ID: MW-4A

Date Collected: 06/21/18 08:05

Date Received: 06/26/18 09:15

Lab Sample ID: 310-133278-1

Matrix: Ground Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	15.3		5.00		mg/L	-		06/27/18 22:33	5
Fluoride	<0.500		0.500		mg/L	-		06/27/18 22:33	5
Sulfate	51.3		5.00		mg/L	-		06/27/18 22:33	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L	-	06/27/18 08:01	06/28/18 13:06	1
Arsenic	<0.00200		0.00200		mg/L	-	06/27/18 08:01	06/28/18 13:06	1
Barium	0.144		0.00200		mg/L	-	06/27/18 08:01	06/28/18 13:06	1
Beryllium	<0.00100		0.00100		mg/L	-	06/27/18 08:01	06/28/18 13:06	1
Boron	<0.200		0.200		mg/L	-	06/27/18 08:01	06/28/18 13:06	1
Cadmium	<0.000500		0.000500		mg/L	-	06/27/18 08:01	06/28/18 13:06	1
Calcium	91.4		0.200		mg/L	-	06/27/18 08:01	06/28/18 13:06	1
Chromium	<0.00500		0.00500		mg/L	-	06/27/18 08:01	06/28/18 13:06	1
Cobalt	<0.000500		0.000500		mg/L	-	06/27/18 08:01	06/28/18 13:06	1
Lead	<0.000500		0.000500		mg/L	-	06/27/18 08:01	06/28/18 13:06	1
Lithium	<0.0100		0.0100		mg/L	-	06/27/18 08:01	06/28/18 13:06	1
Molybdenum	<0.00200		0.00200		mg/L	-	06/27/18 08:01	06/28/18 13:06	1
Selenium	<0.00500		0.00500		mg/L	-	06/27/18 08:01	06/28/18 13:06	1
Thallium	<0.00100		0.00100		mg/L	-	06/27/18 08:01	06/28/18 13:06	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L	-	06/28/18 07:42	06/29/18 12:59	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	440		30.0		mg/L	-		06/26/18 13:53	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.5	HF	0.1		SU	-		06/26/18 15:06	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR Landfill

TestAmerica Job ID: 310-133278-1

Client Sample ID: MW-5B

Date Collected: 06/21/18 09:45

Date Received: 06/26/18 09:15

Lab Sample ID: 310-133278-2

Matrix: Ground Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	65.0		5.00		mg/L	-		06/27/18 22:51	5
Fluoride	<0.500		0.500		mg/L	-		06/27/18 22:51	5
Sulfate	119		5.00		mg/L	-		06/27/18 22:51	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L	-	06/27/18 08:01	06/28/18 13:09	1
Arsenic	<0.00200		0.00200		mg/L	-	06/27/18 08:01	06/28/18 13:09	1
Barium	0.336		0.00200		mg/L	-	06/27/18 08:01	06/28/18 13:09	1
Beryllium	<0.00100		0.00100		mg/L	-	06/27/18 08:01	06/28/18 13:09	1
Boron	<0.200		0.200		mg/L	-	06/27/18 08:01	06/28/18 13:09	1
Cadmium	<0.000500		0.000500		mg/L	-	06/27/18 08:01	06/28/18 13:09	1
Calcium	147		0.200		mg/L	-	06/27/18 08:01	06/28/18 13:09	1
Chromium	<0.00500		0.00500		mg/L	-	06/27/18 08:01	06/28/18 13:09	1
Cobalt	<0.000500		0.000500		mg/L	-	06/27/18 08:01	06/28/18 13:09	1
Lead	<0.000500		0.000500		mg/L	-	06/27/18 08:01	06/28/18 13:09	1
Lithium	<0.0100		0.0100		mg/L	-	06/27/18 08:01	06/28/18 13:09	1
Molybdenum	<0.00200		0.00200		mg/L	-	06/27/18 08:01	06/28/18 13:09	1
Selenium	<0.00500		0.00500		mg/L	-	06/27/18 08:01	06/28/18 13:09	1
Thallium	<0.00100		0.00100		mg/L	-	06/27/18 08:01	06/28/18 13:09	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L	-	06/28/18 07:42	06/29/18 13:01	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	828		30.0		mg/L	-		06/26/18 13:53	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.3	HF	0.1		SU	-		06/26/18 15:08	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR Landfill

TestAmerica Job ID: 310-133278-1

Client Sample ID: MW-6A

Date Collected: 06/21/18 08:50

Date Received: 06/26/18 09:15

Lab Sample ID: 310-133278-3

Matrix: Ground Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<5.00		5.00		mg/L			06/27/18 23:09	5
Fluoride	<0.500		0.500		mg/L			06/27/18 23:09	5
Sulfate	<5.00		5.00		mg/L			06/27/18 23:09	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		06/27/18 08:01	06/28/18 13:12	1
Arsenic	<0.00200		0.00200		mg/L		06/27/18 08:01	06/28/18 13:12	1
Barium	0.222		0.00200		mg/L		06/27/18 08:01	06/28/18 13:12	1
Beryllium	<0.00100		0.00100		mg/L		06/27/18 08:01	06/28/18 13:12	1
Boron	<0.200		0.200		mg/L		06/27/18 08:01	06/28/18 13:12	1
Cadmium	<0.000500		0.000500		mg/L		06/27/18 08:01	06/28/18 13:12	1
Calcium	80.1		0.200		mg/L		06/27/18 08:01	06/28/18 13:12	1
Chromium	<0.00500		0.00500		mg/L		06/27/18 08:01	06/28/18 13:12	1
Cobalt	<0.000500		0.000500		mg/L		06/27/18 08:01	06/28/18 13:12	1
Lead	<0.000500		0.000500		mg/L		06/27/18 08:01	06/28/18 13:12	1
Lithium	<0.0100		0.0100		mg/L		06/27/18 08:01	06/28/18 13:12	1
Molybdenum	<0.00200		0.00200		mg/L		06/27/18 08:01	06/28/18 13:12	1
Selenium	<0.00500		0.00500		mg/L		06/27/18 08:01	06/28/18 13:12	1
Thallium	<0.00100		0.00100		mg/L		06/27/18 08:01	06/28/18 13:12	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		06/28/18 07:42	06/29/18 13:03	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	368		30.0		mg/L			06/26/18 13:53	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.6	HF	0.1		SU			06/26/18 15:09	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR Landfill

TestAmerica Job ID: 310-133278-1

Client Sample ID: MW-13

Date Collected: 06/20/18 17:20

Date Received: 06/26/18 09:15

Lab Sample ID: 310-133278-4

Matrix: Ground Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	5.84		5.00		mg/L			06/27/18 22:28	5
Fluoride	0.528		0.500		mg/L			06/27/18 22:28	5
Sulfate	62.1		5.00		mg/L			06/27/18 22:28	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		06/27/18 08:01	06/28/18 13:16	1
Arsenic	<0.00200		0.00200		mg/L		06/27/18 08:01	06/28/18 13:16	1
Barium	0.118		0.00200		mg/L		06/27/18 08:01	06/28/18 13:16	1
Beryllium	<0.00100		0.00100		mg/L		06/27/18 08:01	06/28/18 13:16	1
Boron	1.34		0.200		mg/L		06/27/18 08:01	06/28/18 13:16	1
Cadmium	<0.000500		0.000500		mg/L		06/27/18 08:01	06/28/18 13:16	1
Calcium	89.5		0.200		mg/L		06/27/18 08:01	06/28/18 13:16	1
Chromium	<0.00500		0.00500		mg/L		06/27/18 08:01	06/28/18 13:16	1
Cobalt	<0.000500		0.000500		mg/L		06/27/18 08:01	06/28/18 13:16	1
Lead	<0.000500		0.000500		mg/L		06/27/18 08:01	06/28/18 13:16	1
Lithium	<0.0100		0.0100		mg/L		06/27/18 08:01	06/28/18 13:16	1
Molybdenum	0.00296		0.00200		mg/L		06/27/18 08:01	06/28/18 13:16	1
Selenium	<0.00500		0.00500		mg/L		06/27/18 08:01	06/28/18 13:16	1
Thallium	<0.00100		0.00100		mg/L		06/27/18 08:01	06/28/18 13:16	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		06/28/18 07:42	06/29/18 13:04	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	472		30.0		mg/L			06/26/18 13:53	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.5	HF	0.1		SU			06/26/18 15:15	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR Landfill

TestAmerica Job ID: 310-133278-1

Client Sample ID: MW-14A

Date Collected: 06/20/18 14:25

Date Received: 06/26/18 09:15

Lab Sample ID: 310-133278-5

Matrix: Ground Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	29.0		5.00		mg/L			06/28/18 00:04	5
Fluoride	0.684		0.500		mg/L			06/28/18 00:04	5
Sulfate	1090		50.0		mg/L			06/28/18 00:22	50

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		06/27/18 08:01	06/28/18 13:40	1
Arsenic	<0.00200		0.00200		mg/L		06/27/18 08:01	06/28/18 13:40	1
Barium	0.0314		0.00200		mg/L		06/27/18 08:01	06/28/18 13:40	1
Beryllium	<0.00100		0.00100		mg/L		06/27/18 08:01	06/28/18 13:40	1
Boron	15.0		2.00		mg/L		06/27/18 08:01	06/29/18 12:24	10
Cadmium	<0.000500		0.000500		mg/L		06/27/18 08:01	06/28/18 13:40	1
Calcium	297		0.200		mg/L		06/27/18 08:01	06/28/18 13:40	1
Chromium	<0.00500		0.00500		mg/L		06/27/18 08:01	06/28/18 13:40	1
Cobalt	<0.000500		0.000500		mg/L		06/27/18 08:01	06/28/18 13:40	1
Lead	<0.000500		0.000500		mg/L		06/27/18 08:01	06/28/18 13:40	1
Lithium	<0.0100		0.0100		mg/L		06/27/18 08:01	06/28/18 13:40	1
Molybdenum	<0.00200		0.00200		mg/L		06/27/18 08:01	06/28/18 13:40	1
Selenium	0.00739		0.00500		mg/L		06/27/18 08:01	06/28/18 13:40	1
Thallium	<0.00100		0.00100		mg/L		06/27/18 08:01	06/28/18 13:40	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		06/28/18 07:42	06/29/18 13:06	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1800		30.0		mg/L			06/26/18 13:53	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.8	HF	0.1		SU			06/26/18 15:18	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR Landfill

TestAmerica Job ID: 310-133278-1

Client Sample ID: MW-15A

Date Collected: 06/20/18 13:00

Date Received: 06/26/18 09:15

Lab Sample ID: 310-133278-6

Matrix: Ground Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<5.00		5.00		mg/L			06/28/18 00:40	5
Fluoride	<0.500		0.500		mg/L			06/28/18 00:40	5
Sulfate	210		5.00		mg/L			06/28/18 00:40	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		06/27/18 08:01	06/28/18 13:44	1
Arsenic	<0.00200		0.00200		mg/L		06/27/18 08:01	06/28/18 13:44	1
Barium	0.0338		0.00200		mg/L		06/27/18 08:01	06/28/18 13:44	1
Beryllium	<0.00100		0.00100		mg/L		06/27/18 08:01	06/28/18 13:44	1
Boron	10.5		2.00		mg/L		06/27/18 08:01	06/29/18 12:27	10
Cadmium	<0.000500		0.000500		mg/L		06/27/18 08:01	06/28/18 13:44	1
Calcium	102		0.200		mg/L		06/27/18 08:01	06/28/18 13:44	1
Chromium	<0.00500		0.00500		mg/L		06/27/18 08:01	06/28/18 13:44	1
Cobalt	<0.000500		0.000500		mg/L		06/27/18 08:01	06/28/18 13:44	1
Lead	<0.000500		0.000500		mg/L		06/27/18 08:01	06/28/18 13:44	1
Lithium	<0.0100		0.0100		mg/L		06/27/18 08:01	06/28/18 13:44	1
Molybdenum	<0.00200		0.00200		mg/L		06/27/18 08:01	06/28/18 13:44	1
Selenium	<0.00500		0.00500		mg/L		06/27/18 08:01	06/28/18 13:44	1
Thallium	<0.00100		0.00100		mg/L		06/27/18 08:01	06/28/18 13:44	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		06/28/18 07:42	06/29/18 13:09	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	676		30.0		mg/L			06/26/18 13:53	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.6	HF	0.1		SU			06/26/18 15:23	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR Landfill

TestAmerica Job ID: 310-133278-1

Client Sample ID: MW-18A

Date Collected: 06/20/18 15:15

Date Received: 06/26/18 09:15

Lab Sample ID: 310-133278-7

Matrix: Ground Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	25.6		5.00		mg/L	-		06/28/18 01:53	5
Fluoride	<0.500		0.500		mg/L	-		06/28/18 01:53	5
Sulfate	709		50.0		mg/L	-		06/28/18 02:12	50

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L	-	06/27/18 08:01	06/28/18 13:47	1
Arsenic	<0.00200		0.00200		mg/L	-	06/27/18 08:01	06/28/18 13:47	1
Barium	0.0352		0.00200		mg/L	-	06/27/18 08:01	06/28/18 13:47	1
Beryllium	<0.00100		0.00100		mg/L	-	06/27/18 08:01	06/28/18 13:47	1
Boron	13.3		2.00		mg/L	-	06/27/18 08:01	06/29/18 12:30	10
Cadmium	<0.000500		0.000500		mg/L	-	06/27/18 08:01	06/28/18 13:47	1
Calcium	264		0.200		mg/L	-	06/27/18 08:01	06/28/18 13:47	1
Chromium	<0.00500		0.00500		mg/L	-	06/27/18 08:01	06/28/18 13:47	1
Cobalt	<0.000500		0.000500		mg/L	-	06/27/18 08:01	06/28/18 13:47	1
Lead	<0.000500		0.000500		mg/L	-	06/27/18 08:01	06/28/18 13:47	1
Lithium	<0.0100		0.0100		mg/L	-	06/27/18 08:01	06/28/18 13:47	1
Molybdenum	<0.00200		0.00200		mg/L	-	06/27/18 08:01	06/28/18 13:47	1
Selenium	<0.00500		0.00500		mg/L	-	06/27/18 08:01	06/28/18 13:47	1
Thallium	<0.00100		0.00100		mg/L	-	06/27/18 08:01	06/28/18 13:47	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L	-	06/28/18 07:42	06/29/18 13:07	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1890		150		mg/L	-		06/26/18 13:53	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.3	HF	0.1		SU	-		06/26/18 15:25	1

Definitions/Glossary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR Landfill

TestAmerica Job ID: 310-133278-1

Qualifiers

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

QC Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR Landfill

TestAmerica Job ID: 310-133278-1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-208249/3

Matrix: Water

Analysis Batch: 208249

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.00		1.00		mg/L			06/27/18 16:26	1
Fluoride	<0.100		0.100		mg/L			06/27/18 16:26	1
Sulfate	<1.00		1.00		mg/L			06/27/18 16:26	1

Lab Sample ID: LCS 310-208249/4

Matrix: Water

Analysis Batch: 208249

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	7.50	7.469		mg/L		100	90 - 110
Fluoride	1.50	1.523		mg/L		102	90 - 110
Sulfate	7.50	7.613		mg/L		102	90 - 110

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 310-207794/1-A

Matrix: Water

Analysis Batch: 207988

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 207794

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		06/27/18 08:00	06/28/18 12:08	1
Arsenic	<0.00200		0.00200		mg/L		06/27/18 08:00	06/28/18 12:08	1
Barium	<0.00200		0.00200		mg/L		06/27/18 08:00	06/28/18 12:08	1
Beryllium	<0.00100		0.00100		mg/L		06/27/18 08:00	06/28/18 12:08	1
Boron	<0.200		0.200		mg/L		06/27/18 08:00	06/28/18 12:08	1
Cadmium	<0.000500		0.000500		mg/L		06/27/18 08:00	06/28/18 12:08	1
Calcium	<0.200		0.200		mg/L		06/27/18 08:00	06/28/18 12:08	1
Chromium	<0.00500		0.00500		mg/L		06/27/18 08:00	06/28/18 12:08	1
Cobalt	<0.000500		0.000500		mg/L		06/27/18 08:00	06/28/18 12:08	1
Lead	<0.000500		0.000500		mg/L		06/27/18 08:00	06/28/18 12:08	1
Lithium	<0.0100		0.0100		mg/L		06/27/18 08:00	06/28/18 12:08	1
Molybdenum	<0.00200		0.00200		mg/L		06/27/18 08:00	06/28/18 12:08	1
Selenium	<0.00500		0.00500		mg/L		06/27/18 08:00	06/28/18 12:08	1
Thallium	<0.00100		0.00100		mg/L		06/27/18 08:00	06/28/18 12:08	1

Lab Sample ID: LCS 310-207794/2-A

Matrix: Water

Analysis Batch: 207988

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 207794

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.0200	0.02023		mg/L		101	80 - 120
Arsenic	0.0400	0.04093		mg/L		102	80 - 120
Barium	0.0400	0.04319		mg/L		108	80 - 120
Beryllium	0.0200	0.02277		mg/L		114	80 - 120
Boron	0.880	0.9485		mg/L		108	80 - 120
Cadmium	0.0200	0.02236		mg/L		112	80 - 120
Calcium	2.00	2.202		mg/L		110	80 - 120
Chromium	0.0400	0.04487		mg/L		112	80 - 120

TestAmerica Cedar Falls

QC Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR Landfill

TestAmerica Job ID: 310-133278-1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 310-207794/2-A

Matrix: Water

Analysis Batch: 207988

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 207794

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cobalt	0.0200	0.02160		mg/L		108	80 - 120
Lead	0.0200	0.02190		mg/L		110	80 - 120
Lithium	0.100	0.09635		mg/L		96	80 - 120
Molybdenum	0.0400	0.04249		mg/L		106	80 - 120
Selenium	0.0400	0.03923		mg/L		98	80 - 120
Thallium	0.0160	0.01702		mg/L		106	80 - 120

Lab Sample ID: 310-133278-4 DU

Matrix: Ground Water

Analysis Batch: 208024

Client Sample ID: MW-13

Prep Type: Total/NA

Prep Batch: 207794

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Antimony	<0.00100		<0.00100		mg/L		NC	20
Arsenic	<0.00200		<0.00200		mg/L		NC	20
Barium	0.118		0.1143		mg/L		3	20
Beryllium	<0.00100		<0.00100		mg/L		NC	20
Boron	1.34		1.310		mg/L		2	20
Cadmium	<0.000500		<0.000500		mg/L		NC	20
Calcium	89.5		86.71		mg/L		3	20
Chromium	<0.00500		<0.00500		mg/L		NC	20
Cobalt	<0.000500		<0.000500		mg/L		NC	20
Lead	<0.000500		<0.000500		mg/L		NC	20
Lithium	<0.0100		<0.0100		mg/L		NC	20
Molybdenum	0.00296		0.002850		mg/L		4	20
Selenium	<0.00500		<0.00500		mg/L		NC	20
Thallium	<0.00100		<0.00100		mg/L		NC	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-207915/1-A

Matrix: Water

Analysis Batch: 208120

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 207915

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		06/28/18 07:42	06/29/18 12:26	1

Lab Sample ID: LCS 310-207915/2-A

Matrix: Water

Analysis Batch: 208120

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 207915

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.00167	0.001541		mg/L		92	80 - 120

TestAmerica Cedar Falls

QC Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR Landfill

TestAmerica Job ID: 310-133278-1

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 310-207714/1

Matrix: Water

Analysis Batch: 207714

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<30.0		30.0		mg/L			06/26/18 13:53	1

Lab Sample ID: LCS 310-207714/2

Matrix: Water

Analysis Batch: 207714

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	1000	1094		mg/L		109	90 - 110

Lab Sample ID: 310-133278-1 DU

Matrix: Ground Water

Analysis Batch: 207714

Client Sample ID: MW-4A

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	440		442.0		mg/L		0.5	24

Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 310-207722/1

Matrix: Water

Analysis Batch: 207722

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.0		SU		100	98 - 102

TestAmerica Cedar Falls

QC Association Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR Landfill

TestAmerica Job ID: 310-133278-1

HPLC/IC

Analysis Batch: 208249

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-133278-1	MW-4A	Total/NA	Ground Water	9056A	
310-133278-2	MW-5B	Total/NA	Ground Water	9056A	
310-133278-3	MW-6A	Total/NA	Ground Water	9056A	
310-133278-4	MW-13	Total/NA	Ground Water	9056A	
310-133278-5	MW-14A	Total/NA	Ground Water	9056A	
310-133278-5	MW-14A	Total/NA	Ground Water	9056A	
310-133278-6	MW-15A	Total/NA	Ground Water	9056A	
310-133278-7	MW-18A	Total/NA	Ground Water	9056A	
310-133278-7	MW-18A	Total/NA	Ground Water	9056A	
MB 310-208249/3	Method Blank	Total/NA	Water	9056A	
LCS 310-208249/4	Lab Control Sample	Total/NA	Water	9056A	

Metals

Prep Batch: 207794

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-133278-1	MW-4A	Total/NA	Ground Water	3010A	
310-133278-2	MW-5B	Total/NA	Ground Water	3010A	
310-133278-3	MW-6A	Total/NA	Ground Water	3010A	
310-133278-4	MW-13	Total/NA	Ground Water	3010A	
310-133278-5	MW-14A	Total/NA	Ground Water	3010A	
310-133278-6	MW-15A	Total/NA	Ground Water	3010A	
310-133278-7	MW-18A	Total/NA	Ground Water	3010A	
MB 310-207794/1-A	Method Blank	Total/NA	Water	3010A	
LCS 310-207794/2-A	Lab Control Sample	Total/NA	Water	3010A	
310-133278-4 DU	MW-13	Total/NA	Ground Water	3010A	

Prep Batch: 207915

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-133278-1	MW-4A	Total/NA	Ground Water	7470A	
310-133278-2	MW-5B	Total/NA	Ground Water	7470A	
310-133278-3	MW-6A	Total/NA	Ground Water	7470A	
310-133278-4	MW-13	Total/NA	Ground Water	7470A	
310-133278-5	MW-14A	Total/NA	Ground Water	7470A	
310-133278-6	MW-15A	Total/NA	Ground Water	7470A	
310-133278-7	MW-18A	Total/NA	Ground Water	7470A	
MB 310-207915/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-207915/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 207988

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 310-207794/1-A	Method Blank	Total/NA	Water	6020A	207794
LCS 310-207794/2-A	Lab Control Sample	Total/NA	Water	6020A	207794

Analysis Batch: 208024

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-133278-1	MW-4A	Total/NA	Ground Water	6020A	207794
310-133278-2	MW-5B	Total/NA	Ground Water	6020A	207794
310-133278-3	MW-6A	Total/NA	Ground Water	6020A	207794
310-133278-4	MW-13	Total/NA	Ground Water	6020A	207794

TestAmerica Cedar Falls

QC Association Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR Landfill

TestAmerica Job ID: 310-133278-1

Metals (Continued)

Analysis Batch: 208024 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-133278-5	MW-14A	Total/NA	Ground Water	6020A	207794
310-133278-6	MW-15A	Total/NA	Ground Water	6020A	207794
310-133278-7	MW-18A	Total/NA	Ground Water	6020A	207794
310-133278-4 DU	MW-13	Total/NA	Ground Water	6020A	207794

Analysis Batch: 208120

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-133278-1	MW-4A	Total/NA	Ground Water	7470A	207915
310-133278-2	MW-5B	Total/NA	Ground Water	7470A	207915
310-133278-3	MW-6A	Total/NA	Ground Water	7470A	207915
310-133278-4	MW-13	Total/NA	Ground Water	7470A	207915
310-133278-5	MW-14A	Total/NA	Ground Water	7470A	207915
310-133278-6	MW-15A	Total/NA	Ground Water	7470A	207915
310-133278-7	MW-18A	Total/NA	Ground Water	7470A	207915
MB 310-207915/1-A	Method Blank	Total/NA	Water	7470A	207915
LCS 310-207915/2-A	Lab Control Sample	Total/NA	Water	7470A	207915

Analysis Batch: 208163

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-133278-5	MW-14A	Total/NA	Ground Water	6020A	207794
310-133278-6	MW-15A	Total/NA	Ground Water	6020A	207794
310-133278-7	MW-18A	Total/NA	Ground Water	6020A	207794

General Chemistry

Analysis Batch: 207714

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-133278-1	MW-4A	Total/NA	Ground Water	SM 2540C	
310-133278-2	MW-5B	Total/NA	Ground Water	SM 2540C	
310-133278-3	MW-6A	Total/NA	Ground Water	SM 2540C	
310-133278-4	MW-13	Total/NA	Ground Water	SM 2540C	
310-133278-5	MW-14A	Total/NA	Ground Water	SM 2540C	
310-133278-6	MW-15A	Total/NA	Ground Water	SM 2540C	
310-133278-7	MW-18A	Total/NA	Ground Water	SM 2540C	
MB 310-207714/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-207714/2	Lab Control Sample	Total/NA	Water	SM 2540C	
310-133278-1 DU	MW-4A	Total/NA	Ground Water	SM 2540C	

Analysis Batch: 207722

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-133278-1	MW-4A	Total/NA	Ground Water	SM 4500 H+ B	
310-133278-2	MW-5B	Total/NA	Ground Water	SM 4500 H+ B	
310-133278-3	MW-6A	Total/NA	Ground Water	SM 4500 H+ B	
310-133278-4	MW-13	Total/NA	Ground Water	SM 4500 H+ B	
310-133278-5	MW-14A	Total/NA	Ground Water	SM 4500 H+ B	
310-133278-6	MW-15A	Total/NA	Ground Water	SM 4500 H+ B	
310-133278-7	MW-18A	Total/NA	Ground Water	SM 4500 H+ B	
LCS 310-207722/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	

TestAmerica Cedar Falls

Lab Chronicle

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR Landfill

TestAmerica Job ID: 310-133278-1

Client Sample ID: MW-4A

Date Collected: 06/21/18 08:05

Date Received: 06/26/18 09:15

Lab Sample ID: 310-133278-1

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	208249	06/27/18 22:33	CJT	TAL CF
Total/NA	Prep	3010A			207794	06/27/18 08:01	JNR	TAL CF
Total/NA	Analysis	6020A		1	208024	06/28/18 13:06	SAD	TAL CF
Total/NA	Prep	7470A			207915	06/28/18 07:42	JNR	TAL CF
Total/NA	Analysis	7470A		1	208120	06/29/18 12:59	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	207714	06/26/18 13:53	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	207722	06/26/18 15:06	ARG	TAL CF

Client Sample ID: MW-5B

Date Collected: 06/21/18 09:45

Date Received: 06/26/18 09:15

Lab Sample ID: 310-133278-2

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	208249	06/27/18 22:51	CJT	TAL CF
Total/NA	Prep	3010A			207794	06/27/18 08:01	JNR	TAL CF
Total/NA	Analysis	6020A		1	208024	06/28/18 13:09	SAD	TAL CF
Total/NA	Prep	7470A			207915	06/28/18 07:42	JNR	TAL CF
Total/NA	Analysis	7470A		1	208120	06/29/18 13:01	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	207714	06/26/18 13:53	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	207722	06/26/18 15:08	ARG	TAL CF

Client Sample ID: MW-6A

Date Collected: 06/21/18 08:50

Date Received: 06/26/18 09:15

Lab Sample ID: 310-133278-3

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	208249	06/27/18 23:09	CJT	TAL CF
Total/NA	Prep	3010A			207794	06/27/18 08:01	JNR	TAL CF
Total/NA	Analysis	6020A		1	208024	06/28/18 13:12	SAD	TAL CF
Total/NA	Prep	7470A			207915	06/28/18 07:42	JNR	TAL CF
Total/NA	Analysis	7470A		1	208120	06/29/18 13:03	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	207714	06/26/18 13:53	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	207722	06/26/18 15:09	ARG	TAL CF

Client Sample ID: MW-13

Date Collected: 06/20/18 17:20

Date Received: 06/26/18 09:15

Lab Sample ID: 310-133278-4

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	208249	06/27/18 22:28	CJT	TAL CF
Total/NA	Prep	3010A			207794	06/27/18 08:01	JNR	TAL CF
Total/NA	Analysis	6020A		1	208024	06/28/18 13:16	SAD	TAL CF

TestAmerica Cedar Falls

Lab Chronicle

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR Landfill

TestAmerica Job ID: 310-133278-1

Client Sample ID: MW-13

Date Collected: 06/20/18 17:20

Date Received: 06/26/18 09:15

Lab Sample ID: 310-133278-4

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			207915	06/28/18 07:42	JNR	TAL CF
Total/NA	Analysis	7470A		1	208120	06/29/18 13:04	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	207714	06/26/18 13:53	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	207722	06/26/18 15:15	ARG	TAL CF

Client Sample ID: MW-14A

Date Collected: 06/20/18 14:25

Date Received: 06/26/18 09:15

Lab Sample ID: 310-133278-5

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	208249	06/28/18 00:04	CJT	TAL CF
Total/NA	Analysis	9056A		50	208249	06/28/18 00:22	CJT	TAL CF
Total/NA	Prep	3010A			207794	06/27/18 08:01	JNR	TAL CF
Total/NA	Analysis	6020A		1	208024	06/28/18 13:40	SAD	TAL CF
Total/NA	Prep	3010A			207794	06/27/18 08:01	JNR	TAL CF
Total/NA	Analysis	6020A		10	208163	06/29/18 12:24	SAD	TAL CF
Total/NA	Prep	7470A			207915	06/28/18 07:42	JNR	TAL CF
Total/NA	Analysis	7470A		1	208120	06/29/18 13:06	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	207714	06/26/18 13:53	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	207722	06/26/18 15:18	ARG	TAL CF

Client Sample ID: MW-15A

Date Collected: 06/20/18 13:00

Date Received: 06/26/18 09:15

Lab Sample ID: 310-133278-6

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	208249	06/28/18 00:40	CJT	TAL CF
Total/NA	Prep	3010A			207794	06/27/18 08:01	JNR	TAL CF
Total/NA	Analysis	6020A		1	208024	06/28/18 13:44	SAD	TAL CF
Total/NA	Prep	3010A			207794	06/27/18 08:01	JNR	TAL CF
Total/NA	Analysis	6020A		10	208163	06/29/18 12:27	SAD	TAL CF
Total/NA	Prep	7470A			207915	06/28/18 07:42	JNR	TAL CF
Total/NA	Analysis	7470A		1	208120	06/29/18 13:09	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	207714	06/26/18 13:53	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	207722	06/26/18 15:23	ARG	TAL CF

Client Sample ID: MW-18A

Date Collected: 06/20/18 15:15

Date Received: 06/26/18 09:15

Lab Sample ID: 310-133278-7

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	208249	06/28/18 01:53	CJT	TAL CF

TestAmerica Cedar Falls

Lab Chronicle

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR Landfill

TestAmerica Job ID: 310-133278-1

Client Sample ID: MW-18A

Date Collected: 06/20/18 15:15

Date Received: 06/26/18 09:15

Lab Sample ID: 310-133278-7

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		50	208249	06/28/18 02:12	CJT	TAL CF
Total/NA	Prep	3010A			207794	06/27/18 08:01	JNR	TAL CF
Total/NA	Analysis	6020A		1	208024	06/28/18 13:47	SAD	TAL CF
Total/NA	Prep	3010A			207794	06/27/18 08:01	JNR	TAL CF
Total/NA	Analysis	6020A		10	208163	06/29/18 12:30	SAD	TAL CF
Total/NA	Prep	7470A			207915	06/28/18 07:42	JNR	TAL CF
Total/NA	Analysis	7470A		1	208120	06/29/18 13:07	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	207714	06/26/18 13:53	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	207722	06/26/18 15:25	ARG	TAL CF

Laboratory References:

TAL CF = TestAmerica Cedar Falls, 704 Enterprise Drive, Cedar Falls, IA 50613, TEL (319)277-2401

Accreditation/Certification Summary

Client: Muscatine Power & Water

TestAmerica Job ID: 310-133278-1

Project/Site: Muscatine Power & Water CCR Landfill

Laboratory: TestAmerica Cedar Falls

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
AIHA-LAP, LLC	IHLAP		101044	11-01-18
Georgia	State Program	4	IA100001 (OR)	09-29-18
Illinois	NELAP	5	200024	11-29-18
Iowa	State Program	7	007	12-01-19
Kansas	NELAP	7	E-10341	01-31-19
Minnesota	NELAP	5	019-999-319	12-31-18
Minnesota (Petrofund)	State Program	1	3349	08-22-18
North Dakota	State Program	8	R-186	09-29-18
Oregon	NELAP	10	IA100001	09-29-18

Method Summary

Client: Muscatine Power & Water

TestAmerica Job ID: 310-133278-1

Project/Site: Muscatine Power & Water CCR Landfill

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL CF
6020A	Metals (ICP/MS)	SW846	TAL CF
7470A	Mercury (CVAA)	SW846	TAL CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CF
SM 4500 H+ B	pH	SM	TAL CF
3010A	Preparation, Total Metals	SW846	TAL CF
7470A	Preparation, Mercury	SW846	TAL CF

Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CF = TestAmerica Cedar Falls, 704 Enterprise Drive, Cedar Falls, IA 50613, TEL (319)277-2401

Cooler/Sample Receipt and Temperature Log Form

Client Information			
Client: <u>Muscantine Power & water</u>			
City/State: <u>Muscantine IA</u>		Project: <u>Muscantine power</u>	
Receipt Information			
Date/Time Received: <u>6/20/15 9:15</u>		Received By: <u>HM</u>	
Delivery Type: <input checked="" type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input type="checkbox"/> TA Courier <input type="checkbox"/> TA Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
Condition of Cooler/Containers			
Sample(s) received in Cooler? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		If yes: Cooler ID: _____	
Multiple Coolers? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		If yes: Cooler # _____ of _____	
Cooler Custody Seals Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		If yes: Which VOA samples are in cooler? <u>1</u>	
Temperature Record			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID: <u>S</u>		Correction Factor (°C): <u>+0.1</u>	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): <u>1.1</u>		Corrected Temp (°C): <u>1.1</u>	
• Sample Container Temperature			
Container type(s) used: _____			
Uncorrected Temp (°C): _____		Corrected Temp (°C): _____	
Exceptions Noted			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			

TestAmerica Cedar Falls

704 Enterprise Drive
Cedar Falls, IA 50613
Phone (319) 277-2401 Fax (319) 277-2425

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Client Information		Sampler		Lab PM:		Carrier Tracking No(s):		COC No:			
Client Contact: Sam Bennett MP&W and Greg Brennan (HR Green)		Phone: Sam Bennett		Hayes, Shawn M							
Company: Muscatine Power & Water		E-Mail: shawn.hayes@testamericainc.com									
Address: 1700 Dick Drake Way		Due Date Requested: by 7/14/18		Analysis Requested		Total Number of containers		Preservation Codes:			
City: Muscatine		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 Other:			
State, Zip: IA, 52761		PO #: 178641						M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2SO4 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)			
Phone: 178641		WO #: 183307									
Email: sbennett@mpw.org and gbrennan@hrgreen.com		Project Name: Muscatine Power & Water CCR Landfill									
Site: Iowa		Event: Federal List									
Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=other)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315 Ra226, 9320 Ra228, Combined Ra226 and Ra228	6020A CCR List, 7470A Mercury	2540C TDS, SM4500_H+ pH	9056A Chloride, Fluoride, Sulfate	Special Instructions/Note:
MW-4A	6-21-18	0805	G	W							
MW-5B	6-21-18	0945	G	W							
MW-6A	6-21-18	0850	G	W							
MW-8											
MW-10											
MW-13	6-20-18	1720	G	W							
MW-14A	6-20-18	1425	G	W							
MW-15A	6-20-18	1300	G	W							
MW-18A	6-20-18	1515	G	W							
MW-21											
MW-22											
Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological Deliverable Requested: I, II, III, IV, Other (specify)											
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months Special Instructions/OC Requirements:											
Empty Kit Relinquished by:											
Relinquished by: Sam Bennett Date/Time: 6/25/18 0832 Company: mpw											
Relinquished by: Date/Time: Company:											
Relinquished by: Date/Time: Company:											
Custody Seal No.: _____ Cooler Temperature(s) °C and Other Remarks:											

Temperature readings: _____

<u>Client Sample ID</u>	<u>Lab ID</u>	<u>Container Type</u>	<u>Container</u> <u>pH</u>	<u>Preservative</u> <u>Added (mls)</u>	<u>Lot #</u>
MW-4A	310-133278-A-1	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-5B	310-133278-A-2	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-6A	310-133278-A-3	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-13	310-133278-A-4	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-14A	310-133278-A-5	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-15A	310-133278-A-6	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-18A	310-133278-A-7	Plastic 250ml - with Nitric Acid	<2	_____	_____

Login Sample Receipt Checklist

Client: Muscatine Power & Water

Job Number: 310-133278-1

Login Number: 133278

List Source: TestAmerica Cedar Falls

List Number: 1

Creator: Patrick, Kathryn E

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Cedar Falls

704 Enterprise Drive

Cedar Falls, IA 50613

Tel: (319)277-2401

TestAmerica Job ID: 310-133152-2

Client Project/Site: Muscatine Power & Water CCR

For:

Muscatine Power & Water

1700 Dick Drake Way

PO BOX 899

Muscatine, Iowa 52761

Attn: Sam Bennett



Authorized for release by:

7/25/2018 4:44:58 PM

Shawn Hayes, Senior Project Manager

(319)229-8211

shawn.hayes@testamericainc.com

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results through

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www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-2

Job ID: 310-133152-2

Laboratory: TestAmerica Cedar Falls

Narrative

Job Narrative
310-133152-2

Comments

No additional comments.

Receipt

The samples were received on 6/22/2018 8:55 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.2° C.

RAD

Method(s) PrecSep_0: Radium 228 Prep Batch 160-373231:

Sample aliquot reduced due to potential matrix interference. Sample was yellow, opaque, and had a strong odor.

MW-23 (310-133152-5)

Method(s) PrecSep-21: Radium 226 Prep Batch 160-373200:

Sample aliquot reduced due to potential matrix interference. Sample was yellow, opaque, and had a strong odor.

MW-23 (310-133152-5)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Sample Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-133152-4	MW-22	Ground Water	06/19/18 17:55	06/22/18 08:55
310-133152-5	MW-23	Ground Water	06/20/18 11:00	06/22/18 08:55
310-133152-6	MW-24	Ground Water	06/20/18 09:15	06/22/18 08:55
310-133152-7	MW-25	Ground Water	06/19/18 10:45	06/22/18 08:55
310-133152-8	Duplicate	Ground Water	06/19/18 12:00	06/22/18 08:55

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-2

Client Sample ID: MW-22

Date Collected: 06/19/18 17:55

Date Received: 06/22/18 08:55

Lab Sample ID: 310-133152-4

Matrix: Ground Water

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.284		0.174	0.176	1.00	0.218	pCi/L	06/29/18 09:07	07/24/18 16:58	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	102		40 - 110					06/29/18 09:07	07/24/18 16:58	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.128	U	0.253	0.253	1.00	0.429	pCi/L	06/29/18 11:19	07/24/18 09:31	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	102		40 - 110					06/29/18 11:19	07/24/18 09:31	1
Y Carrier	89.7		40 - 110					06/29/18 11:19	07/24/18 09:31	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.412	U	0.307	0.308	5.00	0.429	pCi/L		07/25/18 14:54	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-2

Client Sample ID: MW-23

Date Collected: 06/20/18 11:00

Date Received: 06/22/18 08:55

Lab Sample ID: 310-133152-5

Matrix: Ground Water

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.161	U	0.186	0.186	1.00	0.295	pCi/L	06/29/18 09:07	07/24/18 16:58	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.3		40 - 110					06/29/18 09:07	07/24/18 16:58	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.149	U	0.361	0.361	1.00	0.662	pCi/L	06/29/18 11:19	07/24/18 09:31	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.3		40 - 110					06/29/18 11:19	07/24/18 09:31	1
Y Carrier	85.6		40 - 110					06/29/18 11:19	07/24/18 09:31	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.0129	U	0.406	0.406	5.00	0.662	pCi/L		07/25/18 14:54	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-2

Client Sample ID: MW-24

Date Collected: 06/20/18 09:15

Date Received: 06/22/18 08:55

Lab Sample ID: 310-133152-6

Matrix: Ground Water

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0261	U	0.0795	0.0795	1.00	0.206	pCi/L	06/29/18 09:07	07/24/18 16:58	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	103		40 - 110					06/29/18 09:07	07/24/18 16:58	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.190	U	0.295	0.295	1.00	0.497	pCi/L	06/29/18 11:19	07/24/18 13:14	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	103		40 - 110					06/29/18 11:19	07/24/18 13:14	1
Y Carrier	87.5		40 - 110					06/29/18 11:19	07/24/18 13:14	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.164	U	0.306	0.306	5.00	0.497	pCi/L		07/25/18 14:54	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-2

Client Sample ID: MW-25

Date Collected: 06/19/18 10:45

Date Received: 06/22/18 08:55

Lab Sample ID: 310-133152-7

Matrix: Ground Water

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0532	U	0.0991	0.0993	1.00	0.183	pCi/L	06/29/18 09:07	07/24/18 16:59	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	98.8		40 - 110					06/29/18 09:07	07/24/18 16:59	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.635		0.261	0.267	1.00	0.363	pCi/L	06/29/18 11:19	07/24/18 09:31	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	98.8		40 - 110					06/29/18 11:19	07/24/18 09:31	1
Y Carrier	83.7		40 - 110					06/29/18 11:19	07/24/18 09:31	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.688		0.279	0.285	5.00	0.363	pCi/L		07/25/18 14:54	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-2

Client Sample ID: Duplicate

Date Collected: 06/19/18 12:00

Date Received: 06/22/18 08:55

Lab Sample ID: 310-133152-8

Matrix: Ground Water

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0303	U	0.104	0.104	1.00	0.209	pCi/L	06/29/18 09:07	07/24/18 16:59	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	102		40 - 110					06/29/18 09:07	07/24/18 16:59	1

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.286	U	0.218	0.219	1.00	0.341	pCi/L	06/29/18 11:19	07/24/18 09:31	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	102		40 - 110					06/29/18 11:19	07/24/18 09:31	1
Y Carrier	86.7		40 - 110					06/29/18 11:19	07/24/18 09:31	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.316	U	0.242	0.242	5.00	0.341	pCi/L		07/25/18 14:54	1

Definitions/Glossary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-2

Qualifiers

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

QC Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-2

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-373200/23-A

Matrix: Water

Analysis Batch: 377690

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 373200

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.03568	U	0.117	0.117	1.00	0.228	pCi/L	06/29/18 09:07	07/24/18 16:59	1
Carrier	MB %Yield	MB Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	105		40 - 110					06/29/18 09:07	07/24/18 16:59	1

Lab Sample ID: LCS 160-373200/1-A

Matrix: Water

Analysis Batch: 377646

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 373200

Analyte		Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226		11.4	11.50		1.43	1.00	0.201	pCi/L	101	68 - 137
Carrier	LCS %Yield	LCS Qualifier	Limits							
Ba Carrier	99.1		40 - 110							

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-373231/23-A

Matrix: Water

Analysis Batch: 377690

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 373231

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.06122	U	0.226	0.226	1.00	0.393	pCi/L	06/29/18 11:19	07/24/18 09:31	1
Carrier	MB %Yield	MB Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	105		40 - 110					06/29/18 11:19	07/24/18 09:31	1
Y Carrier	83.4		40 - 110					06/29/18 11:19	07/24/18 09:31	1

Lab Sample ID: LCS 160-373231/1-A

Matrix: Water

Analysis Batch: 377646

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 373231

Analyte		Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228		8.12	8.542		1.02	1.00	0.412	pCi/L	105	56 - 140
Carrier	LCS %Yield	LCS Qualifier	Limits							
Ba Carrier	99.1		40 - 110							
Y Carrier	83.4		40 - 110							

TestAmerica Cedar Falls

QC Association Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-2

Rad

Prep Batch: 373200

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-133152-4	MW-22	Total/NA	Ground Water	PrecSep-21	
310-133152-5	MW-23	Total/NA	Ground Water	PrecSep-21	
310-133152-6	MW-24	Total/NA	Ground Water	PrecSep-21	
310-133152-7	MW-25	Total/NA	Ground Water	PrecSep-21	
310-133152-8	Duplicate	Total/NA	Ground Water	PrecSep-21	
MB 160-373200/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-373200/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 373231

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-133152-4	MW-22	Total/NA	Ground Water	PrecSep_0	
310-133152-5	MW-23	Total/NA	Ground Water	PrecSep_0	
310-133152-6	MW-24	Total/NA	Ground Water	PrecSep_0	
310-133152-7	MW-25	Total/NA	Ground Water	PrecSep_0	
310-133152-8	Duplicate	Total/NA	Ground Water	PrecSep_0	
MB 160-373231/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-373231/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Lab Chronicle

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-2

Client Sample ID: MW-22

Date Collected: 06/19/18 17:55

Date Received: 06/22/18 08:55

Lab Sample ID: 310-133152-4

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			373200	06/29/18 09:07	JLC	TAL SL
Total/NA	Analysis	9315		1	377690	07/24/18 16:58	RTM	TAL SL
Total/NA	Prep	PrecSep_0			373231	06/29/18 11:19	JLC	TAL SL
Total/NA	Analysis	9320		1	377690	07/24/18 09:31	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	378055	07/25/18 14:54	RTM	TAL SL

Client Sample ID: MW-23

Date Collected: 06/20/18 11:00

Date Received: 06/22/18 08:55

Lab Sample ID: 310-133152-5

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			373200	06/29/18 09:07	JLC	TAL SL
Total/NA	Analysis	9315		1	377690	07/24/18 16:58	RTM	TAL SL
Total/NA	Prep	PrecSep_0			373231	06/29/18 11:19	JLC	TAL SL
Total/NA	Analysis	9320		1	377690	07/24/18 09:31	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	378055	07/25/18 14:54	RTM	TAL SL

Client Sample ID: MW-24

Date Collected: 06/20/18 09:15

Date Received: 06/22/18 08:55

Lab Sample ID: 310-133152-6

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			373200	06/29/18 09:07	JLC	TAL SL
Total/NA	Analysis	9315		1	377690	07/24/18 16:58	RTM	TAL SL
Total/NA	Prep	PrecSep_0			373231	06/29/18 11:19	JLC	TAL SL
Total/NA	Analysis	9320		1	377690	07/24/18 13:14	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	378055	07/25/18 14:54	RTM	TAL SL

Client Sample ID: MW-25

Date Collected: 06/19/18 10:45

Date Received: 06/22/18 08:55

Lab Sample ID: 310-133152-7

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			373200	06/29/18 09:07	JLC	TAL SL
Total/NA	Analysis	9315		1	377690	07/24/18 16:59	RTM	TAL SL
Total/NA	Prep	PrecSep_0			373231	06/29/18 11:19	JLC	TAL SL
Total/NA	Analysis	9320		1	377690	07/24/18 09:31	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	378055	07/25/18 14:54	RTM	TAL SL

TestAmerica Cedar Falls

Lab Chronicle

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-2

Client Sample ID: Duplicate

Date Collected: 06/19/18 12:00

Date Received: 06/22/18 08:55

Lab Sample ID: 310-133152-8

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			373200	06/29/18 09:07	JLC	TAL SL
Total/NA	Analysis	9315		1	377690	07/24/18 16:59	RTM	TAL SL
Total/NA	Prep	PrecSep_0			373231	06/29/18 11:19	JLC	TAL SL
Total/NA	Analysis	9320		1	377690	07/24/18 09:31	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	378055	07/25/18 14:54	RTM	TAL SL

Laboratory References:

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-2

Laboratory: TestAmerica Cedar Falls

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
AIHA-LAP, LLC	IHLAP		101044	11-01-18
Georgia	State Program	4	IA100001 (OR)	09-29-18
Illinois	NELAP	5	200024	11-29-18
Iowa	State Program	7	007	12-01-19
Kansas	NELAP	7	E-10341	01-31-19
Minnesota	NELAP	5	019-999-319	12-31-18
Minnesota (Petrofund)	State Program	1	3349	08-22-18
North Dakota	State Program	8	R-186	09-29-18
Oregon	NELAP	10	IA100001	09-29-18

Laboratory: TestAmerica St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska	State Program	10	MO00054	06-30-19
ANAB	DoD ELAP		L2305	04-06-19
Arizona	State Program	9	AZ0813	12-08-18
California	State Program	9	2886	06-30-19
Connecticut	State Program	1	PH-0241	03-31-19
Florida	NELAP	4	E87689	06-30-19
Illinois	NELAP	5	200023	11-30-18
Iowa	State Program	7	373	12-01-18
Kansas	NELAP	7	E-10236	10-31-18
Kentucky (DW)	State Program	4	90125	12-31-18
Louisiana	NELAP	6	04080	06-30-19
Louisiana (DW)	NELAP	6	LA180017	12-31-18
Maryland	State Program	3	310	09-30-18 *
Michigan	State Program	5	9005	06-30-18 *
Missouri	State Program	7	780	06-30-18 *
Nevada	State Program	9	MO000542018-1	07-31-18 *
New Jersey	NELAP	2	MO002	06-30-19
New York	NELAP	2	11616	03-31-19
North Dakota	State Program	8	R207	06-30-18 *
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-18 *
Pennsylvania	NELAP	3	68-00540	02-28-19
South Carolina	State Program	4	85002001	06-30-18 *
Texas	NELAP	6	T104704193-17-11	07-31-18 *
US Fish & Wildlife	Federal		058448	07-31-18
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542016-8	07-31-18 *
Virginia	NELAP	3	460230	06-14-19
Washington	State Program	10	C592	08-30-18 *
West Virginia DEP	State Program	3	381	08-31-18 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica Cedar Falls

Method Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-2

Method	Method Description	Protocol	Laboratory
9315	Radium-226 (GFPC)	SW846	TAL SL
9320	Radium-228 (GFPC)	SW846	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

None = None

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566



Cooler/Sample Receipt and Temperature Log Form

Client Information			
Client: <u>MUSCattoe River & water</u>			
City/State: <u>MUSCATOGE IA</u>		Project: <u>MUSCattoe River</u>	
Receipt Information			
Date/Time Received: <u>4/22/18</u> <u>055</u>		Received By: <u>HMM</u>	
Delivery Type: <input checked="" type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input type="checkbox"/> TA Courier <input type="checkbox"/> TA Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
Condition of Cooler/Containers			
Sample(s) received in Cooler?		If yes: Cooler ID:	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Multiple Coolers?		If yes: Cooler # _____ of _____	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Cooler Custody Seals Present?		If yes: Cooler custody seals intact?	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?		If yes: Sample custody seals intact?	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?		If yes: Which VOA samples are in cooler? ↓	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Temperature Record			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID: <u>H</u>		Correction Factor (°C): <u>+0.0</u>	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): <u>0.2</u>		Corrected Temp (°C): <u>0.2</u>	
• Sample Container Temperature			
Container type(s) used:			
Uncorrected Temp (°C):		Corrected Temp (°C):	
Exceptions Noted			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			

TestAmerica Cedar Falls

704 Enterprise Drive
Cedar Falls, IA 50613
Phone (319) 277-2401 Fax (319) 277-2425

Chain of Custody Record

TestAmerica

704 ENTERPRISE DRIVE CEDAR FALLS, IA 50613

Client Information Client Contact: Sam Bennett MP&W and Greg Brennan (HR Green) Address: 1700 Dick Drake Way City: Muscatine State, Zip: IA, 52761 Phone: 170044-18327 Email: sbennett@mpw.org and gbrennan@hrgreen.com Project Name: Muscatine Power & Water CCR Landfill Site: Iowa		Sampler: <u>Shawn Bennett</u> Lab POC: Hayes, Shawn M E-Mail: shawn.hayes@testamericainc.com Phone:		Carrier Tracking No(s): Job #:		COC No: Page:	
Analysis Requested Due Date Requested: <u>by 7/14/18</u> TAT Requested (days): PO #: 170044-18327 WO #: 31007856 TestAmerica Project #: 31007856 Event: Federal List				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 Other:			
Sample Identification MW-4A MW-5B MW-6A MW-8 MW-10 MW-13 MW-16A MW-16B MW-18A MW-21 MW-22		Sample Date 6-19-18 6-19-18 6-20-18 6-20-18 6-21-18 6-21-18 6-21-18 6-21-18 6-21-18 6-21-18		Sample Type (C=Comp, G=grab) Matrix (Weather, Structural, Operational) Preservation Code:		Field Filtered Sample (Yes or No) Perform MS/MSD (Yes or No) 9315_Ra226, 9320_Ra228, Combined Ra226 and Ra228 6026A CCR List, 7470A Mercury 2540C TDS, SM4500 H+ pH 9056A Chloride, Fluoride, Sulfate	
Possible Hazard Identification <input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological Deliverable Requested: I, II, III, IV, Other (specify)				Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months			
Empty Kit Relinquished by: <u>Shawn Bennett</u> Relinquished by: <u>Shawn Bennett</u> Relinquished by: <u>Shawn Bennett</u> Relinquished by:				Method of Shipment: _____ Received by: _____ Received by: <u>Shawn Bennett</u> Received by: _____ Received by:			
Custody Seals Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Custody Seal No.:				Cooler Temperature(s) °C and Other Remarks:			

TestAmerica Cedar Falls

704 Enterprise Drive
Cedar Falls, IA 50613
Phone (319) 277-2401 Fax (319) 277-2425

Chain of Custody Record

TestAmerica

THE TESTER IS RESPONSIBLE FOR THE

Client Information Company: Muscaline Power & Water Address: 1700 Dick Drake Way City: Muscaline State, Zip: IA, 52761 Phone: Email: sbennett@mpw.org and gbrennan@hrgreen.com Project Name: Muscaline Power & Water CCR Landfill Site: Iowa		Lab PM: Hayes, Shawn M E-Mail: shawn.hayes@testamericainc.com Carrier Tracking No(s): Page: Job #:		COC No: Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Iga J - DI Water K - EDTA L - EDA Other: M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)	
Analysis Requested Due Date Requested: 07/14/18 TAT Requested (days): PO # 170014 185307 WO # TestAmerica Project #: 31007856 Event: Federal List		Carrier Tracking No(s): Page: Job #:		COC No: Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Iga J - DI Water K - EDTA L - EDA Other: M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)	
Sample Identification MW-23 MW-24 MW-25 Duplicate		Sample Date 6-20-18 6-20-18 6-19-18 6-19-18		Sample Time 1100 0915 1045 1200	
Sample Type (C=comp, G=grab) Preservation Code:		Matrix (W=water, B=soil, O=ore, S=sediment, L=leachate, A=air) BR-TESMA, Job#		Field Filtered Sample (Yes or No) Perform MS/MSD (Yes or No) 8315, Ra226, 9320, Ra228, Combined Ra226 and Ra228 6020A CCR List, 7470A Mercury 2540C TDS, 564500, H+ pH 9056A Chloride, Fluoride, Sulfate	
Total Number of Containers		Special Instructions/Note:		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For Months	
Possible Hazard Identification <input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological		Deliverable Requested: I, II, III, IV, Other (specify)		Special Instructions/OC Requirements:	
Empty Kit Relinquished by:		Date:		Method of Shipment:	
Relinquished by:		Date/Time: 6/21/18 0800		Received by:	
Relinquished by:		Date/Time: 6/21/18 0831		Received by:	
Relinquished by:		Date/Time:		Received by:	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:	

Temperature readings: _____

<u>Client Sample ID</u>	<u>Lab ID</u>	<u>Container Type</u>	<u>Container pH</u>	<u>Preservative Added (mls)</u>	<u>Lot #</u>
MW-08	310-133152-A-1	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-10	310-133152-A-2	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-21	310-133152-A-3	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-22	310-133152-A-4	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-22	310-133152-C-4	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-22	310-133152-D-4	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-23	310-133152-A-5	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-23	310-133152-C-5	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-23	310-133152-D-5	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-24	310-133152-A-6	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-24	310-133152-C-6	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-24	310-133152-D-6	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-25	310-133152-A-7	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-25	310-133152-C-7	Plastic 1 liter - Nitric Acid	<2	_____	_____
MW-25	310-133152-D-7	Plastic 1 liter - Nitric Acid	<2	_____	_____
Duplicate	310-133152-A-8	Plastic 250ml - with Nitric Acid	<2	_____	_____
Duplicate	310-133152-C-8	Plastic 1 liter - Nitric Acid	<2	_____	_____
Duplicate	310-133152-D-8	Plastic 1 liter - Nitric Acid	<2	_____	_____

Login Sample Receipt Checklist

Client: Muscatine Power & Water

Job Number: 310-133152-2

Login Number: 133152

List Source: TestAmerica Cedar Falls

List Number: 1

Creator: Hummel, Matt R

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Muscatine Power & Water

Job Number: 310-133152-2

Login Number: 133152

List Number: 2

Creator: Press, Nicholas B

List Source: TestAmerica St. Louis

List Creation: 06/23/18 10:38 AM

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	18
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Muscatine Power & Water

Job Number: 310-133152-2

Login Number: 133152

List Number: 3

Creator: Press, Nicholas B

List Source: TestAmerica St. Louis

List Creation: 06/23/18 10:39 AM

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	18
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Tracer/Carrier Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-133152-2

Method: 9315 - Radium-226 (GFPC)

Matrix: Ground Water

Prep Type: Total/NA

Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba Carrier (40-110)					
310-133152-4	MW-22	102					
310-133152-5	MW-23	90.3					
310-133152-6	MW-24	103					
310-133152-7	MW-25	98.8					
310-133152-8	Duplicate	102					

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Method: 9315 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba Carrier (40-110)					
LCS 160-373200/1-A	Lab Control Sample	99.1					
MB 160-373200/23-A	Method Blank	105					

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Method: 9320 - Radium-228 (GFPC)

Matrix: Ground Water

Prep Type: Total/NA

Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	Y Carrier (40-110)				
310-133152-4	MW-22	102	89.7				
310-133152-5	MW-23	90.3	85.6				
310-133152-6	MW-24	103	87.5				
310-133152-7	MW-25	98.8	83.7				
310-133152-8	Duplicate	102	86.7				

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Y Carrier = Y Carrier

Method: 9320 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	Y Carrier (40-110)				
LCS 160-373231/1-A	Lab Control Sample	99.1	83.4				
MB 160-373231/23-A	Method Blank	105	83.4				

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Y Carrier = Y Carrier

TestAmerica Cedar Falls

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power & Water CCR Landfill Permit No. 70-SDP-6-82P
Monitoring Well/Piezometer No. MW-22
Upgradient X Downgradient _____
Name of person sampling Neil Hoskins

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) ☒ YES ☐ NO

If no, explain _____

Standing Water or Litter? (please check) ☐ YES ☒ NO

If yes, explain _____

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)

Elevation:

Top of inner well casing 744.274 Ground Elevation 741.125

Depth of Well 41 Inside Casing Diameter (in inches) 2

Equipment Used Slope Indicator Co. Water level indicator Model 51453

Groundwater Level (± 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	6/19/18, 17:00	15.41	728.86
*After Purging	6/19/18, 17:55	22.76	721.51
*Before Purging	6/19/18, 17:00	15.41	728.86

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 1.45

No. of Well Volumes (based on current water level) 0.35

Was well pumped/bailed dry? No

Equipment used:

Bailer type _____ Dedicated Bailer? _____

Pump type Peristaltic Pump Dedicated Pump? Yes

If not dedicated, method of cleaning _____

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319.

Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

D. FIELD MEASUREMENT*Weather Conditions** Mostly cloudy, 75°F, North wind**Field Measurements (after stabilization):****Temperature** 17.4 **Units** C**Equipment Used** Horiba U-50**pH** 7.90**Equipment Used** Horiba U-50**Specific Conductance** 0.690 **Units** mS/m**Equipment Used** Horiba U-50**Comments****CERTIFICATION**

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature _____ **Date** _____**Telephone** _____ **Fax** _____ **Email** _____**NOTE:** Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319.**Questions? Call or Email:** Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power & Water CCR Landfill Permit No. 70-SDP-6-82P
Monitoring Well/Piezometer No. MW-23
Upgradient X Downgradient _____
Name of person sampling Neil Hoskins

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) ☒ YES ☐ NO

If no, explain _____

Standing Water or Litter? (please check) ☐ YES ☒ NO

If yes, explain _____

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)

Elevation:

Top of inner well casing 726.901 Ground Elevation 723.732

Depth of Well 25 Inside Casing Diameter (in inches) 2

Equipment Used Slope Indicator Co. water level indicator Model 51453

Groundwater Level (± 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	6/20/18, 10:15	5.4	721.5
*After Purging	6/20/18, 11:00	10.5	716.4
*Before Purging	6/20/18, 10:15	5.4	721.5

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 0.92

No. of Well Volumes (based on current water level) 0.29

Was well pumped/bailed dry? No

Equipment used:

Bailer type _____ Dedicated Bailer? _____

Pump type Peristaltic Pump Dedicated Pump? Yes

If not dedicated, method of cleaning _____

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319.

Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

D. FIELD MEASUREMENT**Weather Conditions 75°F, Partly Cloudy, North wind**Field Measurements (after stabilization):**Temperature 21.56 Units CEquipment Used Horiba U-50pH 7.69Equipment Used Horiba U-50Specific Conductance 0.566 Units mS/mEquipment Used Horiba U-50**Comments*CERTIFICATION**

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature _____ Date _____

Telephone _____ Fax _____ Email _____

NOTE: Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319.Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power & Water CCR Landfill Permit No. 70-SDP-6-82P
Monitoring Well/Piezometer No. MW-24
Upgradient _____ Downgradient X
Name of person sampling Neil Hoskins

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) ☒ YES ☐ NO

If no, explain _____

Standing Water or Litter? (please check) ☐ YES ☒ NO

If yes, explain _____

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)

Elevation:

Top of inner well casing 735.32 Ground Elevation 732.1

Depth of Well 20 Inside Casing Diameter (in inches) 2

Equipment Used Slope Indicator Co. Water level indicator Model 51453

Groundwater Level (± 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	6/20/18, 7:40	13.85	721.47
*After Purging	6/20/18, 9:15	14.48	720.84
*Before Purging	6/20/18, 7:40	13.85	721.47

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 2.51

No. of Well Volumes (based on current water level) 2.50

Was well pumped/bailed dry? No

Equipment used:

Bailer type _____ Dedicated Bailer? _____

Pump type Peristaltic Pump Dedicated Pump? Yes

If not dedicated, method of cleaning _____

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319.

Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

D. FIELD MEASUREMENT*Weather Conditions** 68°F, Cloudy, 2-5mph South wind**Field Measurements (after stabilization):****Temperature** 19.06 **Units** C**Equipment Used** Horiba U-50**pH** 7.47**Equipment Used** Horiba U-50**Specific Conductance** 0.633 **Units** mS/m**Equipment Used** Horiba U-50**Comments****CERTIFICATION**

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature _____ **Date** _____**Telephone** _____ **Fax** _____ **Email** _____**NOTE:** Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319.**Questions? Call or Email:** Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power & Water Permit No. 70-SDP-6-82P
Monitoring Well/Piezometer No. MW-25
Upgradient ☒ Downgradient _____
Name of person sampling Neil Hoskins

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) ☒ YES ☐ NO

If no, explain _____

Standing Water or Litter? (please check) ☐ YES ☒ NO

If yes, explain _____

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)

Elevation:

Top of inner well casing 739.121 Ground Elevation 736.143

Depth of Well 35 Inside Casing Diameter (in inches) 2

Equipment Used Slope Indicator Co. Water level indicator Model 51453

Groundwater Level (± 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	6/19/18, 10:10	21.17	717.95
*After Purging	6/19/18, 10:45	21.37	717.75
*Before Purging	6/19/18, 10:10	21.17	717.95

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 0.92

No. of Well Volumes (based on current water level) 0.41

Was well pumped/bailed dry? No

Equipment used:

Bailer type _____ Dedicated Bailer? _____

Pump type Peristaltic Pump Dedicated Pump? Yes

If not dedicated, method of cleaning _____

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319.

Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

D. FIELD MEASUREMENT**Weather Conditions Clear, Calm, 74°F**Field Measurements (after stabilization):**Temperature 21.39 Units CEquipment Used Horiba U-50pH 7.96Equipment Used Horiba U-50Specific Conductance 1.020 Units mS/mEquipment Used Horiba U-50**Comments*CERTIFICATION**

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature _____ Date _____

Telephone _____ Fax _____ Email _____

NOTE: Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319.Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

LOW FLOW SAMPLING FORM

DATE	6/21/2018	WELL ID	MW-4A	SAMPLE DATE / TIME	6/21/2018 8:05
SITE	Muscataine Power & Water	DW	5.90		
PROJECT #	June Sampling	WELL DEPTH	24.55	NOTE	
WEATHER	Mostly cloudy- 75°F- North wind	PUMP TYPE	GeoTech Peristaltic		
				DEPTH TO INTAKE	19.5'

[illegible][illegible]

LOW FLOW SAMPLING FORM

DATE	6/21/2018	WELL ID	MW-5B	SAMPLE DATE / TIME	6/21/2018 9:45
SITE	Muscataine Power & Water	DTW	2.82		
PROJECT #	June Sampling	WELL DEPTH	25.30	NOTE	
WEATHER	Mostly cloudy- 76°F- North wind	PUMP TYPE	GeoTech Peristaltic		
				DEPTH TO INTAKE	25'

[illegible]

	0.5-5.0 min	200-500 ml	- - -	minimize	- - -	+/- 0.1	+/-10 mV	+/- 3%	+/- 10%	+/- 10% or +/-0.2 mg.
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LOW FLOW SAMPLING FORM

DATE	6/21/2018	WELL ID	MW-6A	SAMPLE DATE / TIME	6/21/2018 8:50
SITE	Muscatine Power & Water	DTW	3.13		
PROJECT #	June Sampling	WELL DEPTH	25.35	DEPTH TO INTAKE	20'
WEATHER	Mostly cloudy- 75°F- North wind	PUMP TYPE	GeoTech Peristaltic		

[illegible]

0.5-5.0 min	200-500 ml
-------------	------------

⋮

minimize

⋮

 ± 0.1

+/-10 mV

+/- 3%

+/- 10%

+/- 10%

Limits

or ± 0.2 mg.

LOW FLOW SAMPLING FORM

DATE	6/19/2018		WELL ID		MW-08		SAMPLE DATE / TIME			
SITE	Muscataine Power & Water		DTW		13.93		NOTE			
PROJECT #	June Sampling		WELL DEPTH		42.95					
WEATHER	Mostly cloudy- 80°F- North wind		PUMP TYPE		GeoTech Peristaltic		DEPTH TO INTAKE 38'			
TIME	PURGE RATE(ml)	VOL REMOVED(m)	DTW	TEMP	Ph	ORP	SpecCond	Turbidity	DO	NOTES
14:30			13.93							
14:35	100	500	15.28	22.32	6.49	118	0.400	27.7	9.23	
14:40	100	1000	15.77	20.76	7.40	-57	0.702	21.6	6.06	
14:45	100	1500	16.24	19.80	7.45	-81	0.715	16.8	5.61	
14:50	100	2000	16.66	18.90	7.49	-85	0.734	23.1	5.11	
14:55	100	2500	17.03	18.78	7.49	-87	0.731	22.0	4.72	
15:00	100	3000	17.40	18.30	7.51	-90	0.736	12.4	4.28	
15:05	100	3500	17.66	17.45	7.53	-92	0.749	16.3	3.99	
15:10	100	4000	17.91	17.27	7.55	-92	0.751	12.1	3.48	
15:15	100	4500	18.12	17.09	7.55	-89	0.757	15.2	3.12	
15:20	100	5000	18.36	16.79	7.57	-91	0.763	14.4	2.72	
15:25	100	5500	18.52	16.80	7.57	-91	0.762	11.3	2.33	
15:30	100	6000	18.62	16.84	7.58	-81	0.761	11.2	1.99	
15:35	100	6500	18.77	16.60	7.58	-76	0.764	11.8	1.66	
15:40	100	7000	18.85	16.57	7.58	-73	0.764	10.6	1.40	
15:45	100	7500	18.89	16.58	7.58	-75	0.767	9.8	1.19	
15:50	100	8000	19.00	16.73	7.59	-76	0.771	9.7	0.95	
15:55	100	8500	19.07	16.78	7.58	-71	0.773	7.8	0.74	Sample Started @ 16:20
16:00	100	9000	19.15	16.78	7.58	-71	0.773	7.5	0.55	Sample Ended @ 16:30
16:05	100	9500	19.21	17.14	7.58	-71	0.775	6.7	0.38	
16:10	100	10000	19.26	17.26	7.58	-66	0.776	6.4	0.22	# of Containers
16:15	100	10500	19.32	17.32	7.58	-67	0.776	6.1	0.07	Preservative
16:20	100	11000	19.35	17.39	7.56	-66	0.775	6.5	0.00	HCl
16:30	100		19.45							HNO ₃
										NaOH
										None
0.5-5.0 min	200-500 ml	---	minimize	---	+/- 0.1	+/-10 mV	+/- 3%	+/- 10%	+/- 10%	Limits or +/-0.2 mg/L

LOW FLOW SAMPLING FORM

DATE	6/19/2018	WELL ID	MW-10	SAMPLE DATE / TIME	6/19/2018 9:15
SITE	Muscataine Power & Water	DTW	4.47		
PROJECT #	June Sampling	WELL DEPTH	20.32	DEPTH TO INTAKE	15.5'
WEATHER	Clear- Calm 73°F- North wind	PUMP TYPE	GeoTech Peristaltic		

[illegible]

0.5-5.0 min 200-500 ml

1

minimize

1

 ± 0.1

+/-10 mV

+/- 3%

+/- 10%

+/- 10%

Limits

or ± 0.2 mg.

or ± 0.2 mg.

LOW FLOW SAMPLING FORM

DATE	6/20/201	WELL ID	MW-13	SAMPLE DATE / TIME	6/20/2018 17:20
SITE	Muscataine Power & Water	DTW	8.92		
PROJECT #	June Sampling	WELL DEPTH	20.00	NOTE	
WEATHER	North wind, partly cloudy, 75°F	PUMP TYPE	GeoTech Peristaltic		
				DEPTH TO INTAKE	15'

[illegible]

0.5-5.0 min	200-500 ml	---	minimize	---	+/- 0.1	+/-10 mV	+/- 3%	+/- 10%	+/- 10%	Limits or +/-0.2 mg.
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LOW FLOW SAMPLING FORM

DATE	6/20/2018			WELL ID		MW-14A		SAMPLE DATE / TIME		
SITE	Muscatine Power & Water			DTW		12.50		NOTE		
PROJECT #	June Sampling			WELL DEPTH		20.50				
WEATHER	North wind, partly cloudy, 78°F			PUMP TYPE		GeoTech Peristaltic		DEPTH TO INTAKE 15.5'		
TIME	PURGE RATE(ml)	VOL REMOVED(π)	DTW	TEMP	Ph	ORP	SpecCond	Turbidity	DO	NOTES
13:20	100		12.50							
13:25	100	500	12.82	24.91	7.30	158	1.88	1.3	4.86	
13:30	100	1000	13.06	23.98	7.25	163	1.90	0.7	5.21	Initial Reading
13:35	100	1500	13.29	23.38	7.25	165	1.91	2.5	4.54	
13:40	100	2000	13.50	22.25	7.25	166	1.96	4.6	4.50	
13:45	100	2500	13.73	21.67	7.25	167	1.97	5.6	5.07	
13:50	100	3000	13.94	21.49	7.27	167	1.91	5.5	5.22	
13:55	100	3500	14.12	21.59	7.30	167	1.89	4.6	5.39	
14:00	100	4000	14.33	21.82	7.31	168	1.88	2.6	5.36	
14:05	100	4500	14.53	21.65	7.30	168	1.89	1.7	7.42	
14:10	100	5000	14.74	20.76	7.30	168	1.94	1.2	5.53	
14:15	100	5500	14.94	20.71	7.29	169	1.95	0.4	4.74	
14:20	100	6000	15.11	20.81	7.28	170	1.95	0.1	4.73	
14:25	100	6500	15.40	20.61	7.26	170	1.97	0.0	4.89	Sample Started
14:35			16.02							Sample Ended
									# of Containers	
										Preservative
										HCl
										HNO ₃
										NaOH
										None
0.5-5.0 min	200-500 ml	- - -	minimize	- - -	+/- 0.1	+/-10 mV	+/- 3%	+/- 10%	+/- 10%	Limits or +/-0.2 mg/l.

LOW FLOW SAMPLING FORM

DATE	6/20/2018	WELL ID	MW-15A	SAMPLE DATE / TIME	6/20/2018 13:00
SITE	Muscataine Power & Water	DTW	10.48		
PROJECT #	June Sampling	WELL DEPTH	20.50	DEPTH TO INTAKE	15'
WEATHER	North wind, partly cloudy, 77°F	PUMP TYPE	GeoTech Peristaltic		

[illegible]

Limits

LOW FLOW SAMPLING FORM

DATE	6/20/2018	WELL ID	MW-18A	SAMPLE DATE / TIME	6/20/2018 15:15
SITE	Muscataine Power & Water	DTW	16.17		
PROJECT #	June Sampling	WELL DEPTH	23.10	DEPTH TO INTAKE	21'
WEATHER	North wind, mostly cloudy, 76°F	PUMP TYPE	GeoTech Peristaltic		

[illegible]

0.5-5.0 min	200-500 ml
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minimize

 ± 0.1

+/-10 mV

+/- 3%

+/- 10%

+/- 10%

Limits

or ± 0.2 mg.

LOW FLOW SAMPLING FORM

[illegible]

LOW FLOW SAMPLING FORM

[illegible]

LOW FLOW SAMPLING FORM

DATE	6/20/2018	WELL ID	MW-23	SAMPLE DATE / TIME	6/20/2018 10:15
SITE	Muscatine Power & Water	DTW	5.40	NOTE	
PROJECT #	June Sampling	WELL DEPTH	43.33		
WEATHER	North wind, partly cloudy, 75°F	PUMP TYPE	GeoTech Peristaltic	DEPTH TO INTAKE	38'

[illegible]

0.5-5.0 min 200-500 ml

minimize

1
2
3

 ± 0.1

+/-10 mV

+/- 3%

+/- 10%

+/- 10%

Limits

or ± 0.2 mg.

LOW FLOW SAMPLING FORM

DATE SITE PROJECT # WEATHER	6/20/2018			WELL ID		MW-24	SAMPLE DATE / TIME			
	Muscatine Power & Water			DTW	13.85	NOTE				
	June Sampling			WELL DEPTH	43.33					
	68°F, 2-5mph S, cloudy			PUMP TYPE	GeoTech Peristaltic					
								DEPTH TO INTAKE		
								38'		
TIME	PURGE RATE(ml)	VOL REMOVED(m³)	DTW	TEMP	pH	ORP	SpecCond	Turbidity	DO	NOTES
7:40			13.85							
7:45	100	500	14.27	20.94	6.76	219	0.686	3.0	3.30	
7:50	100	1000	14.37	20.42	7.03	196	0.669	2.7	2.26	
7:55	100	1500	14.43	20.14	6.93	186	0.658	2.8	1.71	
8:00	100	2000	14.46	19.87	7.01	180	0.645	4.9	1.40	
8:05	100	2500	14.49	19.60	7.11	173	0.632	6.2	1.18	
8:10	100	3000	14.51	19.36	7.18	168	0.625	6.6	1.05	
8:15	100	3500	14.50	19.15	7.22	164	0.624	7.0	0.97	
8:20	100	4000	14.52	18.95	7.27	161	0.621	6.6	0.88	
8:25	100	4500	14.54	18.81	7.28	159	0.622	6.3	0.85	
8:30	100	5000	14.55	18.72	7.33	157	0.622	5.6	0.84	
8:35	100	5500	14.54	18.66	7.37	155	0.626	5.2	0.90	
8:40	100	6000	14.54	18.67	7.42	154	0.628	4.2	0.99	
8:45	100	6500	14.54	18.55	7.46	153	0.634	3.9	1.10	
8:50	100	7000	14.51	18.63	7.43	152	0.640	3.5	1.12	
8:55	100	7500	14.49	18.77	7.42	152	0.644	3.1	1.13	
9:00	100	8000	14.47	18.87	7.45	151	0.637	2.1	1.03	
9:05	100	8500	14.47	18.92	7.45	151	0.636	1.7	1.01	Sample Started @ 9:15:00 AM
9:10	100	9000	14.48	18.97	7.47	151	0.630	1.7	0.97	Sample Ended @ 9:48:00 AM
9:15	100	9500	14.48	19.06	7.47	151	0.633	1.8	1.03	
9:48	100		14.48							# of Containers
										Preservative
										HCl
										HNO₃
										NaOH
										None
0.5-5.0 min	200-500 ml	- - -	minimize	- - -	+/- 0.1	+/-10 mV	+/- 3%	+/- 10%	+/- 10%	Limits or +/-0.2 mg.

LOW FLOW SAMPLING FORM

DATE	6/19/2018	WELL ID	MW-25	SAMPLE DATE / TIME	6/19/2018 10:45
SITE	Muscataine Power & Water	DTW	21.17	NOTE	
PROJECT #	June Sampling	WELL DEPTH	43.33		
WEATHER	Clear, calm, 74°F	PUMP TYPE	GeoTech Peristaltic	DEPTH TO INTAKE	38'

[illegible]

0.5-5.0 min	200-500 ml	---	minimize	---	+/- 0.1	+/-10 mV	+/- 3%	+/- 10%	Limits or +/-0.2 mg.
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TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Cedar Falls
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319)277-2401

TestAmerica Job ID: 310-138236-1

Client Project/Site: Muscatine Power & Water CCR

For:

Muscatine Power & Water
1700 Dick Drake Way
PO BOX 899
Muscatine, Iowa 52761

Attn: Sam Bennett



Authorized for release by:
9/21/2018 12:22:11 PM

Shawn Hayes, Senior Project Manager
(319)229-8211
shawn.hayes@testamericainc.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Job ID: 310-138236-1

Laboratory: TestAmerica Cedar Falls

Narrative

Job Narrative
310-138236-1

Comments

No additional comments.

Receipt

The samples were received on 8/31/2018 9:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.5° C.

HPLC/IC

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals

Method(s) 6020A: The laboratory control sample (LCS) for preparation batch 310-214518 and analytical batch 310-215368 recovered outside control limits for the following analyte: Boron. This analyte was biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

Method(s) 6020A: The continuing calibration verification (CCV) associated with batch 310-215368 recovered above the upper control limit for Boron. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

Method(s) 6020A: Due to sample matrix effect on the internal standard (ISTD), a dilution was required for the following samples: MW-14A (310-138236-9), MW-15A (310-138236-10), MW-18A (310-138236-11) and MW-25 (310-138236-14).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Sample Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-138236-1	MW-08	Ground Water	08/27/18 16:45	08/31/18 09:00
310-138236-2	MW-10	Ground Water	08/27/18 12:55	08/31/18 09:00
310-138236-3	MW-22	Ground Water	08/27/18 14:45	08/31/18 09:00
310-138236-4	MW-23	Ground Water	08/27/18 13:45	08/31/18 09:00
310-138236-5	MW-4A	Ground Water	08/28/18 13:45	08/31/18 09:00
310-138236-6	MW-5B	Ground Water	08/29/18 09:40	08/31/18 09:00
310-138236-7	MW-6A	Ground Water	08/29/18 08:30	08/31/18 09:00
310-138236-8	MW-13	Ground Water	08/28/18 09:15	08/31/18 09:00
310-138236-9	MW-14A	Ground Water	08/29/18 12:45	08/31/18 09:00
310-138236-10	MW-15A	Ground Water	08/29/18 11:00	08/31/18 09:00
310-138236-11	MW-18A	Ground Water	08/29/18 14:25	08/31/18 09:00
310-138236-12	MW-21	Ground Water	08/28/18 10:20	08/31/18 09:00
310-138236-13	MW-24	Ground Water	08/27/18 16:00	08/31/18 09:00
310-138236-14	MW-25	Ground Water	08/28/18 08:10	08/31/18 09:00
310-138236-15	DUP-1	Ground Water	08/29/18 12:00	08/31/18 09:00

Detection Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Client Sample ID: MW-08

Lab Sample ID: 310-138236-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	15.6		5.00		mg/L	5		9056A	Total/NA
Sulfate	94.7	F1	5.00		mg/L	5		9056A	Total/NA
Barium	0.0649		0.00200		mg/L	1		6020A	Total/NA
Calcium	83.6		0.200		mg/L	1		6020A	Total/NA
Molybdenum	0.00224		0.00200		mg/L	1		6020A	Total/NA
Total Dissolved Solids	414		30.0		mg/L	1		SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	7.2	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-10

Lab Sample ID: 310-138236-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	34.3		5.00		mg/L	5		9056A	Total/NA
Arsenic	0.00360		0.00200		mg/L	1		6020A	Total/NA
Barium	0.216		0.00200		mg/L	1		6020A	Total/NA
Calcium	85.4		0.200		mg/L	1		6020A	Total/NA
Molybdenum	0.00220		0.00200		mg/L	1		6020A	Total/NA
Total Dissolved Solids	392		30.0		mg/L	1		SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	7.4	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-22

Lab Sample ID: 310-138236-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	29.8		5.00		mg/L	5		9056A	Total/NA
Sulfate	125		5.00		mg/L	5		9056A	Total/NA
Arsenic	0.00261		0.00200		mg/L	1		6020A	Total/NA
Barium	0.181		0.00200		mg/L	1		6020A	Total/NA
Calcium	80.7		0.200		mg/L	1		6020A	Total/NA
Molybdenum	0.00424		0.00200		mg/L	1		6020A	Total/NA
Total Dissolved Solids	420		30.0		mg/L	1		SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	7.6	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-23

Lab Sample ID: 310-138236-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	14.2		5.00		mg/L	5		9056A	Total/NA
Sulfate	31.7		5.00		mg/L	5		9056A	Total/NA
Barium	0.0779		0.00200		mg/L	1		6020A	Total/NA
Calcium	63.9		0.200		mg/L	1		6020A	Total/NA
Lead	0.000626		0.000500		mg/L	1		6020A	Total/NA
Molybdenum	0.00617		0.00200		mg/L	1		6020A	Total/NA
Total Dissolved Solids	340		30.0		mg/L	1		SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	7.6	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-4A

Lab Sample ID: 310-138236-5

This Detection Summary does not include radiochemical test results.

TestAmerica Cedar Falls

Detection Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Client Sample ID: MW-4A (Continued)

Lab Sample ID: 310-138236-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	19.4		5.00		mg/L	5		9056A	Total/NA
Sulfate	52.2		5.00		mg/L	5		9056A	Total/NA
Barium	0.149		0.00200		mg/L	1		6020A	Total/NA
Calcium	91.3		0.200		mg/L	1		6020A	Total/NA
Total Dissolved Solids	420		30.0		mg/L	1		SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	7.5	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-5B

Lab Sample ID: 310-138236-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	70.8		5.00		mg/L	5		9056A	Total/NA
Sulfate	120		5.00		mg/L	5		9056A	Total/NA
Barium	0.357		0.00200		mg/L	1		6020A	Total/NA
Calcium	146		0.200		mg/L	1		6020A	Total/NA
Total Dissolved Solids	622		30.0		mg/L	1		SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	7.2	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-6A

Lab Sample ID: 310-138236-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.206		0.00200		mg/L	1		6020A	Total/NA
Calcium	73.3		0.200		mg/L	1		6020A	Total/NA
Total Dissolved Solids	298		30.0		mg/L	1		SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	7.3	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-13

Lab Sample ID: 310-138236-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	7.24		5.00		mg/L	5		9056A	Total/NA
Sulfate	72.7		5.00		mg/L	5		9056A	Total/NA
Barium	0.122		0.00200		mg/L	1		6020A	Total/NA
Boron	1.45		0.200		mg/L	1		6020A	Total/NA
Calcium	93.1		0.200		mg/L	1		6020A	Total/NA
Molybdenum	0.00278		0.00200		mg/L	1		6020A	Total/NA
Total Dissolved Solids	384		30.0		mg/L	1		SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	7.3	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-14A

Lab Sample ID: 310-138236-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	33.1		5.00		mg/L	5		9056A	Total/NA
Sulfate	1070		50.0		mg/L	50		9056A	Total/NA
Barium	0.0344		0.00200		mg/L	1		6020A	Total/NA
Boron	14.0		2.00		mg/L	10		6020A	Total/NA
Calcium	309		0.200		mg/L	1		6020A	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Cedar Falls

Detection Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Client Sample ID: MW-14A (Continued)

Lab Sample ID: 310-138236-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Selenium	0.00827		0.00500		mg/L	1		6020A	Total/NA
Total Dissolved Solids	1900		150		mg/L	1		SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	7.1	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-15A

Lab Sample ID: 310-138236-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	10.1		5.00		mg/L	5		9056A	Total/NA
Sulfate	400		50.0		mg/L	50		9056A	Total/NA
Barium	0.0335		0.00200		mg/L	1		6020A	Total/NA
Boron	14.6		2.00		mg/L	10		6020A	Total/NA
Calcium	155		0.200		mg/L	1		6020A	Total/NA
Total Dissolved Solids	948		60.0		mg/L	1		SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	7.2	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-18A

Lab Sample ID: 310-138236-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	26.9		5.00		mg/L	5		9056A	Total/NA
Sulfate	675		50.0		mg/L	50		9056A	Total/NA
Barium	0.0360		0.00200		mg/L	1		6020A	Total/NA
Boron	10.5		2.00		mg/L	10		6020A	Total/NA
Calcium	223		0.200		mg/L	1		6020A	Total/NA
Total Dissolved Solids	1330		150		mg/L	1		SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	7.1	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-21

Lab Sample ID: 310-138236-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	96.6		5.00		mg/L	5		9056A	Total/NA
Barium	0.0622		0.00200		mg/L	1		6020A	Total/NA
Boron	1.36		0.200		mg/L	1		6020A	Total/NA
Calcium	78.7		0.200		mg/L	1		6020A	Total/NA
Total Dissolved Solids	416		30.0		mg/L	1		SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	7.1	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-24

Lab Sample ID: 310-138236-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	18.1		5.00		mg/L	5		9056A	Total/NA
Sulfate	70.0		5.00		mg/L	5		9056A	Total/NA
Barium	0.0776		0.00200		mg/L	1		6020A	Total/NA
Calcium	72.8		0.200		mg/L	1		6020A	Total/NA
Total Dissolved Solids	368		30.0		mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Cedar Falls

Detection Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Client Sample ID: MW-24 (Continued)

Lab Sample ID: 310-138236-13

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	7.5	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: MW-25

Lab Sample ID: 310-138236-14

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	11.4		5.00		mg/L	5		9056A	Total/NA
Sulfate	343		20.0		mg/L	20		9056A	Total/NA
Barium	0.0487		0.00200		mg/L	1		6020A	Total/NA
Boron	14.4		2.00		mg/L	10		6020A	Total/NA
Calcium	141		0.200		mg/L	1		6020A	Total/NA
Total Dissolved Solids	NC		30.0		mg/L	1		SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	7.5	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: DUP-1

Lab Sample ID: 310-138236-15

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.202		0.00200		mg/L	1		6020A	Total/NA
Calcium	72.0		0.200		mg/L	1		6020A	Total/NA
Total Dissolved Solids	280		30.0		mg/L	1		SM 2540C	Total/NA
Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	7.3	HF	0.1		SU	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Cedar Falls

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Client Sample ID: MW-08

Date Collected: 08/27/18 16:45

Date Received: 08/31/18 09:00

Lab Sample ID: 310-138236-1

Matrix: Ground Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	15.6		5.00		mg/L			09/04/18 13:08	5
Fluoride	<0.500		0.500		mg/L			09/04/18 13:08	5
Sulfate	94.7	F1	5.00		mg/L			09/04/18 13:08	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		09/05/18 08:08	09/06/18 17:20	1
Arsenic	<0.00200		0.00200		mg/L		09/05/18 08:08	09/06/18 17:20	1
Barium	0.0649		0.00200		mg/L		09/05/18 08:08	09/06/18 17:20	1
Beryllium	<0.00100		0.00100		mg/L		09/05/18 08:08	09/06/18 17:20	1
Boron	<0.200		0.200		mg/L		09/05/18 08:08	09/13/18 13:06	1
Cadmium	<0.000500		0.000500		mg/L		09/05/18 08:08	09/06/18 17:20	1
Calcium	83.6		0.200		mg/L		09/05/18 08:08	09/06/18 17:20	1
Chromium	<0.00500		0.00500		mg/L		09/05/18 08:08	09/06/18 17:20	1
Copper	<0.00500		0.00500		mg/L		09/05/18 08:08	09/06/18 17:20	1
Lead	<0.000500		0.000500		mg/L		09/05/18 08:08	09/06/18 17:20	1
Lithium	<0.0100		0.0100		mg/L		09/05/18 08:08	09/06/18 17:20	1
Molybdenum	0.00224		0.00200		mg/L		09/05/18 08:08	09/06/18 17:20	1
Selenium	<0.00500		0.00500		mg/L		09/05/18 08:08	09/06/18 17:20	1
Thallium	<0.00100		0.00100		mg/L		09/05/18 08:08	09/06/18 17:20	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/04/18 11:11	09/05/18 11:31	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	414		30.0		mg/L			09/01/18 11:54	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.2	HF	0.1		SU			08/31/18 20:43	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Client Sample ID: MW-10

Date Collected: 08/27/18 12:55

Date Received: 08/31/18 09:00

Lab Sample ID: 310-138236-2

Matrix: Ground Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<5.00		5.00		mg/L	-		09/04/18 14:26	5
Fluoride	<0.500		0.500		mg/L	-		09/04/18 14:26	5
Sulfate	34.3		5.00		mg/L	-		09/04/18 14:26	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L	-	09/05/18 08:08	09/06/18 17:45	1
Arsenic	0.00360		0.00200		mg/L	-	09/05/18 08:08	09/06/18 17:45	1
Barium	0.216		0.00200		mg/L	-	09/05/18 08:08	09/06/18 17:45	1
Beryllium	<0.00100		0.00100		mg/L	-	09/05/18 08:08	09/06/18 17:45	1
Boron	<0.200	* ^	0.200		mg/L	-	09/05/18 08:08	09/12/18 17:14	1
Cadmium	<0.000500		0.000500		mg/L	-	09/05/18 08:08	09/06/18 17:45	1
Calcium	85.4		0.200		mg/L	-	09/05/18 08:08	09/06/18 17:45	1
Chromium	<0.00500		0.00500		mg/L	-	09/05/18 08:08	09/06/18 17:45	1
Copper	<0.00500		0.00500		mg/L	-	09/05/18 08:08	09/06/18 17:45	1
Lead	<0.000500		0.000500		mg/L	-	09/05/18 08:08	09/06/18 17:45	1
Lithium	<0.0100		0.0100		mg/L	-	09/05/18 08:08	09/06/18 17:45	1
Molybdenum	0.00220		0.00200		mg/L	-	09/05/18 08:08	09/06/18 17:45	1
Selenium	<0.00500		0.00500		mg/L	-	09/05/18 08:08	09/06/18 17:45	1
Thallium	<0.00100		0.00100		mg/L	-	09/05/18 08:08	09/06/18 17:45	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L	-	09/04/18 11:11	09/05/18 11:35	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	392		30.0		mg/L	-		09/01/18 11:54	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.4	HF	0.1		SU	-		08/31/18 20:46	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Client Sample ID: MW-22

Date Collected: 08/27/18 14:45

Date Received: 08/31/18 09:00

Lab Sample ID: 310-138236-3

Matrix: Ground Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	29.8		5.00		mg/L	-		09/04/18 14:42	5
Fluoride	<0.500		0.500		mg/L	-		09/04/18 14:42	5
Sulfate	125		5.00		mg/L	-		09/04/18 14:42	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L	-	09/05/18 08:08	09/06/18 17:49	1
Arsenic	0.00261		0.00200		mg/L	-	09/05/18 08:08	09/06/18 17:49	1
Barium	0.181		0.00200		mg/L	-	09/05/18 08:08	09/06/18 17:49	1
Beryllium	<0.00100		0.00100		mg/L	-	09/05/18 08:08	09/06/18 17:49	1
Boron	<0.200	* ^	0.200		mg/L	-	09/05/18 08:08	09/12/18 17:17	1
Cadmium	<0.000500		0.000500		mg/L	-	09/05/18 08:08	09/06/18 17:49	1
Calcium	80.7		0.200		mg/L	-	09/05/18 08:08	09/06/18 17:49	1
Chromium	<0.00500		0.00500		mg/L	-	09/05/18 08:08	09/06/18 17:49	1
Copper	<0.00500		0.00500		mg/L	-	09/05/18 08:08	09/06/18 17:49	1
Lead	<0.000500		0.000500		mg/L	-	09/05/18 08:08	09/06/18 17:49	1
Lithium	<0.0100		0.0100		mg/L	-	09/05/18 08:08	09/06/18 17:49	1
Molybdenum	0.00424		0.00200		mg/L	-	09/05/18 08:08	09/06/18 17:49	1
Selenium	<0.00500		0.00500		mg/L	-	09/05/18 08:08	09/06/18 17:49	1
Thallium	<0.00100		0.00100		mg/L	-	09/05/18 08:08	09/06/18 17:49	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L	-	09/04/18 11:11	09/05/18 11:37	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	420		30.0		mg/L	-		09/01/18 11:54	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.6	HF	0.1		SU	-		08/31/18 20:50	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Client Sample ID: MW-23

Date Collected: 08/27/18 13:45

Date Received: 08/31/18 09:00

Lab Sample ID: 310-138236-4

Matrix: Ground Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	14.2		5.00		mg/L	-		09/04/18 14:58	5
Fluoride	<0.500		0.500		mg/L	-		09/04/18 14:58	5
Sulfate	31.7		5.00		mg/L	-		09/04/18 14:58	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L	-	09/05/18 08:08	09/06/18 17:52	1
Arsenic	<0.00200		0.00200		mg/L	-	09/05/18 08:08	09/06/18 17:52	1
Barium	0.0779		0.00200		mg/L	-	09/05/18 08:08	09/06/18 17:52	1
Beryllium	<0.00100		0.00100		mg/L	-	09/05/18 08:08	09/06/18 17:52	1
Boron	<0.200	* ^	0.200		mg/L	-	09/05/18 08:08	09/12/18 17:20	1
Cadmium	<0.000500		0.000500		mg/L	-	09/05/18 08:08	09/06/18 17:52	1
Calcium	63.9		0.200		mg/L	-	09/05/18 08:08	09/06/18 17:52	1
Chromium	<0.00500		0.00500		mg/L	-	09/05/18 08:08	09/06/18 17:52	1
Copper	<0.00500		0.00500		mg/L	-	09/05/18 08:08	09/06/18 17:52	1
Lead	0.000626		0.000500		mg/L	-	09/05/18 08:08	09/06/18 17:52	1
Lithium	<0.0100		0.0100		mg/L	-	09/05/18 08:08	09/06/18 17:52	1
Molybdenum	0.00617		0.00200		mg/L	-	09/05/18 08:08	09/06/18 17:52	1
Selenium	<0.00500		0.00500		mg/L	-	09/05/18 08:08	09/06/18 17:52	1
Thallium	<0.00100		0.00100		mg/L	-	09/05/18 08:08	09/06/18 17:52	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L	-	09/04/18 11:11	09/05/18 11:38	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	340		30.0		mg/L	-		09/01/18 11:54	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.6	HF	0.1		SU	-		08/31/18 20:51	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Client Sample ID: MW-4A

Date Collected: 08/28/18 13:45

Date Received: 08/31/18 09:00

Lab Sample ID: 310-138236-5

Matrix: Ground Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	19.4		5.00		mg/L	-		09/04/18 15:13	5
Fluoride	<0.500		0.500		mg/L	-		09/04/18 15:13	5
Sulfate	52.2		5.00		mg/L	-		09/04/18 15:13	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L	-	09/05/18 08:08	09/06/18 17:55	1
Arsenic	<0.00200		0.00200		mg/L	-	09/05/18 08:08	09/06/18 17:55	1
Barium	0.149		0.00200		mg/L	-	09/05/18 08:08	09/06/18 17:55	1
Beryllium	<0.00100		0.00100		mg/L	-	09/05/18 08:08	09/06/18 17:55	1
Boron	<0.200	* ^	0.200		mg/L	-	09/05/18 08:08	09/12/18 17:23	1
Cadmium	<0.000500		0.000500		mg/L	-	09/05/18 08:08	09/06/18 17:55	1
Calcium	91.3		0.200		mg/L	-	09/05/18 08:08	09/06/18 17:55	1
Chromium	<0.00500		0.00500		mg/L	-	09/05/18 08:08	09/06/18 17:55	1
Copper	<0.00500		0.00500		mg/L	-	09/05/18 08:08	09/06/18 17:55	1
Lead	<0.000500		0.000500		mg/L	-	09/05/18 08:08	09/06/18 17:55	1
Lithium	<0.0100		0.0100		mg/L	-	09/05/18 08:08	09/06/18 17:55	1
Molybdenum	<0.00200		0.00200		mg/L	-	09/05/18 08:08	09/06/18 17:55	1
Selenium	<0.00500		0.00500		mg/L	-	09/05/18 08:08	09/06/18 17:55	1
Thallium	<0.00100		0.00100		mg/L	-	09/05/18 08:08	09/06/18 17:55	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L	-	09/04/18 11:11	09/05/18 11:40	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	420		30.0		mg/L	-		09/01/18 11:54	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.5	HF	0.1		SU	-		08/31/18 20:52	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Client Sample ID: MW-5B

Date Collected: 08/29/18 09:40

Date Received: 08/31/18 09:00

Lab Sample ID: 310-138236-6

Matrix: Ground Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	70.8		5.00		mg/L	-		09/04/18 15:29	5
Fluoride	<0.500		0.500		mg/L	-		09/04/18 15:29	5
Sulfate	120		5.00		mg/L	-		09/04/18 15:29	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L	-	09/05/18 08:08	09/06/18 17:58	1
Arsenic	<0.00200		0.00200		mg/L	-	09/05/18 08:08	09/06/18 17:58	1
Barium	0.357		0.00200		mg/L	-	09/05/18 08:08	09/06/18 17:58	1
Beryllium	<0.00100		0.00100		mg/L	-	09/05/18 08:08	09/06/18 17:58	1
Boron	<0.200	* ^	0.200		mg/L	-	09/05/18 08:08	09/12/18 17:27	1
Cadmium	<0.000500		0.000500		mg/L	-	09/05/18 08:08	09/06/18 17:58	1
Calcium	146		0.200		mg/L	-	09/05/18 08:08	09/06/18 17:58	1
Chromium	<0.00500		0.00500		mg/L	-	09/05/18 08:08	09/06/18 17:58	1
Copper	<0.00500		0.00500		mg/L	-	09/05/18 08:08	09/06/18 17:58	1
Lead	<0.000500		0.000500		mg/L	-	09/05/18 08:08	09/06/18 17:58	1
Lithium	<0.0100		0.0100		mg/L	-	09/05/18 08:08	09/06/18 17:58	1
Molybdenum	<0.00200		0.00200		mg/L	-	09/05/18 08:08	09/06/18 17:58	1
Selenium	<0.00500		0.00500		mg/L	-	09/05/18 08:08	09/06/18 17:58	1
Thallium	<0.00100		0.00100		mg/L	-	09/05/18 08:08	09/06/18 17:58	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L	-	09/04/18 11:11	09/05/18 11:42	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	622		30.0		mg/L	-		09/01/18 11:54	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.2	HF	0.1		SU	-		08/31/18 20:53	1

TestAmerica Cedar Falls

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Client Sample ID: MW-6A

Date Collected: 08/29/18 08:30

Date Received: 08/31/18 09:00

Lab Sample ID: 310-138236-7

Matrix: Ground Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<5.00		5.00		mg/L	-		09/04/18 15:44	5
Fluoride	<0.500		0.500		mg/L	-		09/04/18 15:44	5
Sulfate	<5.00		5.00		mg/L	-		09/04/18 15:44	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L	-	09/05/18 08:08	09/06/18 18:01	1
Arsenic	<0.00200		0.00200		mg/L	-	09/05/18 08:08	09/06/18 18:01	1
Barium	0.206		0.00200		mg/L	-	09/05/18 08:08	09/06/18 18:01	1
Beryllium	<0.00100		0.00100		mg/L	-	09/05/18 08:08	09/06/18 18:01	1
Boron	<0.200	* ^	0.200		mg/L	-	09/05/18 08:08	09/12/18 17:30	1
Cadmium	<0.000500		0.000500		mg/L	-	09/05/18 08:08	09/06/18 18:01	1
Calcium	73.3		0.200		mg/L	-	09/05/18 08:08	09/06/18 18:01	1
Chromium	<0.00500		0.00500		mg/L	-	09/05/18 08:08	09/06/18 18:01	1
Copper	<0.00500		0.00500		mg/L	-	09/05/18 08:08	09/06/18 18:01	1
Lead	<0.000500		0.000500		mg/L	-	09/05/18 08:08	09/06/18 18:01	1
Lithium	<0.0100		0.0100		mg/L	-	09/05/18 08:08	09/06/18 18:01	1
Molybdenum	<0.00200		0.00200		mg/L	-	09/05/18 08:08	09/06/18 18:01	1
Selenium	<0.00500		0.00500		mg/L	-	09/05/18 08:08	09/06/18 18:01	1
Thallium	<0.00100		0.00100		mg/L	-	09/05/18 08:08	09/06/18 18:01	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L	-	09/04/18 11:11	09/05/18 11:43	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	298		30.0		mg/L	-		09/01/18 11:54	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.3	HF	0.1		SU	-		08/31/18 21:02	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Client Sample ID: MW-13

Date Collected: 08/28/18 09:15

Date Received: 08/31/18 09:00

Lab Sample ID: 310-138236-8

Matrix: Ground Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	7.24		5.00		mg/L			09/04/18 16:00	5
Fluoride	<0.500		0.500		mg/L			09/04/18 16:00	5
Sulfate	72.7		5.00		mg/L			09/04/18 16:00	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		09/05/18 08:08	09/06/18 18:04	1
Arsenic	<0.00200		0.00200		mg/L		09/05/18 08:08	09/06/18 18:04	1
Barium	0.122		0.00200		mg/L		09/05/18 08:08	09/06/18 18:04	1
Beryllium	<0.00100		0.00100		mg/L		09/05/18 08:08	09/06/18 18:04	1
Boron	1.45		0.200		mg/L		09/05/18 08:08	09/13/18 13:16	1
Cadmium	<0.000500		0.000500		mg/L		09/05/18 08:08	09/06/18 18:04	1
Calcium	93.1		0.200		mg/L		09/05/18 08:08	09/06/18 18:04	1
Chromium	<0.00500		0.00500		mg/L		09/05/18 08:08	09/06/18 18:04	1
Copper	<0.00500		0.00500		mg/L		09/05/18 08:08	09/06/18 18:04	1
Lead	<0.000500		0.000500		mg/L		09/05/18 08:08	09/06/18 18:04	1
Lithium	<0.0100		0.0100		mg/L		09/05/18 08:08	09/06/18 18:04	1
Molybdenum	0.00278		0.00200		mg/L		09/05/18 08:08	09/06/18 18:04	1
Selenium	<0.00500		0.00500		mg/L		09/05/18 08:08	09/06/18 18:04	1
Thallium	<0.00100		0.00100		mg/L		09/05/18 08:08	09/06/18 18:04	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/04/18 11:11	09/05/18 11:45	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	384		30.0		mg/L			09/01/18 11:54	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.3	HF	0.1		SU			08/31/18 21:05	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Client Sample ID: MW-14A

Date Collected: 08/29/18 12:45

Date Received: 08/31/18 09:00

Lab Sample ID: 310-138236-9

Matrix: Ground Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	33.1		5.00		mg/L			09/04/18 16:15	5
Fluoride	<0.500		0.500		mg/L			09/04/18 16:15	5
Sulfate	1070		50.0		mg/L			09/04/18 16:31	50

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		09/05/18 08:08	09/06/18 18:08	1
Arsenic	<0.00200		0.00200		mg/L		09/05/18 08:08	09/06/18 18:08	1
Barium	0.0344		0.00200		mg/L		09/05/18 08:08	09/06/18 18:08	1
Beryllium	<0.00100		0.00100		mg/L		09/05/18 08:08	09/06/18 18:08	1
Boron	14.0		2.00		mg/L		09/05/18 08:08	09/13/18 13:19	10
Cadmium	<0.000500		0.000500		mg/L		09/05/18 08:08	09/06/18 18:08	1
Calcium	309		0.200		mg/L		09/05/18 08:08	09/06/18 18:08	1
Chromium	<0.00500		0.00500		mg/L		09/05/18 08:08	09/06/18 18:08	1
Copper	<0.00500		0.00500		mg/L		09/05/18 08:08	09/06/18 18:08	1
Lead	<0.000500		0.000500		mg/L		09/05/18 08:08	09/06/18 18:08	1
Lithium	<0.0100		0.0100		mg/L		09/05/18 08:08	09/06/18 18:08	1
Molybdenum	<0.00200		0.00200		mg/L		09/05/18 08:08	09/06/18 18:08	1
Selenium	0.00827		0.00500		mg/L		09/05/18 08:08	09/06/18 18:08	1
Thallium	<0.00100		0.00100		mg/L		09/05/18 08:08	09/06/18 18:08	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/04/18 11:11	09/05/18 11:50	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1900		150		mg/L			09/01/18 11:54	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.1	HF	0.1		SU			08/31/18 21:06	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Client Sample ID: MW-15A

Date Collected: 08/29/18 11:00

Date Received: 08/31/18 09:00

Lab Sample ID: 310-138236-10

Matrix: Ground Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	10.1		5.00		mg/L			09/04/18 16:47	5
Fluoride	<0.500		0.500		mg/L			09/04/18 16:47	5
Sulfate	400		50.0		mg/L			09/05/18 00:06	50

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		09/05/18 08:08	09/06/18 18:11	1
Arsenic	<0.00200		0.00200		mg/L		09/05/18 08:08	09/06/18 18:11	1
Barium	0.0335		0.00200		mg/L		09/05/18 08:08	09/06/18 18:11	1
Beryllium	<0.00100		0.00100		mg/L		09/05/18 08:08	09/06/18 18:11	1
Boron	14.6		2.00		mg/L		09/05/18 08:08	09/13/18 13:31	10
Cadmium	<0.000500		0.000500		mg/L		09/05/18 08:08	09/06/18 18:11	1
Calcium	155		0.200		mg/L		09/05/18 08:08	09/06/18 18:11	1
Chromium	<0.00500		0.00500		mg/L		09/05/18 08:08	09/06/18 18:11	1
Copper	<0.00500		0.00500		mg/L		09/05/18 08:08	09/06/18 18:11	1
Lead	<0.000500		0.000500		mg/L		09/05/18 08:08	09/06/18 18:11	1
Lithium	<0.0100		0.0100		mg/L		09/05/18 08:08	09/06/18 18:11	1
Molybdenum	<0.00200		0.00200		mg/L		09/05/18 08:08	09/06/18 18:11	1
Selenium	<0.00500		0.00500		mg/L		09/05/18 08:08	09/06/18 18:11	1
Thallium	<0.00100		0.00100		mg/L		09/05/18 08:08	09/06/18 18:11	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/04/18 11:11	09/05/18 11:51	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	948		60.0		mg/L			09/01/18 11:54	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.2	HF	0.1		SU			08/31/18 21:08	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Client Sample ID: MW-18A

Date Collected: 08/29/18 14:25

Date Received: 08/31/18 09:00

Lab Sample ID: 310-138236-11

Matrix: Ground Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	26.9		5.00		mg/L			09/04/18 17:33	5
Fluoride	<0.500		0.500		mg/L			09/04/18 17:33	5
Sulfate	675		50.0		mg/L			09/04/18 17:49	50

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		09/05/18 08:08	09/06/18 18:14	1
Arsenic	<0.00200		0.00200		mg/L		09/05/18 08:08	09/06/18 18:14	1
Barium	0.0360		0.00200		mg/L		09/05/18 08:08	09/06/18 18:14	1
Beryllium	<0.00100		0.00100		mg/L		09/05/18 08:08	09/06/18 18:14	1
Boron	10.5		2.00		mg/L		09/05/18 08:08	09/13/18 13:35	10
Cadmium	<0.000500		0.000500		mg/L		09/05/18 08:08	09/06/18 18:14	1
Calcium	223		0.200		mg/L		09/05/18 08:08	09/06/18 18:14	1
Chromium	<0.00500		0.00500		mg/L		09/05/18 08:08	09/06/18 18:14	1
Copper	<0.00500		0.00500		mg/L		09/05/18 08:08	09/06/18 18:14	1
Lead	<0.000500		0.000500		mg/L		09/05/18 08:08	09/06/18 18:14	1
Lithium	<0.0100		0.0100		mg/L		09/05/18 08:08	09/06/18 18:14	1
Molybdenum	<0.00200		0.00200		mg/L		09/05/18 08:08	09/06/18 18:14	1
Selenium	<0.00500		0.00500		mg/L		09/05/18 08:08	09/06/18 18:14	1
Thallium	<0.00100		0.00100		mg/L		09/05/18 08:08	09/06/18 18:14	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/04/18 11:11	09/05/18 11:53	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1330		150		mg/L			09/01/18 11:54	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.1	HF	0.1		SU			08/31/18 21:09	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Client Sample ID: MW-21

Date Collected: 08/28/18 10:20

Date Received: 08/31/18 09:00

Lab Sample ID: 310-138236-12

Matrix: Ground Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<5.00		5.00		mg/L			09/04/18 18:04	5
Fluoride	<0.500		0.500		mg/L			09/04/18 18:04	5
Sulfate	96.6		5.00		mg/L			09/04/18 18:04	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		09/05/18 08:08	09/06/18 18:30	1
Arsenic	<0.00200		0.00200		mg/L		09/05/18 08:08	09/06/18 18:30	1
Barium	0.0622		0.00200		mg/L		09/05/18 08:08	09/06/18 18:30	1
Beryllium	<0.00100		0.00100		mg/L		09/05/18 08:08	09/06/18 18:30	1
Boron	1.36		0.200		mg/L		09/05/18 08:08	09/13/18 13:38	1
Cadmium	<0.000500		0.000500		mg/L		09/05/18 08:08	09/06/18 18:30	1
Calcium	78.7		0.200		mg/L		09/05/18 08:08	09/06/18 18:30	1
Chromium	<0.00500		0.00500		mg/L		09/05/18 08:08	09/06/18 18:30	1
Copper	<0.00500		0.00500		mg/L		09/05/18 08:08	09/06/18 18:30	1
Lead	<0.000500		0.000500		mg/L		09/05/18 08:08	09/06/18 18:30	1
Lithium	<0.0100		0.0100		mg/L		09/05/18 08:08	09/06/18 18:30	1
Molybdenum	<0.00200		0.00200		mg/L		09/05/18 08:08	09/06/18 18:30	1
Selenium	<0.00500		0.00500		mg/L		09/05/18 08:08	09/06/18 18:30	1
Thallium	<0.00100		0.00100		mg/L		09/05/18 08:08	09/06/18 18:30	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/04/18 11:11	09/05/18 11:54	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	416		30.0		mg/L			09/01/18 11:54	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.1	HF	0.1		SU			08/31/18 21:10	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Client Sample ID: MW-24

Date Collected: 08/27/18 16:00

Date Received: 08/31/18 09:00

Lab Sample ID: 310-138236-13

Matrix: Ground Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	18.1		5.00		mg/L	-		09/04/18 18:36	5
Fluoride	<0.500		0.500		mg/L	-		09/04/18 18:36	5
Sulfate	70.0		5.00		mg/L	-		09/04/18 18:36	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L	-	09/05/18 08:08	09/06/18 18:33	1
Arsenic	<0.00200		0.00200		mg/L	-	09/05/18 08:08	09/06/18 18:33	1
Barium	0.0776		0.00200		mg/L	-	09/05/18 08:08	09/06/18 18:33	1
Beryllium	<0.00100		0.00100		mg/L	-	09/05/18 08:08	09/06/18 18:33	1
Boron	<0.200	*	0.200		mg/L	-	09/05/18 08:08	09/12/18 17:58	1
Cadmium	<0.000500		0.000500		mg/L	-	09/05/18 08:08	09/06/18 18:33	1
Calcium	72.8		0.200		mg/L	-	09/05/18 08:08	09/06/18 18:33	1
Chromium	<0.00500		0.00500		mg/L	-	09/05/18 08:08	09/06/18 18:33	1
Copper	<0.00500		0.00500		mg/L	-	09/05/18 08:08	09/06/18 18:33	1
Lead	<0.000500		0.000500		mg/L	-	09/05/18 08:08	09/06/18 18:33	1
Lithium	<0.0100		0.0100		mg/L	-	09/05/18 08:08	09/06/18 18:33	1
Molybdenum	<0.00200		0.00200		mg/L	-	09/05/18 08:08	09/06/18 18:33	1
Selenium	<0.00500		0.00500		mg/L	-	09/05/18 08:08	09/06/18 18:33	1
Thallium	<0.00100		0.00100		mg/L	-	09/05/18 08:08	09/06/18 18:33	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L	-	09/04/18 11:11	09/05/18 11:56	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	368		30.0		mg/L	-		09/01/18 11:54	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.5	HF	0.1		SU	-		08/31/18 21:11	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Client Sample ID: MW-25

Date Collected: 08/28/18 08:10

Date Received: 08/31/18 09:00

Lab Sample ID: 310-138236-14

Matrix: Ground Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	11.4		5.00		mg/L			09/04/18 18:51	5
Fluoride	<0.500		0.500		mg/L			09/04/18 18:51	5
Sulfate	343		20.0		mg/L			09/04/18 19:07	20

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		09/05/18 08:08	09/06/18 18:36	1
Arsenic	<0.00200		0.00200		mg/L		09/05/18 08:08	09/06/18 18:36	1
Barium	0.0487		0.00200		mg/L		09/05/18 08:08	09/06/18 18:36	1
Beryllium	<0.00100		0.00100		mg/L		09/05/18 08:08	09/06/18 18:36	1
Boron	14.4		2.00		mg/L		09/05/18 08:08	09/13/18 13:41	10
Cadmium	<0.000500		0.000500		mg/L		09/05/18 08:08	09/06/18 18:36	1
Calcium	141		0.200		mg/L		09/05/18 08:08	09/06/18 18:36	1
Chromium	<0.00500		0.00500		mg/L		09/05/18 08:08	09/06/18 18:36	1
Copper	<0.00500		0.00500		mg/L		09/05/18 08:08	09/06/18 18:36	1
Lead	<0.000500		0.000500		mg/L		09/05/18 08:08	09/06/18 18:36	1
Lithium	<0.0100		0.0100		mg/L		09/05/18 08:08	09/06/18 18:36	1
Molybdenum	<0.00200		0.00200		mg/L		09/05/18 08:08	09/06/18 18:36	1
Selenium	<0.00500		0.00500		mg/L		09/05/18 08:08	09/06/18 18:36	1
Thallium	<0.00100		0.00100		mg/L		09/05/18 08:08	09/06/18 18:36	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/04/18 11:11	09/05/18 11:57	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	NC		30.0		mg/L			09/01/18 11:54	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.5	HF	0.1		SU			08/31/18 21:14	1

Client Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Client Sample ID: DUP-1

Date Collected: 08/29/18 12:00

Date Received: 08/31/18 09:00

Lab Sample ID: 310-138236-15

Matrix: Ground Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<5.00		5.00		mg/L	-		09/07/18 19:22	5
Fluoride	<0.500		0.500		mg/L	-		09/07/18 19:22	5
Sulfate	<5.00		5.00		mg/L	-		09/07/18 19:22	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L	-	09/05/18 08:08	09/06/18 18:39	1
Arsenic	<0.00200		0.00200		mg/L	-	09/05/18 08:08	09/06/18 18:39	1
Barium	0.202		0.00200		mg/L	-	09/05/18 08:08	09/06/18 18:39	1
Beryllium	<0.00100		0.00100		mg/L	-	09/05/18 08:08	09/06/18 18:39	1
Boron	<0.200	*	0.200		mg/L	-	09/05/18 08:08	09/12/18 18:04	1
Cadmium	<0.000500		0.000500		mg/L	-	09/05/18 08:08	09/06/18 18:39	1
Calcium	72.0		0.200		mg/L	-	09/05/18 08:08	09/06/18 18:39	1
Chromium	<0.00500		0.00500		mg/L	-	09/05/18 08:08	09/06/18 18:39	1
Copper	<0.00500		0.00500		mg/L	-	09/05/18 08:08	09/06/18 18:39	1
Lead	<0.000500		0.000500		mg/L	-	09/05/18 08:08	09/06/18 18:39	1
Lithium	<0.0100		0.0100		mg/L	-	09/05/18 08:08	09/06/18 18:39	1
Molybdenum	<0.00200		0.00200		mg/L	-	09/05/18 08:08	09/06/18 18:39	1
Selenium	<0.00500		0.00500		mg/L	-	09/05/18 08:08	09/06/18 18:39	1
Thallium	<0.00100		0.00100		mg/L	-	09/05/18 08:08	09/06/18 18:39	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L	-	09/04/18 11:11	09/05/18 11:59	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	280		30.0		mg/L	-		09/01/18 11:54	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.3	HF	0.1		SU	-		08/31/18 21:15	1

Definitions/Glossary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.

Metals

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
*	LCS or LCSD is outside acceptance limits.
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

QC Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-214912/3

Matrix: Water

Analysis Batch: 214912

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.00		1.00		mg/L			09/04/18 12:22	1
Fluoride	<0.100		0.100		mg/L			09/04/18 12:22	1
Sulfate	<1.00		1.00		mg/L			09/04/18 12:22	1

Lab Sample ID: LCS 310-214912/4

Matrix: Water

Analysis Batch: 214912

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	7.50	7.768		mg/L		104	90 - 110
Fluoride	1.50	1.498		mg/L		100	90 - 110
Sulfate	7.50	6.790		mg/L		91	90 - 110

Lab Sample ID: 310-138236-1 MS

Matrix: Ground Water

Analysis Batch: 214912

Client Sample ID: MW-08

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	15.6		25.0	40.75		mg/L		101	80 - 120
Fluoride	<0.500		5.00	5.340		mg/L		107	80 - 120
Sulfate	94.7	F1	25.0	111.7	F1	mg/L		68	80 - 120

Lab Sample ID: 310-138236-1 MSD

Matrix: Ground Water

Analysis Batch: 214912

Client Sample ID: MW-08

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	15.6		25.0	40.45		mg/L		99	80 - 120	1	15
Fluoride	<0.500		5.00	5.372		mg/L		107	80 - 120	1	15
Sulfate	94.7	F1	25.0	111.5	F1	mg/L		67	80 - 120	0	15

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 310-214518/1-A

Matrix: Water

Analysis Batch: 214819

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 214518

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		09/05/18 08:08	09/06/18 17:14	1
Arsenic	<0.00200		0.00200		mg/L		09/05/18 08:08	09/06/18 17:14	1
Barium	<0.00200		0.00200		mg/L		09/05/18 08:08	09/06/18 17:14	1
Beryllium	<0.00100		0.00100		mg/L		09/05/18 08:08	09/06/18 17:14	1
Cadmium	<0.000500		0.000500		mg/L		09/05/18 08:08	09/06/18 17:14	1
Calcium	<0.200		0.200		mg/L		09/05/18 08:08	09/06/18 17:14	1
Chromium	<0.00500		0.00500		mg/L		09/05/18 08:08	09/06/18 17:14	1
Copper	<0.00500		0.00500		mg/L		09/05/18 08:08	09/06/18 17:14	1
Lead	<0.000500		0.000500		mg/L		09/05/18 08:08	09/06/18 17:14	1
Lithium	<0.0100		0.0100		mg/L		09/05/18 08:08	09/06/18 17:14	1
Molybdenum	<0.00200		0.00200		mg/L		09/05/18 08:08	09/06/18 17:14	1

TestAmerica Cedar Falls

QC Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: MB 310-214518/1-A

Matrix: Water

Analysis Batch: 214819

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 214518

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Selenium	<0.00500		0.00500		mg/L		09/05/18 08:08	09/06/18 17:14	1
Thallium	<0.00100		0.00100		mg/L		09/05/18 08:08	09/06/18 17:14	1

Lab Sample ID: MB 310-214518/1-A

Matrix: Water

Analysis Batch: 215515

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 214518

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	<0.200		0.200		mg/L		09/05/18 08:08	09/13/18 13:00	1

Lab Sample ID: LCS 310-214518/2-A

Matrix: Water

Analysis Batch: 214819

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 214518

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.0200	0.02211		mg/L		111	80 - 120
Arsenic	0.0400	0.03735		mg/L		93	80 - 120
Barium	0.0400	0.04496		mg/L		112	80 - 120
Beryllium	0.0200	0.02150		mg/L		107	80 - 120
Cadmium	0.0200	0.02275		mg/L		114	80 - 120
Calcium	2.00	2.290		mg/L		115	80 - 120
Chromium	0.0400	0.04480		mg/L		112	80 - 120
Copper	0.0400	0.04142		mg/L		104	80 - 120
Lead	0.0200	0.02220		mg/L		111	80 - 120
Lithium	0.100	0.09335		mg/L		93	80 - 120
Molybdenum	0.0400	0.04346		mg/L		109	80 - 120
Selenium	0.0400	0.04194		mg/L		105	80 - 120
Thallium	0.0160	0.01779		mg/L		111	80 - 120

Lab Sample ID: LCS 310-214518/2-A

Matrix: Water

Analysis Batch: 215515

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 214518

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	0.880	0.8670		mg/L		99	80 - 120

Lab Sample ID: 310-138236-1 MS

Matrix: Ground Water

Analysis Batch: 214819

Client Sample ID: MW-08

Prep Type: Total/NA

Prep Batch: 214518

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	<0.00100		0.0200	0.02313		mg/L		116	75 - 125
Arsenic	<0.00200		0.0400	0.03938		mg/L		97	75 - 125
Barium	0.0649		0.0400	0.1134		mg/L		121	75 - 125
Beryllium	<0.00100		0.0200	0.02206		mg/L		110	75 - 125
Cadmium	<0.000500		0.0200	0.02277		mg/L		114	75 - 125
Calcium	83.6		2.00	90.43	4	mg/L		342	75 - 125
Chromium	<0.00500		0.0400	0.04604		mg/L		115	75 - 125
Copper	<0.00500		0.0400	0.04103		mg/L		103	75 - 125

TestAmerica Cedar Falls

QC Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: 310-138236-1 MS

Matrix: Ground Water

Analysis Batch: 214819

Client Sample ID: MW-08

Prep Type: Total/NA

Prep Batch: 214518

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Lead	<0.000500		0.0200	0.02274		mg/L		114	75 - 125
Lithium	<0.0100		0.100	0.09771		mg/L		98	75 - 125
Molybdenum	0.00224		0.0400	0.04766		mg/L		114	75 - 125
Selenium	<0.00500		0.0400	0.03803		mg/L		95	75 - 125
Thallium	<0.00100		0.0160	0.01811		mg/L		113	75 - 125

Lab Sample ID: 310-138236-1 MS

Matrix: Ground Water

Analysis Batch: 215515

Client Sample ID: MW-08

Prep Type: Total/NA

Prep Batch: 214518

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	<0.200		0.880	0.9232		mg/L		105	75 - 125

Lab Sample ID: 310-138236-1 MSD

Matrix: Ground Water

Analysis Batch: 214819

Client Sample ID: MW-08

Prep Type: Total/NA

Prep Batch: 214518

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Antimony	<0.00100		0.0200	0.02175		mg/L		109	75 - 125	6	20
Arsenic	<0.00200		0.0400	0.03696		mg/L		91	75 - 125	6	20
Barium	0.0649		0.0400	0.1066		mg/L		104	75 - 125	6	20
Beryllium	<0.00100		0.0200	0.02110		mg/L		106	75 - 125	4	20
Cadmium	<0.000500		0.0200	0.02127		mg/L		106	75 - 125	7	20
Calcium	83.6		2.00	84.47	4	mg/L		44	75 - 125	7	20
Chromium	<0.00500		0.0400	0.04345		mg/L		109	75 - 125	6	20
Copper	<0.00500		0.0400	0.03834		mg/L		96	75 - 125	7	20
Lead	<0.000500		0.0200	0.02144		mg/L		107	75 - 125	6	20
Lithium	<0.0100		0.100	0.09057		mg/L		91	75 - 125	8	20
Molybdenum	0.00224		0.0400	0.04419		mg/L		105	75 - 125	8	20
Selenium	<0.00500		0.0400	0.03685		mg/L		92	75 - 125	3	20
Thallium	<0.00100		0.0160	0.01731		mg/L		108	75 - 125	5	20

Lab Sample ID: 310-138236-1 MSD

Matrix: Ground Water

Analysis Batch: 215515

Client Sample ID: MW-08

Prep Type: Total/NA

Prep Batch: 214518

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Boron	<0.200		0.880	0.9864		mg/L		112	75 - 125	7	20

Lab Sample ID: 310-138236-11 DU

Matrix: Ground Water

Analysis Batch: 214819

Client Sample ID: MW-18A

Prep Type: Total/NA

Prep Batch: 214518

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Antimony	<0.00100		<0.00100		mg/L		NC	20
Arsenic	<0.00200		<0.00200		mg/L		NC	20
Barium	0.0360		0.03528		mg/L		2	20
Beryllium	<0.00100		<0.00100		mg/L		NC	20
Cadmium	<0.000500		<0.000500		mg/L		NC	20

TestAmerica Cedar Falls

QC Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: 310-138236-11 DU

Matrix: Ground Water

Analysis Batch: 214819

Client Sample ID: MW-18A

Prep Type: Total/NA

Prep Batch: 214518

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Calcium	223		217.3		mg/L		3	20
Chromium	<0.00500		<0.00500		mg/L		NC	20
Copper	<0.00500		<0.00500		mg/L		NC	20
Lead	<0.000500		<0.000500		mg/L		NC	20
Lithium	<0.0100		<0.0100		mg/L		NC	20
Molybdenum	<0.00200		<0.00200		mg/L		NC	20
Selenium	<0.00500		<0.00500		mg/L		NC	20
Thallium	<0.00100		<0.00100		mg/L		NC	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-214447/1-A

Matrix: Water

Analysis Batch: 214595

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 214447

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		09/04/18 11:11	09/05/18 11:24	1

Lab Sample ID: LCS 310-214447/2-A

Matrix: Water

Analysis Batch: 214595

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 214447

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.00167	0.001580		mg/L		95	80 - 120

Lab Sample ID: 310-138236-1 MS

Matrix: Ground Water

Analysis Batch: 214595

Client Sample ID: MW-08

Prep Type: Total/NA

Prep Batch: 214447

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	<0.000200		0.00167	0.001716		mg/L		103	80 - 120

Lab Sample ID: 310-138236-1 MSD

Matrix: Ground Water

Analysis Batch: 214595

Client Sample ID: MW-08

Prep Type: Total/NA

Prep Batch: 214447

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Mercury	<0.000200		0.00167	0.001681		mg/L		101	80 - 120	2	20

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 310-214306/1

Matrix: Water

Analysis Batch: 214306

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<30.0		30.0		mg/L			09/01/18 11:54	1

TestAmerica Cedar Falls

QC Sample Results

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

Lab Sample ID: LCS 310-214306/2

Matrix: Water

Analysis Batch: 214306

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	1000	968.0		mg/L		97	90 - 110

Lab Sample ID: 310-138236-1 DU

Matrix: Ground Water

Analysis Batch: 214306

Client Sample ID: MW-08

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	414		400.0		mg/L		3	24

Lab Sample ID: 310-138236-11 DU

Matrix: Ground Water

Analysis Batch: 214306

Client Sample ID: MW-18A

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	1330		1300		mg/L		2	24

Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 310-214282/1

Matrix: Water

Analysis Batch: 214282

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.0		SU		100	98 - 102

Lab Sample ID: 310-138236-7 DU

Matrix: Ground Water

Analysis Batch: 214282

Client Sample ID: MW-6A

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	7.3	HF	7.3		SU		0	20

QC Association Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

HPLC/IC

Analysis Batch: 214912

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-138236-1	MW-08	Total/NA	Ground Water	9056A	
310-138236-2	MW-10	Total/NA	Ground Water	9056A	
310-138236-3	MW-22	Total/NA	Ground Water	9056A	
310-138236-4	MW-23	Total/NA	Ground Water	9056A	
310-138236-5	MW-4A	Total/NA	Ground Water	9056A	
310-138236-6	MW-5B	Total/NA	Ground Water	9056A	
310-138236-7	MW-6A	Total/NA	Ground Water	9056A	
310-138236-8	MW-13	Total/NA	Ground Water	9056A	
310-138236-9	MW-14A	Total/NA	Ground Water	9056A	
310-138236-9	MW-14A	Total/NA	Ground Water	9056A	
310-138236-10	MW-15A	Total/NA	Ground Water	9056A	
310-138236-10	MW-15A	Total/NA	Ground Water	9056A	
310-138236-11	MW-18A	Total/NA	Ground Water	9056A	
310-138236-11	MW-18A	Total/NA	Ground Water	9056A	
310-138236-12	MW-21	Total/NA	Ground Water	9056A	
310-138236-13	MW-24	Total/NA	Ground Water	9056A	
310-138236-14	MW-25	Total/NA	Ground Water	9056A	
310-138236-14	MW-25	Total/NA	Ground Water	9056A	
310-138236-15	DUP-1	Total/NA	Ground Water	9056A	
MB 310-214912/3	Method Blank	Total/NA	Water	9056A	
LCS 310-214912/4	Lab Control Sample	Total/NA	Water	9056A	
310-138236-1 MS	MW-08	Total/NA	Ground Water	9056A	
310-138236-1 MSD	MW-08	Total/NA	Ground Water	9056A	

Metals

Prep Batch: 214447

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-138236-1	MW-08	Total/NA	Ground Water	7470A	
310-138236-2	MW-10	Total/NA	Ground Water	7470A	
310-138236-3	MW-22	Total/NA	Ground Water	7470A	
310-138236-4	MW-23	Total/NA	Ground Water	7470A	
310-138236-5	MW-4A	Total/NA	Ground Water	7470A	
310-138236-6	MW-5B	Total/NA	Ground Water	7470A	
310-138236-7	MW-6A	Total/NA	Ground Water	7470A	
310-138236-8	MW-13	Total/NA	Ground Water	7470A	
310-138236-9	MW-14A	Total/NA	Ground Water	7470A	
310-138236-10	MW-15A	Total/NA	Ground Water	7470A	
310-138236-11	MW-18A	Total/NA	Ground Water	7470A	
310-138236-12	MW-21	Total/NA	Ground Water	7470A	
310-138236-13	MW-24	Total/NA	Ground Water	7470A	
310-138236-14	MW-25	Total/NA	Ground Water	7470A	
310-138236-15	DUP-1	Total/NA	Ground Water	7470A	
MB 310-214447/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-214447/2-A	Lab Control Sample	Total/NA	Water	7470A	
310-138236-1 MS	MW-08	Total/NA	Ground Water	7470A	
310-138236-1 MSD	MW-08	Total/NA	Ground Water	7470A	

TestAmerica Cedar Falls

QC Association Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Metals (Continued)

Prep Batch: 214518

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-138236-1	MW-08	Total/NA	Ground Water	3010A	
310-138236-2	MW-10	Total/NA	Ground Water	3010A	
310-138236-3	MW-22	Total/NA	Ground Water	3010A	
310-138236-4	MW-23	Total/NA	Ground Water	3010A	
310-138236-5	MW-4A	Total/NA	Ground Water	3010A	
310-138236-6	MW-5B	Total/NA	Ground Water	3010A	
310-138236-7	MW-6A	Total/NA	Ground Water	3010A	
310-138236-8	MW-13	Total/NA	Ground Water	3010A	
310-138236-9	MW-14A	Total/NA	Ground Water	3010A	
310-138236-10	MW-15A	Total/NA	Ground Water	3010A	
310-138236-11	MW-18A	Total/NA	Ground Water	3010A	
310-138236-12	MW-21	Total/NA	Ground Water	3010A	
310-138236-13	MW-24	Total/NA	Ground Water	3010A	
310-138236-14	MW-25	Total/NA	Ground Water	3010A	
310-138236-15	DUP-1	Total/NA	Ground Water	3010A	
MB 310-214518/1-A	Method Blank	Total/NA	Water	3010A	
LCS 310-214518/2-A	Lab Control Sample	Total/NA	Water	3010A	
310-138236-1 MS	MW-08	Total/NA	Ground Water	3010A	
310-138236-1 MSD	MW-08	Total/NA	Ground Water	3010A	
310-138236-11 DU	MW-18A	Total/NA	Ground Water	3010A	

Analysis Batch: 214595

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-138236-1	MW-08	Total/NA	Ground Water	7470A	214447
310-138236-2	MW-10	Total/NA	Ground Water	7470A	214447
310-138236-3	MW-22	Total/NA	Ground Water	7470A	214447
310-138236-4	MW-23	Total/NA	Ground Water	7470A	214447
310-138236-5	MW-4A	Total/NA	Ground Water	7470A	214447
310-138236-6	MW-5B	Total/NA	Ground Water	7470A	214447
310-138236-7	MW-6A	Total/NA	Ground Water	7470A	214447
310-138236-8	MW-13	Total/NA	Ground Water	7470A	214447
310-138236-9	MW-14A	Total/NA	Ground Water	7470A	214447
310-138236-10	MW-15A	Total/NA	Ground Water	7470A	214447
310-138236-11	MW-18A	Total/NA	Ground Water	7470A	214447
310-138236-12	MW-21	Total/NA	Ground Water	7470A	214447
310-138236-13	MW-24	Total/NA	Ground Water	7470A	214447
310-138236-14	MW-25	Total/NA	Ground Water	7470A	214447
310-138236-15	DUP-1	Total/NA	Ground Water	7470A	214447
MB 310-214447/1-A	Method Blank	Total/NA	Water	7470A	214447
LCS 310-214447/2-A	Lab Control Sample	Total/NA	Water	7470A	214447
310-138236-1 MS	MW-08	Total/NA	Ground Water	7470A	214447
310-138236-1 MSD	MW-08	Total/NA	Ground Water	7470A	214447

Analysis Batch: 214815

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-138236-1	MW-08	Total/NA	Ground Water	6020A	214518
310-138236-2	MW-10	Total/NA	Ground Water	6020A	214518
310-138236-3	MW-22	Total/NA	Ground Water	6020A	214518
310-138236-4	MW-23	Total/NA	Ground Water	6020A	214518
310-138236-5	MW-4A	Total/NA	Ground Water	6020A	214518
310-138236-6	MW-5B	Total/NA	Ground Water	6020A	214518

TestAmerica Cedar Falls

QC Association Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Metals (Continued)

Analysis Batch: 214815 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-138236-7	MW-6A	Total/NA	Ground Water	6020A	214518
310-138236-8	MW-13	Total/NA	Ground Water	6020A	214518
310-138236-9	MW-14A	Total/NA	Ground Water	6020A	214518
310-138236-10	MW-15A	Total/NA	Ground Water	6020A	214518
310-138236-11	MW-18A	Total/NA	Ground Water	6020A	214518
310-138236-12	MW-21	Total/NA	Ground Water	6020A	214518
310-138236-13	MW-24	Total/NA	Ground Water	6020A	214518
310-138236-14	MW-25	Total/NA	Ground Water	6020A	214518
310-138236-15	DUP-1	Total/NA	Ground Water	6020A	214518
MB 310-214518/1-A	Method Blank	Total/NA	Water	6020A	214518
LCS 310-214518/2-A	Lab Control Sample	Total/NA	Water	6020A	214518
310-138236-1 MS	MW-08	Total/NA	Ground Water	6020A	214518
310-138236-1 MSD	MW-08	Total/NA	Ground Water	6020A	214518
310-138236-11 DU	MW-18A	Total/NA	Ground Water	6020A	214518

Analysis Batch: 214819

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-138236-1	MW-08	Total/NA	Ground Water	6020A	214518
310-138236-2	MW-10	Total/NA	Ground Water	6020A	214518
310-138236-3	MW-22	Total/NA	Ground Water	6020A	214518
310-138236-4	MW-23	Total/NA	Ground Water	6020A	214518
310-138236-5	MW-4A	Total/NA	Ground Water	6020A	214518
310-138236-6	MW-5B	Total/NA	Ground Water	6020A	214518
310-138236-7	MW-6A	Total/NA	Ground Water	6020A	214518
310-138236-8	MW-13	Total/NA	Ground Water	6020A	214518
310-138236-9	MW-14A	Total/NA	Ground Water	6020A	214518
310-138236-10	MW-15A	Total/NA	Ground Water	6020A	214518
310-138236-11	MW-18A	Total/NA	Ground Water	6020A	214518
310-138236-12	MW-21	Total/NA	Ground Water	6020A	214518
310-138236-13	MW-24	Total/NA	Ground Water	6020A	214518
310-138236-14	MW-25	Total/NA	Ground Water	6020A	214518
310-138236-15	DUP-1	Total/NA	Ground Water	6020A	214518
MB 310-214518/1-A	Method Blank	Total/NA	Water	6020A	214518
LCS 310-214518/2-A	Lab Control Sample	Total/NA	Water	6020A	214518
310-138236-1 MS	MW-08	Total/NA	Ground Water	6020A	214518
310-138236-1 MSD	MW-08	Total/NA	Ground Water	6020A	214518
310-138236-11 DU	MW-18A	Total/NA	Ground Water	6020A	214518

Analysis Batch: 215368

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-138236-2	MW-10	Total/NA	Ground Water	6020A	214518
310-138236-3	MW-22	Total/NA	Ground Water	6020A	214518
310-138236-4	MW-23	Total/NA	Ground Water	6020A	214518
310-138236-5	MW-4A	Total/NA	Ground Water	6020A	214518
310-138236-6	MW-5B	Total/NA	Ground Water	6020A	214518
310-138236-7	MW-6A	Total/NA	Ground Water	6020A	214518
310-138236-13	MW-24	Total/NA	Ground Water	6020A	214518
310-138236-15	DUP-1	Total/NA	Ground Water	6020A	214518

TestAmerica Cedar Falls

QC Association Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Metals (Continued)

Analysis Batch: 215515

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-138236-1	MW-08	Total/NA	Ground Water	6020A	214518
310-138236-8	MW-13	Total/NA	Ground Water	6020A	214518
310-138236-9	MW-14A	Total/NA	Ground Water	6020A	214518
310-138236-10	MW-15A	Total/NA	Ground Water	6020A	214518
310-138236-11	MW-18A	Total/NA	Ground Water	6020A	214518
310-138236-12	MW-21	Total/NA	Ground Water	6020A	214518
310-138236-14	MW-25	Total/NA	Ground Water	6020A	214518
MB 310-214518/1-A	Method Blank	Total/NA	Water	6020A	214518
LCS 310-214518/2-A	Lab Control Sample	Total/NA	Water	6020A	214518
310-138236-1 MS	MW-08	Total/NA	Ground Water	6020A	214518
310-138236-1 MSD	MW-08	Total/NA	Ground Water	6020A	214518

General Chemistry

Analysis Batch: 214282

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-138236-1	MW-08	Total/NA	Ground Water	SM 4500 H+ B	
310-138236-2	MW-10	Total/NA	Ground Water	SM 4500 H+ B	
310-138236-3	MW-22	Total/NA	Ground Water	SM 4500 H+ B	
310-138236-4	MW-23	Total/NA	Ground Water	SM 4500 H+ B	
310-138236-5	MW-4A	Total/NA	Ground Water	SM 4500 H+ B	
310-138236-6	MW-5B	Total/NA	Ground Water	SM 4500 H+ B	
310-138236-7	MW-6A	Total/NA	Ground Water	SM 4500 H+ B	
310-138236-8	MW-13	Total/NA	Ground Water	SM 4500 H+ B	
310-138236-9	MW-14A	Total/NA	Ground Water	SM 4500 H+ B	
310-138236-10	MW-15A	Total/NA	Ground Water	SM 4500 H+ B	
310-138236-11	MW-18A	Total/NA	Ground Water	SM 4500 H+ B	
310-138236-12	MW-21	Total/NA	Ground Water	SM 4500 H+ B	
310-138236-13	MW-24	Total/NA	Ground Water	SM 4500 H+ B	
310-138236-14	MW-25	Total/NA	Ground Water	SM 4500 H+ B	
310-138236-15	DUP-1	Total/NA	Ground Water	SM 4500 H+ B	
LCS 310-214282/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
310-138236-7 DU	MW-6A	Total/NA	Ground Water	SM 4500 H+ B	

Analysis Batch: 214306

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-138236-1	MW-08	Total/NA	Ground Water	SM 2540C	
310-138236-2	MW-10	Total/NA	Ground Water	SM 2540C	
310-138236-3	MW-22	Total/NA	Ground Water	SM 2540C	
310-138236-4	MW-23	Total/NA	Ground Water	SM 2540C	
310-138236-5	MW-4A	Total/NA	Ground Water	SM 2540C	
310-138236-6	MW-5B	Total/NA	Ground Water	SM 2540C	
310-138236-7	MW-6A	Total/NA	Ground Water	SM 2540C	
310-138236-8	MW-13	Total/NA	Ground Water	SM 2540C	
310-138236-9	MW-14A	Total/NA	Ground Water	SM 2540C	
310-138236-10	MW-15A	Total/NA	Ground Water	SM 2540C	
310-138236-11	MW-18A	Total/NA	Ground Water	SM 2540C	
310-138236-12	MW-21	Total/NA	Ground Water	SM 2540C	
310-138236-13	MW-24	Total/NA	Ground Water	SM 2540C	
310-138236-14	MW-25	Total/NA	Ground Water	SM 2540C	

TestAmerica Cedar Falls

QC Association Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

General Chemistry (Continued)

Analysis Batch: 214306 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-138236-15	DUP-1	Total/NA	Ground Water	SM 2540C	
MB 310-214306/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-214306/2	Lab Control Sample	Total/NA	Water	SM 2540C	
310-138236-1 DU	MW-08	Total/NA	Ground Water	SM 2540C	
310-138236-11 DU	MW-18A	Total/NA	Ground Water	SM 2540C	

Lab Chronicle

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Client Sample ID: MW-08

Date Collected: 08/27/18 16:45

Date Received: 08/31/18 09:00

Lab Sample ID: 310-138236-1

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	214912	09/04/18 13:08	MLU	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	214815	09/06/18 17:20	SAD	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	214819	09/06/18 17:20	SAD	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	215515	09/13/18 13:06	SAD	TAL CF
Total/NA	Prep	7470A			214447	09/04/18 11:11	JNR	TAL CF
Total/NA	Analysis	7470A		1	214595	09/05/18 11:31	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	214306	09/01/18 11:54	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	214282	08/31/18 20:43	JMH	TAL CF

Client Sample ID: MW-10

Date Collected: 08/27/18 12:55

Date Received: 08/31/18 09:00

Lab Sample ID: 310-138236-2

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	214912	09/04/18 14:26	MLU	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	214815	09/06/18 17:45	SAD	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	214819	09/06/18 17:45	SAD	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	215368	09/12/18 17:14	SAD	TAL CF
Total/NA	Prep	7470A			214447	09/04/18 11:11	JNR	TAL CF
Total/NA	Analysis	7470A		1	214595	09/05/18 11:35	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	214306	09/01/18 11:54	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	214282	08/31/18 20:46	JMH	TAL CF

Client Sample ID: MW-22

Date Collected: 08/27/18 14:45

Date Received: 08/31/18 09:00

Lab Sample ID: 310-138236-3

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	214912	09/04/18 14:42	MLU	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	214815	09/06/18 17:49	SAD	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	214819	09/06/18 17:49	SAD	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	215368	09/12/18 17:17	SAD	TAL CF
Total/NA	Prep	7470A			214447	09/04/18 11:11	JNR	TAL CF

TestAmerica Cedar Falls

Lab Chronicle

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Client Sample ID: MW-22

Date Collected: 08/27/18 14:45

Date Received: 08/31/18 09:00

Lab Sample ID: 310-138236-3

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	7470A		1	214595	09/05/18 11:37	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	214306	09/01/18 11:54	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	214282	08/31/18 20:50	JMH	TAL CF

Client Sample ID: MW-23

Date Collected: 08/27/18 13:45

Date Received: 08/31/18 09:00

Lab Sample ID: 310-138236-4

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	214912	09/04/18 14:58	MLU	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	214815	09/06/18 17:52	SAD	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	214819	09/06/18 17:52	SAD	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	215368	09/12/18 17:20	SAD	TAL CF
Total/NA	Prep	7470A			214447	09/04/18 11:11	JNR	TAL CF
Total/NA	Analysis	7470A		1	214595	09/05/18 11:38	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	214306	09/01/18 11:54	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	214282	08/31/18 20:51	JMH	TAL CF

Client Sample ID: MW-4A

Date Collected: 08/28/18 13:45

Date Received: 08/31/18 09:00

Lab Sample ID: 310-138236-5

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	214912	09/04/18 15:13	MLU	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	214815	09/06/18 17:55	SAD	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	214819	09/06/18 17:55	SAD	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	215368	09/12/18 17:23	SAD	TAL CF
Total/NA	Prep	7470A			214447	09/04/18 11:11	JNR	TAL CF
Total/NA	Analysis	7470A		1	214595	09/05/18 11:40	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	214306	09/01/18 11:54	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	214282	08/31/18 20:52	JMH	TAL CF

TestAmerica Cedar Falls

Lab Chronicle

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Client Sample ID: MW-5B

Date Collected: 08/29/18 09:40

Date Received: 08/31/18 09:00

Lab Sample ID: 310-138236-6

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	214912	09/04/18 15:29	MLU	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	214815	09/06/18 17:58	SAD	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	214819	09/06/18 17:58	SAD	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	215368	09/12/18 17:27	SAD	TAL CF
Total/NA	Prep	7470A			214447	09/04/18 11:11	JNR	TAL CF
Total/NA	Analysis	7470A		1	214595	09/05/18 11:42	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	214306	09/01/18 11:54	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	214282	08/31/18 20:53	JMH	TAL CF

Client Sample ID: MW-6A

Date Collected: 08/29/18 08:30

Date Received: 08/31/18 09:00

Lab Sample ID: 310-138236-7

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	214912	09/04/18 15:44	MLU	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	214815	09/06/18 18:01	SAD	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	214819	09/06/18 18:01	SAD	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	215368	09/12/18 17:30	SAD	TAL CF
Total/NA	Prep	7470A			214447	09/04/18 11:11	JNR	TAL CF
Total/NA	Analysis	7470A		1	214595	09/05/18 11:43	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	214306	09/01/18 11:54	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	214282	08/31/18 21:02	JMH	TAL CF

Client Sample ID: MW-13

Date Collected: 08/28/18 09:15

Date Received: 08/31/18 09:00

Lab Sample ID: 310-138236-8

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	214912	09/04/18 16:00	MLU	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	214815	09/06/18 18:04	SAD	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	214819	09/06/18 18:04	SAD	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	215515	09/13/18 13:16	SAD	TAL CF
Total/NA	Prep	7470A			214447	09/04/18 11:11	JNR	TAL CF
Total/NA	Analysis	7470A		1	214595	09/05/18 11:45	JNR	TAL CF

TestAmerica Cedar Falls

Lab Chronicle

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540C		1	214306	09/01/18 11:54	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	214282	08/31/18 21:05	JMH	TAL CF

Client Sample ID: MW-14A

Lab Sample ID: 310-138236-9

Date Collected: 08/29/18 12:45

Matrix: Ground Water

Date Received: 08/31/18 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	214912	09/04/18 16:15	MLU	TAL CF
Total/NA	Analysis	9056A		50	214912	09/04/18 16:31	MLU	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	214815	09/06/18 18:08	SAD	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	214819	09/06/18 18:08	SAD	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		10	215515	09/13/18 13:19	SAD	TAL CF
Total/NA	Prep	7470A			214447	09/04/18 11:11	JNR	TAL CF
Total/NA	Analysis	7470A		1	214595	09/05/18 11:50	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	214306	09/01/18 11:54	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	214282	08/31/18 21:06	JMH	TAL CF

Client Sample ID: MW-15A

Lab Sample ID: 310-138236-10

Date Collected: 08/29/18 11:00

Matrix: Ground Water

Date Received: 08/31/18 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	214912	09/04/18 16:47	MLU	TAL CF
Total/NA	Analysis	9056A		50	214912	09/05/18 00:06	MLU	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	214815	09/06/18 18:11	SAD	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	214819	09/06/18 18:11	SAD	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		10	215515	09/13/18 13:31	SAD	TAL CF
Total/NA	Prep	7470A			214447	09/04/18 11:11	JNR	TAL CF
Total/NA	Analysis	7470A		1	214595	09/05/18 11:51	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	214306	09/01/18 11:54	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	214282	08/31/18 21:08	JMH	TAL CF

Client Sample ID: MW-18A

Lab Sample ID: 310-138236-11

Date Collected: 08/29/18 14:25

Matrix: Ground Water

Date Received: 08/31/18 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	214912	09/04/18 17:33	MLU	TAL CF
Total/NA	Analysis	9056A		50	214912	09/04/18 17:49	MLU	TAL CF

TestAmerica Cedar Falls

Lab Chronicle

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Client Sample ID: MW-18A

Date Collected: 08/29/18 14:25

Date Received: 08/31/18 09:00

Lab Sample ID: 310-138236-11

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	214815	09/06/18 18:14	SAD	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	214819	09/06/18 18:14	SAD	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		10	215515	09/13/18 13:35	SAD	TAL CF
Total/NA	Prep	7470A			214447	09/04/18 11:11	JNR	TAL CF
Total/NA	Analysis	7470A		1	214595	09/05/18 11:53	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	214306	09/01/18 11:54	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	214282	08/31/18 21:09	JMH	TAL CF

Client Sample ID: MW-21

Date Collected: 08/28/18 10:20

Date Received: 08/31/18 09:00

Lab Sample ID: 310-138236-12

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	214912	09/04/18 18:04	MLU	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	214815	09/06/18 18:30	SAD	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	214819	09/06/18 18:30	SAD	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	215515	09/13/18 13:38	SAD	TAL CF
Total/NA	Prep	7470A			214447	09/04/18 11:11	JNR	TAL CF
Total/NA	Analysis	7470A		1	214595	09/05/18 11:54	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	214306	09/01/18 11:54	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	214282	08/31/18 21:10	JMH	TAL CF

Client Sample ID: MW-24

Date Collected: 08/27/18 16:00

Date Received: 08/31/18 09:00

Lab Sample ID: 310-138236-13

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	214912	09/04/18 18:36	MLU	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	214815	09/06/18 18:33	SAD	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	214819	09/06/18 18:33	SAD	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	215368	09/12/18 17:58	SAD	TAL CF
Total/NA	Prep	7470A			214447	09/04/18 11:11	JNR	TAL CF
Total/NA	Analysis	7470A		1	214595	09/05/18 11:56	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	214306	09/01/18 11:54	SAS	TAL CF

TestAmerica Cedar Falls

Lab Chronicle

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 4500 H+ B		1	214282	08/31/18 21:11	JMH	TAL CF

Client Sample ID: MW-25

Date Collected: 08/28/18 08:10

Date Received: 08/31/18 09:00

Lab Sample ID: 310-138236-14

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	214912	09/04/18 18:51	MLU	TAL CF
Total/NA	Analysis	9056A		20	214912	09/04/18 19:07	MLU	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	214815	09/06/18 18:36	SAD	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	214819	09/06/18 18:36	SAD	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		10	215515	09/13/18 13:41	SAD	TAL CF
Total/NA	Prep	7470A			214447	09/04/18 11:11	JNR	TAL CF
Total/NA	Analysis	7470A		1	214595	09/05/18 11:57	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	214306	09/01/18 11:54	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	214282	08/31/18 21:14	JMH	TAL CF

Client Sample ID: DUP-1

Date Collected: 08/29/18 12:00

Date Received: 08/31/18 09:00

Lab Sample ID: 310-138236-15

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	214912	09/07/18 19:22	MLU	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	214815	09/06/18 18:39	SAD	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	214819	09/06/18 18:39	SAD	TAL CF
Total/NA	Prep	3010A			214518	09/05/18 08:08	JNR	TAL CF
Total/NA	Analysis	6020A		1	215368	09/12/18 18:04	SAD	TAL CF
Total/NA	Prep	7470A			214447	09/04/18 11:11	JNR	TAL CF
Total/NA	Analysis	7470A		1	214595	09/05/18 11:59	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	214306	09/01/18 11:54	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	214282	08/31/18 21:15	JMH	TAL CF

Laboratory References:

TAL CF = TestAmerica Cedar Falls, 704 Enterprise Drive, Cedar Falls, IA 50613, TEL (319)277-2401

Accreditation/Certification Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Laboratory: TestAmerica Cedar Falls

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
AIHA-LAP, LLC	IHLAP		101044	11-01-18
Georgia	State Program	4	IA100001 (OR)	09-29-18
Illinois	NELAP	5	200024	11-29-18
Iowa	State Program	7	007	12-01-19
Kansas	NELAP	7	E-10341	01-31-19
Minnesota	NELAP	5	019-999-319	12-31-18
Minnesota (Petrofund)	State Program	1	3349	08-22-19
North Dakota	State Program	8	R-186	09-29-18
Oregon	NELAP	10	IA100001	09-29-18

Method Summary

Client: Muscatine Power & Water
Project/Site: Muscatine Power & Water CCR

TestAmerica Job ID: 310-138236-1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL CF
6020A	Metals (ICP/MS)	SW846	TAL CF
7470A	Mercury (CVAA)	SW846	TAL CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CF
SM 4500 H+ B	pH	SM	TAL CF
3010A	Preparation, Total Metals	SW846	TAL CF
7470A	Preparation, Mercury	SW846	TAL CF

Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CF = TestAmerica Cedar Falls, 704 Enterprise Drive, Cedar Falls, IA 50613, TEL (319)277-2401



310-138236 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information			
Client: Muscatine Power & Water			
City/State: Muscatine, IA		Project:	
Receipt Information			
Date/Time Received: 8/31/18 0900		Received By: AM	
Delivery Type: <input checked="" type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input type="checkbox"/> TA Courier <input type="checkbox"/> TA Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other:			
Condition of Cooler/Containers			
Sample(s) received in Cooler?		If yes: Cooler ID:	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Multiple Coolers?		If yes: Cooler # ____ of ____	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Cooler Custody Seals Present?		If yes: Cooler custody seals intact?	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?		If yes: Sample custody seals intact?	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?		If yes: Which VOA samples are in cooler? ↓	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Temperature Record			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: <input type="checkbox"/> NONE			
Thermometer ID: L		Correction Factor (°C): +0.2	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): 2.3		Corrected Temp (°C): 2.5	
• Sample Container Temperature			
Container type(s) used:			
Uncorrected Temp (°C):		Corrected Temp (°C):	
Exceptions Noted			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			

Chain of Custody Record

TestAmerica

Client Information Client Contact: Sam Bennett MP&W and Greg Brennan (HR Green) Company: Muscatine Power & Water Address: 1700 Dick Drake Way City: Muscatine State: IA, 52761 Phone: 563-262-3583 Email: sbennett@mpw.org and gbrennan@hrgreen.com Project Name: Muscatine Power & Water CCR Landfill Site: Iowa		Name of Client: Sam Bennett Title: VP Phone: 563-262-3583 Email: shawn.nayes@testamericainc.com		TestAmerica Project #: 31007856 Event:		Due Date Requested: TAT Requested (days): Normal PO #: 184240 WO #:		Analysis Requested		Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Anchor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other:		Special Instructions/Note: 2 Reports, 1 for State and one for Federal									
Sample Identification		Sample Date		Sample Time		Sample Type (C=Comp, G=grab)		Matrix (W=water, S=solid, O=other)		Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)		6020A CCR List, 7470A Mercury		2540C TDS, SM4500, H+ pH		9055A Chloride, Fluoride, Sulfate		Total Number of Containers	
MW-08		8-27-18	1645	G	GW																
MW-10		8-27-18	1255		GW																
MW-22		8-27-18	1445		GW																
MW-23		8-27-18	1345		GW																
MW-4A		8-28-18	1345		GW																
MW-5B		8-29-18	0940		GW																
MW-6A		8-29-18	0830		GW																
MW-13		8-28-18	0915		GW																
MW-14A		8-29-18	1245		GW																
MW-15A		8-29-18	1100		GW																
MW-18A		8-29-18	1425		GW																
Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological		Deliverable Requested: I, II, III, IV, Other (specify)		Empty Kit Relinquished by: Sam Bennett		Date: 8-30-18 0800		Company: MPW		Received by: [Signature]		Date/Time: 8/31/18 0900		Company: JACF							
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:		Received by:		Date/Time:		Company:					
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:		Received by:		Date/Time:		Company:					
Relinquished by:		Date/Time:		Company:		Received 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:		Method of Shipment:		Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For <input type="checkbox"/> Months		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)		Special Instructions/OC Requirements:		Date/Time:		Company:					

Chain of Custody Record

TestArmedad

[illegible]

Temperature readings: _____

<u>Client Sample ID</u>	<u>Lab ID</u>	<u>Container Type</u>	<u>Container</u> <u>pH</u>	<u>Preservative</u> <u>Added (mls)</u>	<u>Lot #</u>
MW-08	310-138236-B-1	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-10	310-138236-B-2	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-22	310-138236-B-3	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-23	310-138236-B-4	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-4A	310-138236-B-5	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-5B	310-138236-B-6	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-6A	310-138236-B-7	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-13	310-138236-B-8	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-14A	310-138236-B-9	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-15A	310-138236-B-10	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-18A	310-138236-B-11	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-21	310-138236-B-12	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-24	310-138236-B-13	Plastic 250ml - with Nitric Acid	<2	_____	_____
MW-25	310-138236-B-14	Plastic 250ml - with Nitric Acid	<2	_____	_____
DUP-1	310-138236-B-15	Plastic 250ml - with Nitric Acid	<2	_____	_____

Login Sample Receipt Checklist

Client: Muscatine Power & Water

Job Number: 310-138236-1

Login Number: 138236

List Source: TestAmerica Cedar Falls

List Number: 1

Creator: Homolar, Dana J

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water	Permit No. 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-4A	
Upgradient	Downgradient ^X
Name of person sampling Neil Hoskins	

A. MONITORING WELL/PIEZOMETER CONDITIONS	
Well/Piezometer Properly Capped? (please check)	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
If no, explain	
Standing Water or Litter? (please check)	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
If yes, explain	

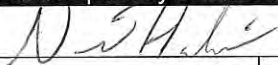
B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)			
Elevation:			
Top of inner well casing 713.45	Ground Elevation 711.18		
Depth of Well 24.55	Inside Casing Diameter (in inches) 2"		
Equipment Used Slope Indicator Co. Water level indicator Model 51453			
Groundwater Level (± 0.01 foot below top of inner casing, MSL):			
	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	8/28/18 13:00	7.91	705.54
*After Purging	8/28/18 13:45	7.99	705.46
*Before Purging			

*C. WELL PURGING	
Quantity of Water Removed from Well (gallons) 0.92	
No. of Well Volumes (based on current water level) 0.34	
Was well pumped/bailed dry? No	
Equipment used:	
Bailer type	Dedicated Bailer?
Pump type Peristaltic	Dedicated Pump? Yes
If not dedicated, method of cleaning	

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.
Questions? Call or Email: Nina Koger Environmental Engineer Sr., 515-725-8309, nina.koger@dnr.iowa.gov

D. FIELD MEASUREMENT*Weather Conditions** Overcast, 75oF, Rain**Field Measurements (after stabilization):****Temperature** 19.44**Units** C**Equipment Used** Horiba U-50**pH** 7.44**Equipment Used** Horiba U-50**Specific Conductance** 0.729**Units** mS/m**Equipment Used** Horiba U-50**Comments****CERTIFICATION**

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature**Date**

9/10/18

Telephone

563-262-3582

Fax**Email**

neil.hoskins@mpw.org

NOTE: Attach Laboratory Report and 8 1/2" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.
Questions? Call or Email: Nina Koger Environmental Engineer Sr., 515-725-8309, nina.koger@dnr.iowa.gov

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water	Permit No. 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-5B	
Upgradient	Downgradient ^X
Name of person sampling Sam Bennett	

A. MONITORING WELL/PIEZOMETER CONDITIONS	
Well/Piezometer Properly Capped? (please check)	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
If no, explain	
Standing Water or Litter? (please check)	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
If yes, explain	

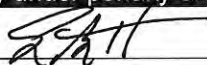
B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)			
Elevation:			
Top of inner well casing 709.10	Ground Elevation 706.73		
Depth of Well 25.30	Inside Casing Diameter (in inches) 2"		
Equipment Used Slope Indicator Co. Water level indicator Model 51453			
Groundwater Level (± 0.01 foot below top of inner casing, MSL):			
	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	8/29/18 09:05	3.12	705.98
*After Purging	8/29/18 09:40	4.04	705.06
*Before Purging			

*C. WELL PURGING	
Quantity of Water Removed from Well (gallons) 0.92	
No. of Well Volumes (based on current water level) 0.26	
Was well pumped/bailed dry? No	
Equipment used:	
Bailer type	Dedicated Bailer?
Pump type Peristaltic	Dedicated Pump? Yes
If not dedicated, method of cleaning	

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.
 Questions? Call or Email: Nina Koger Environmental Engineer Sr., 515-725-8309, nina.koger@dnr.iowa.gov

D. FIELD MEASUREMENT*Weather Conditions** Mostly Cloudy, 70oF, Variable 1-5mph wind**Field Measurements (after stabilization):****Temperature** 18.46**Units** C**Equipment Used** Horiba U-50**pH** 7.14**Equipment Used** Horiba U-50**Specific Conductance** 1.01**Units** mS/m**Equipment Used** Horiba U-50**Comments****CERTIFICATION**

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature**Date** 9-11-18**Telephone** 563-262-3583**Fax****Email** sbennett@mpw.org**NOTE:** Attach Laboratory Report and 8 1/2" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water	Permit No. 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-6A	
Upgradient	Downgradient ^X
Name of person sampling Sam Bennett	

A. MONITORING WELL/PIEZOMETER CONDITIONS	
Well/Piezometer Properly Capped? (please check)	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
If no, explain	
Standing Water or Litter? (please check)	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
If yes, explain	

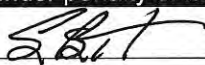
B. GROUNDWATER ELEVATION MEASUREMENT (\pm 0.01 foot, MSL)			
Elevation:			
Top of inner well casing 708.92	Ground Elevation 706.49		
Depth of Well 25.35	Inside Casing Diameter (in inches) 2"		
Equipment Used Slope Indicator Co. Water level indicator Model 51453			
Groundwater Level (\pm 0.01 foot below top of inner casing, MSL):			
	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	8/29/18 07:40	3.37	705.55
*After Purging	8/29/18 08:30	3.71	705.21
*Before Purging			

*C. WELL PURGING	
Quantity of Water Removed from Well (gallons) 1.32	
No. of Well Volumes (based on current water level) 0.37	
Was well pumped/bailed dry? No	
Equipment used:	
Bailer type	Dedicated Bailer?
Pump type Peristaltic	Dedicated Pump? Yes
If not dedicated, method of cleaning	

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 Questions? Call or Email: Nina Koger Environmental Engineer Sr., 515-725-8309, nina.koger@dnr.iowa.gov

D. FIELD MEASUREMENT*Weather Conditions** Cloudy, 65oF, variable 2-5mph wind**Field Measurements (after stabilization):****Temperature** 15.45 **Units** C**Equipment Used** Horiba U-50**pH** 7.18**Equipment Used** Horiba U-50**Specific Conductance** 0.573 **Units** mS/m**Equipment Used** Horiba U-50**Comments****CERTIFICATION**

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature**Date**

9-11-18

Telephone

563-262-3583

Fax**Email**

sbennett@mpw.org

NOTE: Attach Laboratory Report and 8 1/2" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.
Questions? Call or Email: Nina Koger Environmental Engineer Sr., 515-725-8309, nina.koger@dnr.iowa.gov

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water	Permit No. 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-08	
Upgradient ^X	Downgradient
Name of person sampling Neil Hoskins	

A. MONITORING WELL/PIEZOMETER CONDITIONS	
Well/Piezometer Properly Capped? (please check)	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
If no, explain	
Standing Water or Litter? (please check)	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
If yes, explain	

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)			
Elevation:			
Top of inner well casing 747.36	Ground Elevation 744.37		
Depth of Well 42.95	Inside Casing Diameter (in inches) 2"		
Equipment Used Slope Indicator Co. Water level indicator Model 51453			
Groundwater Level (± 0.01 foot below top of inner casing, MSL):			
	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	08/27/18 16:20	16.94	730.42
*After Purging	08/27/18 16:45	20.69	726.67
*Before Purging			

*C. WELL PURGING	
Quantity of Water Removed from Well (gallons) 0.66	
No. of Well Volumes (based on current water level) 0.16	
Was well pumped/bailed dry? No	
Equipment used:	
Bailer type	Dedicated Bailer?
Pump type Peristaltic	Dedicated Pump? Yes
If not dedicated, method of cleaning	

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.
Questions? Call or Email: Nina Koger Environmental Engineer Sr., 515-725-8309, nina.koger@dnr.iowa.gov

D. FIELD MEASUREMENT*Weather Conditions** Cloudy, 85oF, SE wind @ 5-10mph**Field Measurements (after stabilization):****Temperature** 21.91 **Units** C**Equipment Used** Horiba U-50**pH** 7.20**Equipment Used** Horiba U-50**Specific Conductance** 0.661 **Units** mS/m**Equipment Used** Horiba U-50**Comments****CERTIFICATION**

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature **Date** 9/10/18**Telephone** 563-262-3582**Fax****Email** neil.hoskins@mpw.org**NOTE:** Attach Laboratory Report and 8 1/2" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.
Questions? Call or Email: Nina Koger Environmental Engineer Sr., 515-725-8309, nina.koger@dnr.iowa.gov

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water	Permit No. 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-10	
Upgradient ^X	Downgradient
Name of person sampling Sam Bennett	

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check)	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
If no, explain	
Standing Water or Litter? (please check)	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
If yes, explain	

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)

Elevation:			
Top of inner well casing 718.51	Ground Elevation 716.32		
Depth of Well 20.32	Inside Casing Diameter (in inches) 2"		
Equipment Used Slope Indicator Co. Water level indicator Model 51453			
Groundwater Level (± 0.01 foot below top of inner casing, MSL):			
	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	8/27/18 12:05	5.73	712.78
*After Purging	8/27/18 12:55	5.82	712.69
*Before Purging			

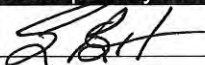
*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 1.32	
No. of Well Volumes (based on current water level) 0.56	
Was well pumped/bailed dry? No	
Equipment used:	
Bailer type	Dedicated Bailer?
Pump type Peristaltic	Dedicated Pump? Yes
If not dedicated, method of cleaning	

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Questions? Call or Email: Nina Koger Environmental Engineer Sr., 515-725-8309, nina.koger@dnr.iowa.gov

D. FIELD MEASUREMENT*Weather Conditions** Cloudy, 82oF, SE wind @ 5-10mph**Field Measurements (after stabilization):****Temperature** 20.21**Units** C**Equipment Used** Horiba U-50**pH** 7.23**Equipment Used** Horiba U-50**Specific Conductance** 0.642**Units** mS/m**Equipment Used** Horiba U-50**Comments****CERTIFICATION**

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature**Date**~~9-18-10~~ ⁵⁰⁸ 9-11-10**Telephone**

563-262-3583

Fax**Email**

sbennett@mpw.org

NOTE: Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

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Questions? Call or Email: Nina Koger Environmental Engineer Sr., 515-725-8309, nina.koger@dnr.iowa.gov

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water	Permit No. 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-13	
Upgradient	Downgradient <input checked="" type="checkbox"/>
Name of person sampling Sam Bennett	

A. MONITORING WELL/PIEZOMETER CONDITIONS	
Well/Piezometer Properly Capped? (please check)	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
If no, explain	
Standing Water or Litter? (please check)	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
If yes, explain	

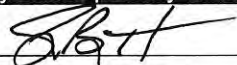
B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)			
Elevation:			
Top of inner well casing 717.63	Ground Elevation 715.44		
Depth of Well 20.00	Inside Casing Diameter (in inches) 2"		
Equipment Used Slope Indicator Co. Water level indicator Model 51453			
Groundwater Level (± 0.01 foot below top of inner casing, MSL):			
	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	8/28/18 08:50	9.08	708.55
*After Purging	8/28/18 09:15	9.46	708.17
*Before Purging			

*C. WELL PURGING	
Quantity of Water Removed from Well (gallons) 0.66	
No. of Well Volumes (based on current water level) 0.37	
Was well pumped/bailed dry? No	
Equipment used:	
Bailer type	Dedicated Bailer?
Pump type Peristaltic	Dedicated Pump? Yes
If not dedicated, method of cleaning	

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.
Questions? Call or Email: Nina Koger Environmental Engineer Sr., 515-725-8309, nina.koger@dnr.iowa.gov

D. FIELD MEASUREMENT*Weather Conditions** Partly Cloudy, 76oF, S wind @ 10-15 mph**Field Measurements (after stabilization):****Temperature** 19.60**Units** °C**Equipment Used** Horiba U-50**pH** 7.37**Equipment Used** Horiba U-50**Specific Conductance** 0.712**Units** mS/m**Equipment Used** Horiba U-50**Comments****CERTIFICATION**

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature**Date** 9-11-18**Telephone** 563-262-3583**Fax****Email** sbennett@mpw.org**NOTE:** Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water	Permit No. 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-14A	
Upgradient	Downgradient ^X
Name of person sampling Neil Hoskins	

A. MONITORING WELL/PIEZOMETER CONDITIONS	
Well/Piezometer Properly Capped? (please check)	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
If no, explain	
Standing Water or Litter? (please check)	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
If yes, explain	

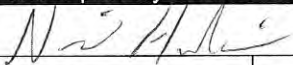
B. GROUNDWATER ELEVATION MEASUREMENT (\pm 0.01 foot, MSL)			
Elevation:			
Top of inner well casing 729.00	Ground Elevation 726.19		
Depth of Well 20.50	Inside Casing Diameter (in inches) 2"		
Equipment Used Slope Indicator Co. Water level indicator Model 51453			
Groundwater Level (\pm 0.01 foot below top of inner casing, MSL):			
	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	08/29/18 11:35	13.76	715.24
*After Purging	08/29/18 12:45	17.15	711.85
*Before Purging			

*C. WELL PURGING	
Quantity of Water Removed from Well (gallons) 1.85	
No. of Well Volumes (based on current water level) 1.68	
Was well pumped/bailed dry? No	
Equipment used:	
Bailer type	Dedicated Bailer?
Pump type Peristaltic	Dedicated Pump? Yes
If not dedicated, method of cleaning	

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Questions? Call or Email: Nina Koger Environmental Engineer Sr., 515-725-8309, nina.koger@dnr.iowa.gov

D. FIELD MEASUREMENT*Weather Conditions** Clear, 71oF, Calm**Field Measurements (after stabilization):****Temperature** 18.73 **Units** C**Equipment Used** Horiba U-50**pH** 7.09**Equipment Used** Horiba U-50**Specific Conductance** 2.17 **Units** mS/m**Equipment Used** Horiba U-50**Comments****CERTIFICATION**

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature**Date**

9/10/18

Telephone 563-262-3582**Fax****Email** neil.hoskins@mpw.org**NOTE:** Attach Laboratory Report and 8 1/2" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water		Permit No. 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-15A		
Upgradient	Downgradient ^X	
Name of person sampling Neil Hoskins		

A. MONITORING WELL/PIEZOMETER CONDITIONS	
Well/Piezometer Properly Capped? (please check)	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
If no, explain	
Standing Water or Litter? (please check)	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
If yes, explain	

B. GROUNDWATER ELEVATION MEASUREMENT (\pm 0.01 foot, MSL)			
Elevation:			
Top of inner well casing 729.99	Ground Elevation 727.12		
Depth of Well 20.50	Inside Casing Diameter (in inches) 2"		
Equipment Used Slope Indicator Co. Water level indicator Model 51453			
Groundwater Level (\pm 0.01 foot below top of inner casing, MSL):			
	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	08/29/18 10:10	12.47	717.52
*After Purging	08/29/18 11:00	15.98	714.01
*Before Purging			

*C. WELL PURGING	
Quantity of Water Removed from Well (gallons) 1.32	
No. of Well Volumes (based on current water level) 1.01	
Was well pumped/bailed dry? No	
Equipment used:	
Bailer type	Dedicated Bailer?
Pump type Peristaltic	Dedicated Pump? Yes
If not dedicated, method of cleaning	

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.
Questions? Call or Email: Nina Koger Environmental Engineer Sr., 515-725-8309, nina.koger@dnr.iowa.gov

D. FIELD MEASUREMENT*Weather Conditions** Mostly Cloudy, 72oF, variable wind @ 1-5mph**Field Measurements (after stabilization):****Temperature** 18.33 **Units** C**Equipment Used** Horiba U-50**pH** 7.25**Equipment Used** Horiba U-50**Specific Conductance** 1.26 **Units** mS/m**Equipment Used** Horiba U-50**Comments****CERTIFICATION**

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature **Date** 9/10/18**Telephone** 563-262-3582**Fax****Email** neil.hoskins@mpw.org**NOTE:** Attach Laboratory Report and 8 1/2" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.
Questions? Call or Email: Nina Koger Environmental Engineer Sr., 515-725-8309, nina.koger@dnr.iowa.gov

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water	Permit No. 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-18A	
Upgradient	Downgradient ^X
Name of person sampling Neil Hoskins	

A. MONITORING WELL/PIEZOMETER CONDITIONS	
Well/Piezometer Properly Capped? (please check)	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
If no, explain	
Standing Water or Litter? (please check)	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
If yes, explain	

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)			
Elevation:			
Top of inner well casing 729.13	Ground Elevation 726.06		
Depth of Well 23.10	Inside Casing Diameter (in inches) 2"		
Equipment Used Slope Indicator Co. Water level indicator Model 51453			
Groundwater Level (± 0.01 foot below top of inner casing, MSL):			
	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	8/29/18 13:15	16.96	712.17
*After Purging	8/29/18 14:25	19.08	710.05
*Before Purging			

*C. WELL PURGING	
Quantity of Water Removed from Well (gallons) 1.85	
No. of Well Volumes (based on current water level) 1.85	
Was well pumped/bailed dry? No	
Equipment used:	
Bailer type	Dedicated Bailer?
Pump type Peristaltic	Dedicated Pump? Yes
If not dedicated, method of cleaning	

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.
Questions? Call or Email: Nina Koger Environmental Engineer Sr., 515-725-8309, nina.koger@dnr.iowa.gov

D. FIELD MEASUREMENT*Weather Conditions** Clear, 72oF, Calm**Field Measurements (after stabilization):****Temperature** 19.08**Units** C**Equipment Used** Horiba U-50**pH** 7.12**Equipment Used** Horiba U-50**Specific Conductance** 1.50**Units** mS/m**Equipment Used** Horiba U-50**Comments****CERTIFICATION**

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature**Date****Telephone** 563-262-3582**Fax****Email** neil.hoskins@mpw.org**NOTE:** Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

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Questions? Call or Email: Nina Koger Environmental Engineer Sr., 515-725-8309, nina.koger@dnr.iowa.gov

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water	Permit No. 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-21	
Upgradient	Downgradient <input checked="" type="checkbox"/>
Name of person sampling Sam Bennett	

A. MONITORING WELL/PIEZOMETER CONDITIONS	
Well/Piezometer Properly Capped? (please check)	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
If no, explain	
Standing Water or Litter? (please check)	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
If yes, explain	

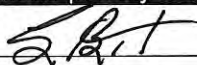
B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)			
Elevation:			
Top of inner well casing 725.75	Ground Elevation 722.81		
Depth of Well 22.20	Inside Casing Diameter (in inches) 2"		
Equipment Used Slope Indicator Co. Water level indicator Model 51453			
Groundwater Level (± 0.01 foot below top of inner casing, MSL):			
	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	8/28/18 09:35	11.72	714.03
*After Purging	08/28/18 10:20	12.54	713.21
*Before Purging			

*C. WELL PURGING	
Quantity of Water Removed from Well (gallons) 1.19	
No. of Well Volumes (based on current water level) 0.70	
Was well pumped/bailed dry? No	
Equipment used:	
Bailer type	Dedicated Bailer?
Pump type Peristaltic	Dedicated Pump? Yes
If not dedicated, method of cleaning	

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.
Questions? Call or Email: Nina Koger Environmental Engineer Sr., 515-725-8309, nina.koger@dnr.iowa.gov

D. FIELD MEASUREMENT*Weather Conditions** Partly Cloudy, 76oF, S wind @ 10-15 mph**Field Measurements (after stabilization):****Temperature** 19.45 **Units** °C**Equipment Used** Horiba U-50**pH** 7.07**Equipment Used** Horiba U-50**Specific Conductance** 0.745 **Units** mS/m**Equipment Used** Horiba U-50**Comments****CERTIFICATION**

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature**Date** 9-11-18**Telephone** 563-262-3583**Fax****Email** sbennett@mpw.org**NOTE:** Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power and Water	Permit No. 70-SDP-6_82P
Monitoring Well/Piezometer No. MW-22	
Upgradient	Downgradient X
Name of person sampling Sam Bennett	

A. MONITORING WELL/PIEZOMETER CONDITIONS	
Well/Piezometer Properly Capped? (please check)	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
If no, explain	
Standing Water or Litter? (please check)	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
If yes, explain	

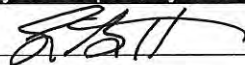
B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)			
Elevation:			
Top of inner well casing 744.75	Ground Elevation 742.00		
Depth of Well 43.33	Inside Casing Diameter (in inches) 2"		
Equipment Used Slope Indicator Co. Water level indicator Model 51453			
Groundwater Level (± 0.01 foot below top of inner casing, MSL):			
	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	8/27/18 14:10	16.84	727.43
*After Purging	8/27/18 14:45	22.06	722.21
*Before Purging			

*C. WELL PURGING	
Quantity of Water Removed from Well (gallons) 0.92	
No. of Well Volumes (based on current water level) 0.23	
Was well pumped/bailed dry? No	
Equipment used:	
Bailer type	Dedicated Bailer?
Pump type Peristaltic	Dedicated Pump? Yes
If not dedicated, method of cleaning	

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.
Questions? Call or Email: Nina Koger Environmental Engineer Sr., 515-725-8309, nina.koger@dnr.iowa.gov

D. FIELD MEASUREMENT*Weather Conditions** Overcast, 85oF, Calm**Field Measurements (after stabilization):****Temperature** 23.06 **Units** C**Equipment Used** Horiba U-50**pH** 7.42**Equipment Used** Horiba U-50**Specific Conductance** 0.676 **Units** mS/m**Equipment Used** Horiba U-50**Comments****CERTIFICATION**

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature**Date**

9-11-18

Telephone

563-262-3583

Fax**Email** sbennett@mpw.org**NOTE:** Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power & Water CCR Landfill Permit No. 70-SDP-6-82P
Monitoring Well/Piezometer No. MW-23
Upgradient ☒ Downgradient _____
Name of person sampling Sam Bennett

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) ☒ YES ☐ NO

If no, explain _____

Standing Water or Litter? (please check) ☐ YES ☒ NO

If yes, explain _____

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)

Elevation:

Top of inner well casing 726.901 Ground Elevation 723.732

Depth of Well 25 Inside Casing Diameter (in inches) 2

Equipment Used Slope Indicator Co. water level indicator Model 51453

Groundwater Level (± 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	8/27/18, 13:20	7.53	719.37
*After Purging	8/27/18, 13:45	11.73	715.17
*Before Purging	8/27/18, 13:20	7.53	719.37

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 0.66

No. of Well Volumes (based on current water level) 0.23

Was well pumped/bailed dry? No

Equipment used:

Bailer type _____ Dedicated Bailer? _____

Pump type Peristaltic Pump Dedicated Pump? Yes

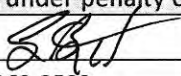
If not dedicated, method of cleaning _____

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319.

Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

D. FIELD MEASUREMENT**Weather Conditions 85°F, Cloudy, Calm**Field Measurements (after stabilization):**Temperature 20.79 Units CEquipment Used Horiba U-50pH 7.55Equipment Used Horiba U-50Specific Conductance 0.578 Units mS/mEquipment Used Horiba U-50**Comments*CERTIFICATION**

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature  Date 9-11-18Telephone 563-262-3583 Fax _____ Email sbennett@mpw.org**NOTE:** Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319.Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power & Water CCR Landfill Permit No. 70-SDP-6-82P
Monitoring Well/Piezometer No. MW-24
Upgradient ☒ Downgradient _____
Name of person sampling Neil Hoskins

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) ☒ YES ☐ NO

If no, explain _____

Standing Water or Litter? (please check) ☐ YES ☒ NO

If yes, explain _____

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)

Elevation:

Top of inner well casing 735.32 Ground Elevation 732.1

Depth of Well 20 Inside Casing Diameter (in inches) 2

Equipment Used Slope Indicator Co. Water level indicator Model 51453

Groundwater Level (± 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	8/27/18, 15:30	16.85	718.47
*After Purging	8/27/18, 16:00	17.52	717.8
*Before Purging	8/27/18, 15:30	16.85	718.47

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 0.79

No. of Well Volumes (based on current water level) 1.54

Was well pumped/bailed dry? No

Equipment used:

Bailer type _____ Dedicated Bailer? _____

Pump type Peristaltic Pump Dedicated Pump? Yes

If not dedicated, method of cleaning _____

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319.

Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

D. FIELD MEASUREMENT**Weather Conditions 85°F, Cloudy, Calm**Field Measurements (after stabilization):**Temperature 21.14 Units CEquipment Used Horiba U-50pH 7.39Equipment Used Horiba U-50Specific Conductance 0.623 Units mS/mEquipment Used Horiba U-50**Comments*CERTIFICATION**

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature  Date 7/11/18Telephone 563-262-3582 Fax _____ Email niel.hoskins@mpw.org**NOTE:** Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319.Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Muscatine Power & Water Permit No. 70-SDP-6-82P
Monitoring Well/Piezometer No. MW-25
Upgradient ☒ Downgradient _____
Name of person sampling Sam Bennett

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) ☒ YES ☐ NO

If no, explain _____

Standing Water or Litter? (please check) ☐ YES ☒ NO

If yes, explain _____

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)

Elevation:

Top of inner well casing 739.121 Ground Elevation 736.143

Depth of Well 35 Inside Casing Diameter (in inches) 2

Equipment Used Slope Indicator Co. Water level indicator Model 51453

Groundwater Level (± 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	8/28/18, 07:40	21.52	717.6
*After Purging	8/28/18, 08:15	21.37	717.38
*Before Purging	8/28/18, 07:40	21.52	717.6

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 0.92

No. of Well Volumes (based on current water level) 0.42

Was well pumped/bailed dry? No

Equipment used:

Bailer type _____ Dedicated Bailer? _____

Pump type Peristaltic Pump Dedicated Pump? Yes

If not dedicated, method of cleaning _____

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319.

Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

D. FIELD MEASUREMENT**Weather Conditions Clear, Calm, 75°F**Field Measurements (after stabilization):**Temperature 21.74 Units CEquipment Used Horiba U-50pH 7.31Equipment Used Horiba U-50Specific Conductance 1.01 Units mS/mEquipment Used Horiba U-50**Comments*CERTIFICATION**

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature  Date 9-11-18Telephone 563-262-3583 Fax _____ Email sbennett@mpw.org**NOTE:** Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319.Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

LOW FLOW SAMPLING FORM

DATE	8/28/2018	WELL ID	MW-4A	SAMPLE DATE / TIME	8/28/18 1345
SITE	Muscataine Power & Water	DTW	7.91	NOTE	
PROJECT #	August Sampling	WELL DEPTH	24.55		
WEATHER	Cloudy/rain- 75°F	PUMP TYPE	GeoTech Peristaltic	DEPTH TO INTAKE	19.5'

[illegible]

<i>0.5-5.0 min</i>	<i>200-500 ml</i>	<i>- - -</i>	<i>minimize</i>	<i>- - -</i>	<i>+/-0.1</i>	<i>+/-10 mV</i>	<i>+/- 3%</i>	<i>+/- 10%</i>	<i>+/- 10%</i>	<i>Limits or +/-0.2 mg</i>
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LOW FLOW SAMPLING FORM

DATE	8/29/2018	WELL ID	MW-5B	SAMPLE DATE / TIME	8/29/18 0940
SITE	Muscataine Power & Water	DTW	3.12	NOTE	
PROJECT #	August Sampling	WELL DEPTH	25.30		
WEATHER	Mostly cloudy- 70°F- variable wind 1-5 mph	PUMP TYPE	GeoTech Peristaltic	DEPTH TO INTAKE	25'

[illegible]

	Limits	+/- 10%	+/- 3%	+/- 10%	+/- 10%	Limits
0.5-5.0 min	200-500 ml	- - -	minimize	- - -	+/- 0.1	+/- 10 mV or +/- 0.2 mg,

LOW FLOW SAMPLING FORM

DATE	8/29/2018	WELL ID	MW-6A	SAMPLE DATE / TIME	8/29/18 0810
SITE	Muscataine Power & Water	DTW	3.37	NOTE	Duplicate
PROJECT #	August Sampling	WELL DEPTH	25.35		
WEATHER	Cloudy- 65°F- Variable wind 2-5mph	PUMP TYPE	GeoTech Peristaltic	DEPTH TO INTAKE	20'

[illegible]

	Limits	Limits	Limits	Limits
0.5-5.0 min	200-500 ml	- - -	minimize	- - -
+/- 0.1	+/-10 mV	+/- 3%	+/- 10%	+/- 10%
or +/-0.2 mg				

LOW FLOW SAMPLING FORM

[illegible]

LOW FLOW SAMPLING FORM

DATE	8/28/2018	WELL ID	MW-13	SAMPLE DATE / TIME	8/28/18 0915
SITE	Muscataine Power & Water	DTW	9.08	NOTE	
PROJECT #	August Sampling	WELL DEPTH	20.00		
WEATHER	Partly cloudy, 76°F S wind 10-15mph	PUMP TYPE	GeoTech Peristaltic	DEPTH TO INTAKE	15'

[illegible][illegible]

LOW FLOW SAMPLING FORM

DATE	8/29/2018	WELL ID	MW-14A	SAMPLE DATE / TIME	8/29/18 1245
SITE	Muscatine Power & Water	DTW	13.76	NOTE	
PROJECT #	August Sampling	WELL DEPTH	20.50		
WEATHER	Clear, 71°F Calm	PUMP TYPE	GeoTech Peristaltic	DEPTH TO INTAKE	15.5'

TIME	PURGE RATE(ml)	VOL REMOVED(m)	DTW	TEMP	Ph	ORP	SpecCond	Turbidity	DO	NOTES
11:35	100		13.76							
11:40	100	500	14.23	20.58	7.11	121	2.05	0.4	5.63	
11:45	100	1000	14.44	20.76	7.10	123	2.05	0.1	5.10	
11:50	100	1500	14.65	18.49	7.09	127	2.18	0.0	5.73	
11:55	100	2000	14.92	18.59	7.09	126	2.18	0.0	5.94	
12:00	100	2500	15.18	18.28	7.09	127	2.17	0.0	6.70	
12:05	100	3000	15.42	19.14	7.09	128	2.16	0.0	6.06	
12:10	100	3500	15.66	20.38	7.10	130	2.06	0.0	5.47	
12:15	100	4000	15.87	20.76	7.10	128	2.05	0.0	4.86	
12:20	100	4500	16.1	20.90	7.10	130	2.06	0.0	4.18	
12:25	100	5000	16.31	20.76	7.10	129	2.04	0.0	3.76	
12:30	100	5500	16.52	19.00	7.10	128	2.13	0.0	3.83	
12:35	100	6000	16.75	19.17	7.09	127	2.13	0.0	3.54	
12:40	100	6500	16.99	18.78	7.09	127	2.16	0.0	3.36	
12:45	100	7000	17.15	18.73	7.09	127	2.17	0.0	3.49	Sample Started/Sample Ended
12:55			17.47							Preservative
										# of Containers
										HCl
										HNO ₃
										NaOH
										Note

0.5-5.0 min	200-500 ml	---	minimize	---	+/- 0.1	+/-10 mV	+/- 3%	+/- 10%	+/- 10%	Limits
										or +/-0.2 mg.

LOW FLOW SAMPLING FORM

DATE	8/29/2018	WELL ID	MW-15A	SAMPLE DATE / TIME	8/29/2018 1100
SITE	Muscataine Power & Water	DTW	12.47		
PROJECT #	August Sampling	WELL DEPTH	20.50	DEPTH TO INTAKE	15'
WEATHER	Mostly cloudy, 72°F variable wind 1-5mph GeoTech Peristaltic				

[illegible]

Limits

LOW FLOW SAMPLING FORM

DATE	8/29/2018	WELL ID	MW-18A	SAMPLE DATE / TIME	8/29/18 1425
SITE	Muscataine Power & Water	DTW	16.96		
PROJECT #	August Sampling	WELL DEPTH	23.10	DEPTH TO INTAKE	21'
WEATHER	Clear, 72°F Calm	PUMP TYPE	GeoTech Peristaltic		

[illegible]

0.5-5.0 min 200-500 ml

minimize

1
1
1

 ± 0.1

$\pm 10\text{ mV}$

+/- 10%

+/- 10%

Limits

or ± 0.2 mg.

or ± 0.2 mg.

LOW FLOW SAMPLING FORM

DATE	8/28/2018	WELL ID	MW-21	SAMPLE DATE / TIME
SITE	Muscataine Power & Water	DTW	11.72	NOTE
PROJECT #	August Sampling	WELL DEPTH	22.20	
WEATHER	Partly cloudy, 76°F S wind 10-15mph	PUMP TYPE	GeoTech Peristaltic	DEPTH TO INTAKE
				17'

[illegible][illegible]

LOW FLOW SAMPLING FORM

[illegible]

LOW FLOW SAMPLING FORM

[illegible]

LOW FLOW SAMPLING FORM

[illegible]

LOW FLOW SAMPLING FORM

[illegible]

Muscatine Power & Water CCR Landfill Federal Parameters Job # 10100095 MW-08 Upgradient												
June-16	August-16	October-16	December-16	February-17	April-17	June-17	August-17	October-17	November-17	March-18	June-18	August-18

Appendix III Parameters:

Boron	mg/L	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2
Calcium	mg/L	152	117	109	89.9	96.5	113	91.3	77	74.7	115	83.6
Chloride	mg/L	19.8	17.8	17.2	15.4	17.1	14.1	14	14.4	14.5	14.9	15.6
Fluoride	mg/L	<.5	< .5	0.72	< .5	1.69	< .5	< .5	< .5	< .5	0.826	< .5
pH	SU	8.26	6.82		7.03	7.05	7.59	6.77	7.24	7.3	7.56	7.2
Sulfate	mg/L	366	187	149	145	145	190	119	106	87.3	136	94.7
Total Dissolved Solids	mg/L	836	664	634	578	624	656	488	470	376	502	414

Appendix IV Parameters:

Anitmony	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001
Arsenic	mg/L	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002
Barium	mg/L	0.0861	0.0671	0.0645	0.0594	0.0636	0.076	0.0596		0.0617	0.0761	0.0649
Beryllium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001
Cadmium	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005		< .0005	< .0005	< .0005
Chromium	mg/L	< .005	< .005	< .005	< .005	< .005	< .005	< .005		< .005	< .005	< .005
Cobalt	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	0.000601	0.00051		< .0005	< .0005	< .0005
Fluoride	mg/L	< .5	< .5	0.72	> .5	1.69	> .5	< .5		< .5	0.826	< .5
Lead	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005		< .0005	< .0005	< .0005
Lithium	mg/L	< .05	< .05	< .05	< .05	< .05	< .05	< .05		< .01	< .01	< .01
Mercury	mg/L	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002		< .0002	< .0002	< .0002
Molybdenum	mg/L	< .002	< .002	< .002	< .002	< .002	< .002	< .002		0.0022	< .002	0.00224
Selenium	mg/L	< .005	< .005	< .005	< .005	< .005	< .005	< .005		< .005	< .005	< .005
Thallium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001		< .001	< .001	< .001
Radium-226	mg/L	0.152	0.4086	0.234	0.0604	0.0229	0.0596	0.087		0.022		
Radium-228	mg/L	0.224	0.0663	0.102	0.161	0.104	0.144	0.249		0.646		
Combined Radium 226 + 228	mg/L	0.375	0.115	0.336	0.221	0.126	0.204	0.336		0.668		

Muscatine Power & Water CCR Landfill Federal Parameters Job # 10100095 MW-10 Upgradient													
June-16	August-16	October-16	December-16	February-17	April-17	June-17	August-17	October-17	November-17	March-18	June-18	August-18	

Appendix III Parameters:

Boron	mg/L	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2
Calcium	mg/L	89.3	80.7	83.3	86.5	81.2	79.2	83.6	85.5	83.3	77.3	88.5	85.4
Chloride	mg/L	6.22	< .5	< .5	< .5	< .5	< .5	< .5	< .5	< .5	< .5	< .5	< .5
Fluoride	mg/L	0.731	< .5	< .5	< .5	< .5	0.774	< .5	< .5	< .5	< .5	< .5	< .5
pH	SU	8.68	7.12	7.27		7.51	7.18	7.45	6.34	7.18	7.04	7.72	7.23
Sulfate	mg/L	42.1	7.3	36.4	38.4	47.3	38.3	35.4	39	46.9	51.4	37.3	34.3
Total Dissolved Solids	mg/L	468	412	444	428	498	538	524	458	414	314	396	392

Appendix IV Parameters:

Antimony	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001		< .001	< .001	< .001
Arsenic	mg/L	0.00298	0.00369	0.00328	0.00312	0.00298	< .002	0.00262	0.00317		< .002	0.00211	0.0036
Barium	mg/L	0.168	0.161	0.163	0.15	0.151	0.138	0.154	0.157		0.129	0.162	0.216
Beryllium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001		< .001	< .001	< .001
Cadmium	mg/L	89.3	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005		< .0005	< .0005	< .0005
Chromium	mg/L	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005		< .005	< .005	< .005
Cobalt	mg/L	0.000555	< .0005	0.000523	0.000638	0.000663	0.000779	0.000621	0.000695		0.000627	0.00107	0.00088
Fluoride	mg/L	0.731	< .5	< .5	< .5	< .5	0.774	< .5	< .5		< .5	< .5	< .5
Lead	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005		< .0005	< .0005	< .0005
Lithium	mg/L	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .05		< .01	< .01	< .01
Mercury	mg/L	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002		< .0002	< .0002	< .0002
Molybdenum	mg/L	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002		< .002	< .002	0.0022
Selenium	mg/L	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005		< .005	< .005	< .005
Thallium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001		< .001	< .001	< .001
Radium-226	mg/L	0.19	0.413	0.119	0.422	0.199	0.139	0.206	0.273		0.188		
Radium-228	mg/L	0.0326	0.255	0.575	0.377	0.314	0.332	-0.00196	0.558		0.0884		
Combined Radium 226 + 228	mg/L	0.223	0.668	0.694	0.799	0.513	0.47	0.204	0.831		0.276		

Muscatine Power & Water CCR Landfill Federal Parameters Job # 10100095 MW-4A Downgradient													
June-16	August-16	October-16	December-16	February-17	April-17	June-17	August-17	October-17	November-17	March-18	June-18	August-18	

Appendix III Parameters:

Boron	mg/L	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	0.66	< .2	< .2
Calcium	mg/L	98.1	88.8	89.3	94.5	86.8	85.9	88.7	89.7	85.3	95.8	91.4	91.3
Chloride	mg/L	12.6	13.2	13.6	13.5	15.1	12.5	13.2	13.2	14.7	8.81	15.3	19.4
Fluoride	mg/L	< .5	< .5	< .5	< .5	0.664	0.801	< .5	< .5	< .5	< .5	< .5	< .5
pH	SU	8.9	7.3	7.38		7.42	7.33	8.16	6.53	7.49	7.36	7.53	7.44
Sulfate	mg/L	32.2	28.4	27.2	32.7	36	39.5	33	35.3	45.4	162	51.3	52.2
Total Dissolved Solids	mg/L	507	426	450	450	460	442	452	420	466	586	440	420

Appendix IV Parameters:

Anitmony	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001
Arsenic	mg/L	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .0002	< .002
Barium	mg/L	0.15	0.128	0.131	0.139	0.143	0.111	0.133	0.133	0.117	0.117	0.144	0.149
Beryllium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001
Cadmium	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005
Chromium	mg/L	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005
Cobalt	mg/L	< .000681	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005
Fluoride	mg/L	< .5	< .5	< .5	< .5	0.664	0.801	< .5	< .5	< .5	< .5	< .5	< .5
Lead	mg/L	< .00147	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005
Lithium	mg/L	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .01	< .01	< .01
Mercury	mg/L	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002
Molybdenum	mg/L	< .002	< .002	M .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002
Selenium	mg/L	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005
Thallium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001
Radium-226	mg/L	0.54	0.326	0.285	0.585	0.215	0.0818	0.177	0.255		0.111		
Radium-228	mg/L	0.171	0.612	0.388	0.0872	0.313	0.227	0.192	0.188		0.339		
Combined Radium 226 + 228	mg/L	0.711	0.938	0.674	0.672	0.528	0.309	0.368	0.443		0.45		

Muscatine Power & Water CCR Landfill Federal Parameters Job # 10100095 MW-5B Downgradient													
June-16	August-16	October-16	December-16	February-17	April-17	June-17	August-17	October-17	November-17	March-18	June-18	August-18	

Appendix III Parameters:													
Boron	mg/L	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2
Calcium	mg/L	147	< .0005	140	147	126	130	140	139	136	134	147	146
Chloride	mg/L	67	65.9	66	67	70.4	62.1	63.4	64	73	68.2	65	70.8
Fluoride	mg/L	< .5	< .5	< .5	1.88	2.14	0.627	< .5	< .5	< .5	< .5	< .5	< .5
pH	SU	8.49	7.08	7.1		6.05	7	7.89	6.95	7.08	7.23	7.3	7.14
Sulfate	mg/L	109		105	109	111	108	108	114	135	122	119	120
Total Dissolved Solids	mg/L	920	672	646	636	684	680	656	734	688	620	828	622

Appendix IV Parameters:													
Anitmony	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001		< .001	< .001	< .001
Arsenic	mg/L	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002		< .002	< .002	< .002
Barium	mg/L	0.331	0.295	0.304	0.315	0.316	0.296	0.31	0.300		0.341	0.336	0.357
Beryllium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001		< .001	< .001	< .001
Cadmium	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005		< .0005	< .0005	< .0005
Chromium	mg/L	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005		< .005	< .005	< .005
Cobalt	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005		< .0005	< .0005	< .0005
Fluoride	mg/L	< .5	< .5	< .5	1.88	2.14	0.627	< .5	< .5		< .5	< .5	< .5
Lead	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005		< .0005	< .0005	< .0005
Lithium	mg/L	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .05		< .01	< .01	< .0005
Mercury	mg/L	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002		< .0002	< .0002	< .0002
Molybdenum	mg/L	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002		< .002	< .002	< .002
Selenium	mg/L	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005		< .005	< .005	< .005
Thallium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001		< .001	< .001	< .001
Radium-226	mg/L	0.365	0.449	0.598	0.509	0.464	0.357	0.433	0.213		0.349		
Radium-228	mg/L	0.3	0.405	-0.169	0.541	0.386	0.664	0.54	0.294		0.61		
Combined Radium 226 + 228	mg/L	0.665	0.854	0.428	1.05	0.85	1.02	0.973	0.507		0.959		

Muscatine Power & Water CCR Landfill Federal Parameters Job # 10100095 MW-6A Downgradient													
June-16	August-16	October-16	December-16	February-17	April-17	June-17	August-17	October-17	November-17	March-18	June-18	August-18	

Appendix III Parameters:

Boron	mg/L	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2	< .2
Calcium	mg/L	81.4	75.4	85.6	68.8	56.3	72.9	71.2	71.9		74.1	80.1	73.3
Chloride	mg/L	5.97	< .5	9.08	9.93	< .5	< .5	< .5	< .5		5.33	< .5	< .5
Fluoride	mg/L	< .5	< .5	2.02	1.89	0.814	< .5	< .5	< .5		< .5	< .5	< .5
pH	SU	8.71	6.79		7.2	7.14	7.7	6.73	7.58		7.4	7.58	7.18
Sulfate	mg/L	< 5	< 5	< 5	5.94	< 5	< 5	< 5	< 5		< 5	< 5	< 5
Total Dissolved Solids	mg/L	440	340	368	336	402	486	364	424		292	368	298

Appendix IV Parameters:

Anitmony	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001		< .001	< .001	< .001
Arsenic	mg/L	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002		< .002	< .002	< .002
Barium	mg/L	0.209	0.199	0.216	0.197	0.152	0.197	0.19	0.206		0.206	0.222	0.206
Beryllium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001		< .001	< .001	< .001
Cadmium	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005		< .0005	< .0005	< .0005
Chromium	mg/L	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005		< .005	< .005	< .005
Cobalt	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005		< .0005	< .0005	< .0005
Fluoride	mg/L	< .5	< .5	2.02	1.89	0.814	< .5	< .5	< .5		< .5	< .5	< .5
Lead	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005		< .0005	< .0005	< .0005
Lithium	mg/L	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .05		< .01	< .01	< .01
Mercury	mg/L	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002		< .0002	< .0002	< .0002
Molybdenum	mg/L	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002		< .002	< .002	< .002
Selenium	mg/L	< .005	< .005	< .005	< .005	< .005	< .005	< .005	< .005		< .005	< .005	< .005
Thallium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001		< .001	< .001	< .001
Radium-226	mg/L	0.226	0.278	0.462	0.166	0.116	0.21	0.136			0.179		
Radium-228	mg/L	0.178	0.599	0.432	0.148	0.182	0.23	0.197			0.439		
Combined Radium 226 + 228	mg/L	0.405	0.876	0.894	0.314	0.298	0.44	0.333			0.618		

Muscatine Power & Water CCR Landfill Federal Parameters Job # 10100095 MW-13 Downgradient										August-18	June-18	March-18	November-17	October-17	August-17	June-17	April-17	February-17	December-16	October-16	August-16	June-16	
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Appendix III Parameters:

Boron	mg/L	47.2	13.3	74.8	7.03	4.35	5.93	2.77	2.72	50	2.92	21.7	1.34	1.45
Calcium	mg/L	218	112	276	105	87.6	97.5	92.8	95.4	208	93.2	149	89.5	93.1
Chloride	mg/L	22.9	17.1	29.8	12.7	14.8	12.8	9.17	9.62	15.2		19.9	5.84	7.24
Fluoride	mg/L	< .5	1.21	3.25	< .5	< .5	0.997	< .5	< .5	< .5		2.08	0.528	< .5
pH	SU	7.82	7.3	7.1		7.72	7.31	7.76	7.08	7.14	7.04	7.72	8.03	7.37
Sulfate	mg/L	975	197	1170	117	110	174	86.7	99.4	931	102	506	62.1	72.7
Total Dissolved Solids	mg/L	1970	694	2740	616	554	574	502	536	2150	562	1120	472	384

Appendix IV Parameters:

Antimony	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001			< .001	< .001	< .001
Arsenic	mg/L	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002			< .002	< .002	< .002
Barium	mg/L	0.0302	0.0616	477	0.0945	0.0872	0.0559	0.0783	0.0857			0.132	0.118	0.122
Beryllium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001			< .001	< .001	< .001
Cadmium	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005			< .0005	< .0005	< .0005
Chromium	mg/L	0.0191	< .005	< .005	< .005	< .005	< .005	< .005	0.00658			< .005	< .005	< .005
Cobalt	mg/L	0.00172	0.000637	0.00179	0.000717	0.000727	0.000695	0.000692	0.000686			0.000964	< .0005	< .0005
Fluoride	mg/L	< .5	1.21	3.25	< .5	> .5	0.997	> .5	< .5			2.08	0.528	< .5
Lead	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005			< .0005	< .0005	< .0005
Lithium	mg/L	< .100	< .05	< .150	< .05	< .05	< .05	< .05	< .05			0.0122	< .01	< .01
Mercury	mg/L	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002			< .0002	< .0002	< .0002
Molybdenum	mg/L	0.0227	0.00867	0.0176	0.00676	0.00416	0.00443	0.00346	0.00329			0.00732	0.00296	0.00278
Selenium	mg/L	< .005	< .005	0.0364	< .005	< .005	< .005	< .005	< .005			0.0195	< .005	< .005
Thallium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001			< .001	< .001	< .001
Radium-226	mg/L	0.0909	0.142	0.312	0.0896	0.11	0.103	0.179	0.164			0.12		
Radium-228	mg/L	0.114	0.0795	0.832	0.173	0.241	0.262	0.0132	0.359			0.665		
Combined Radium 226 + 228	mg/L	0.205	0.222	1.14	0.262	0.35	0.365	0.192	0.523			0.785		

Muscatine Power & Water CCR Landfill Federal Parameters Job # 10100095 MW-15A Downgradient												
June-16	August-16	October-16	December-16	February-17	April-17	June-17	August-17	October-17	November-17	March-18	June-18	August-18

Appendix III Parameters:

Boron	mg/L	16.8	20.6	17.9	18.4	14.9	14.7	16.4	14.7	12.9	11	10.5	14.6
Calcium	mg/L	206	199	203	244	233	226	186	206	217	278	102	155
Chloride	mg/L	17.1	17.2	17.6	19	21.5	47.4	12.8	15.4	20.5	37.4	< 5	10.1
Fluoride	mg/L	< .5	0.549	< .5	< .5	< .5	6.7	< .5	< .5	< .5	< .5	< .5	< .5
pH	SU	7.97	7.16	7.27		7.2	7.31	7.84	6.96	6.94	7	7.35	7.25
Sulfate	mg/L	827	605	607	732	849	853	537	664	835	1110	210	400
Total Dissolved Solids	mg/L	1620	1270	1500	1600	1470	1780	1280	1390	1520	1820	676	948

Appendix IV Parameters:

Antimony	mg/L	< .05	< .001	< .001	< .001	< .001	< .001	< .001	< .001		< .001	< .001	< .001
Arsenic	mg/L	< .1	< .002	< .002	< .002	< .002	< .002	< .002	< .002		< .002	< .002	< .002
Barium	mg/L	2.13	0.044	0.0426	0.0406	0.0402	0.0364	0.0327	0.0338		0.0285	>0338	0.0335
Beryllium	mg/L	< .05	< .001	< .001	< .001	< .001	< .001	< .001	< .001		< .001	< .001	< .001
Cadmium	mg/L	< .025	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005		< .0005	< .0005	< .0005
Chromium	mg/L	< .250	< .005	< .005	< .005	< .005	< .005	< .005	< .005		< .005	< .005	< .005
Cobalt	mg/L	< .025	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005		< .0005	< .0005	< .0005
Fluoride	mg/L	< .5	0.549	< .5	< .5	> .5	6.7	< .5	< .5		< .5	< .5	< .5
Lead	mg/L	< .025	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005		< .0005	< .0005	< .0005
Lithium	mg/L	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .05		< .0005	< .01	< .01
Mercury	mg/L	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002		< .0002	< .0002	< .0002
Molybdenum	mg/L	< .1	< .002	< .002	< .002	< .002	< .002	< .002	< .002		< .002	< .002	< .002
Selenium	mg/L	< .25	< .005	< .005	< .005	< .005	< .005	< .005	< .005		< .005	< .005	< .005
Thallium	mg/L	< .05	< .001	< .001	< .001	< .001	< .001	< .001	< .001		< .001	< .001	< .001
Radium-226	mg/L	0.0942	0.0703	0.164	0.106	0.0814	0.0124	0.100	0.047		0.0518		
Radium-228	mg/L	0.216	0.18	0.123	0.145	0.0218	0.0842	0.121	0.197		0.0715		
Combined Radium 226 + 228	mg/L	0.31	0.251	0.286	0.251	0.103	0.0966	0.221	0.244		0.123		

Muscatine Power & Water CCR Landfill Federal Parameters Job # 10100095 MW-21 Downgradient													
June-16	August-16	October-16	December-16	February-17	April-17	June-17	August-17	October-17	November-17	March-18	June-18	August-18	

Appendix III Parameters:

Boron	mg/L	< 2	7.23	8.45	6.93	4.87	4.49	7.36	7.05	3.33	2.24	8.81	6.84	1.36
Calcium	mg/L	37.2	146	185	178	118	110	149	163	62.3		191	159	78.7
Chloride	mg/L	27.7	16.6	24.4	19.2	14.2	15.6	15.1	16.1	5.09		27.1	10.9	< 5
Fluoride	mg/L	< .5	< .5	< .5	< .5	0.993	0.768	< .5	< .5	< .5		< .5	< .5	< .5
pH	SU	7.56	6.56	6.66		5.9	6.6	7.34	6.77	6.76	6.87	7.28	7.25	7.07
Sulfate	mg/L	713	520	603	645	415	461	541	590	206		624	489	96.6
Total Dissolved Solids	mg/L	1440	1110	1420	1240	1010	1060	1140	1220	514		1150	952	416

Appendix IV Parameters:

Anitmony	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001			0.00195	< .001	< .001
Arsenic	mg/L	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002			0.00265	< .002	< .002
Barium	mg/L	0.0573	0.0482	0.0606	0.056	0.0735	0.0356	0.0461	0.0499			0.0281	0.0515	0.0622
Beryllium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001			< .001	< .001	< .001
Cadmium	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005			< .0005	< .0005	< .0005
Chromium	mg/L	0.00694	0.00538	0.00582	0.00561	< .005	< .005	0.00586	0.00572			< .005	0.00726	< .005
Cobalt	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005			< .0005	< .0005	< .0005
Fluoride	mg/L	< .5	< .5	< .5	< .5	0.993	0.768	< .5	< .5			< .5	< .5	< .5
Lead	mg/L	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005	< .0005			< .0005	0.000633	< .0005
Lithium	mg/L	< .05	< .05	< .05	< .05	< .05	< .05	< .05	< .05			< .01	0.0189	< .01
Mercury	mg/L	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002	< .0002			< .0002	< .0002	< .0002
Molybdenum	mg/L	< .002	< .002	< .002	< .002	< .002	< .002	< .002	< .002			< .002	0.00383	< .002
Selenium	mg/L	0.0165	0.0103	0.0137	0.0119	0.0074	0.00674	0.0106	0.0109			< .005	0.00939	< .005
Thallium	mg/L	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001			< .001	< .001	< .001
Radium-226	mg/L	0.299	0.148	0.427	0.128	0.0502	-0.00511	0.0379	0.209			0.0141		
Radium-228	mg/L	-0.0462	0.0116	0.391	0.178	-0.0507	0.1	0.507	0.605			0.344		
Combined Radium 226 + 228	mg/L	0.253	0.159	0.817	0.306	-0.000573	0.0953	0.545	0.814			0.358		

Muscatine Power & Water CCR Landfill Federal Parameters Job # 10100095				August-18	June-18	March-18
MW-22 Downgradient						

Appendix III Parameters:

Boron	mg/L	< .2	< .2	< .2
Calcium	mg/L	69.8	91.5	80.7
Chloride	mg/L	30	27.2	29.8
Fluoride	mg/L	< .5	< .5	< .5
pH	SU	7.36	7.9	7.42
Sulfate	mg/L	123	134	125
Total Dissolved Solids	mg/L	424	434	420

Appendix IV Parameters:

Anitmony	mg/L	< .001	< .001	< .001
Arsenic	mg/L	< .002	0.00245	0.00261
Barium	mg/L	0.15	0.184	0.181
Beryllium	mg/L	< .001	< .001	< .001
Cadmium	mg/L	< .0005	< .0005	< .0005
Chromium	mg/L	< .005	< .005	< .005
Cobalt	mg/L	0.00142	0.00129	0.00149
Fluoride	mg/L	< .5	< .5	< .5
Lead	mg/L	< .0005	< .0005	< .0005
Lithium	mg/L	< .01	< .01	< .01
Mercury	mg/L	< .0002	< .0002	< .0002
Molybdenum	mg/L	0.00568	0.00423	0.00424
Selenium	mg/L	< .005	< .005	< .005
Thallium	mg/L	< .001	< .001	< .001
Radium-226	mg/L	0.122	0.284	
Radium-228	mg/L	0.135	0.128	
Combined Radium 226 + 228	mg/L	0.257	0.412	

Muscatine Power & Water CCR Landfill Federal Parameters Job # 10100095		August-18
MW-23 Downgradient		June-18

Appendix III Parameters:

Boron	mg/L	< .2	< .2
Calcium	mg/L	70.5	63.9
Chloride	mg/L	15.9	14.2
Fluoride	mg/L	< .5	< .5
pH	SU	7.69	7.55
Sulfate	mg/L	38.4	31.7
Total Dissolved Solids	mg/L	384	340

Appendix IV Parameters:

Antimony	mg/L	< .001	< .001
Arsenic	mg/L	< .002	< .002
Barium	mg/L	0.106	0.0779
Beryllium	mg/L	< .001	< .001
Cadmium	mg/L	< .0005	< .0005
Chromium	mg/L	< .005	< .005
Cobalt	mg/L	0.00161	0.00066
Fluoride	mg/L	< .5	< .5
Lead	mg/L	0.00151	0.000626
Lithium	mg/L	< .01	< .01
Mercury	mg/L	< .0002	< .0002
Molybdenum	mg/L	0.00822	0.00617
Selenium	mg/L	< .005	< .005
Thallium	mg/L	< .001	< .001
Radium-226	mg/L	0.161	
Radium-228	mg/L	-0.419	
Combined Radium 226 + 228	mg/L	0.0129	

Muscatine Power & Water CCR Landfill	
Federal Parameters	
Job # 10100095	
MW-24	
Downgradient	
	June-18
	August-18

Appendix III Parameters:

Boron	mg/L	< .2	< .2
Calcium	mg/L	88	72.8
Chloride	mg/L	19.9	18.1
Fluoride	mg/L	0.653	< .5
pH	SU	7.47	7.39
Sulfate	mg/L	101	70
Total Dissolved Solids	mg/L	474	368

Appendix IV Parameters:

Anitmony	mg/L	< .001	< .001
Arsenic	mg/L	< .002	< .002
Barium	mg/L	0.0695	0.0776
Beryllium	mg/L	< .001	< .001
Cadmium	mg/L	< .0005	< .0005
Chromium	mg/L	< .005	< .005
Cobalt	mg/L	< .0005	< .0005
Fluoride	mg/L	0.653	< .5
Lead	mg/L	< .0005	< .0005
Lithium	mg/L	< .01	< .01
Mercury	mg/L	< .0002	< .0002
Molybdenum	mg/L	0.00447	< .002
Selenium	mg/L	< .005	< .005
Thallium	mg/L	< .001	< .001
Radium-226	mg/L	-0.0261	
Radium-228	mg/L	0.19	
Combined Radium 226 + 228	mg/L	0.164	

Muscatine Power & Water CCR Landfill		June-18	August-18
Federal Parameters			
Job # 10100095			
MW-25			
Downgradient			

Appendix III Parameters:

Boron	mg/L	14	14.4
Calcium	mg/L	171	141
Chloride	mg/L	11.4	11.4
Fluoride	mg/L	0.551	< .5
pH	SU	7.96	7.31
Sulfate	mg/L	382	343
Total Dissolved Solids	mg/L	962	NC

Appendix IV Parameters:

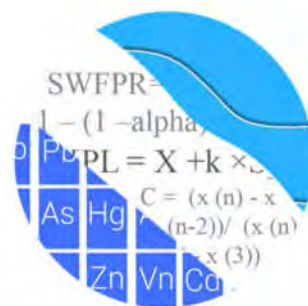
Anitmony	mg/L	< .001	< .001
Arsenic	mg/L	< .002	< .002
Barium	mg/L	0.0828	0.0487
Beryllium	mg/L	< .001	< .001
Cadmium	mg/L	< .0005	< .0005
Chromium	mg/L	< .005	< .005
Cobalt	mg/L	< .0005	< .0005
Fluoride	mg/L	0.551	< .5
Lead	mg/L	< .0005	< .0005
Lithium	mg/L	< .01	< .01
Mercury	mg/L	< .0002	< .0002
Molybdenum	mg/L	0.00279	< .002
Selenium	mg/L	< .005	< .005
Thallium	mg/L	< .001	< .001
Radium-226	mg/L	0.0532	
Radium-228	mg/L	0.635	
Combined Radium 226 + 228	mg/L	0.688	

APPENDIX D

STATISTICAL RESULTS AND METHODOLOGIES

- Annual Statistical Results Report, October 11, 2018
- Flow Charts showing statistical procedure methodologies

GROUNDWATER STATS CONSULTING



October 11, 2018

HR Green, Inc.
Attn: Mr. Greg Brennan
8710 Earhart Ln, SW
Cedar Rapids, Iowa 52404

Dear Mr. Brennan,

Groundwater Stats Consulting, formerly the statistical consulting division of Sanitas Technologies, is pleased to provide the statistical analysis of groundwater data for the August 2018 sample event at the Muscatine Power & Water for the Coal Combustion Residuals (CCR) program. The analysis complies with the federal rule for the Disposal of Coal Combustion Residuals from Electric Utilities (CCR Rule, 2015) as well as with the USEPA Unified Guidance (2009).

Data were sent electronically to Groundwater Stats Consulting, and the statistical analysis was reviewed by Dr. Jim Loftis, professor emeritus of Civil and Environmental Engineering at Colorado State University and consultant to Groundwater Stats Consulting.

The monitoring well network at Muscatine Power & Water consists of the following: upgradient wells MW-08 and MW-10 as well as MW-22 which was installed this year; and downgradient wells MW-4A, MW-5B, MW-6A, MW-13, MW-14A, MW-15A, MW-18A, and MW-21. Sampling began for the CCR program in June 2016 and a total of 8 background sample events were completed for all wells except newly installed well MW-22.

The following Appendix III constituents were evaluated using prediction limits: boron, calcium, chloride, fluoride, pH, sulfate, and total dissolved solids (TDS). The following Appendix IV parameters were evaluated using confidence intervals: antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, combined radium 226 + 228, fluoride, lead, lithium, mercury, molybdenum, selenium and thallium.

Background Screening

Background data were screened in October 2017 for all parameters at each well for the constituents listed above, and the results of the screening were submitted during that time. A summary of those findings was submitted with that report, and discussed below.

Outlier Screening and Trend Tests

Time series plots were used to initially screen for suspected outliers, trends, and seasonal patterns. Outliers and trends in background data result in increased variation and statistical limits that are not conservative from a regulatory perspective, if not addressed.

Box plots provide visual representation of variation within individual wells and between all wells. Data were further evaluated through the Analysis of Variance test to determine whether observed variation is statistically significant, and guide the decision logic for determining an appropriate statistical limit as discussed below.

A handful of possible outliers were identified and formally tested using Tukey's box plot method. When outliers were confirmed, these values were flagged in the computer database with "o" in order to deselect prior to construction of statistical limits. Flagged values appear as a disconnected, lighter symbol on the time series graphs.

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

The Sen's Slope/Mann Kendall trend test was used to evaluate all proposed background data through August 2017 to identify statistically significant increasing or decreasing trends. In the absence of suspected contamination, significant trending data are typically not included as part of the background data used for construction of prediction limits. This step serves to eliminate the trend and, thus, reduce variation in background. When statistically significant decreasing trends are present, earlier data are evaluated to determine whether earlier concentration levels are significantly different than current reported concentrations and will be deselected as necessary. When the historical records of data are truncated for the reasons above, a summary report will be provided to show the date ranges used in construction of the statistical limits.

The results of the trend analyses showed a statistically significant decreasing trend for chloride in upgradient well MW-08. This trend was relatively low in magnitude when compared to average concentrations; therefore, no adjustments were made to the data sets. No other statistically significant trends were identified for any of the Appendix III parameters.

Natural systems continuously evolve due to physical changes made to the environment and unrelated to the site. To accommodate these types of changes, data for all wells and constituents are re-evaluated for the purpose of updating statistical limits. Improved sample size results in statistical limits that provide better representation of the true background population. In the case of interwell prediction limits, when a minimum of 2 new data points are available at each upgradient well, data will be evaluated to determine whether newer measurements are representative of earlier measurements in which case they may be incorporated into background.

Determination of Statistical Method

The Analysis of Variance (ANOVA) was used to identify the most appropriate statistical approach for Muscatine Power & Water. Interwell tests, which compare downgradient well data to statistical limits constructed from pooled upgradient well data, are appropriate when average concentrations are similar across upgradient wells. Intrawell tests, which compare compliance data from a single well to screened historical data within the same well, are appropriate when upgradient wells exhibit spatial variation; when statistical limits constructed from upgradient wells would not be conservative from a regulatory perspective; and when downgradient water quality is unimpacted compared to upgradient water quality for the same parameters.

In cases where downgradient concentrations are elevated relative to upgradient concentrations, an independent study and hydrogeological investigation would be required to identify local geochemical conditions and expected groundwater quality for the region to justify an intrawell approach. Such an assessment is beyond the scope of services provided by Groundwater Stats Consulting.

The ANOVA noted no variation in groundwater among upgradient wells for fluoride and pH. Boron contained 100% nondetects in upgradient wells; therefore, the ANOVA test could not be performed. As a result, interwell tests are recommended for boron, fluoride and pH. The ANOVA identified spatial variation in groundwater upgradient of the site for calcium, chloride, sulfate and TDS, indicating intrawell methods should be considered for these parameters if no pre-existing contamination from the site is

suspected downgradient wells. Additional testing was conducted as described below to determine intrawell eligibility.

Intrawell limits constructed from carefully screened background data from within each well serve to provide statistical limits that are conservative (i.e. lower) from a regulatory perspective, and that will rapidly identify a change in more recent compliance data from within a given well. This statistical method removes the element of variation from across wells and eliminates the chance of mistaking natural spatial variation for a release from the facility. Prior to performing intrawell prediction limits, it is necessary to demonstrate that water at downgradient wells is not suspected to have existing impacts from the practices of the facility.

First, to establish baseline upgradient concentrations, tolerance limits (either parametric or nonparametric as appropriate) were constructed using pooled upgradient well data for each of the Appendix III parameters recommended for intrawell analyses. Parametric tolerance limits were constructed with a target of 99% confidence and 95% coverage. The confidence and coverage levels for nonparametric tolerance limits are dependent upon the number of background samples. As more data are collected, the background population is better represented and the confidence and coverage levels increase.

Next, to determine whether average downgradient concentrations are elevated relative to the upgradient well baseline concentrations established by the tolerance limits above, confidence intervals were constructed on downgradient wells for each of the Appendix III parameters exhibiting spatial variation. The results showed that at least one confidence interval exceeded its respective limit for each of the parameters tested.

When the entire confidence interval exceeds a background standard, it is an indication that downgradient concentrations are elevated above background levels. Therefore, interwell methods are recommended initially in lieu of intrawell methods until further research identifies whether the elevated downgradient concentrations are likely the result of natural geological conditions, an off-site source, or may be the result of the facility. After such a study, data would be re-evaluated to determine the most appropriate statistical Detection Monitoring method.

Prediction Limits – Appendix III Parameters August 2018

Interwell prediction limits were constructed as recommended in the CCR Rule (2015) and in the EPA Unified Guidance (2009), based on a 1-of-2 resample plan using pooled upgradient well data for all Appendix III parameters. In the event of an initial exceedance of compliance well data, a resample will be collected to determine whether the initial

exceedance is confirmed, in which case a statistically significant increase (SSI) is identified. If the resample falls within the statistical limit, the initial exceedance is considered to be a false positive result and, therefore, no further action is necessary.

Parametric prediction limits were constructed when background data followed a normal or transformed-normal distribution. Non-parametric prediction limits are provided for data sets with greater than 50% nondetects, and for data sets which do not follow a normal or transformed-normal distribution. Downgradient measurements were compared to these background limits. A summary table of well/constituent pairs found to exceed their respective limits follows this letter.

The Sen's Slope/Mann Kendall trend test was performed on the exceedances noted above to determine whether concentrations are increasing, decreasing or stabilizing over time. No statistically significant increasing trends were noted. Well MW-18A showed statistically significant decreasing trends for boron, calcium and sulfate.

Confidence Intervals – Appendix IV Parameters

Confidence intervals were constructed at all downgradient wells for detected Appendix IV parameters. A minimum of 4 samples is required to construct confidence intervals; however, 8 samples are generally recommended for better representation of the true average population. Established Maximum Contaminant Levels (MCLs) are used as the GWPS comparisons, unless background limits are higher as discussed below. For parameters without MCLs (cobalt, lithium, and molybdenum), the Regional Screening Level (RSL) was used unless background was higher. Parametric confidence intervals are constructed with 99% confidence when data follow a normal or transformed-normal distribution. For all other cases, nonparametric confidence intervals are constructed, with the confidence level based on the number of samples available.

Background limits are established for the Appendix IV parameters using upper tolerance limits constructed with 95% confidence/95% coverage using pooled upgradient well data, for comparison against established MCLs. When background limits, or Alternate Contaminant Levels (ACLs), are higher than established MCLs or RSLs, the CCR Rule recommends using these as the GWPS for the confidence interval comparisons. The GWPS is exceeded only when the entire confidence interval exceeds its respective GWPS. None of the confidence intervals exceeded their respective standard.

Thank you for the opportunity to assist you in the statistical analysis of groundwater quality for Muscatine Power & Water. If you have any questions or comments, please feel free to contact me.

For Groundwater Stats Consulting,

A handwritten signature in cursive script that reads "Kristina Rayner". The ink is dark and the signature is fluid, with a large initial 'K' and a stylized 'R'.

Kristina L. Rayner
Groundwater Statistician

Interwell Prediction Limit Summary - Significant Results

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water Printed 10/10/2018, 5:25 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg	N Bg	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron (mg/L)	MW-13	0.2	n/a	8/28/2018	1.45	Yes	27	n/a	n/a	100	n/a	n/a	n/a	0.00233	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-14A	0.2	n/a	8/29/2018	14	Yes	27	n/a	n/a	100	n/a	n/a	n/a	0.00233	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-15A	0.2	n/a	8/29/2018	14.6	Yes	27	n/a	n/a	100	n/a	n/a	n/a	0.00233	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-18A	0.2	n/a	8/29/2018	10.5	Yes	27	n/a	n/a	100	n/a	n/a	n/a	0.00233	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-21	0.2	n/a	8/28/2018	1.36	Yes	27	n/a	n/a	100	n/a	n/a	n/a	0.00233	NP Inter (NDs) 1 of 2
Calcium (mg/L)	MW-14A	152	n/a	8/29/2018	309	Yes	27	n/a	n/a	0	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-15A	152	n/a	8/29/2018	155	Yes	27	n/a	n/a	0	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-18A	152	n/a	8/29/2018	223	Yes	27	n/a	n/a	0	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-5B	30	n/a	8/29/2018	70.8	Yes	27	n/a	n/a	40.74	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-14A	30	n/a	8/29/2018	33.1	Yes	27	n/a	n/a	40.74	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-14A	366	n/a	8/29/2018	1070	Yes	27	n/a	n/a	0	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-15A	366	n/a	8/29/2018	400	Yes	27	n/a	n/a	0	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-18A	366	n/a	8/29/2018	675	Yes	27	n/a	n/a	0	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Total Dissolved Solids (mg/L)	MW-14A	752.2	n/a	8/29/2018	1900	Yes	27	500.5	119.7	0	None	No	0.0009403	Param Inter 1 of 2	
Total Dissolved Solids (mg/L)	MW-15A	752.2	n/a	8/29/2018	948	Yes	27	500.5	119.7	0	None	No	0.0009403	Param Inter 1 of 2	
Total Dissolved Solids (mg/L)	MW-18A	752.2	n/a	8/29/2018	1330	Yes	27	500.5	119.7	0	None	No	0.0009403	Param Inter 1 of 2	

Trend Tests Summary Table - Prediction Limit Increases

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water Printed 10/4/2018, 12:25 PM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Xform</u>	<u>Alpha</u>	<u>Method</u>
Boron (mg/L)	MW-13	-3.238	-13	-30	No	10	0	n/a	n/a	0.01	NP
Boron (mg/L)	MW-14A	-2.063	-24	-38	No	12	0	n/a	n/a	0.01	NP
Boron (mg/L)	MW-15A	-2.814	-35	-38	No	12	0	n/a	n/a	0.01	NP
Boron (mg/L)	MW-18A	-2.346	-41	-38	Yes	12	0	n/a	n/a	0.01	NP
Boron (mg/L)	MW-21	-3.071	-30	-38	No	12	8.333	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-14A	-1.299	-9	-38	No	12	0	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-15A	-6.217	-3	-38	No	12	0	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-18A	-41.32	-53	-38	Yes	12	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-5B	1.581	21	38	No	12	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-14A	2.509	21	38	No	12	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-14A	31.02	12	38	No	12	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-15A	-11.41	-2	-38	No	12	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-18A	-154.7	-46	-38	Yes	12	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-14A	-42.1	-3	-38	No	12	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-15A	-161	-15	-38	No	12	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-18A	-307.4	-29	-34	No	11	0	n/a	n/a	0.01	NP

MUSCATINE POWER & WATER GWPS			
Constituent Name	MCL	RSL	Background Limit
Antimony, Total (mg/L)	0.006		0.001
Arsenic, Total (mg/L)	0.01		0.0037
Barium, Total (mg/L)	2		0.22
Beryllium, Total (mg/L)	0.004		0.001
Cadmium, Total (mg/L)	0.005		0.0005
Chromium, Total (mg/L)	0.1		0.005
Cobalt, Total (mg/L)	n/a	0.006	0.0015
Combined Radium, Total (pCi/L)	5		0.94
Fluoride, Total (mg/L)	4		0.83
Lead, Total (mg/L)	0.015		0.0005
Lithium, Total (mg/L)	n/a	0.04	0.01
Mercury, Total (mg/L)	0.002		0.0002
Molybdenum, Total (mg/L)	n/a	0.1	0.0057
Selenium, Total (mg/L)	0.05		0.005
Thallium, Total (mg/L)	0.002		0.001

**MCL = Maximum Contaminant Level*

**RSL = Regional Screening Level*

Confidence Interval Summary Table - All Results

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water Printed 10/10/2018, 6:13 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig. N	Mean	Std. Dev.	%NDs	ND Adj	Transform	Alpha	Method
Antimony (mg/L)	MW-4A	0.001	0.001	0.006	No 11	0.001	0	100	None	No	0.006	NP (NDs)
Antimony (mg/L)	MW-5B	0.001	0.001	0.006	No 11	0.001	0	100	None	No	0.006	NP (NDs)
Antimony (mg/L)	MW-6A	0.001	0.001	0.006	No 11	0.001	0	100	None	No	0.006	NP (NDs)
Antimony (mg/L)	MW-13	0.001	0.001	0.006	No 11	0.001	0	100	None	No	0.006	NP (NDs)
Antimony (mg/L)	MW-14A	0.001	0.001	0.006	No 11	0.001	0	100	None	No	0.006	NP (NDs)
Antimony (mg/L)	MW-15A	0.001	0.001	0.006	No 11	0.005455	0.01477	100	None	No	0.006	NP (NDs)
Antimony (mg/L)	MW-18A	0.00195	0.001	0.006	No 11	0.005541	0.01475	90.91	None	No	0.006	NP (NDs)
Arsenic (mg/L)	MW-4A	0.002	0.002	0.01	No 11	0.002	0	100	None	No	0.006	NP (NDs)
Arsenic (mg/L)	MW-5B	0.002	0.002	0.01	No 11	0.002	0	100	None	No	0.006	NP (NDs)
Arsenic (mg/L)	MW-6A	0.002	0.002	0.01	No 11	0.002	0	100	None	No	0.006	NP (NDs)
Arsenic (mg/L)	MW-13	0.002	0.002	0.01	No 11	0.002	0	100	None	No	0.006	NP (NDs)
Arsenic (mg/L)	MW-14A	0.002	0.002	0.01	No 11	0.002	0	100	None	No	0.006	NP (NDs)
Arsenic (mg/L)	MW-15A	0.002	0.002	0.01	No 11	0.01091	0.02955	100	None	No	0.006	NP (NDs)
Arsenic (mg/L)	MW-18A	0.00265	0.002	0.01	No 11	0.01097	0.02953	90.91	None	No	0.006	NP (NDs)
Barium (mg/L)	MW-4A	0.1447	0.124	2	No 11	0.1344	0.01245	0	None	No	0.01	Param.
Barium (mg/L)	MW-5B	0.3353	0.3013	2	No 11	0.3183	0.02038	0	None	No	0.01	Param.
Barium (mg/L)	MW-6A	0.2136	0.1851	2	No 11	0.1991	0.01823	0	None	x^2	0.01	Param.
Barium (mg/L)	MW-13	0.1101	0.05594	2	No 11	0.08301	0.03248	0	None	No	0.01	Param.
Barium (mg/L)	MW-14A	0.0391	0.03103	2	No 11	0.03506	0.004841	0	None	No	0.01	Param.
Barium (mg/L)	MW-15A	0.04101	0.03355	2	No 10	0.03728	0.004185	0	None	No	0.01	Param.
Barium (mg/L)	MW-18A	0.0403	0.0281	2	No 11	0.04092	0.02002	9.091	None	No	0.006	NP (normality)
Beryllium (mg/L)	MW-4A	0.001	0.001	0.004	No 11	0.001	0	100	None	No	0.006	NP (NDs)
Beryllium (mg/L)	MW-5B	0.001	0.001	0.004	No 11	0.001	0	100	None	No	0.006	NP (NDs)
Beryllium (mg/L)	MW-6A	0.001	0.001	0.004	No 11	0.001	0	100	None	No	0.006	NP (NDs)
Beryllium (mg/L)	MW-13	0.001	0.001	0.004	No 11	0.001	0	100	None	No	0.006	NP (NDs)
Beryllium (mg/L)	MW-14A	0.001	0.001	0.004	No 11	0.001	0	100	None	No	0.006	NP (NDs)
Beryllium (mg/L)	MW-15A	0.001	0.001	0.004	No 11	0.005455	0.01477	100	None	No	0.006	NP (NDs)
Beryllium (mg/L)	MW-18A	0.001	0.001	0.004	No 11	0.005455	0.01477	100	None	No	0.006	NP (NDs)
Cadmium (mg/L)	MW-4A	0.0005	0.0005	0.005	No 11	0.0005	0	100	None	No	0.006	NP (NDs)
Cadmium (mg/L)	MW-5B	0.0005	0.0005	0.005	No 11	0.0005	0	100	None	No	0.006	NP (NDs)
Cadmium (mg/L)	MW-6A	0.0005	0.0005	0.005	No 11	0.0005	0	100	None	No	0.006	NP (NDs)
Cadmium (mg/L)	MW-13	0.0005	0.0005	0.005	No 11	0.0005	0	100	None	No	0.006	NP (NDs)
Cadmium (mg/L)	MW-14A	0.0005	0.0005	0.005	No 11	0.0005	0	100	None	No	0.006	NP (NDs)
Cadmium (mg/L)	MW-15A	0.0005	0.0005	0.005	No 11	0.002727	0.007387	100	None	No	0.006	NP (NDs)
Cadmium (mg/L)	MW-18A	0.0005	0.0005	0.005	No 11	0.002727	0.007387	100	None	No	0.006	NP (NDs)
Chromium (mg/L)	MW-4A	0.005	0.005	0.1	No 11	0.005	0	100	None	No	0.006	NP (NDs)
Chromium (mg/L)	MW-5B	0.005	0.005	0.1	No 11	0.005	0	100	None	No	0.006	NP (NDs)
Chromium (mg/L)	MW-6A	0.005	0.005	0.1	No 11	0.005	0	100	None	No	0.006	NP (NDs)
Chromium (mg/L)	MW-13	0.005	0.005	0.1	No 10	0.005158	0.0004996	90	None	No	0.011	NP (NDs)
Chromium (mg/L)	MW-14A	0.005	0.005	0.1	No 11	0.005	0	100	None	No	0.006	NP (NDs)
Chromium (mg/L)	MW-15A	0.005	0.005	0.1	No 11	0.02727	0.07387	100	None	No	0.006	NP (NDs)
Chromium (mg/L)	MW-18A	0.005	0.005	0.1	No 11	0.02727	0.07387	100	None	No	0.006	NP (NDs)
Cobalt (mg/L)	MW-4A	0.0005	0.0005	0.006	No 11	0.0005165	0.00005457	90.91	None	No	0.006	NP (NDs)
Cobalt (mg/L)	MW-5B	0.0005	0.0005	0.006	No 11	0.0005	0	100	None	No	0.006	NP (NDs)
Cobalt (mg/L)	MW-6A	0.0005	0.0005	0.006	No 11	0.0005	0	100	None	No	0.006	NP (NDs)
Cobalt (mg/L)	MW-13	0.0007805	0.0005411	0.006	No 10	0.0006608	0.0001414	30	Kapla..	No	0.01	Param.
Cobalt (mg/L)	MW-14A	0.0005	0.0005	0.006	No 11	0.0005	0	100	Kapla..	No	0.006	NP (NDs)
Cobalt (mg/L)	MW-15A	0.0005	0.0005	0.006	No 11	0.002727	0.007387	100	Kapla..	No	0.006	NP (NDs)
Cobalt (mg/L)	MW-18A	0.0005	0.0005	0.006	No 11	0.002727	0.007387	100	Kapla..	No	0.006	NP (NDs)
Combined Radium 226 + 228 (pCi/L)	MW-4A	0.7583	0.3735	5	No 9	0.5659	0.1992	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-5B	1.031	0.5925	5	No 9	0.8118	0.2271	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-6A	0.7309	0.3134	5	No 9	0.5211	0.2298	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-13	0.5607	0.1772	5	No 8	0.363	0.2029	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-14A	0.4542	0.1302	5	No 9	0.2922	0.1678	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-15A	0.2876	0.1315	5	No 9	0.2095	0.08085	0	None	No	0.01	Param.

Confidence Interval Summary Table - All Results

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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water Printed 10/10/2018, 6:13 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig. N	Mean	Std. Dev.	%NDs	ND Adj	Transform	Alpha	Method
Combined Radium 226 + 228 (pCi/L)	MW-18A	0.5629	0.2171	5	No 9	0.39	0.1791	0	None	No	0.01	Param.
Fluoride (mg/L)	MW-4A	0.664	0.5	4	No 12	0.5388	0.0951	83.33	None	No	0.01	NP (NDs)
Fluoride (mg/L)	MW-5B	1.88	0.5	4	No 12	0.7623	0.5866	75	None	No	0.01	NP (normality)
Fluoride (mg/L)	MW-6A	1.89	0.5	4	No 12	0.7687	0.5621	75	None	No	0.01	NP (normality)
Fluoride (mg/L)	MW-13	1.21	0.5	4	No 11	0.7559	0.5028	63.64	None	No	0.006	NP (normality)
Fluoride (mg/L)	MW-14A	0.684	0.5	4	No 11	0.5501	0.1187	81.82	None	No	0.006	NP (NDs)
Fluoride (mg/L)	MW-15A	0.5	0.5	4	No 11	0.5045	0.01477	90.91	None	No	0.006	NP (NDs)
Fluoride (mg/L)	MW-18A	0.5	0.5	4	No 11	0.5265	0.08774	90.91	None	No	0.006	NP (NDs)
Lead (mg/L)	MW-4A	0.0005	0.0005	0.015	No 10	0.0005	0	100	None	No	0.011	NP (NDs)
Lead (mg/L)	MW-5B	0.0005	0.0005	0.015	No 11	0.0005	0	100	None	No	0.006	NP (NDs)
Lead (mg/L)	MW-6A	0.0005	0.0005	0.015	No 11	0.0005	0	100	None	No	0.006	NP (NDs)
Lead (mg/L)	MW-13	0.0005	0.0005	0.015	No 11	0.0005	0	100	None	No	0.006	NP (NDs)
Lead (mg/L)	MW-14A	0.0005	0.0005	0.015	No 11	0.0005	0	100	None	No	0.006	NP (NDs)
Lead (mg/L)	MW-15A	0.0005	0.0005	0.015	No 11	0.002727	0.007387	100	None	No	0.006	NP (NDs)
Lead (mg/L)	MW-18A	0.0005	0.0005	0.015	No 11	0.002727	0.007387	100	None	No	0.006	NP (NDs)
Lithium (mg/L)	MW-4A	0.05	0.01	0.04	No 11	0.03909	0.01868	100	None	No	0.006	NP (NDs)
Lithium (mg/L)	MW-5B	0.05	0.01	0.04	No 11	0.03909	0.01868	100	None	No	0.006	NP (NDs)
Lithium (mg/L)	MW-6A	0.05	0.01	0.04	No 11	0.03909	0.01868	100	None	No	0.006	NP (NDs)
Lithium (mg/L)	MW-13	0.1	0.01	0.04	No 12	0.04935	0.04126	91.67	None	No	0.01	NP (NDs)
Lithium (mg/L)	MW-14A	0.05	0.01	0.04	No 11	0.03909	0.01868	100	None	No	0.006	NP (NDs)
Lithium (mg/L)	MW-15A	0.05	0.01	0.04	No 11	0.03909	0.01868	100	None	No	0.006	NP (NDs)
Lithium (mg/L)	MW-18A	0.05	0.01	0.04	No 11	0.03909	0.01868	100	None	No	0.006	NP (NDs)
Mercury (mg/L)	MW-4A	0.0002	0.0002	0.002	No 11	0.0002	0	100	None	No	0.006	NP (NDs)
Mercury (mg/L)	MW-5B	0.0002	0.0002	0.002	No 11	0.0002	0	100	None	No	0.006	NP (NDs)
Mercury (mg/L)	MW-6A	0.0002	0.0002	0.002	No 11	0.0002	0	100	None	No	0.006	NP (NDs)
Mercury (mg/L)	MW-13	0.0002	0.0002	0.002	No 11	0.0002	0	100	None	No	0.006	NP (NDs)
Mercury (mg/L)	MW-14A	0.0002	0.0002	0.002	No 11	0.0002	0	100	None	No	0.006	NP (NDs)
Mercury (mg/L)	MW-15A	0.0002	0.0002	0.002	No 11	0.0002	0	100	None	No	0.006	NP (NDs)
Mercury (mg/L)	MW-18A	0.0002	0.0002	0.002	No 10	0.0002	0	100	None	No	0.011	NP (NDs)
Molybdenum (mg/L)	MW-4A	0.002	0.002	0.1	No 11	0.002	0	100	None	No	0.006	NP (NDs)
Molybdenum (mg/L)	MW-5B	0.002	0.002	0.1	No 11	0.002	0	100	None	No	0.006	NP (NDs)
Molybdenum (mg/L)	MW-6A	0.002	0.002	0.1	No 11	0.002	0	100	None	No	0.006	NP (NDs)
Molybdenum (mg/L)	MW-13	0.006416	0.002921	0.1	No 10	0.004691	0.002111	0	None	sqrt(x)	0.01	Param.
Molybdenum (mg/L)	MW-14A	0.002	0.002	0.1	No 11	0.002	0	100	None	No	0.006	NP (NDs)
Molybdenum (mg/L)	MW-15A	0.002	0.002	0.1	No 11	0.01091	0.02955	100	None	No	0.006	NP (NDs)
Molybdenum (mg/L)	MW-18A	0.002	0.002	0.1	No 11	0.01091	0.02955	100	None	No	0.006	NP (NDs)
Selenium (mg/L)	MW-4A	0.005	0.005	0.05	No 11	0.005	0	100	None	No	0.006	NP (NDs)
Selenium (mg/L)	MW-5B	0.005	0.005	0.05	No 11	0.005	0	100	None	No	0.006	NP (NDs)
Selenium (mg/L)	MW-6A	0.005	0.005	0.05	No 11	0.005	0	100	None	No	0.006	NP (NDs)
Selenium (mg/L)	MW-13	0.005	0.005	0.05	No 10	0.00645	0.004585	90	None	No	0.011	NP (NDs)
Selenium (mg/L)	MW-14A	0.008282	0.0072	0.05	No 11	0.007641	0.0009769	9.091	None	x^5	0.01	Param.
Selenium (mg/L)	MW-15A	0.00502	0.005	0.05	No 11	0.02727	0.07387	90.91	None	No	0.006	NP (NDs)
Selenium (mg/L)	MW-18A	0.005	0.005	0.05	No 11	0.02727	0.07387	100	None	No	0.006	NP (NDs)
Thallium (mg/L)	MW-4A	0.001	0.001	0.002	No 11	0.001	0	100	None	No	0.006	NP (NDs)
Thallium (mg/L)	MW-5B	0.001	0.001	0.002	No 11	0.001	0	100	None	No	0.006	NP (NDs)
Thallium (mg/L)	MW-6A	0.001	0.001	0.002	No 11	0.001	0	100	None	No	0.006	NP (NDs)
Thallium (mg/L)	MW-13	0.001	0.001	0.002	No 11	0.001	0	100	None	No	0.006	NP (NDs)
Thallium (mg/L)	MW-14A	0.001	0.001	0.002	No 11	0.001	0	100	None	No	0.006	NP (NDs)
Thallium (mg/L)	MW-15A	0.001	0.001	0.002	No 11	0.005455	0.01477	100	None	No	0.006	NP (NDs)
Thallium (mg/L)	MW-18A	0.001	0.001	0.002	No 11	0.005455	0.01477	100	None	No	0.006	NP (NDs)

Prediction Limits

Interwell Prediction Limit Summary - Significant Results

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water Printed 10/10/2018, 5:25 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg	N Bg	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron (mg/L)	MW-13	0.2	n/a	8/28/2018	1.45	Yes	27	n/a	n/a	100	n/a	n/a	n/a	0.00233	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-14A	0.2	n/a	8/29/2018	14	Yes	27	n/a	n/a	100	n/a	n/a	n/a	0.00233	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-15A	0.2	n/a	8/29/2018	14.6	Yes	27	n/a	n/a	100	n/a	n/a	n/a	0.00233	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-18A	0.2	n/a	8/29/2018	10.5	Yes	27	n/a	n/a	100	n/a	n/a	n/a	0.00233	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-21	0.2	n/a	8/28/2018	1.36	Yes	27	n/a	n/a	100	n/a	n/a	n/a	0.00233	NP Inter (NDs) 1 of 2
Calcium (mg/L)	MW-14A	152	n/a	8/29/2018	309	Yes	27	n/a	n/a	0	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-15A	152	n/a	8/29/2018	155	Yes	27	n/a	n/a	0	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-18A	152	n/a	8/29/2018	223	Yes	27	n/a	n/a	0	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-5B	30	n/a	8/29/2018	70.8	Yes	27	n/a	n/a	40.74	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-14A	30	n/a	8/29/2018	33.1	Yes	27	n/a	n/a	40.74	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-14A	366	n/a	8/29/2018	1070	Yes	27	n/a	n/a	0	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-15A	366	n/a	8/29/2018	400	Yes	27	n/a	n/a	0	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-18A	366	n/a	8/29/2018	675	Yes	27	n/a	n/a	0	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Total Dissolved Solids (mg/L)	MW-14A	752.2	n/a	8/29/2018	1900	Yes	27	500.5	119.7	0	None	No	0.0009403	Param Inter 1 of 2	
Total Dissolved Solids (mg/L)	MW-15A	752.2	n/a	8/29/2018	948	Yes	27	500.5	119.7	0	None	No	0.0009403	Param Inter 1 of 2	
Total Dissolved Solids (mg/L)	MW-18A	752.2	n/a	8/29/2018	1330	Yes	27	500.5	119.7	0	None	No	0.0009403	Param Inter 1 of 2	

Interwell Prediction Limit Summary - All Results

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water Printed 10/10/2018, 5:25 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg	N Bg	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron (mg/L)	MW-4A	0.2	n/a	8/28/2018	0.2ND	No	27	n/a	n/a	100	n/a	n/a	n/a	0.00233	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-5B	0.2	n/a	8/29/2018	0.2ND	No	27	n/a	n/a	100	n/a	n/a	n/a	0.00233	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-6A	0.2	n/a	8/29/2018	0.2ND	No	27	n/a	n/a	100	n/a	n/a	n/a	0.00233	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-13	0.2	n/a	8/28/2018	1.45	Yes	27	n/a	n/a	100	n/a	n/a	n/a	0.00233	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-14A	0.2	n/a	8/29/2018	14	Yes	27	n/a	n/a	100	n/a	n/a	n/a	0.00233	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-15A	0.2	n/a	8/29/2018	14.6	Yes	27	n/a	n/a	100	n/a	n/a	n/a	0.00233	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-18A	0.2	n/a	8/29/2018	10.5	Yes	27	n/a	n/a	100	n/a	n/a	n/a	0.00233	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-21	0.2	n/a	8/28/2018	1.36	Yes	27	n/a	n/a	100	n/a	n/a	n/a	0.00233	NP Inter (NDs) 1 of 2
Calcium (mg/L)	MW-4A	152	n/a	8/28/2018	91.3	No	27	n/a	n/a	0	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-5B	152	n/a	8/29/2018	146	No	27	n/a	n/a	0	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-6A	152	n/a	8/29/2018	73.3	No	27	n/a	n/a	0	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-13	152	n/a	8/28/2018	93.1	No	27	n/a	n/a	0	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-14A	152	n/a	8/29/2018	309	Yes	27	n/a	n/a	0	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-15A	152	n/a	8/29/2018	155	Yes	27	n/a	n/a	0	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-18A	152	n/a	8/29/2018	223	Yes	27	n/a	n/a	0	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Calcium (mg/L)	MW-21	152	n/a	8/28/2018	78.7	No	27	n/a	n/a	0	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-4A	30	n/a	8/28/2018	19.4	No	27	n/a	n/a	40.74	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-5B	30	n/a	8/29/2018	70.8	Yes	27	n/a	n/a	40.74	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-6A	30	n/a	8/29/2018	5ND	No	27	n/a	n/a	40.74	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-13	30	n/a	8/28/2018	7.24	No	27	n/a	n/a	40.74	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-14A	30	n/a	8/29/2018	33.1	Yes	27	n/a	n/a	40.74	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-15A	30	n/a	8/29/2018	10.1	No	27	n/a	n/a	40.74	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-18A	30	n/a	8/29/2018	26.9	No	27	n/a	n/a	40.74	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-21	30	n/a	8/28/2018	5ND	No	27	n/a	n/a	40.74	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Fluoride (mg/L)	MW-4A	0.826	n/a	8/28/2018	0.5ND	No	26	n/a	n/a	84.62	n/a	n/a	n/a	0.002476	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-5B	0.826	n/a	8/29/2018	0.5ND	No	26	n/a	n/a	84.62	n/a	n/a	n/a	0.002476	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-6A	0.826	n/a	8/29/2018	0.5ND	No	26	n/a	n/a	84.62	n/a	n/a	n/a	0.002476	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-13	0.826	n/a	8/28/2018	0.5ND	No	26	n/a	n/a	84.62	n/a	n/a	n/a	0.002476	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-14A	0.826	n/a	8/29/2018	0.5ND	No	26	n/a	n/a	84.62	n/a	n/a	n/a	0.002476	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-15A	0.826	n/a	8/29/2018	0.5ND	No	26	n/a	n/a	84.62	n/a	n/a	n/a	0.002476	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-18A	0.826	n/a	8/29/2018	0.5ND	No	26	n/a	n/a	84.62	n/a	n/a	n/a	0.002476	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-21	0.826	n/a	8/28/2018	0.5ND	No	26	n/a	n/a	84.62	n/a	n/a	n/a	0.002476	NP Inter (NDs) 1 of 2
pH (SU)	MW-4A	7.9	7.04	8/28/2018	7.44	No	27	n/a	n/a	0	n/a	n/a	n/a	0.00466	NP Inter (normality) 1 of 2
pH (SU)	MW-5B	7.9	7.04	8/29/2018	7.14	No	27	n/a	n/a	0	n/a	n/a	n/a	0.00466	NP Inter (normality) 1 of 2
pH (SU)	MW-6A	7.9	7.04	8/29/2018	7.18	No	27	n/a	n/a	0	n/a	n/a	n/a	0.00466	NP Inter (normality) 1 of 2
pH (SU)	MW-13	7.9	7.04	8/28/2018	7.37	No	27	n/a	n/a	0	n/a	n/a	n/a	0.00466	NP Inter (normality) 1 of 2
pH (SU)	MW-14A	7.9	7.04	8/29/2018	7.09	No	27	n/a	n/a	0	n/a	n/a	n/a	0.00466	NP Inter (normality) 1 of 2
pH (SU)	MW-15A	7.9	7.04	8/29/2018	7.25	No	27	n/a	n/a	0	n/a	n/a	n/a	0.00466	NP Inter (normality) 1 of 2
pH (SU)	MW-18A	7.9	7.04	8/29/2018	7.12	No	27	n/a	n/a	0	n/a	n/a	n/a	0.00466	NP Inter (normality) 1 of 2
pH (SU)	MW-21	7.9	7.04	8/28/2018	7.07	No	27	n/a	n/a	0	n/a	n/a	n/a	0.00466	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-4A	366	n/a	8/28/2018	52.2	No	27	n/a	n/a	0	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-5B	366	n/a	8/29/2018	120	No	27	n/a	n/a	0	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-6A	366	n/a	8/29/2018	5ND	No	27	n/a	n/a	0	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-13	366	n/a	8/28/2018	72.7	No	27	n/a	n/a	0	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-14A	366	n/a	8/29/2018	1070	Yes	27	n/a	n/a	0	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-15A	366	n/a	8/29/2018	400	Yes	27	n/a	n/a	0	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-18A	366	n/a	8/29/2018	675	Yes	27	n/a	n/a	0	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-21	366	n/a	8/28/2018	96.6	No	27	n/a	n/a	0	n/a	n/a	n/a	0.00233	NP Inter (normality) 1 of 2
Total Dissolved Solids (mg/L)	MW-4A	752.2	n/a	8/28/2018	420	No	27	500.5	119.7	0	None	No	No	0.0009403	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-5B	752.2	n/a	8/29/2018	622	No	27	500.5	119.7	0	None	No	No	0.0009403	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-6A	752.2	n/a	8/29/2018	298	No	27	500.5	119.7	0	None	No	No	0.0009403	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-13	752.2	n/a	8/28/2018	384	No	27	500.5	119.7	0	None	No	No	0.0009403	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-14A	752.2	n/a	8/29/2018	1900	Yes	27	500.5	119.7	0	None	No	No	0.0009403	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-15A	752.2	n/a	8/29/2018	948	Yes	27	500.5	119.7	0	None	No	No	0.0009403	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-18A	752.2	n/a	8/29/2018	1330	Yes	27	500.5	119.7	0	None	No	No	0.0009403	Param Inter 1 of 2

Interwell Prediction Limit Summary - All Results

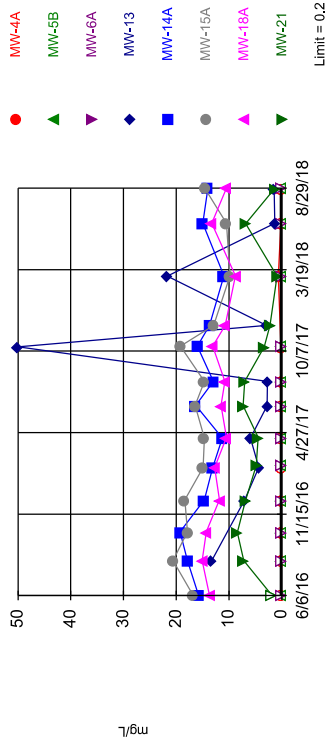
Page 2

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water Printed 10/10/2018, 5:25 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Date</u>	<u>Observ.</u>	<u>Sig.</u>	<u>Bg</u>	<u>N</u>	<u>Bg Mean</u>	<u>Std. Dev.</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Total Dissolved Solids (mg/L)	MW-21	752.2	n/a	8/28/2018	416	No	27	500.5	119.7	0	None	No	0.0009403	Param	Inter 1 of 2

Exceeds Limit: MW-13, MW-14A, MW-15A, MW-18A, MW-21

Prediction Limit
Interwell Non-parametric



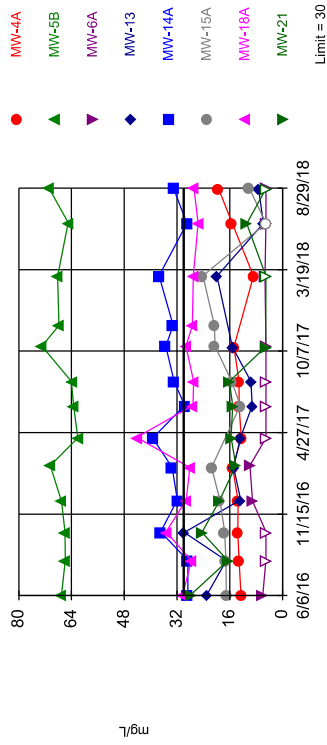
Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. All background values ($n = 27$) were censored; limit is most recent reporting limit. Annual per-constituent alpha = 0.03664. Individual comparison alpha = 0.00233 (1 of 2). Comparing 8 points to limit.

Constituent: Boron Analysis Run 10/10/2018 5:24 PM View: Interwell PLs

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Exceeds Limit: MW-5B, MW-14A

Prediction Limit
Interwell Non-parametric



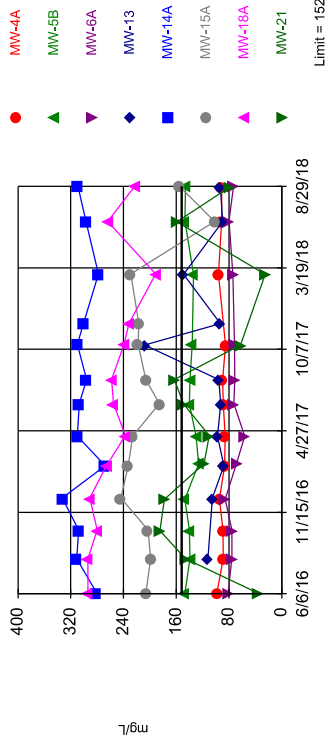
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 27 background values. 40.74% NDs. Annual per-constituent alpha = 0.03664. Individual comparison alpha = 0.00233 (1 of 2). Comparing 8 points to limit.

Constituent: Chloride Analysis Run 10/10/2018 5:24 PM View: Interwell PLs

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Exceeds Limit: MW-14A, MW-15A, MW-18A

Prediction Limit
Interwell Non-parametric



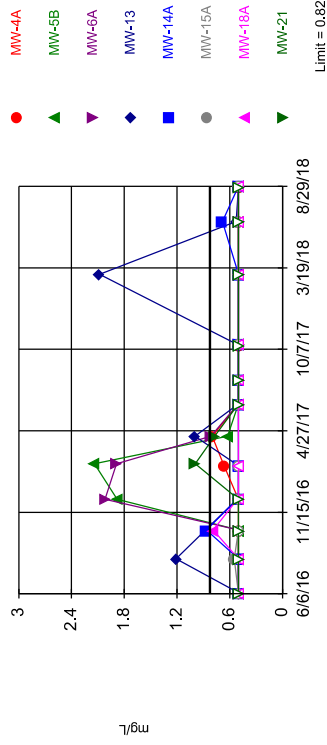
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 27 background values. Annual per-constituent alpha = 0.03664. Individual comparison alpha = 0.00233 (1 of 2). Comparing 8 points to limit.

Constituent: Calcium Analysis Run 10/10/2018 5:24 PM View: Interwell PLs

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Within Limit

Prediction Limit
Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 26 background values. 84.62% NDs. Annual per-constituent alpha = 0.03888. Individual comparison alpha = 0.002476 (1 of 2). Comparing 8 points to limit.

Constituent: Fluoride Analysis Run 10/10/2018 5:24 PM View: Interwell PLs

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Prediction Limit

Constituent: Boron (mg/L) Analysis Run 10/10/2018 5:25 PM View: Interwell PLs
 Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-15A	MW-18A	MW-10 (bg)	MW-08 (bg)	MW-5B	MW-4A	MW-6A	MW-21	MW-14A
6/6/2016	16.8	13.7	<0.2						
6/7/2016				<0.2	<0.2	<0.2	<0.2		
6/8/2016								<2	15.8
8/15/2016	20.6	15.1	<0.2					7.23	17.9
8/16/2016				<0.2	<0.2	<0.2	<0.2		
10/10/2016			<0.2	<0.2				8.45	
10/11/2016	17.9	14.3			<0.2	<0.2	<0.2		19.3
12/12/2016					<0.2	<0.2	<0.2	6.93	
12/14/2016	18.4	11.8	<0.2	<0.2					14.7
2/17/2017	14.9	12.7	<0.2			<0.2			13.1
2/21/2017				<0.2	<0.2		<0.2	4.87	
4/17/2017	14.7		<0.2	<0.2	<0.2	<0.2	<0.2		11.3
4/18/2017		10.5						4.49	
6/19/2017			<0.2	<0.2					
6/20/2017					<0.2	<0.2		7.36	
6/21/2017	16.4	11.5					<0.2		16.3
8/7/2017			<0.2	<0.2		<0.2			
8/8/2017	14.7	10.8			<0.2		<0.2	7.05	13
10/16/2017			<0.2	<0.2		<0.2		3.33	
10/17/2017	19.2	13.1			<0.2		<0.2		16
11/28/2017	12.9 (R)	10.7 (R)						2.24 (R)	13.7 (R)
3/5/2018			<0.2						
3/6/2018				<0.2	<0.2	0.66	<0.2	0.885	
3/7/2018	9.8	8.81							11
6/19/2018			<0.2	<0.2				6.84	
6/20/2018	10.5	13.3							15
6/21/2018					<0.2	<0.2	<0.2		
8/27/2018			<0.2	<0.2					
8/28/2018						<0.2		1.36	
8/29/2018	14.6	10.5			<0.2		<0.2		14

Prediction Limit

Page 2

Constituent: Boron (mg/L) Analysis Run 10/10/2018 5:25 PM View: Interwell PLs
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-13	MW-22 (bg)
6/6/2016		
6/7/2016		
6/8/2016	47.2 (o)	
8/15/2016	13.3	
8/16/2016		
10/10/2016	74.8 (o)	
10/11/2016		
12/12/2016		
12/14/2016	7.03	
2/17/2017	4.35	
2/21/2017		
4/17/2017	5.93	
4/18/2017		
6/19/2017		
6/20/2017	2.77	
6/21/2017		
8/7/2017		
8/8/2017	2.72	
10/16/2017	50	
10/17/2017		
11/28/2017	2.92 (R)	
3/5/2018		
3/6/2018	21.7	<0.2
3/7/2018		
6/19/2018		<0.2
6/20/2018	1.34	
6/21/2018		
8/27/2018		<0.2
8/28/2018	1.45	
8/29/2018		

Prediction Limit

Constituent: Calcium (mg/L) Analysis Run 10/10/2018 5:25 PM View: Interwell PLs

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-15A	MW-18A	MW-10 (bg)	MW-08 (bg)	MW-5B	MW-4A	MW-6A	MW-21	MW-14A
6/6/2016	206	294	89.3						
6/7/2016				152	147	98.2	81.4		
6/8/2016								37.2	281
8/15/2016	199	294	80.7					146	311
8/16/2016				117	139	88.8	75.4		
10/10/2016			83.3	118				185	
10/11/2016	203	280			140	89.3	75.7		308
12/12/2016					147	94.5	85.6	178	
12/14/2016	244	291	86.5	109					333
2/17/2017	233	266	81.2			86.8			268
2/21/2017				89.9	126		68.8	118	
4/17/2017	226		79.2	96.5	130	85.9	56.3		310
4/18/2017		237						110	
6/19/2017			83.6	113					
6/20/2017					140	88.7		149	
6/21/2017	186	255					72.9		307
8/7/2017			85.5	91.3		89.7			
8/8/2017	206	258			139		71.2	163	296
10/16/2017			83.3	77		85.3		62.3	
10/17/2017	218	239			136		71.9		310
11/28/2017	217 (R)	232 (R)							301 (R)
3/5/2018			77.3						
3/6/2018				74.7	134	95.8	74.1	25.1	
3/7/2018	229	191							278
6/19/2018			88.5	115				159	
6/20/2018	102	264							297
6/21/2018					147	91.4	80.1		
8/27/2018			85.4	83.6					
8/28/2018						91.3		78.7	
8/29/2018	155	223			146		73.3		309

Prediction Limit

Constituent: Calcium (mg/L) Analysis Run 10/10/2018 5:25 PM View: Interwell PLs
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-13	MW-22 (bg)
6/6/2016		
6/7/2016		
6/8/2016	218 (o)	
8/15/2016	112	
8/16/2016		
10/10/2016	276 (o)	
10/11/2016		
12/12/2016		
12/14/2016	105	
2/17/2017	87.6	
2/21/2017		
4/17/2017	97.5	
4/18/2017		
6/19/2017		
6/20/2017	92.8	
6/21/2017		
8/7/2017		
8/8/2017	95.4	
10/16/2017	208	
10/17/2017		
11/28/2017	93.2 (R)	
3/5/2018		
3/6/2018	149	69.8
3/7/2018		
6/19/2018		91.5
6/20/2018	89.5	
6/21/2018		
8/27/2018		80.7
8/28/2018	93.1	
8/29/2018		

Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 10/10/2018 5:25 PM View: Interwell PLs

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-18A	MW-15A	MW-10 (bg)	MW-08 (bg)	MW-6A	MW-5B	MW-4A	MW-21	MW-14A
6/6/2016	30.4	17.1	6.22						
6/7/2016				19.8	5.97	67	12.6		
6/8/2016								27.7	28.7
8/15/2016	27.6	17.2	<5					16.6	28.7
8/16/2016				17.8	<5	65.9	13.2		
10/10/2016			<5	16.2				24.4	
10/11/2016	35.3	17.6			<5	66	13.6		37
12/12/2016					9.08	67	13.5	19.2	
12/14/2016	29.2	19	<5	17.2					31.9
2/17/2017	28.1	21.5	<5				15.1		33.5
2/21/2017				15.4	9.93	70.4		14.2	
4/17/2017		47.4 (o)	<5	17.1	<5	62.1	12.5		39.4
4/18/2017	44.2							15.6	
6/19/2017			<5	14.1					
6/20/2017						63.4	13.2	15.1	
6/21/2017	27.2	12.8			<5				29.7
8/7/2017			<5	14			13.2		
8/8/2017	27	15.4			<5	64		16.1	32.9
10/16/2017			<5	14.4			14.7	5.09	
10/17/2017	29.3	20.5			<5	73			35.4
11/28/2017	27.4 (R)	20.7 (R)				67.8 (R)			33.2 (R)
3/5/2018			<5						
3/6/2018				14.5	5.33	68.2	8.81	<5	
3/7/2018	27.1	24.2							37.4
6/19/2018			<5	14.9				10.9	
6/20/2018	25.6	<5							29
6/21/2018					<5	65	15.3		
8/27/2018			<5	15.6					
8/28/2018							19.4	<5	
8/29/2018	26.9	10.1			<5	70.8			33.1

Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 10/10/2018 5:25 PM View: Interwell PLs
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-13	MW-22 (bg)
6/6/2016		
6/7/2016		
6/8/2016	22.9	
8/15/2016	17.1	
8/16/2016		
10/10/2016	29.8	
10/11/2016		
12/12/2016		
12/14/2016	12.7	
2/17/2017	14.8	
2/21/2017		
4/17/2017	12.8	
4/18/2017		
6/19/2017		
6/20/2017	9.17	
6/21/2017		
8/7/2017		
8/8/2017	9.62	
10/16/2017	15.2	
10/17/2017		
11/28/2017		
3/5/2018		
3/6/2018	19.9	30
3/7/2018		
6/19/2018		27.2
6/20/2018	5.84	
6/21/2018		
8/27/2018		29.8
8/28/2018	7.24	
8/29/2018		

Prediction Limit

Constituent: Fluoride (mg/L) Analysis Run 10/10/2018 5:25 PM View: Interwell PLs

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-10 (bg)	MW-15A	MW-18A	MW-08 (bg)	MW-6A	MW-4A	MW-5B	MW-13	MW-21
6/6/2016	0.731	<0.5	<0.5						
6/7/2016				<0.5	<0.5	<0.5	<0.5		
6/8/2016								<0.5	<0.5
8/15/2016	<0.5	0.549	<0.5					1.21	<0.5
8/16/2016				<0.5	<0.5	<0.5	<0.5		
10/10/2016	<0.5			<0.5				3.25 (o)	<0.5
10/11/2016		<0.5	0.791		<0.5	<0.5	<0.5		
12/12/2016					2.02	<0.5	1.88		<0.5
12/14/2016	<0.5	<0.5	<0.5 (F2)	0.72				<0.5	
2/17/2017	<0.5	<0.5	<0.5			0.664		<0.5	
2/21/2017				<0.5	1.89		2.14		0.993
4/17/2017	0.774	6.7 (o)		1.69 (F1o)	0.814	0.801	0.627	0.997	
4/18/2017			3.16 (o)						0.768
6/19/2017	<0.5			<0.5					
6/20/2017						<0.5	<0.5	<0.5	<0.5
6/21/2017		<0.5	<0.5		<0.5				
8/7/2017	<0.5			<0.5		<0.5			
8/8/2017		<0.5	<0.5		<0.5		<0.5	<0.5	<0.5
10/16/2017	<0.5			<0.5		<0.5		<0.5	<0.5
10/17/2017		<0.5	<0.5		<0.5		<0.5		
3/5/2018	<0.5								
3/6/2018				<0.5	<0.5	<0.5	<0.5	2.08	<0.5
3/7/2018		<0.5	<0.5						
6/19/2018	<0.5			0.826					<0.5
6/20/2018		<0.5	<0.5					0.528	
6/21/2018					<0.5	<0.5	<0.5		
8/27/2018	<0.5			<0.5					
8/28/2018						<0.5		<0.5	<0.5
8/29/2018		<0.5	<0.5		<0.5		<0.5		

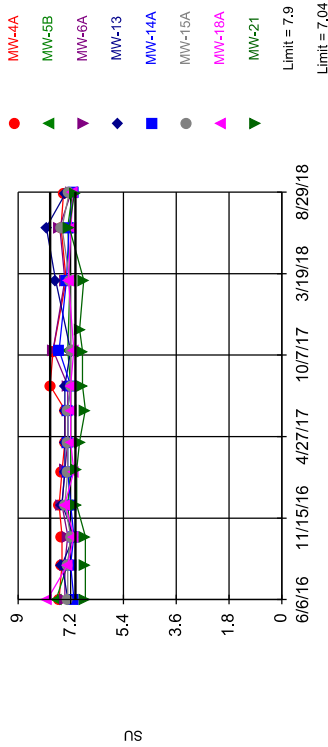
Prediction Limit

Constituent: Fluoride (mg/L) Analysis Run 10/10/2018 5:25 PM View: Interwell PLs
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-14A	MW-22 (bg)
6/6/2016		
6/7/2016		
6/8/2016	<0.5	
8/15/2016	<0.5	
8/16/2016		
10/10/2016		
10/11/2016	0.867	
12/12/2016		
12/14/2016	<0.5	
2/17/2017	<0.5	
2/21/2017		
4/17/2017	1.93 (o)	
4/18/2017		
6/19/2017		
6/20/2017		
6/21/2017	<0.5	
8/7/2017		
8/8/2017	<0.5	
10/16/2017		
10/17/2017	<0.5	
3/5/2018		
3/6/2018		<0.5
3/7/2018	<0.5	
6/19/2018		<0.5
6/20/2018	0.684	
6/21/2018		
8/27/2018		<0.5
8/28/2018		
8/29/2018	<0.5	

Within Limits

Prediction Limit
Interwell Non-parametric



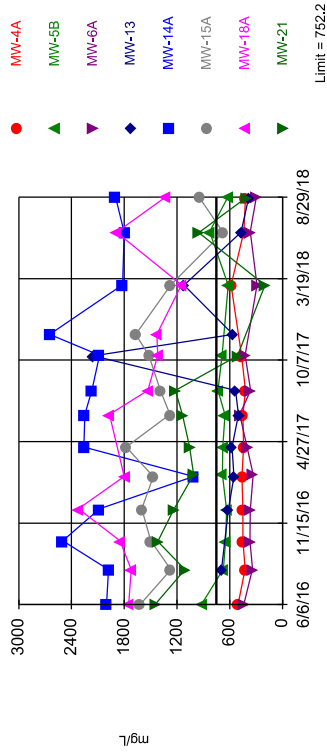
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limits are highest and lowest of 27 background values. Annual per-constituent alpha = 0.07327. Individual comparison alpha = 0.00466 (1 of 2). Comparing 8 points to limit.

Constituent: pH Analysis Run 10/10/2018 5:24 PM View: Interwell PLs

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Exceeds Limit: MW-14A, MW-15A, MW-18A

Prediction Limit
Interwell Parametric



Background Data Summary: Mean=500.5, Std. Dev.=119.7, n=27. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9099, critical = 0.894. Kappa = 2.102 (c=7, w=8, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.0009403. Comparing 8 points to limit.

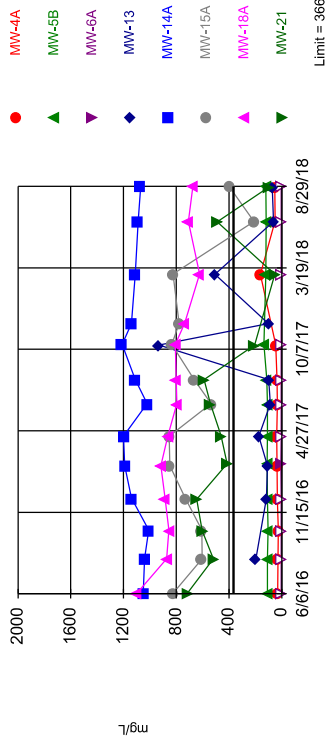
Constituent: Total Dissolved Solids Analysis Run 10/10/2018 5:24 PM View: Interwell PLs

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Hollow symbols indicate censored values.

Exceeds Limit: MW-14A, MW-15A, MW-18A

Prediction Limit
Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 27 background values. Annual per-constituent alpha = 0.03664. Individual comparison alpha = 0.00233 (1 of 2). Comparing 8 points to limit.

Constituent: Sulfate Analysis Run 10/10/2018 5:24 PM View: Interwell PLs

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Prediction Limit

Constituent: pH (SU) Analysis Run 10/10/2018 5:25 PM View: Interwell PLs
 Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-18A	MW-15A	MW-10 (bg)	MW-08 (bg)	MW-6A	MW-5B	MW-4A	MW-21	MW-14A
6/6/2016	8	7.3	7.4						
6/7/2016				7.2	7.4	7.7	7.6		
6/8/2016								6.7	7.1
8/15/2016	7.3	7.3	7.3					6.7	7.2
8/16/2016				7.3	7.4	7.3	7.5		
10/10/2016			7.2	7.1				6.7	
10/11/2016	7.1	7.2			7.3	7.2	7.5		7.1
12/12/2016					7.5	7.3	7.6	7	
12/14/2016	7.4	7.4	7.3	7.3					7.2
2/17/2017	7.1	7.3	7.2				7.5		7.3
2/21/2017				7.3	7.4	7.2		7	
4/17/2017		7.3	7.3	7.1	7.3	7.2	7.4		7.3
4/18/2017	7.2							6.9	
6/19/2017			7.2	7.1					
6/20/2017						7.2	7.4	6.7	
6/21/2017	7.2	7.3			7.3				7.3
8/7/2017			7.9	7.3			7.9		
8/8/2017	7.2	7.2			7.3	7.2		6.8	7.2
10/16/2017			7.3	7.4			7.8	6.8	
10/17/2017	7.1	7.2			7.8	7.3			7.6
11/28/2017								6.9 (R)	
3/5/2018			7.04						
3/6/2018				7.3	7.4	7.23	7.36	6.76	
3/7/2018	7.28	7.24							7.35
6/19/2018			7.72	7.56				7.25	
6/20/2018	7.19	7.5							7.26
6/21/2018					7.58	7.3	7.53		
8/27/2018			7.23	7.2					
8/28/2018							7.44	7.07	
8/29/2018	7.12	7.25			7.18	7.14			7.09

Prediction Limit

Constituent: pH (SU) Analysis Run 10/10/2018 5:25 PM View: Interwell PLs
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-13	MW-22 (bg)
6/6/2016		
6/7/2016		
6/8/2016	7.3	
8/15/2016	7.5	
8/16/2016		
10/10/2016	7.1	
10/11/2016		
12/12/2016		
12/14/2016	7.5	
2/17/2017	7.4	
2/21/2017		
4/17/2017	7.4	
4/18/2017		
6/19/2017		
6/20/2017	7.4	
6/21/2017		
8/7/2017		
8/8/2017	7.4	
10/16/2017	7.2	
10/17/2017		
11/28/2017		
3/5/2018		
3/6/2018	7.72	7.36
3/7/2018		
6/19/2018		7.9
6/20/2018	8.03	
6/21/2018		
8/27/2018		7.42
8/28/2018	7.37	
8/29/2018		

Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 10/10/2018 5:25 PM View: Interwell PLs
 Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-15A	MW-18A	MW-10 (bg)	MW-08 (bg)	MW-5B	MW-4A	MW-6A	MW-21	MW-14A
6/6/2016	827	1100	42.1						
6/7/2016				366	109	32.2	<5		
6/8/2016								713	1050
8/15/2016	605	874	33.8					520	1040
8/16/2016				187	109	28.4	<5		
10/10/2016			36.4	187				603	
10/11/2016	607	855			105	27.2	<5		1010
12/12/2016					109	32.7	<5	645	
12/14/2016	732	886	38.4	149					1140
2/17/2017	849	917	47.3			36			1190
2/21/2017				145	111		5.94	415	
4/17/2017	853		38.3	145	108	39.5	<5		1200
4/18/2017		863						461	
6/19/2017			35.4	190					
6/20/2017					108	33		541	
6/21/2017	537	796					<5		1020
8/7/2017			39	119		35.3			
8/8/2017	664	801			114		<5	590	1110
10/16/2017			46.9	106		45.4		206	
10/17/2017	835	808			135		<5		1210
11/28/2017	779 (R)	737 (R)							1140 (R)
3/5/2018			51.4						
3/6/2018				87.3	122	162	<5	53.7	
3/7/2018	824	624							1110
6/19/2018			37.3	136				489	
6/20/2018	210	709							1090
6/21/2018					119	51.3	<5		
8/27/2018			34.3	94.7					
8/28/2018						52.2		96.6	
8/29/2018	400	675			120		<5		1070

Prediction Limit

Page 2

Constituent: Sulfate (mg/L) Analysis Run 10/10/2018 5:25 PM View: Interwell PLs
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-13	MW-22 (bg)
6/6/2016		
6/7/2016		
6/8/2016	975 (o)	
8/15/2016	197	
8/16/2016		
10/10/2016	1170 (o)	
10/11/2016		
12/12/2016		
12/14/2016	117	
2/17/2017	110	
2/21/2017		
4/17/2017	174	
4/18/2017		
6/19/2017		
6/20/2017	86.7	
6/21/2017		
8/7/2017		
8/8/2017	99.4	
10/16/2017	931	
10/17/2017		
11/28/2017	102 (R)	
3/5/2018		
3/6/2018	506	123
3/7/2018		
6/19/2018		134
6/20/2018	62.1	
6/21/2018		
8/27/2018		125
8/28/2018	72.7	
8/29/2018		

Prediction Limit

Constituent: Total Dissolved Solids (mg/L) Analysis Run 10/10/2018 5:25 PM View: Interwell PLs

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-15A	MW-10 (bg)	MW-18A	MW-6A	MW-4A	MW-08 (bg)	MW-5B	MW-14A	MW-21
6/6/2016	1620	468	1750						
6/7/2016				440	507	836	920		
6/8/2016								2000	1440
8/15/2016	1270	412	1720					1980	1110
8/16/2016				340	426	664	672		
10/10/2016		444				708			1420
10/11/2016	1500		1850	370	450		646	2500	
12/12/2016				368	450		636		1240
12/14/2016	1600	428	2320			634		2080	
2/17/2017	1470	498	1800		460			1010	
2/21/2017				336		578	684		1010
4/17/2017	1780	538		402	442	624	680	2260	
4/18/2017			4160 (o)						1060
6/19/2017		524				656			
6/20/2017					452		656		1140
6/21/2017	1280		1970	486				2250	
8/7/2017		458			420	488			
8/8/2017	1390		1530	364			734	2170	1220
10/16/2017		414			466	470			514
10/17/2017	1520		1420	424			688	2080	
11/28/2017	1670 (R)		1430 (R)					2650 (R)	
3/5/2018		314							
3/6/2018				292	586	376	620		200
3/7/2018	1270		1150					1820	
6/19/2018		396				502			952
6/20/2018	676		1890					1800	
6/21/2018				368	440		828		
8/27/2018		392				414			
8/28/2018					420				416
8/29/2018	948		1330	298			622	1900	

Prediction Limit

Page 2

Constituent: Total Dissolved Solids (mg/L) Analysis Run 10/10/2018 5:25 PM View: Interwell PLs

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-13	MW-22 (bg)
6/6/2016		
6/7/2016		
6/8/2016	1970 (o)	
8/15/2016	694	
8/16/2016		
10/10/2016	2740 (o)	
10/11/2016		
12/12/2016		
12/14/2016	616	
2/17/2017	554	
2/21/2017		
4/17/2017	574	
4/18/2017		
6/19/2017		
6/20/2017	502	
6/21/2017		
8/7/2017		
8/8/2017	536	
10/16/2017	2150	
10/17/2017		
11/28/2017	562 (R)	
3/5/2018		
3/6/2018	1120	424
3/7/2018		
6/19/2018		434
6/20/2018	472	
6/21/2018		
8/27/2018		420
8/28/2018	384	
8/29/2018		

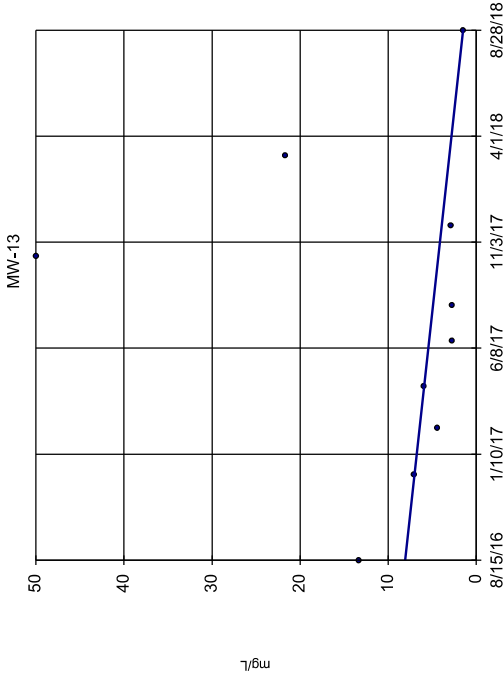
Trend Tests

Trend Tests Summary Table - Prediction Limit Increases

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water Printed 10/4/2018, 12:25 PM

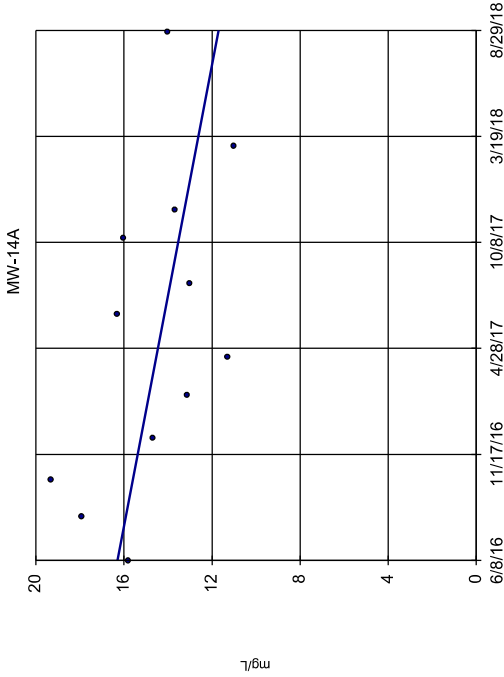
<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Xform</u>	<u>Alpha</u>	<u>Method</u>
Boron (mg/L)	MW-13	-3.238	-13	-30	No	10	0	n/a	n/a	0.01	NP
Boron (mg/L)	MW-14A	-2.063	-24	-38	No	12	0	n/a	n/a	0.01	NP
Boron (mg/L)	MW-15A	-2.814	-35	-38	No	12	0	n/a	n/a	0.01	NP
Boron (mg/L)	MW-18A	-2.346	-41	-38	Yes	12	0	n/a	n/a	0.01	NP
Boron (mg/L)	MW-21	-3.071	-30	-38	No	12	8.333	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-14A	-1.299	-9	-38	No	12	0	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-15A	-6.217	-3	-38	No	12	0	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-18A	-41.32	-53	-38	Yes	12	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-5B	1.581	21	38	No	12	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-14A	2.509	21	38	No	12	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-14A	31.02	12	38	No	12	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-15A	-11.41	-2	-38	No	12	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-18A	-154.7	-46	-38	Yes	12	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-14A	-42.1	-3	-38	No	12	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-15A	-161	-15	-38	No	12	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	MW-18A	-307.4	-29	-34	No	11	0	n/a	n/a	0.01	NP

Sen's Slope Estimator



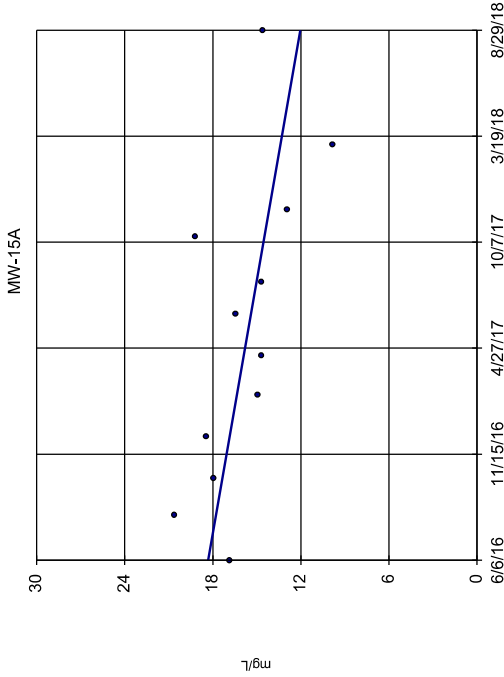
Constituent: Boron Analysis Run 10/4/2018 12:24 PM View: Trend Tests
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Sen's Slope Estimator



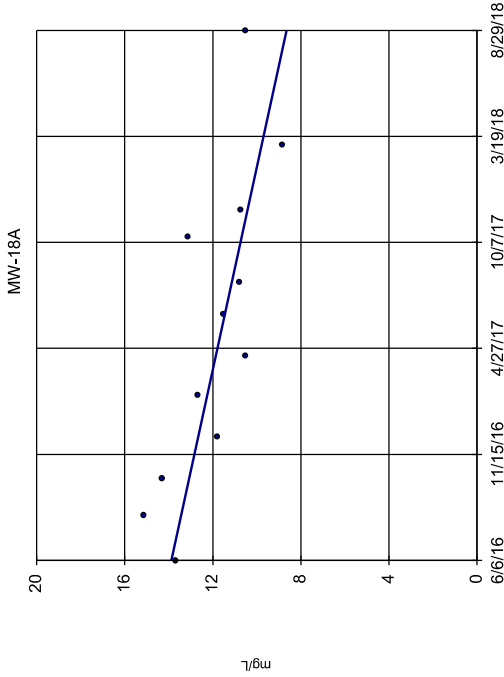
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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Sen's Slope Estimator



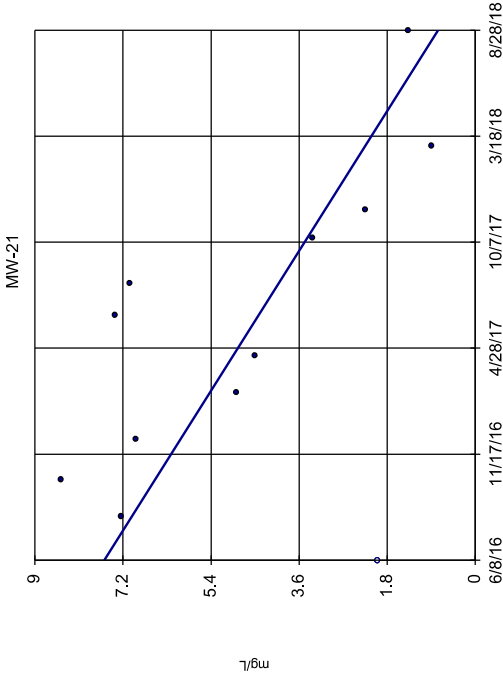
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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Sen's Slope Estimator



Constituent: Boron Analysis Run 10/4/2018 12:24 PM View: Trend Tests
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

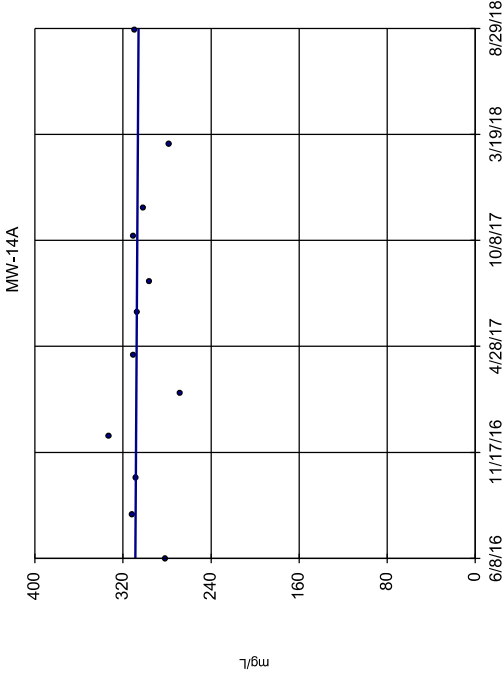
Sen's Slope Estimator



n = 12
Slope = -3.071
units per year.
Mann-Kendall
statistic = -30
critical = -38
Trend not sig-
nificant at 99%
confidence level
($\alpha = 0.005$ per
tail).

Constituent: Boron Analysis Run 10/4/2018 12:24 PM View: Trend Tests
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

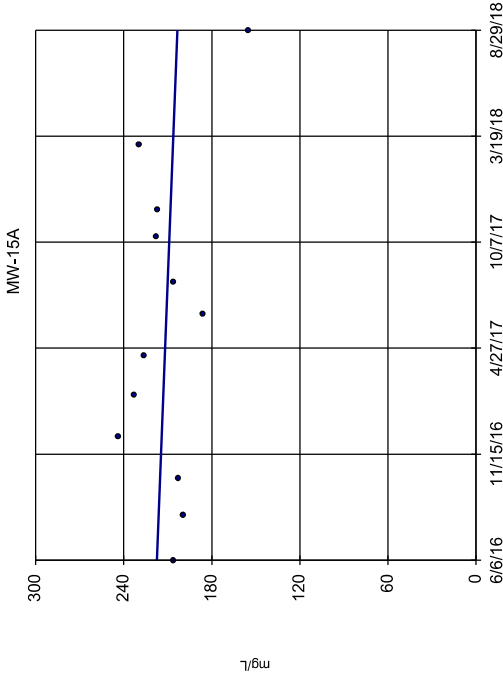
Sen's Slope Estimator



n = 12
Slope = -1.299
units per year.
Mann-Kendall
statistic = -9
critical = -38
Trend not sig-
nificant at 99%
confidence level
($\alpha = 0.005$ per
tail).

Constituent: Calcium Analysis Run 10/4/2018 12:24 PM View: Trend Tests
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

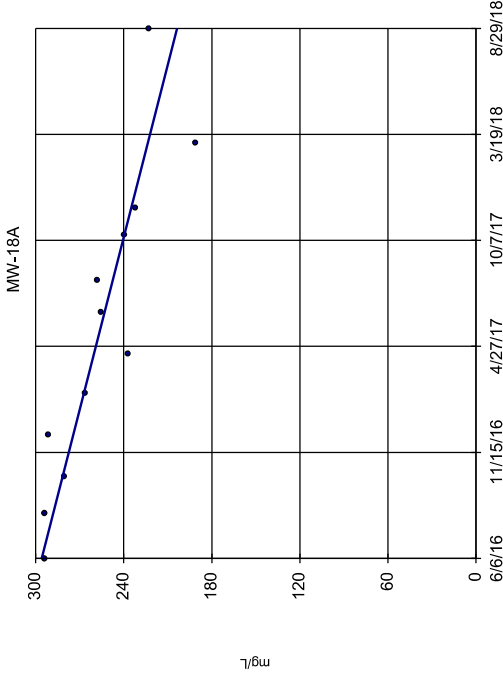
Sen's Slope Estimator



n = 12
Slope = -6.217
units per year.
Mann-Kendall
statistic = -3
critical = -38
Trend not sig-
nificant at 99%
confidence level
($\alpha = 0.005$ per
tail).

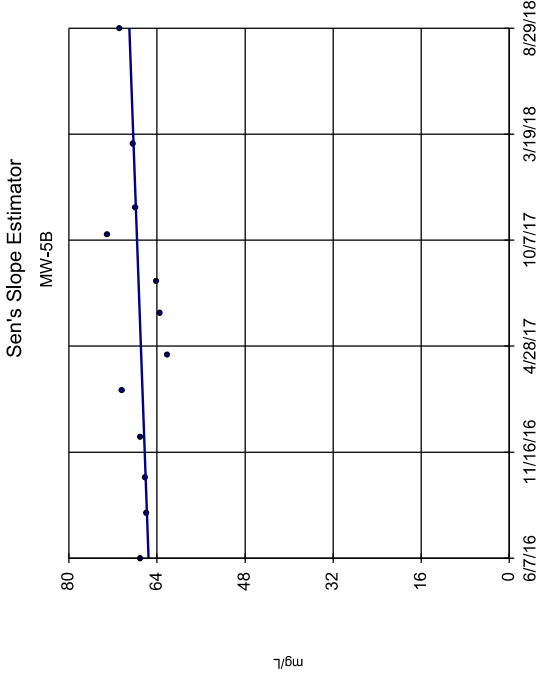
Constituent: Calcium Analysis Run 10/4/2018 12:24 PM View: Trend Tests
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Sen's Slope Estimator

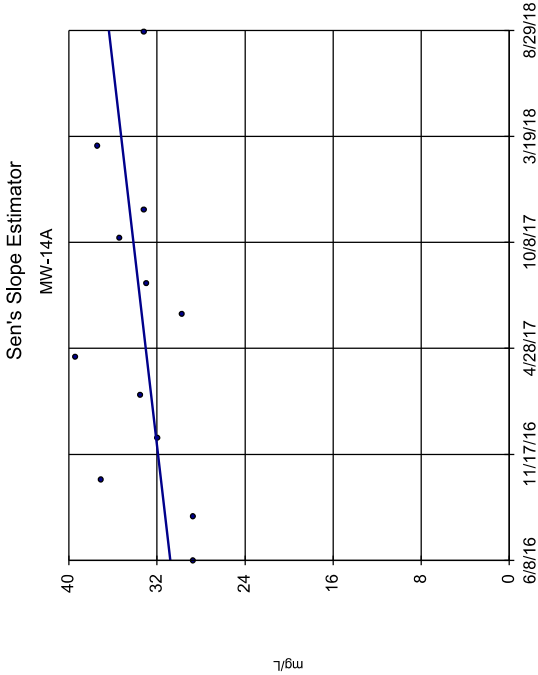


n = 12
Slope = -41.32
units per year.
Mann-Kendall
statistic = -53
critical = -38
Decreasing trend
significant at 99%
confidence level
($\alpha = 0.005$ per
tail).

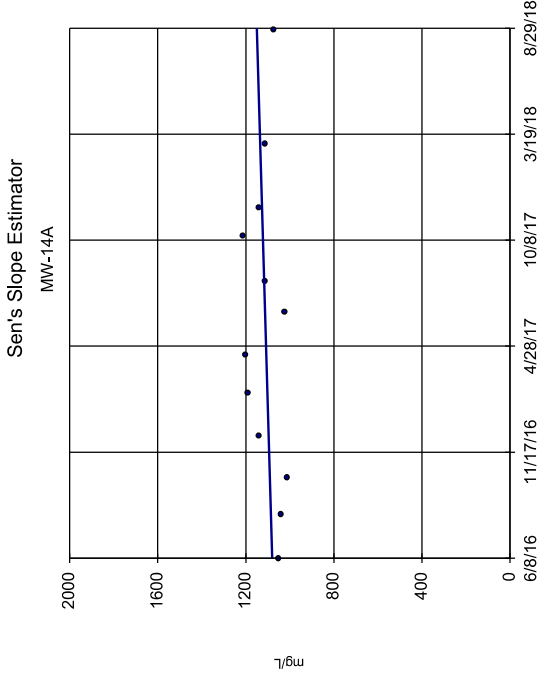
Constituent: Calcium Analysis Run 10/4/2018 12:24 PM View: Trend Tests
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water



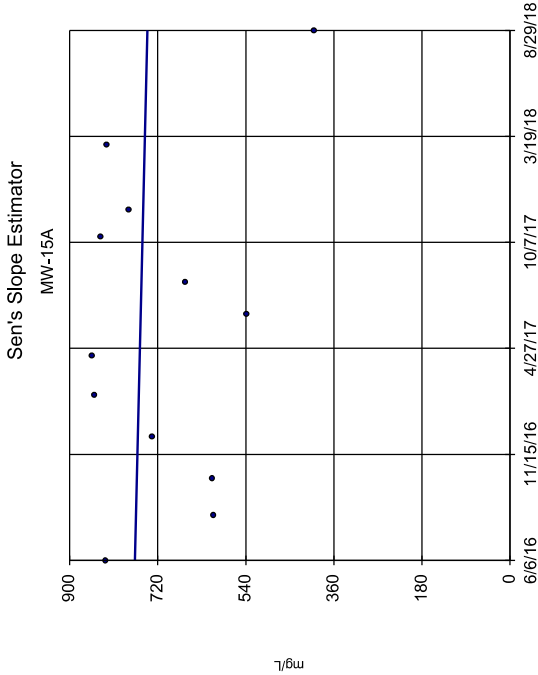
Constituent: Chloride Analysis Run 10/4/2018 12:24 PM View: Trend Tests
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water



Constituent: Chloride Analysis Run 10/4/2018 12:24 PM View: Trend Tests
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water



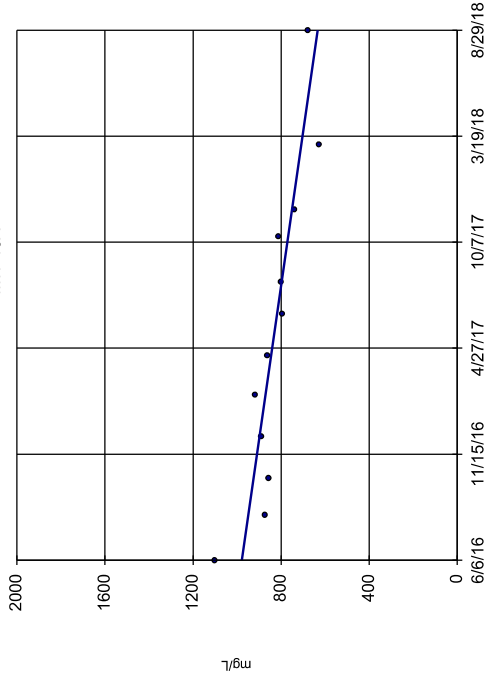
Constituent: Sulfate Analysis Run 10/4/2018 12:24 PM View: Trend Tests
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water



Constituent: Sulfate Analysis Run 10/4/2018 12:24 PM View: Trend Tests
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Sen's Slope Estimator

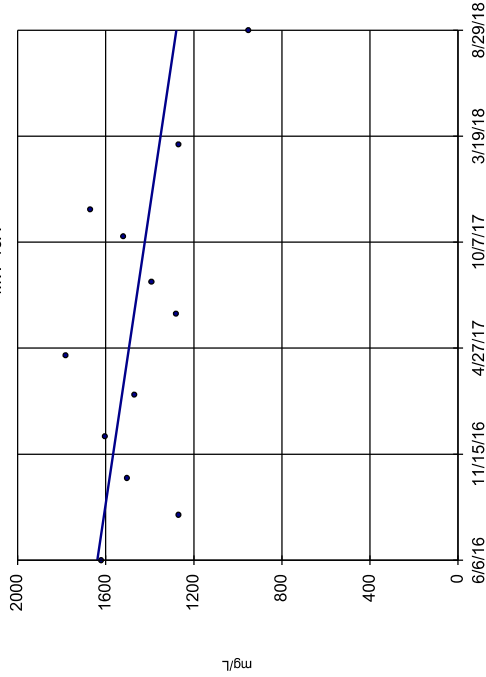
MW-18A



Constituent: Sulfate Analysis Run 10/4/2018 12:24 PM View: Trend Tests
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Sen's Slope Estimator

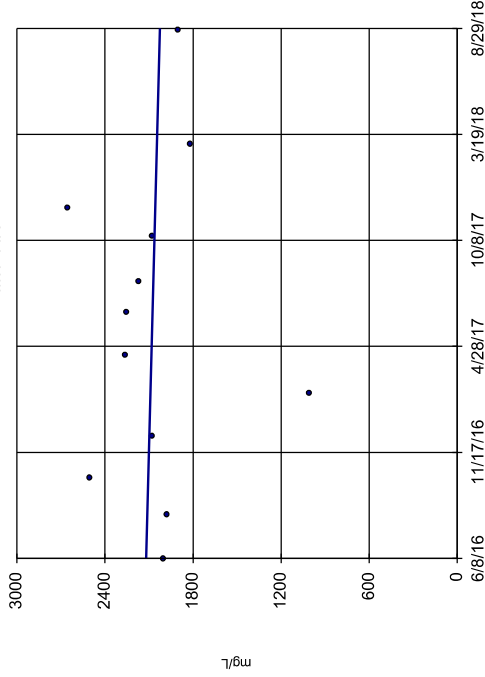
MW-15A



Constituent: Total Dissolved Solids Analysis Run 10/4/2018 12:24 PM View: Trend Tests
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Sen's Slope Estimator

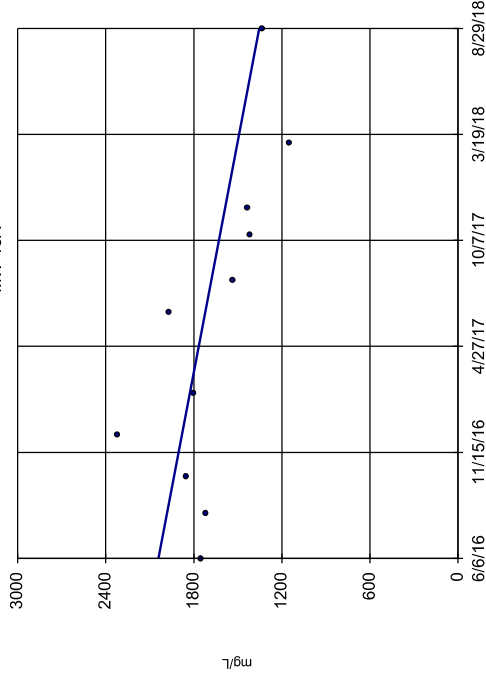
MW-14A



Constituent: Total Dissolved Solids Analysis Run 10/4/2018 12:24 PM View: Trend Tests
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Sen's Slope Estimator

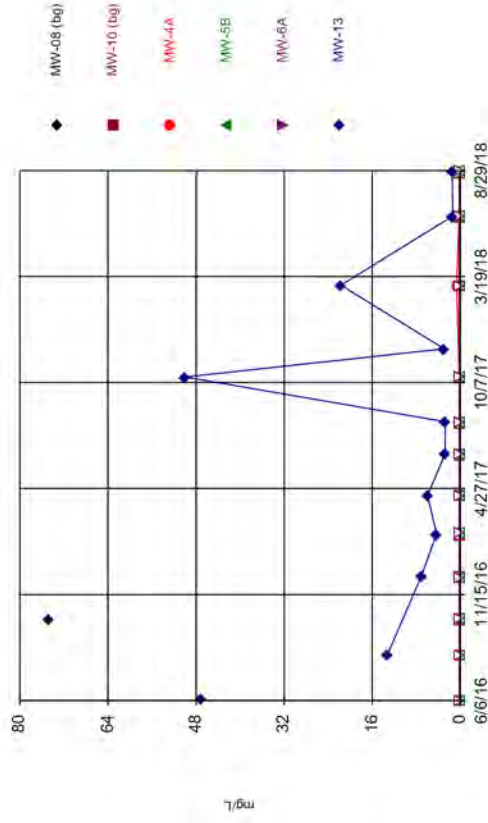
MW-18A



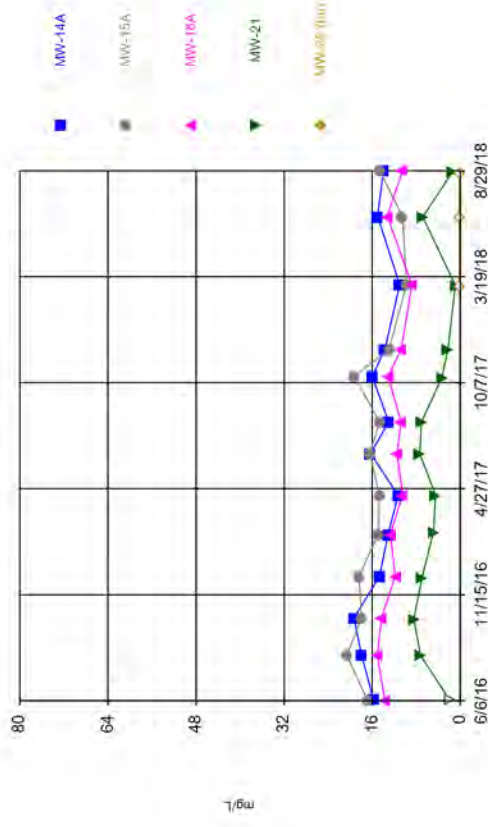
Constituent: Total Dissolved Solids Analysis Run 10/4/2018 12:24 PM View: Trend Tests
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Time Series

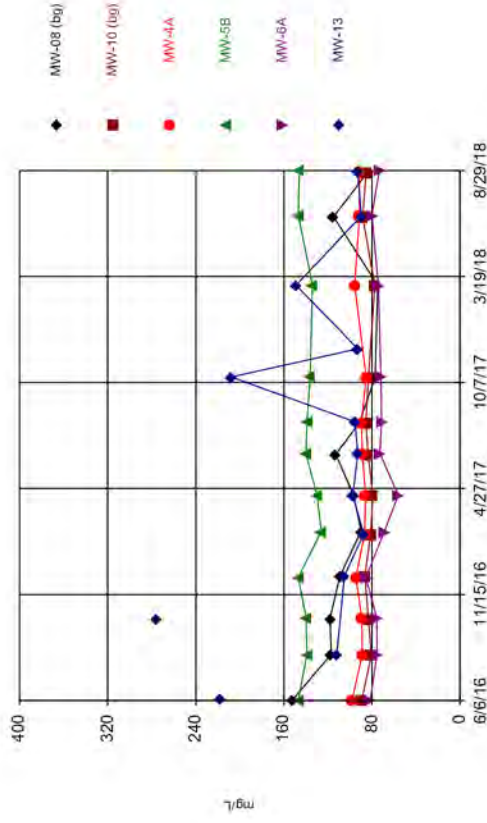
Time Series



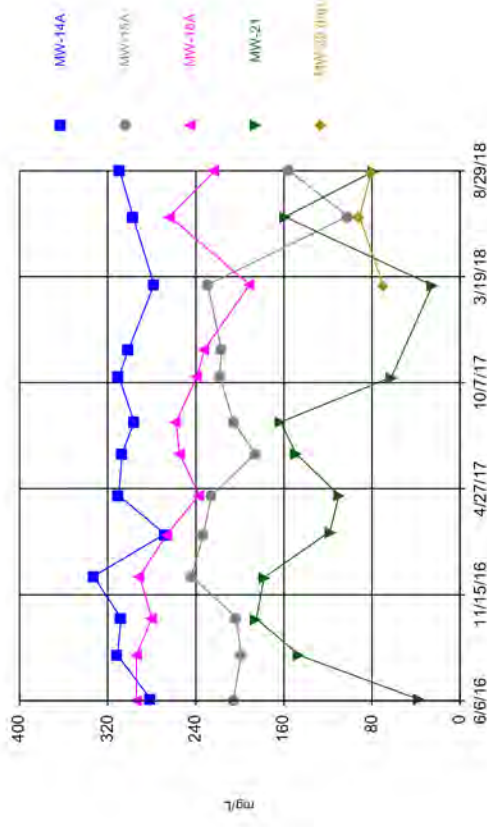
Time Series



Time Series



Time Series



Time Series

Constituent: Boron (mg/L) Analysis Run 10/10/2018 4:48 PM View: Descriptive
 Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-4A	MW-5B	MW-6A	MW-13
6/6/2016		<0.2				
6/7/2016	<0.2		<0.2	<0.2	<0.2	
6/8/2016						47.2 (o)
8/15/2016		<0.2				13.3
8/16/2016	<0.2		<0.2	<0.2	<0.2	
10/10/2016	<0.2	<0.2				74.8 (o)
10/11/2016			<0.2	<0.2	<0.2	
12/12/2016			<0.2	<0.2	<0.2	
12/14/2016	<0.2	<0.2				7.03
2/17/2017		<0.2	<0.2			4.35
2/21/2017	<0.2			<0.2	<0.2	
4/17/2017	<0.2	<0.2	<0.2	<0.2	<0.2	5.93
6/19/2017	<0.2	<0.2				
6/20/2017			<0.2	<0.2		2.77
6/21/2017					<0.2	
8/7/2017	<0.2	<0.2	<0.2			
8/8/2017				<0.2	<0.2	2.72
10/16/2017	<0.2	<0.2	<0.2			50
10/17/2017				<0.2	<0.2	
11/28/2017						2.92 (R)
3/5/2018		<0.2				
3/6/2018	<0.2		0.66	<0.2	<0.2	21.7
6/19/2018	<0.2	<0.2				
6/20/2018						1.34
6/21/2018			<0.2	<0.2	<0.2	
8/27/2018	<0.2	<0.2				
8/28/2018			<0.2			1.45
8/29/2018				<0.2	<0.2	

Time Series

Constituent: Boron (mg/L) Analysis Run 10/10/2018 4:48 PM View: Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-14A	MW-15A	MW-18A	MW-21	MW-22 (bg)
6/6/2016		16.8	13.7		
6/8/2016	15.8			<2	
8/15/2016	17.9	20.6	15.1	7.23	
10/10/2016				8.45	
10/11/2016	19.3	17.9	14.3		
12/12/2016				6.93	
12/14/2016	14.7	18.4	11.8		
2/17/2017	13.1	14.9	12.7		
2/21/2017				4.87	
4/17/2017	11.3	14.7			
4/18/2017			10.5	4.49	
6/20/2017				7.36	
6/21/2017	16.3	16.4	11.5		
8/8/2017	13	14.7	10.8	7.05	
10/16/2017				3.33	
10/17/2017	16	19.2	13.1		
11/28/2017	13.7 (R)	12.9 (R)	10.7 (R)	2.24 (R)	
3/6/2018				0.885	<0.2
3/7/2018	11	9.8	8.81		
6/19/2018				6.84	<0.2
6/20/2018	15	10.5	13.3		
8/27/2018					<0.2
8/28/2018				1.36	
8/29/2018	14	14.6	10.5		

Time Series

Constituent: Calcium (mg/L) Analysis Run 10/10/2018 4:48 PM View: Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-4A	MW-5B	MW-6A	MW-13
6/6/2016		89.3				
6/7/2016	152		98.2	147	81.4	
6/8/2016						218 (o)
8/15/2016		80.7				112
8/16/2016	117		88.8	139	75.4	
10/10/2016	118	83.3				276 (o)
10/11/2016			89.3	140	75.7	
12/12/2016			94.5	147	85.6	
12/14/2016	109	86.5				105
2/17/2017		81.2	86.8			87.6
2/21/2017	89.9			126	68.8	
4/17/2017	96.5	79.2	85.9	130	56.3	97.5
6/19/2017	113	83.6				
6/20/2017			88.7	140		92.8
6/21/2017					72.9	
8/7/2017	91.3	85.5	89.7			
8/8/2017				139	71.2	95.4
10/16/2017	77	83.3	85.3			208
10/17/2017				136	71.9	
11/28/2017						93.2 (R)
3/5/2018		77.3				
3/6/2018	74.7		95.8	134	74.1	149
6/19/2018	115	88.5				
6/20/2018						89.5
6/21/2018			91.4	147	80.1	
8/27/2018	83.6	85.4				
8/28/2018			91.3			93.1
8/29/2018				146	73.3	

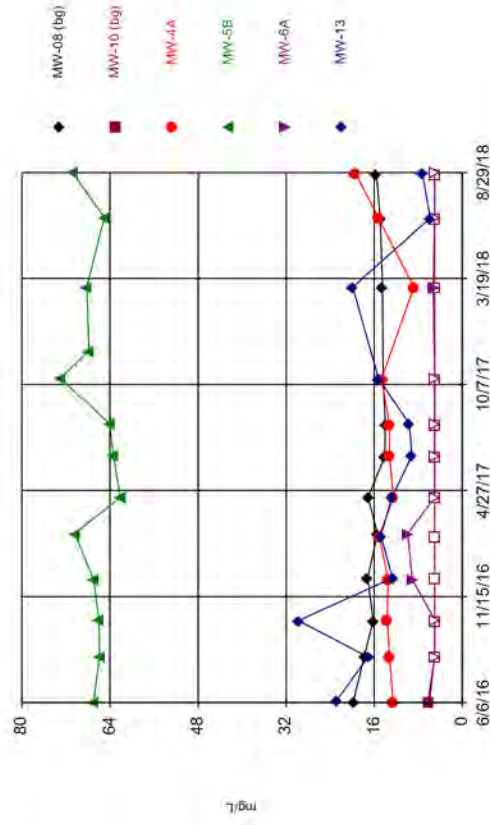
Time Series

Constituent: Calcium (mg/L) Analysis Run 10/10/2018 4:48 PM View: Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-14A	MW-15A	MW-18A	MW-21	MW-22 (bg)
6/6/2016		206	294		
6/8/2016	281			37.2	
8/15/2016	311	199	294	146	
10/10/2016				185	
10/11/2016	308	203	280		
12/12/2016				178	
12/14/2016	333	244	291		
2/17/2017	268	233	266		
2/21/2017				118	
4/17/2017	310	226			
4/18/2017			237	110	
6/20/2017				149	
6/21/2017	307	186	255		
8/8/2017	296	206	258	163	
10/16/2017				62.3	
10/17/2017	310	218	239		
11/28/2017	301 (R)	217 (R)	232 (R)		
3/6/2018				25.1	69.8
3/7/2018	278	229	191		
6/19/2018				159	91.5
6/20/2018	297	102	264		
8/27/2018					80.7
8/28/2018				78.7	
8/29/2018	309	155	223		

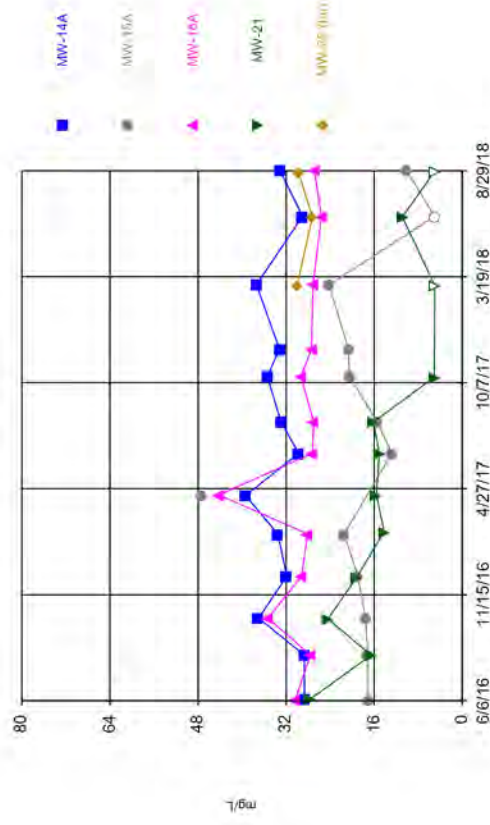
StdAde™ v0.6.100 Groundwater Data Consulting, LLC
Hollow symbols indicate censored values.

Time Series



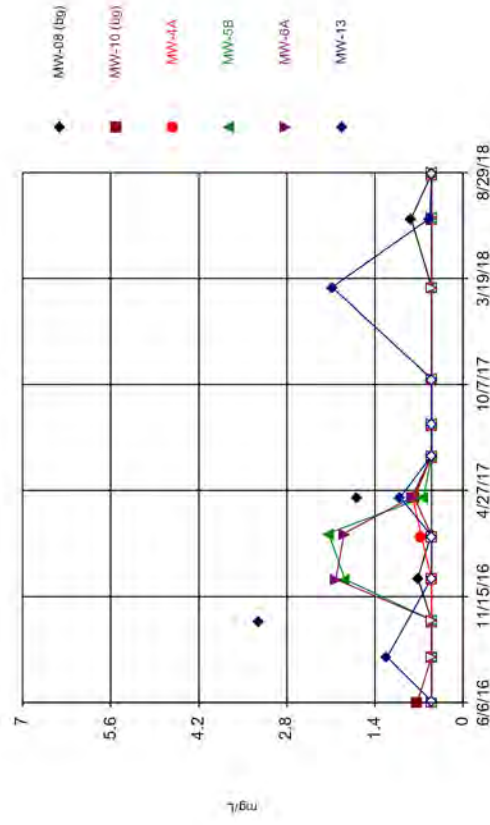
StdAde™ v0.6.100 Groundwater Data Consulting, LLC
Hollow symbols indicate censored values.

Time Series



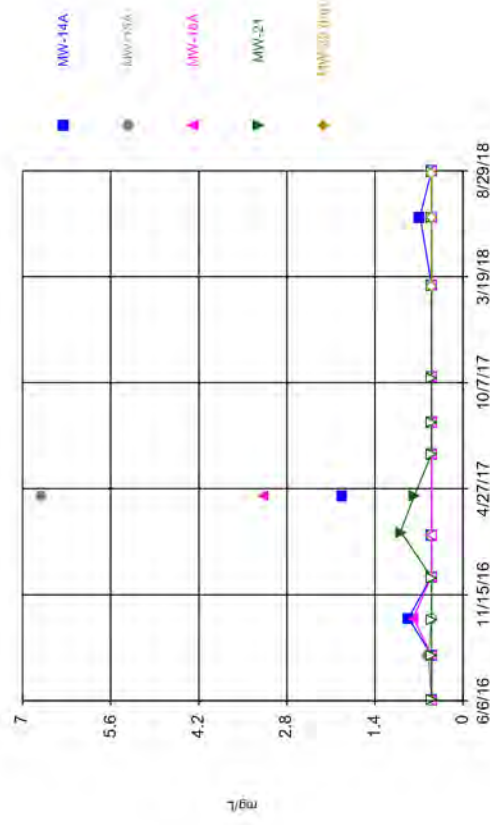
StdAde™ v0.6.100 Groundwater Data Consulting, LLC
Hollow symbols indicate censored values.

Time Series



StdAde™ v0.6.100 Groundwater Data Consulting, LLC
Hollow symbols indicate censored values.

Time Series



Time Series

Constituent: Chloride (mg/L) Analysis Run 10/10/2018 4:48 PM View: Descriptive
 Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-4A	MW-5B	MW-6A	MW-13
6/6/2016		6.22				
6/7/2016	19.8		12.6	67	5.97	
6/8/2016						22.9
8/15/2016		<5				17.1
8/16/2016	17.8		13.2	65.9	<5	
10/10/2016	16.2	<5				29.8
10/11/2016			13.6	66	<5	
12/12/2016			13.5	67	9.08	
12/14/2016	17.2	<5				12.7
2/17/2017		<5	15.1			14.8
2/21/2017	15.4			70.4	9.93	
4/17/2017	17.1	<5	12.5	62.1	<5	12.8
6/19/2017	14.1	<5				
6/20/2017			13.2	63.4		9.17
6/21/2017					<5	
8/7/2017	14	<5	13.2			
8/8/2017				64	<5	9.62
10/16/2017	14.4	<5	14.7			15.2
10/17/2017				73	<5	
11/28/2017				67.8 (R)		
3/5/2018		<5				
3/6/2018	14.5		8.81	68.2	5.33	19.9
6/19/2018	14.9	<5				
6/20/2018						5.84
6/21/2018			15.3	65	<5	
8/27/2018	15.6	<5				
8/28/2018			19.4			7.24
8/29/2018				70.8	<5	

Time Series

Constituent: Chloride (mg/L) Analysis Run 10/10/2018 4:48 PM View: Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-14A	MW-15A	MW-18A	MW-21	MW-22 (bg)
6/6/2016		17.1	30.4		
6/8/2016	28.7			27.7	
8/15/2016	28.7	17.2	27.6	16.6	
10/10/2016				24.4	
10/11/2016	37	17.6	35.3		
12/12/2016				19.2	
12/14/2016	31.9	19	29.2		
2/17/2017	33.5	21.5	28.1		
2/21/2017				14.2	
4/17/2017	39.4	47.4 (o)			
4/18/2017			44.2	15.6	
6/20/2017				15.1	
6/21/2017	29.7	12.8	27.2		
8/8/2017	32.9	15.4	27	16.1	
10/16/2017				5.09	
10/17/2017	35.4	20.5	29.3		
11/28/2017	33.2 (R)	20.7 (R)	27.4 (R)		
3/6/2018				<5	30
3/7/2018	37.4	24.2	27.1		
6/19/2018				10.9	27.2
6/20/2018	29	<5	25.6		
8/27/2018					29.8
8/28/2018				<5	
8/29/2018	33.1	10.1	26.9		

Time Series

Constituent: Fluoride (mg/L) Analysis Run 10/10/2018 4:48 PM View: Descriptive
 Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

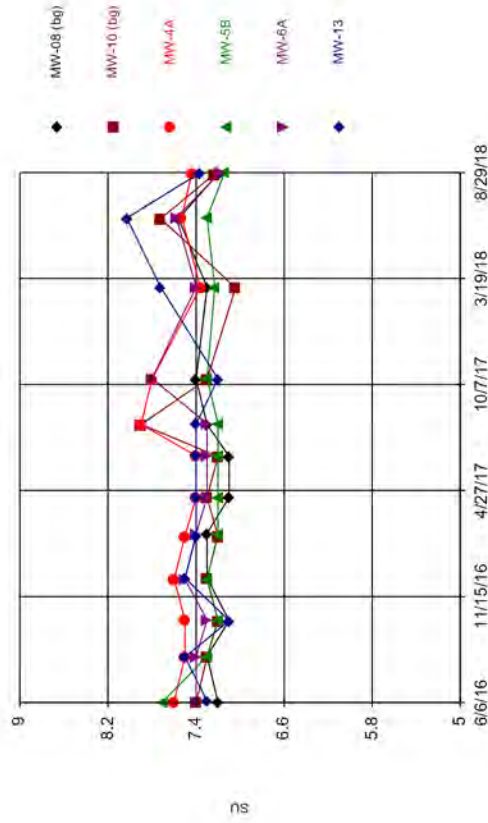
	MW-08 (bg)	MW-10 (bg)	MW-4A	MW-5B	MW-6A	MW-13
6/6/2016		0.731				
6/7/2016	<0.5		<0.5	<0.5	<0.5	
6/8/2016						<0.5
8/15/2016		<0.5				1.21
8/16/2016	<0.5		<0.5	<0.5	<0.5	
10/10/2016	<0.5	<0.5				3.25 (o)
10/11/2016			<0.5	<0.5	<0.5	
12/12/2016			<0.5	1.88	2.02	
12/14/2016	0.72	<0.5				<0.5
2/17/2017		<0.5	0.664			<0.5
2/21/2017	<0.5			2.14	1.89	
4/17/2017	1.69 (F1o)	0.774	0.801	0.627	0.814	0.997
6/19/2017	<0.5	<0.5				
6/20/2017			<0.5	<0.5		<0.5
6/21/2017					<0.5	
8/7/2017	<0.5	<0.5	<0.5			
8/8/2017				<0.5	<0.5	<0.5
10/16/2017	<0.5	<0.5	<0.5			<0.5
10/17/2017				<0.5	<0.5	
3/5/2018		<0.5				
3/6/2018	<0.5		<0.5	<0.5	<0.5	2.08
6/19/2018	0.826	<0.5				
6/20/2018						0.528
6/21/2018			<0.5	<0.5	<0.5	
8/27/2018	<0.5	<0.5				
8/28/2018			<0.5			<0.5
8/29/2018				<0.5	<0.5	

Time Series

Constituent: Fluoride (mg/L) Analysis Run 10/10/2018 4:48 PM View: Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

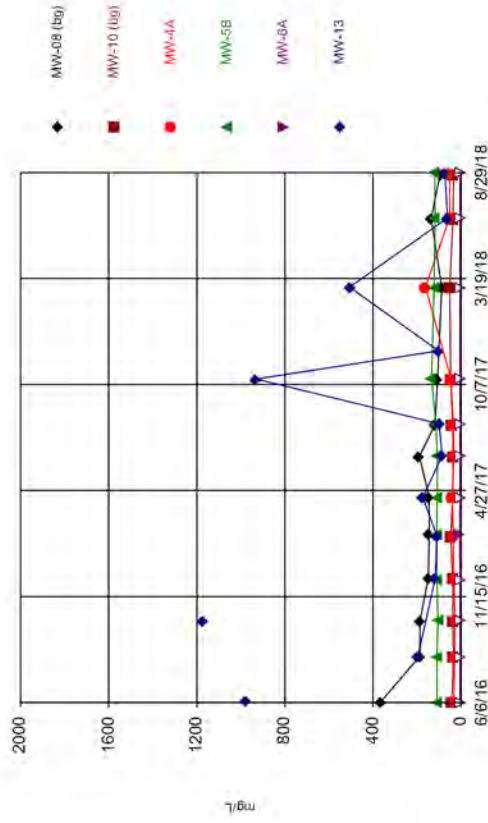
	MW-14A	MW-15A	MW-18A	MW-21	MW-22 (bg)
6/6/2016		<0.5	<0.5		
6/8/2016	<0.5			<0.5	
8/15/2016	<0.5	0.549	<0.5	<0.5	
10/10/2016				<0.5	
10/11/2016	0.867	<0.5	0.791		
12/12/2016				<0.5	
12/14/2016	<0.5	<0.5	<0.5 (F2)		
2/17/2017	<0.5	<0.5	<0.5		
2/21/2017				0.993	
4/17/2017	1.93 (o)	6.7 (o)			
4/18/2017			3.16 (o)	0.768	
6/20/2017				<0.5	
6/21/2017	<0.5	<0.5	<0.5		
8/8/2017	<0.5	<0.5	<0.5	<0.5	
10/16/2017				<0.5	
10/17/2017	<0.5	<0.5	<0.5		
3/6/2018				<0.5	<0.5
3/7/2018	<0.5	<0.5	<0.5		
6/19/2018				<0.5	<0.5
6/20/2018	0.684	<0.5	<0.5		
8/27/2018					<0.5
8/28/2018				<0.5	
8/29/2018	<0.5	<0.5	<0.5		

Time Series



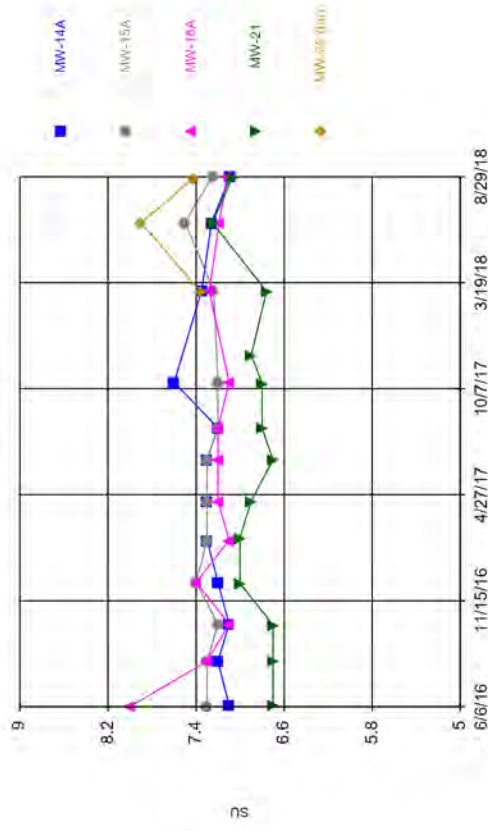
Constituent: pH Analysis Run 10/10/2018 4:45 PM View: Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Time Series



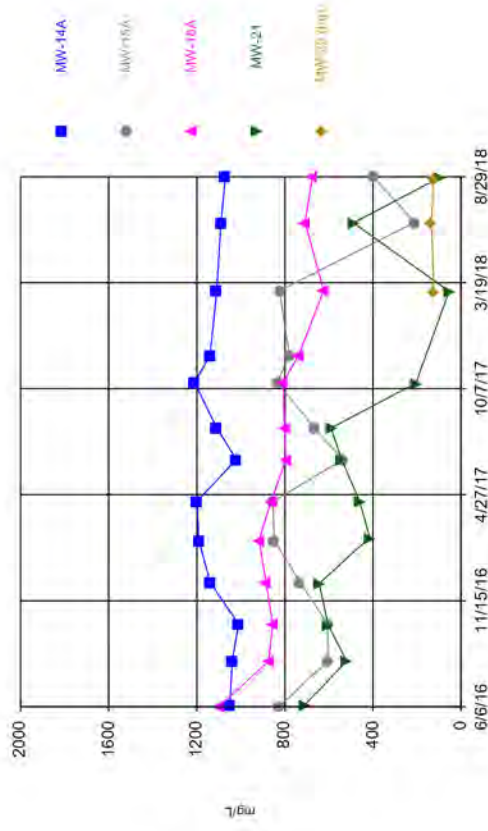
Constituent: Sulfate Analysis Run 10/10/2018 4:45 PM View: Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Time Series



Constituent: pH Analysis Run 10/10/2018 4:45 PM View: Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Time Series



Constituent: Sulfate Analysis Run 10/10/2018 4:45 PM View: Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Time Series

Constituent: pH (SU) Analysis Run 10/10/2018 4:48 PM View: Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-4A	MW-5B	MW-6A	MW-13
6/6/2016		7.4				
6/7/2016	7.2		7.6	7.7	7.4	
6/8/2016						7.3
8/15/2016		7.3				7.5
8/16/2016	7.3		7.5	7.3	7.4	
10/10/2016	7.1	7.2				7.1
10/11/2016			7.5	7.2	7.3	
12/12/2016			7.6	7.3	7.5	
12/14/2016	7.3	7.3				7.5
2/17/2017		7.2	7.5			7.4
2/21/2017	7.3			7.2	7.4	
4/17/2017	7.1	7.3	7.4	7.2	7.3	7.4
6/19/2017	7.1	7.2				
6/20/2017			7.4	7.2		7.4
6/21/2017					7.3	
8/7/2017	7.3	7.9	7.9			
8/8/2017				7.2	7.3	7.4
10/16/2017	7.4	7.3	7.8			7.2
10/17/2017				7.3	7.8	
3/5/2018		7.04				
3/6/2018	7.3		7.36	7.23	7.4	7.72
6/19/2018	7.56	7.72				
6/20/2018						8.03
6/21/2018			7.53	7.3	7.58	
8/27/2018	7.2	7.23				
8/28/2018			7.44			7.37
8/29/2018				7.14	7.18	

Time Series

Constituent: pH (SU) Analysis Run 10/10/2018 4:48 PM View: Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-14A	MW-15A	MW-18A	MW-21	MW-22 (bg)
6/6/2016		7.3	8		
6/8/2016	7.1			6.7	
8/15/2016	7.2	7.3	7.3	6.7	
10/10/2016				6.7	
10/11/2016	7.1	7.2	7.1		
12/12/2016				7	
12/14/2016	7.2	7.4	7.4		
2/17/2017	7.3	7.3	7.1		
2/21/2017				7	
4/17/2017	7.3	7.3			
4/18/2017			7.2	6.9	
6/20/2017				6.7	
6/21/2017	7.3	7.3	7.2		
8/8/2017	7.2	7.2	7.2	6.8	
10/16/2017				6.8	
10/17/2017	7.6	7.2	7.1		
11/28/2017				6.9 (R)	
3/6/2018				6.76	7.36
3/7/2018	7.35	7.24	7.28		
6/19/2018				7.25	7.9
6/20/2018	7.26	7.5	7.19		
8/27/2018					7.42
8/28/2018				7.07	
8/29/2018	7.09	7.25	7.12		

Time Series

Constituent: Sulfate (mg/L) Analysis Run 10/10/2018 4:48 PM View: Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

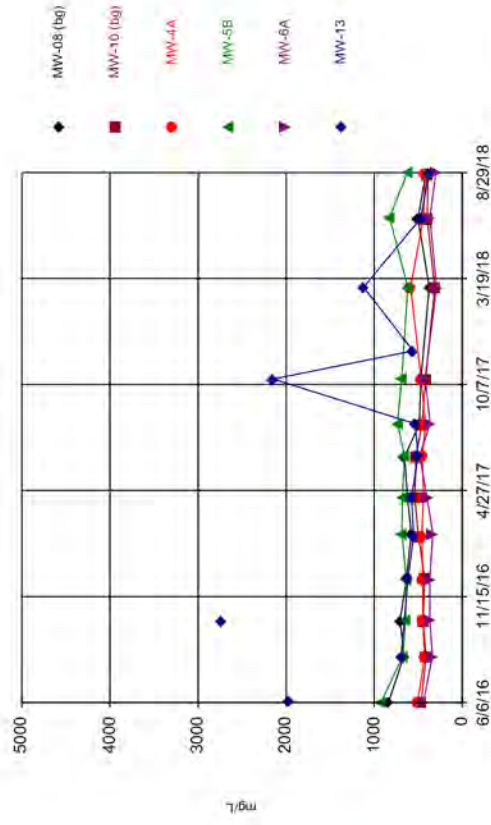
	MW-08 (bg)	MW-10 (bg)	MW-4A	MW-5B	MW-6A	MW-13
6/6/2016		42.1				
6/7/2016	366		32.2	109	<5	
6/8/2016						975 (o)
8/15/2016		33.8				197
8/16/2016	187		28.4	109	<5	
10/10/2016	187	36.4				1170 (o)
10/11/2016			27.2	105	<5	
12/12/2016			32.7	109	<5	
12/14/2016	149	38.4				117
2/17/2017		47.3	36			110
2/21/2017	145			111	5.94	
4/17/2017	145	38.3	39.5	108	<5	174
6/19/2017	190	35.4				
6/20/2017			33	108		86.7
6/21/2017					<5	
8/7/2017	119	39	35.3			
8/8/2017				114	<5	99.4
10/16/2017	106	46.9	45.4			931
10/17/2017				135	<5	
11/28/2017						102 (R)
3/5/2018		51.4				
3/6/2018	87.3		162	122	<5	506
6/19/2018	136	37.3				
6/20/2018						62.1
6/21/2018			51.3	119	<5	
8/27/2018	94.7	34.3				
8/28/2018			52.2			72.7
8/29/2018				120	<5	

Time Series

Constituent: Sulfate (mg/L) Analysis Run 10/10/2018 4:48 PM View: Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

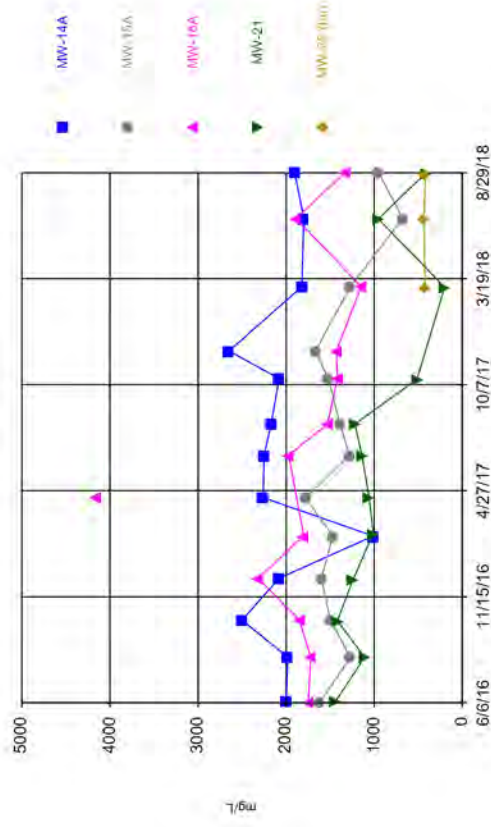
	MW-14A	MW-15A	MW-18A	MW-21	MW-22 (bg)
6/6/2016		827	1100		
6/8/2016	1050			713	
8/15/2016	1040	605	874	520	
10/10/2016				603	
10/11/2016	1010	607	855		
12/12/2016				645	
12/14/2016	1140	732	886		
2/17/2017	1190	849	917		
2/21/2017				415	
4/17/2017	1200	853			
4/18/2017			863	461	
6/20/2017				541	
6/21/2017	1020	537	796		
8/8/2017	1110	664	801	590	
10/16/2017				206	
10/17/2017	1210	835	808		
11/28/2017	1140 (R)	779 (R)	737 (R)		
3/6/2018				53.7	123
3/7/2018	1110	824	624		
6/19/2018				489	134
6/20/2018	1090	210	709		
8/27/2018					125
8/28/2018				96.6	
8/29/2018	1070	400	675		

Time Series



Constituent: Total Dissolved Solids Analysis Run 10/10/2018 4:45 PM View: Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Time Series



Constituent: Total Dissolved Solids Analysis Run 10/10/2018 4:45 PM View: Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Time Series

Constituent: Total Dissolved Solids (mg/L) Analysis Run 10/10/2018 4:48 PM View: Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-08 (bg)	MW-10 (bg)	MW-4A	MW-5B	MW-6A	MW-13
6/6/2016		468				
6/7/2016	836		507	920	440	
6/8/2016						1970 (o)
8/15/2016		412				694
8/16/2016	664		426	672	340	
10/10/2016	708	444				2740 (o)
10/11/2016			450	646	370	
12/12/2016			450	636	368	
12/14/2016	634	428				616
2/17/2017		498	460			554
2/21/2017	578			684	336	
4/17/2017	624	538	442	680	402	574
6/19/2017	656	524				
6/20/2017			452	656		502
6/21/2017					486	
8/7/2017	488	458	420			
8/8/2017				734	364	536
10/16/2017	470	414	466			2150
10/17/2017				688	424	
11/28/2017						562 (R)
3/5/2018		314				
3/6/2018	376		586	620	292	1120
6/19/2018	502	396				
6/20/2018						472
6/21/2018			440	828	368	
8/27/2018	414	392				
8/28/2018			420			384
8/29/2018				622	298	

Time Series

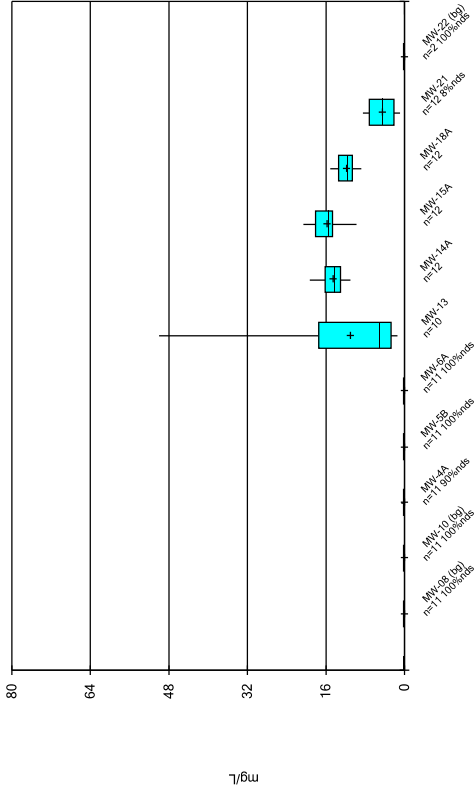
Constituent: Total Dissolved Solids (mg/L) Analysis Run 10/10/2018 4:48 PM View: Descriptive

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

	MW-14A	MW-15A	MW-18A	MW-21	MW-22 (bg)
6/6/2016		1620	1750		
6/8/2016	2000			1440	
8/15/2016	1980	1270	1720	1110	
10/10/2016				1420	
10/11/2016	2500	1500	1850		
12/12/2016				1240	
12/14/2016	2080	1600	2320		
2/17/2017	1010	1470	1800		
2/21/2017				1010	
4/17/2017	2260	1780			
4/18/2017			4160 (o)	1060	
6/20/2017				1140	
6/21/2017	2250	1280	1970		
8/8/2017	2170	1390	1530	1220	
10/16/2017				514	
10/17/2017	2080	1520	1420		
11/28/2017	2650 (R)	1670 (R)	1430 (R)		
3/6/2018				200	424
3/7/2018	1820	1270	1150		
6/19/2018				952	434
6/20/2018	1800	676	1890		
8/27/2018					420
8/28/2018				416	
8/29/2018	1900	948	1330		

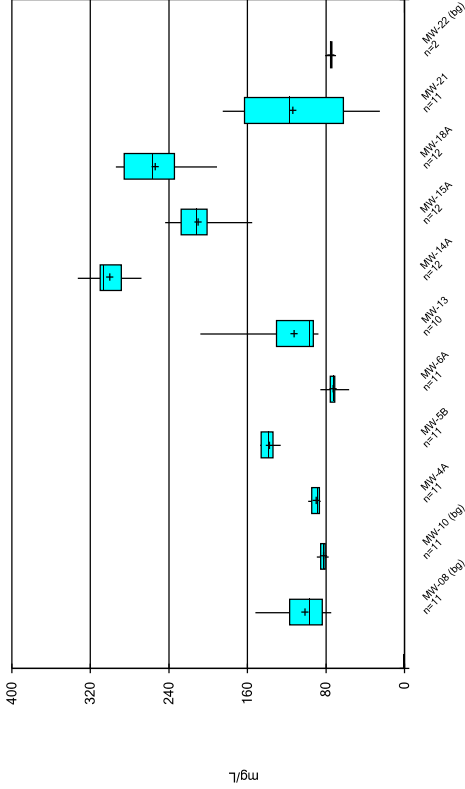
Box Plots

Box & Whiskers Plot



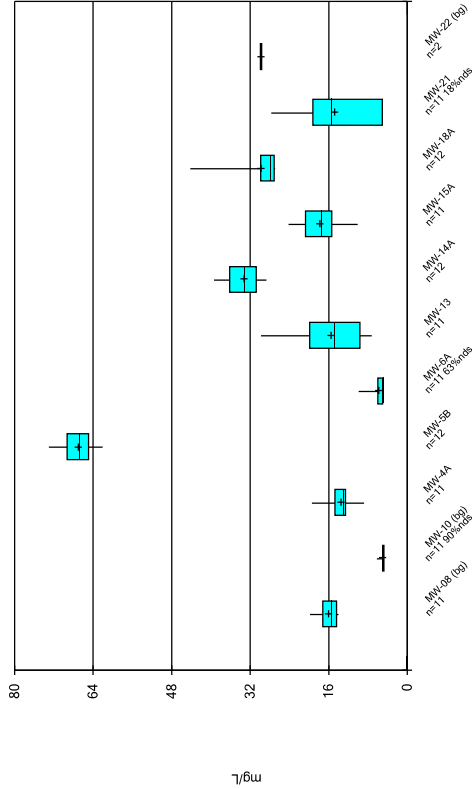
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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



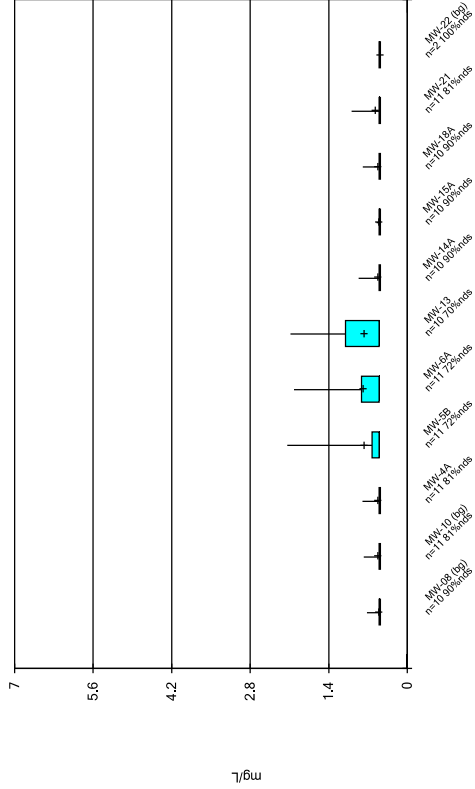
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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



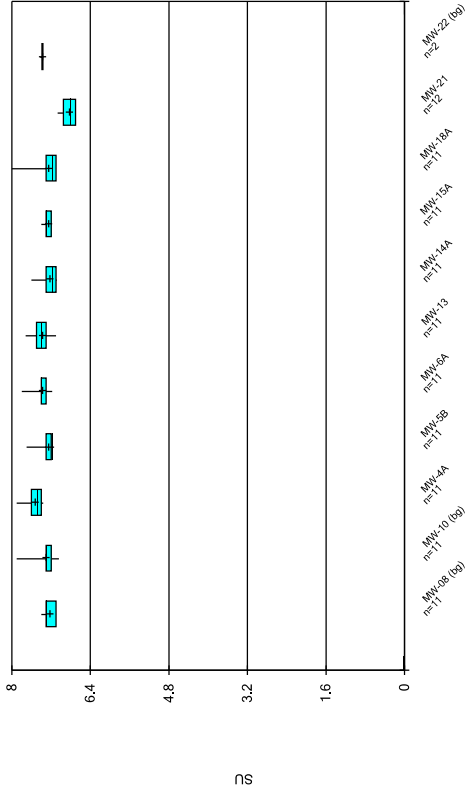
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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



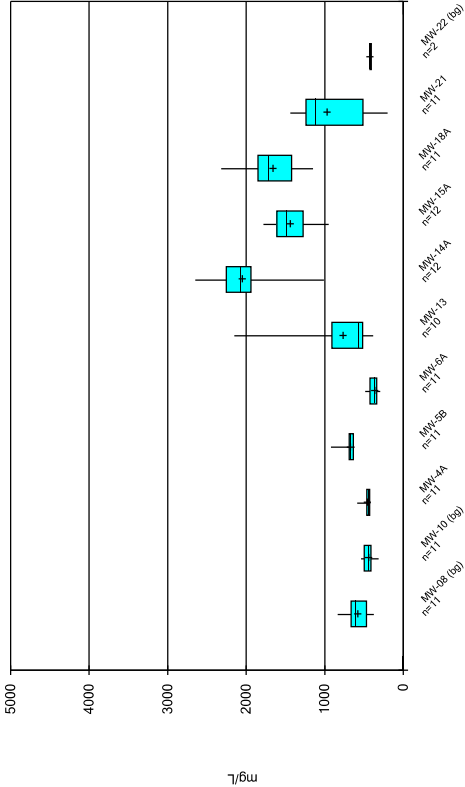
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Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



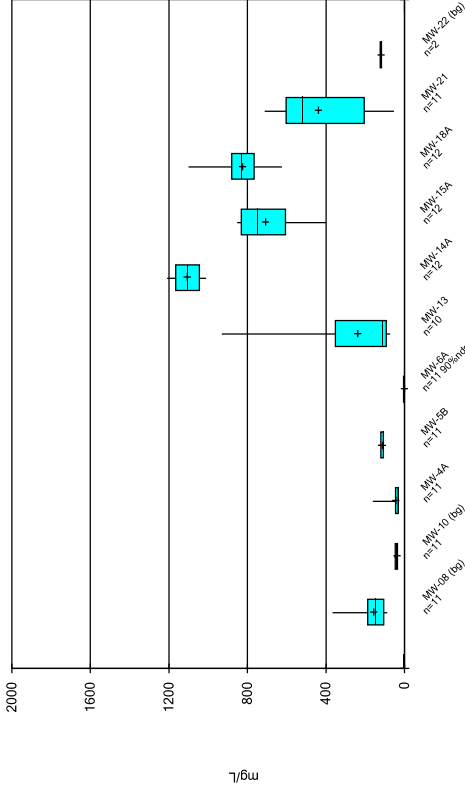
Constituent: pH Analysis Run 10/4/2018 12:27 PM View: Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



Constituent: Total Dissolved Solids Analysis Run 10/4/2018 12:27 PM View: Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Box & Whiskers Plot



Constituent: Sulfate Analysis Run 10/4/2018 12:27 PM View: Descriptive
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Confidence Intervals

Confidence Interval Summary Table - All Results

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water Printed 10/10/2018, 6:13 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig. N	Mean	Std. Dev.	%NDs	ND Adj	Transform	Alpha	Method
Antimony (mg/L)	MW-4A	0.001	0.001	0.006	No 11	0.001	0	100	None	No	0.006	NP (NDs)
Antimony (mg/L)	MW-5B	0.001	0.001	0.006	No 11	0.001	0	100	None	No	0.006	NP (NDs)
Antimony (mg/L)	MW-6A	0.001	0.001	0.006	No 11	0.001	0	100	None	No	0.006	NP (NDs)
Antimony (mg/L)	MW-13	0.001	0.001	0.006	No 11	0.001	0	100	None	No	0.006	NP (NDs)
Antimony (mg/L)	MW-14A	0.001	0.001	0.006	No 11	0.001	0	100	None	No	0.006	NP (NDs)
Antimony (mg/L)	MW-15A	0.001	0.001	0.006	No 11	0.005455	0.01477	100	None	No	0.006	NP (NDs)
Antimony (mg/L)	MW-18A	0.00195	0.001	0.006	No 11	0.005541	0.01475	90.91	None	No	0.006	NP (NDs)
Arsenic (mg/L)	MW-4A	0.002	0.002	0.01	No 11	0.002	0	100	None	No	0.006	NP (NDs)
Arsenic (mg/L)	MW-5B	0.002	0.002	0.01	No 11	0.002	0	100	None	No	0.006	NP (NDs)
Arsenic (mg/L)	MW-6A	0.002	0.002	0.01	No 11	0.002	0	100	None	No	0.006	NP (NDs)
Arsenic (mg/L)	MW-13	0.002	0.002	0.01	No 11	0.002	0	100	None	No	0.006	NP (NDs)
Arsenic (mg/L)	MW-14A	0.002	0.002	0.01	No 11	0.002	0	100	None	No	0.006	NP (NDs)
Arsenic (mg/L)	MW-15A	0.002	0.002	0.01	No 11	0.01091	0.02955	100	None	No	0.006	NP (NDs)
Arsenic (mg/L)	MW-18A	0.00265	0.002	0.01	No 11	0.01097	0.02953	90.91	None	No	0.006	NP (NDs)
Barium (mg/L)	MW-4A	0.1447	0.124	2	No 11	0.1344	0.01245	0	None	No	0.01	Param.
Barium (mg/L)	MW-5B	0.3353	0.3013	2	No 11	0.3183	0.02038	0	None	No	0.01	Param.
Barium (mg/L)	MW-6A	0.2136	0.1851	2	No 11	0.1991	0.01823	0	None	x^2	0.01	Param.
Barium (mg/L)	MW-13	0.1101	0.05594	2	No 11	0.08301	0.03248	0	None	No	0.01	Param.
Barium (mg/L)	MW-14A	0.0391	0.03103	2	No 11	0.03506	0.004841	0	None	No	0.01	Param.
Barium (mg/L)	MW-15A	0.04101	0.03355	2	No 10	0.03728	0.004185	0	None	No	0.01	Param.
Barium (mg/L)	MW-18A	0.0403	0.0281	2	No 11	0.04092	0.02002	9.091	None	No	0.006	NP (normality)
Beryllium (mg/L)	MW-4A	0.001	0.001	0.004	No 11	0.001	0	100	None	No	0.006	NP (NDs)
Beryllium (mg/L)	MW-5B	0.001	0.001	0.004	No 11	0.001	0	100	None	No	0.006	NP (NDs)
Beryllium (mg/L)	MW-6A	0.001	0.001	0.004	No 11	0.001	0	100	None	No	0.006	NP (NDs)
Beryllium (mg/L)	MW-13	0.001	0.001	0.004	No 11	0.001	0	100	None	No	0.006	NP (NDs)
Beryllium (mg/L)	MW-14A	0.001	0.001	0.004	No 11	0.001	0	100	None	No	0.006	NP (NDs)
Beryllium (mg/L)	MW-15A	0.001	0.001	0.004	No 11	0.005455	0.01477	100	None	No	0.006	NP (NDs)
Beryllium (mg/L)	MW-18A	0.001	0.001	0.004	No 11	0.005455	0.01477	100	None	No	0.006	NP (NDs)
Cadmium (mg/L)	MW-4A	0.0005	0.0005	0.005	No 11	0.0005	0	100	None	No	0.006	NP (NDs)
Cadmium (mg/L)	MW-5B	0.0005	0.0005	0.005	No 11	0.0005	0	100	None	No	0.006	NP (NDs)
Cadmium (mg/L)	MW-6A	0.0005	0.0005	0.005	No 11	0.0005	0	100	None	No	0.006	NP (NDs)
Cadmium (mg/L)	MW-13	0.0005	0.0005	0.005	No 11	0.0005	0	100	None	No	0.006	NP (NDs)
Cadmium (mg/L)	MW-14A	0.0005	0.0005	0.005	No 11	0.0005	0	100	None	No	0.006	NP (NDs)
Cadmium (mg/L)	MW-15A	0.0005	0.0005	0.005	No 11	0.002727	0.007387	100	None	No	0.006	NP (NDs)
Cadmium (mg/L)	MW-18A	0.0005	0.0005	0.005	No 11	0.002727	0.007387	100	None	No	0.006	NP (NDs)
Chromium (mg/L)	MW-4A	0.005	0.005	0.1	No 11	0.005	0	100	None	No	0.006	NP (NDs)
Chromium (mg/L)	MW-5B	0.005	0.005	0.1	No 11	0.005	0	100	None	No	0.006	NP (NDs)
Chromium (mg/L)	MW-6A	0.005	0.005	0.1	No 11	0.005	0	100	None	No	0.006	NP (NDs)
Chromium (mg/L)	MW-13	0.005	0.005	0.1	No 10	0.005158	0.0004996	90	None	No	0.011	NP (NDs)
Chromium (mg/L)	MW-14A	0.005	0.005	0.1	No 11	0.005	0	100	None	No	0.006	NP (NDs)
Chromium (mg/L)	MW-15A	0.005	0.005	0.1	No 11	0.02727	0.07387	100	None	No	0.006	NP (NDs)
Chromium (mg/L)	MW-18A	0.005	0.005	0.1	No 11	0.02727	0.07387	100	None	No	0.006	NP (NDs)
Cobalt (mg/L)	MW-4A	0.0005	0.0005	0.006	No 11	0.0005165	0.00005457	90.91	None	No	0.006	NP (NDs)
Cobalt (mg/L)	MW-5B	0.0005	0.0005	0.006	No 11	0.0005	0	100	None	No	0.006	NP (NDs)
Cobalt (mg/L)	MW-6A	0.0005	0.0005	0.006	No 11	0.0005	0	100	None	No	0.006	NP (NDs)
Cobalt (mg/L)	MW-13	0.0007805	0.0005411	0.006	No 10	0.0006608	0.0001414	30	Kapla..	No	0.01	Param.
Cobalt (mg/L)	MW-14A	0.0005	0.0005	0.006	No 11	0.0005	0	100	Kapla..	No	0.006	NP (NDs)
Cobalt (mg/L)	MW-15A	0.0005	0.0005	0.006	No 11	0.002727	0.007387	100	Kapla..	No	0.006	NP (NDs)
Cobalt (mg/L)	MW-18A	0.0005	0.0005	0.006	No 11	0.002727	0.007387	100	Kapla..	No	0.006	NP (NDs)
Combined Radium 226 + 228 (pCi/L)	MW-4A	0.7583	0.3735	5	No 9	0.5659	0.1992	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-5B	1.031	0.5925	5	No 9	0.8118	0.2271	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-6A	0.7309	0.3134	5	No 9	0.5211	0.2298	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-13	0.5607	0.1772	5	No 8	0.363	0.2029	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-14A	0.4542	0.1302	5	No 9	0.2922	0.1678	0	None	No	0.01	Param.
Combined Radium 226 + 228 (pCi/L)	MW-15A	0.2876	0.1315	5	No 9	0.2095	0.08085	0	None	No	0.01	Param.

Confidence Interval Summary Table - All Results

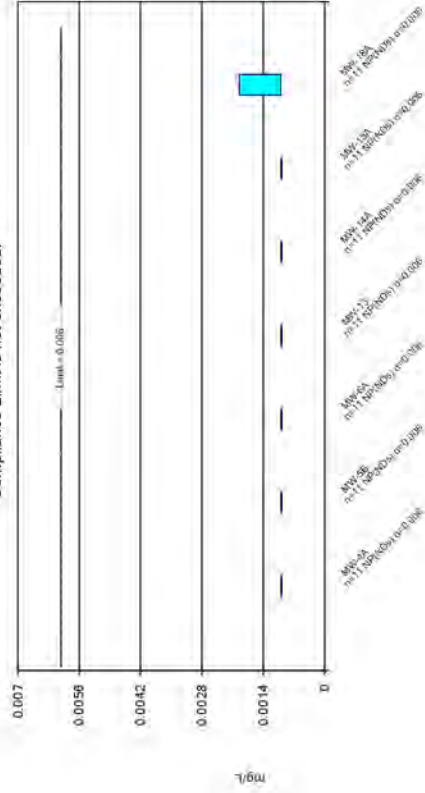
Page 2

Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water Printed 10/10/2018, 6:13 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig. N	Mean	Std. Dev.	%NDs	ND Adj	Transform	Alpha	Method
Combined Radium 226 + 228 (pCi/L)	MW-18A	0.5629	0.2171	5	No 9	0.39	0.1791	0	None	No	0.01	Param.
Fluoride (mg/L)	MW-4A	0.664	0.5	4	No 12	0.5388	0.0951	83.33	None	No	0.01	NP (NDs)
Fluoride (mg/L)	MW-5B	1.88	0.5	4	No 12	0.7623	0.5866	75	None	No	0.01	NP (normality)
Fluoride (mg/L)	MW-6A	1.89	0.5	4	No 12	0.7687	0.5621	75	None	No	0.01	NP (normality)
Fluoride (mg/L)	MW-13	1.21	0.5	4	No 11	0.7559	0.5028	63.64	None	No	0.006	NP (normality)
Fluoride (mg/L)	MW-14A	0.684	0.5	4	No 11	0.5501	0.1187	81.82	None	No	0.006	NP (NDs)
Fluoride (mg/L)	MW-15A	0.5	0.5	4	No 11	0.5045	0.01477	90.91	None	No	0.006	NP (NDs)
Fluoride (mg/L)	MW-18A	0.5	0.5	4	No 11	0.5265	0.08774	90.91	None	No	0.006	NP (NDs)
Lead (mg/L)	MW-4A	0.0005	0.0005	0.015	No 10	0.0005	0	100	None	No	0.011	NP (NDs)
Lead (mg/L)	MW-5B	0.0005	0.0005	0.015	No 11	0.0005	0	100	None	No	0.006	NP (NDs)
Lead (mg/L)	MW-6A	0.0005	0.0005	0.015	No 11	0.0005	0	100	None	No	0.006	NP (NDs)
Lead (mg/L)	MW-13	0.0005	0.0005	0.015	No 11	0.0005	0	100	None	No	0.006	NP (NDs)
Lead (mg/L)	MW-14A	0.0005	0.0005	0.015	No 11	0.0005	0	100	None	No	0.006	NP (NDs)
Lead (mg/L)	MW-15A	0.0005	0.0005	0.015	No 11	0.002727	0.007387	100	None	No	0.006	NP (NDs)
Lead (mg/L)	MW-18A	0.0005	0.0005	0.015	No 11	0.002727	0.007387	100	None	No	0.006	NP (NDs)
Lithium (mg/L)	MW-4A	0.05	0.01	0.04	No 11	0.03909	0.01868	100	None	No	0.006	NP (NDs)
Lithium (mg/L)	MW-5B	0.05	0.01	0.04	No 11	0.03909	0.01868	100	None	No	0.006	NP (NDs)
Lithium (mg/L)	MW-6A	0.05	0.01	0.04	No 11	0.03909	0.01868	100	None	No	0.006	NP (NDs)
Lithium (mg/L)	MW-13	0.1	0.01	0.04	No 12	0.04935	0.04126	91.67	None	No	0.01	NP (NDs)
Lithium (mg/L)	MW-14A	0.05	0.01	0.04	No 11	0.03909	0.01868	100	None	No	0.006	NP (NDs)
Lithium (mg/L)	MW-15A	0.05	0.01	0.04	No 11	0.03909	0.01868	100	None	No	0.006	NP (NDs)
Lithium (mg/L)	MW-18A	0.05	0.01	0.04	No 11	0.03909	0.01868	100	None	No	0.006	NP (NDs)
Mercury (mg/L)	MW-4A	0.0002	0.0002	0.002	No 11	0.0002	0	100	None	No	0.006	NP (NDs)
Mercury (mg/L)	MW-5B	0.0002	0.0002	0.002	No 11	0.0002	0	100	None	No	0.006	NP (NDs)
Mercury (mg/L)	MW-6A	0.0002	0.0002	0.002	No 11	0.0002	0	100	None	No	0.006	NP (NDs)
Mercury (mg/L)	MW-13	0.0002	0.0002	0.002	No 11	0.0002	0	100	None	No	0.006	NP (NDs)
Mercury (mg/L)	MW-14A	0.0002	0.0002	0.002	No 11	0.0002	0	100	None	No	0.006	NP (NDs)
Mercury (mg/L)	MW-15A	0.0002	0.0002	0.002	No 11	0.0002	0	100	None	No	0.006	NP (NDs)
Mercury (mg/L)	MW-18A	0.0002	0.0002	0.002	No 10	0.0002	0	100	None	No	0.011	NP (NDs)
Molybdenum (mg/L)	MW-4A	0.002	0.002	0.1	No 11	0.002	0	100	None	No	0.006	NP (NDs)
Molybdenum (mg/L)	MW-5B	0.002	0.002	0.1	No 11	0.002	0	100	None	No	0.006	NP (NDs)
Molybdenum (mg/L)	MW-6A	0.002	0.002	0.1	No 11	0.002	0	100	None	No	0.006	NP (NDs)
Molybdenum (mg/L)	MW-13	0.006416	0.002921	0.1	No 10	0.004691	0.002111	0	None	sqrt(x)	0.01	Param.
Molybdenum (mg/L)	MW-14A	0.002	0.002	0.1	No 11	0.002	0	100	None	No	0.006	NP (NDs)
Molybdenum (mg/L)	MW-15A	0.002	0.002	0.1	No 11	0.01091	0.02955	100	None	No	0.006	NP (NDs)
Molybdenum (mg/L)	MW-18A	0.002	0.002	0.1	No 11	0.01091	0.02955	100	None	No	0.006	NP (NDs)
Selenium (mg/L)	MW-4A	0.005	0.005	0.05	No 11	0.005	0	100	None	No	0.006	NP (NDs)
Selenium (mg/L)	MW-5B	0.005	0.005	0.05	No 11	0.005	0	100	None	No	0.006	NP (NDs)
Selenium (mg/L)	MW-6A	0.005	0.005	0.05	No 11	0.005	0	100	None	No	0.006	NP (NDs)
Selenium (mg/L)	MW-13	0.005	0.005	0.05	No 10	0.00645	0.004585	90	None	No	0.011	NP (NDs)
Selenium (mg/L)	MW-14A	0.008282	0.0072	0.05	No 11	0.007641	0.0009769	9.091	None	x^5	0.01	Param.
Selenium (mg/L)	MW-15A	0.00502	0.005	0.05	No 11	0.02727	0.07387	90.91	None	No	0.006	NP (NDs)
Selenium (mg/L)	MW-18A	0.005	0.005	0.05	No 11	0.02727	0.07387	100	None	No	0.006	NP (NDs)
Thallium (mg/L)	MW-4A	0.001	0.001	0.002	No 11	0.001	0	100	None	No	0.006	NP (NDs)
Thallium (mg/L)	MW-5B	0.001	0.001	0.002	No 11	0.001	0	100	None	No	0.006	NP (NDs)
Thallium (mg/L)	MW-6A	0.001	0.001	0.002	No 11	0.001	0	100	None	No	0.006	NP (NDs)
Thallium (mg/L)	MW-13	0.001	0.001	0.002	No 11	0.001	0	100	None	No	0.006	NP (NDs)
Thallium (mg/L)	MW-14A	0.001	0.001	0.002	No 11	0.001	0	100	None	No	0.006	NP (NDs)
Thallium (mg/L)	MW-15A	0.001	0.001	0.002	No 11	0.005455	0.01477	100	None	No	0.006	NP (NDs)
Thallium (mg/L)	MW-18A	0.001	0.001	0.002	No 11	0.005455	0.01477	100	None	No	0.006	NP (NDs)

Non-Parametric Confidence Interval

Compliance Limit is not exceeded.



Constituent: Antimony Analysis Run 10/10/2018 6:11 PM View: Confidence Intervals - App IV
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Parametric and Non-Parametric (NP) Confidence Interval

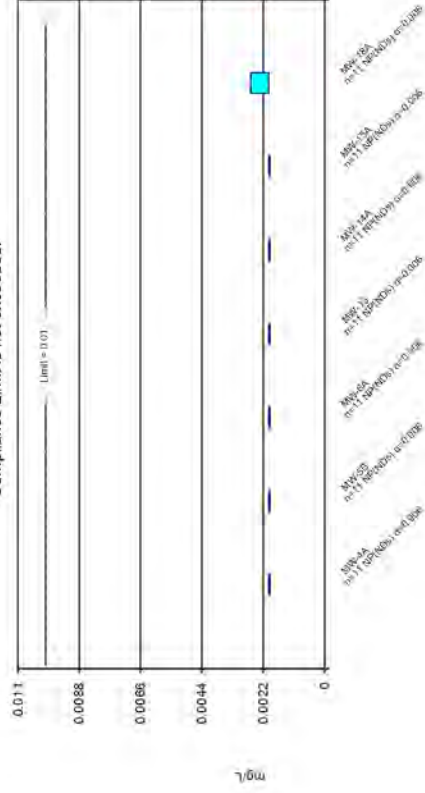
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk. alpha based on n.



Constituent: Barium Analysis Run 10/10/2018 6:11 PM View: Confidence Intervals - App IV
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Non-Parametric Confidence Interval

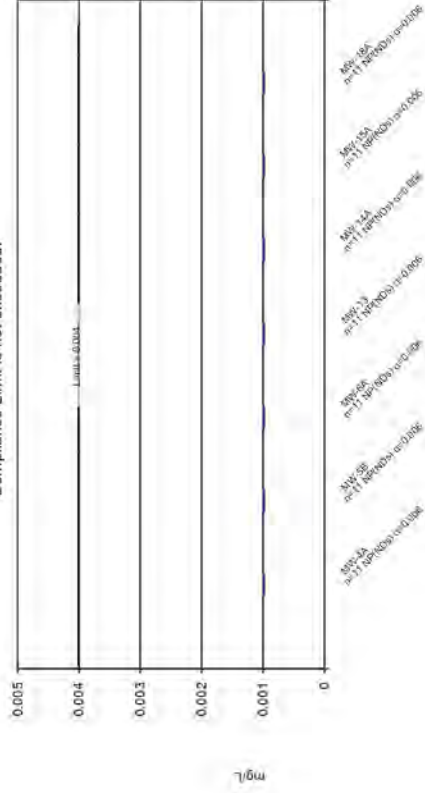
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Constituent: Arsenic Analysis Run 10/10/2018 6:11 PM View: Confidence Intervals - App IV
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Non-Parametric Confidence Interval

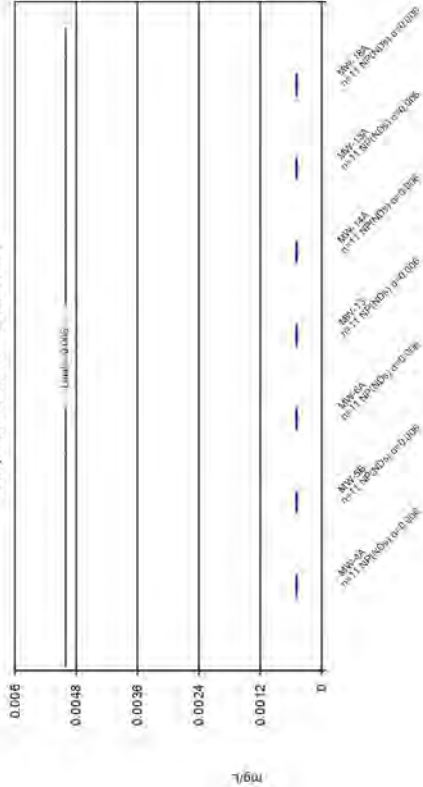
Compliance Limit is not exceeded.



Constituent: Beryllium Analysis Run 10/10/2018 6:11 PM View: Confidence Intervals - App IV
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Non-Parametric Confidence Interval

Compliance Limit is not exceeded.



Constituent: Cadmium Analysis Run 10/10/2018 6:11 PM View: Confidence Intervals - App IV
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Parametric and Non-Parametric (NP) Confidence Interval

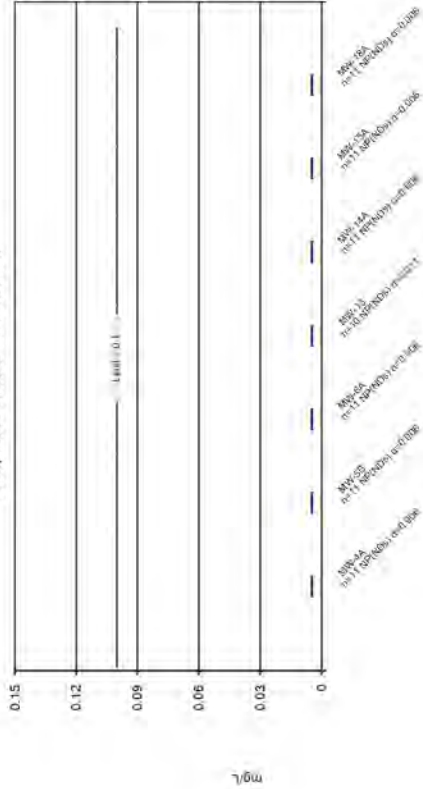
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Constituent: Cobalt Analysis Run 10/10/2018 6:11 PM View: Confidence Intervals - App IV
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Non-Parametric Confidence Interval

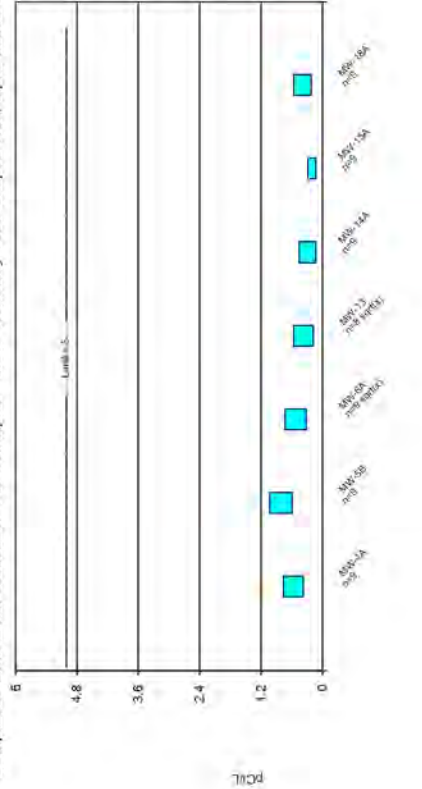
Compliance Limit is not exceeded.



Constituent: Chromium Analysis Run 10/10/2018 6:11 PM View: Confidence Intervals - App IV
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Parametric Confidence Interval

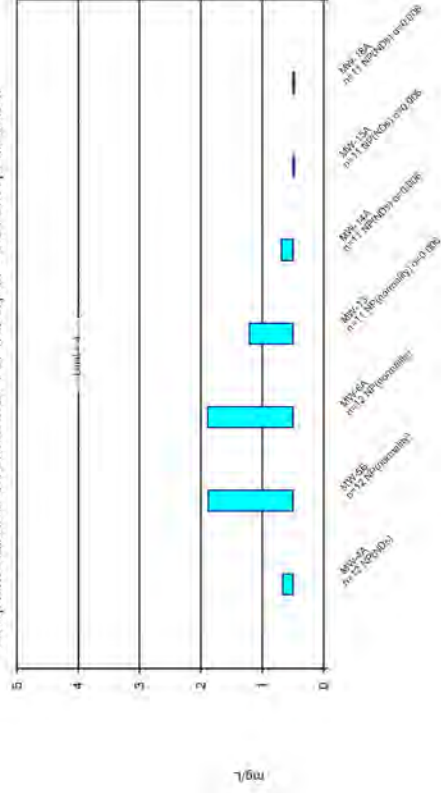
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk. alpha based on n.



Constituent: Combined Radium 226 + 228 Analysis Run 10/10/2018 6:11 PM View: Confidence Intervals - App IV
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Non-Parametric Confidence Interval

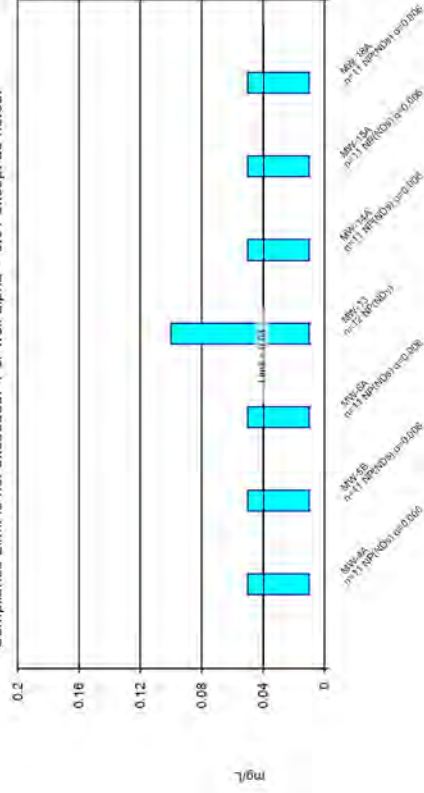
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted.



Constituent: Fluoride Analysis Run 10/10/2018 6:11 PM View: Confidence Intervals - App IV
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Non-Parametric Confidence Interval

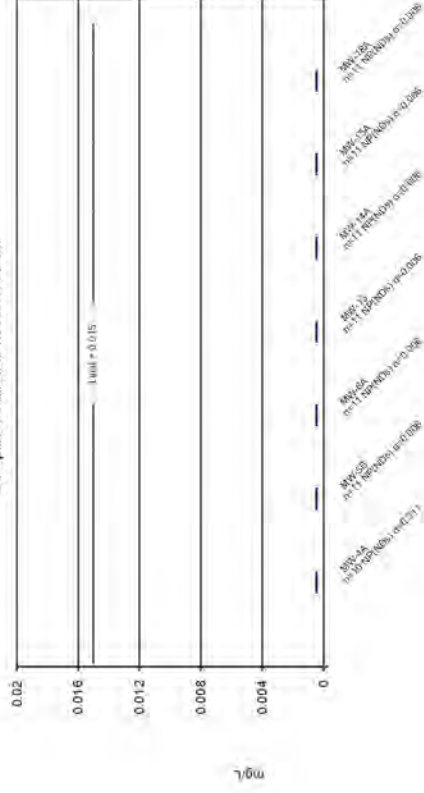
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted.



Constituent: Lithium Analysis Run 10/10/2018 6:11 PM View: Confidence Intervals - App IV
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Non-Parametric Confidence Interval

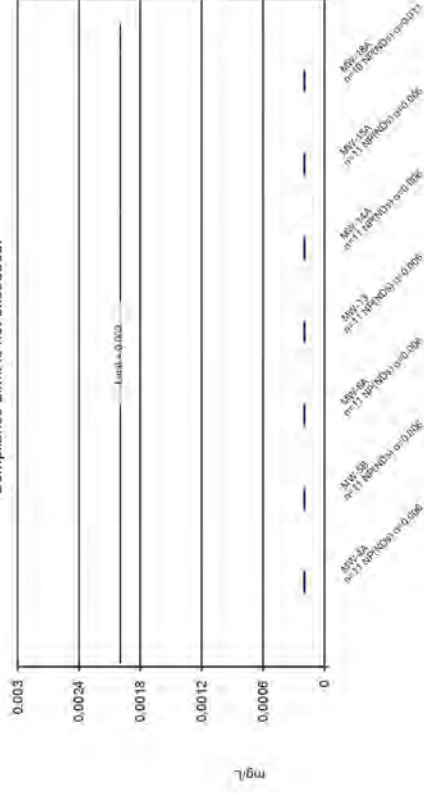
Compliance Limit is not exceeded.



Constituent: Lead Analysis Run 10/10/2018 6:11 PM View: Confidence Intervals - App IV
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Non-Parametric Confidence Interval

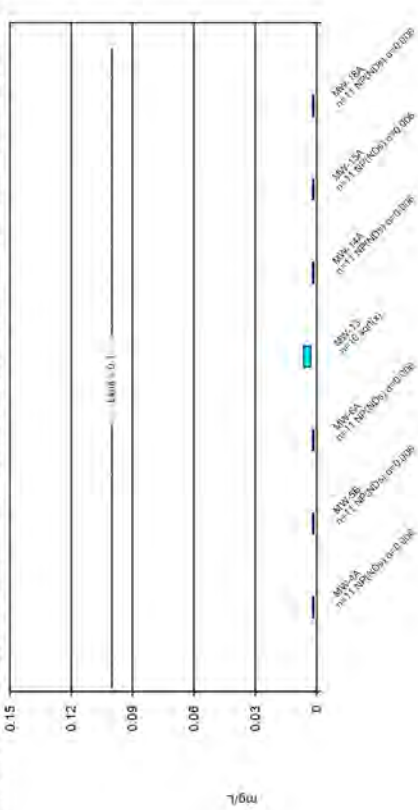
Compliance Limit is not exceeded.



Constituent: Mercury Analysis Run 10/10/2018 6:11 PM View: Confidence Intervals - App IV
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Parametric and Non-Parametric (NP) Confidence Interval

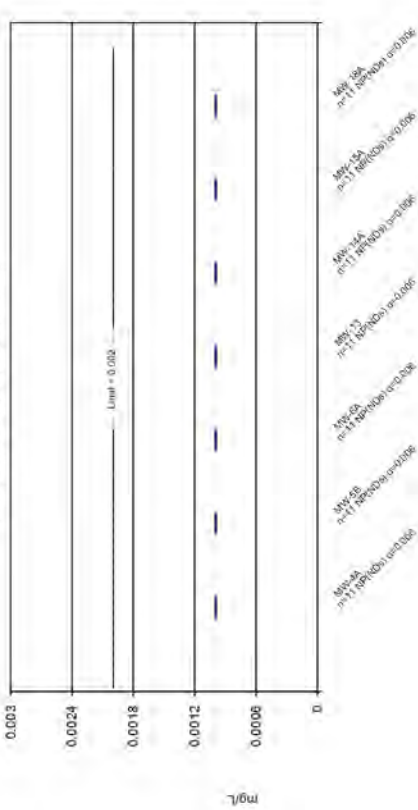
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk. alpha based on n.



Constituent: Molybdenum Analysis Run 10/10/2018 6:11 PM View: Confidence Intervals - App IV
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Non-Parametric Confidence Interval

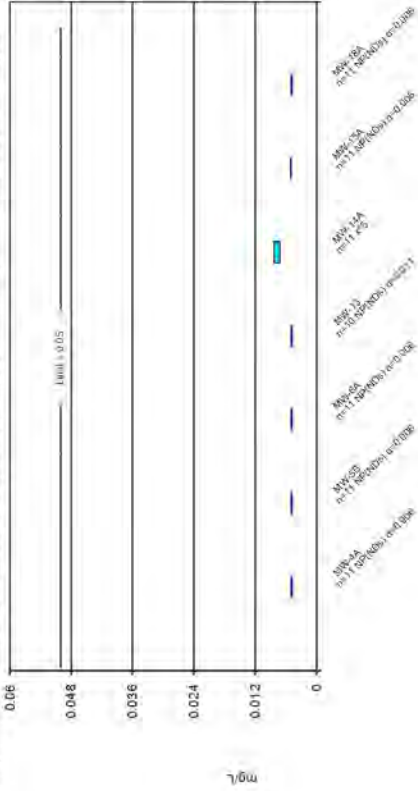
Compliance Limit is not exceeded.



Constituent: Thallium Analysis Run 10/10/2018 6:11 PM View: Confidence Intervals - App IV
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

Parametric and Non-Parametric (NP) Confidence Interval

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



Constituent: Selenium Analysis Run 10/10/2018 6:11 PM View: Confidence Intervals - App IV
Muscatine Power & Water Client: HR Green, Inc. Data: Muscatine Power & Water

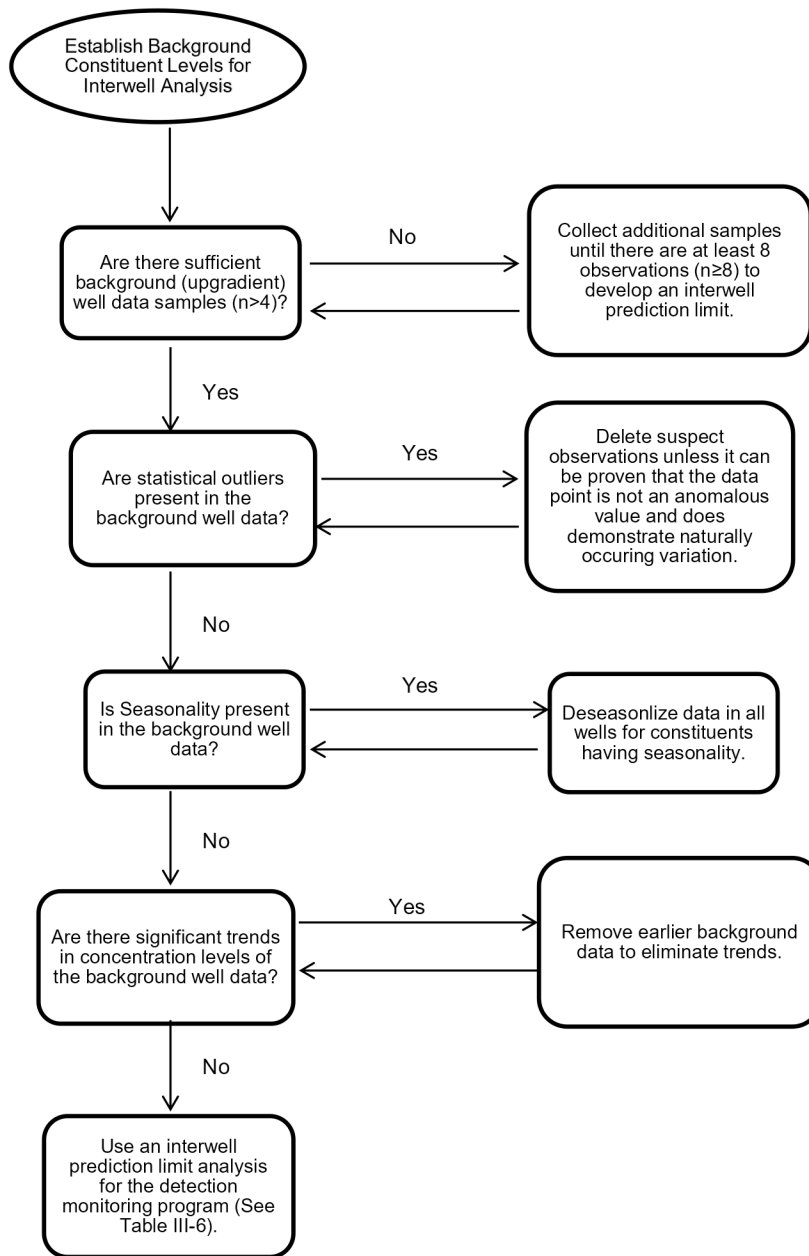
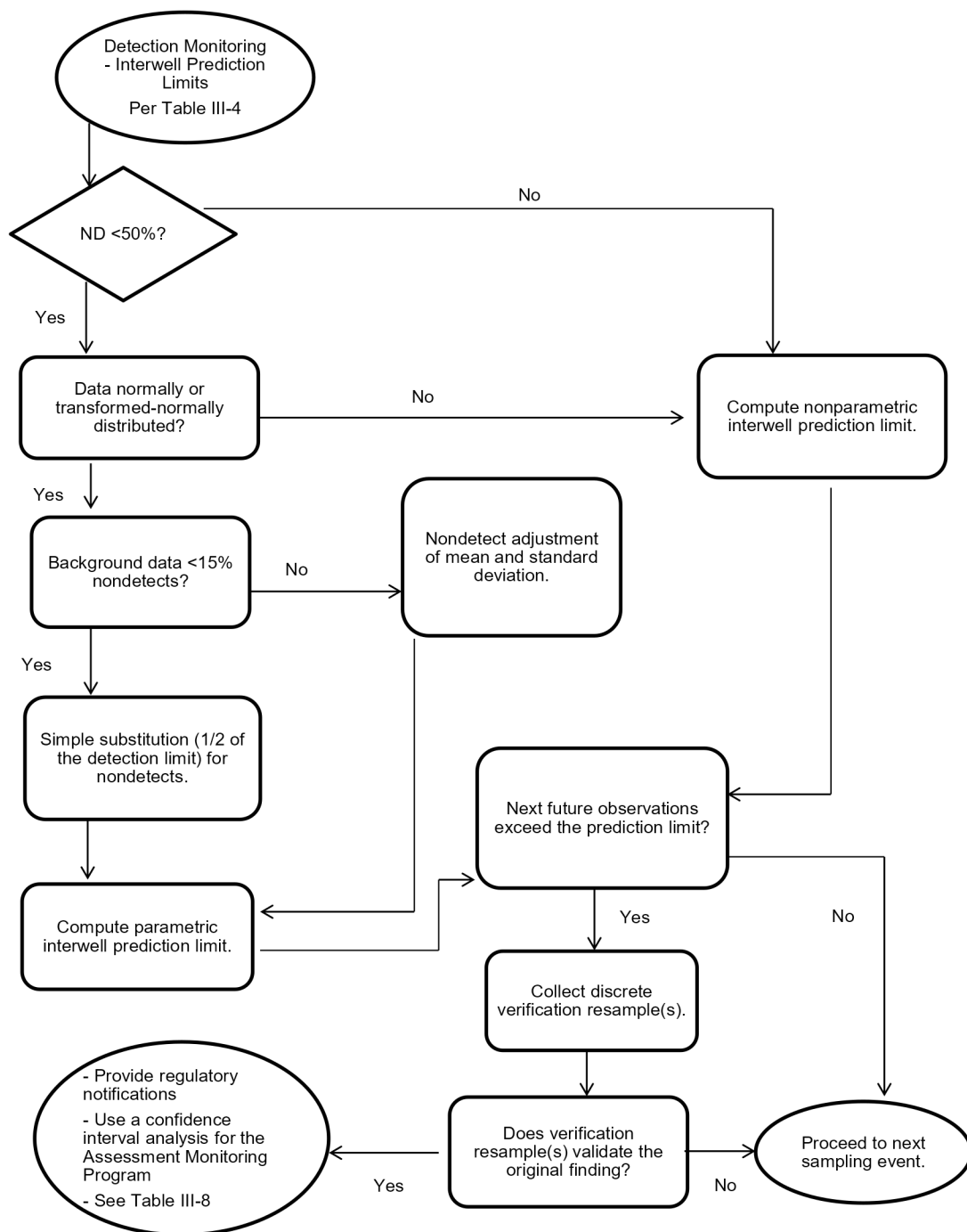


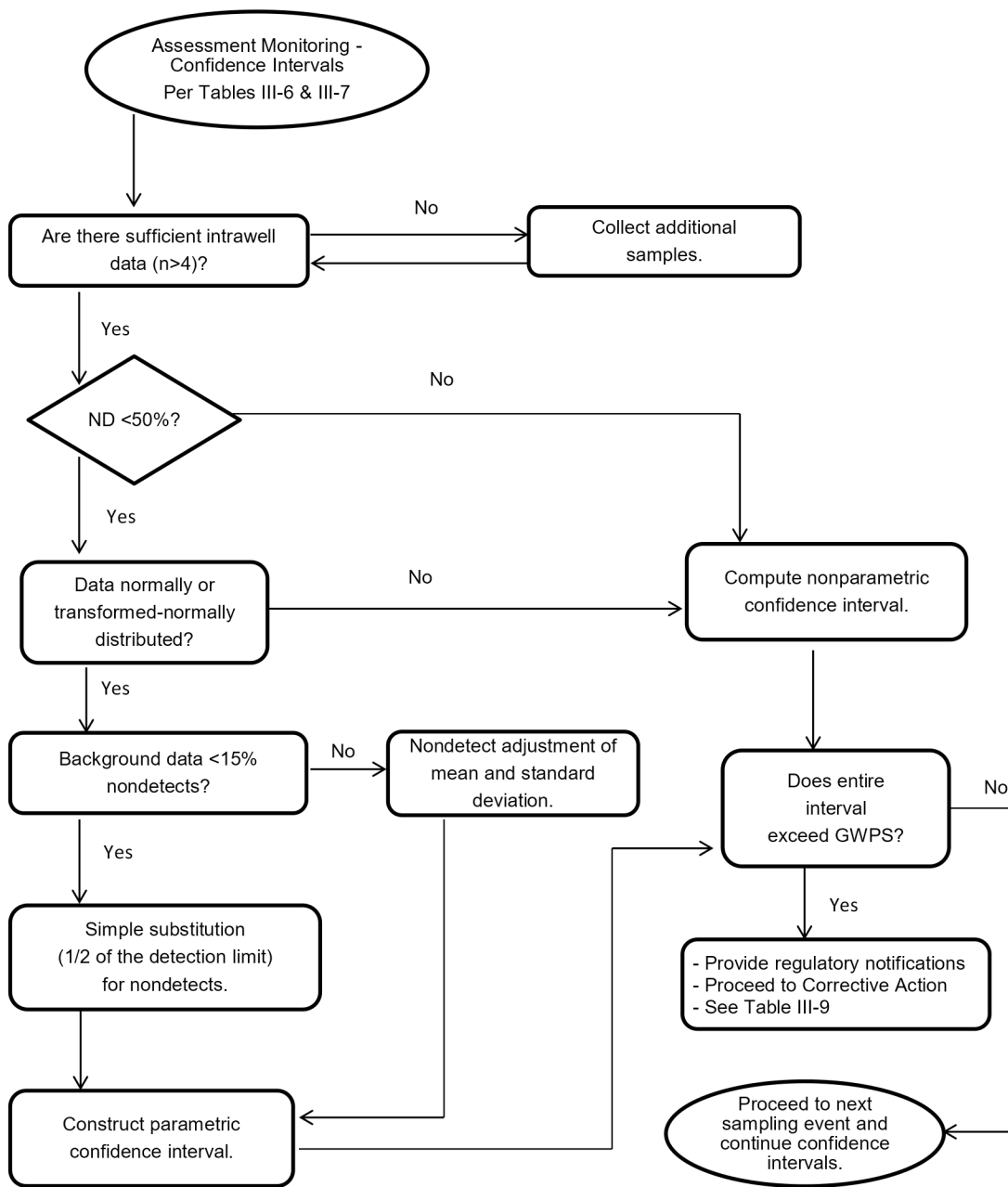
Table III-4: Methodology to Screen Background Data for Interwell Limits and Establish Background Constituent Levels

From: *Groundwater Monitoring System and Sampling and Analysis Program, CCR Landfill* (HR Green, May 2017).



**Table III-6: Methodology for Detection Monitoring -
Computing Interwell Prediction Limits**

From: *Groundwater Monitoring System and Sampling and Analysis Program, CCR Landfill* (HR Green, May 2017).



**Table III-8: Methodology for Assessment Monitoring –
Constructing Confidence Intervals**

From: *Groundwater Monitoring System and Sampling and Analysis Program, CCR Landfill* (HR Green, May 2017).

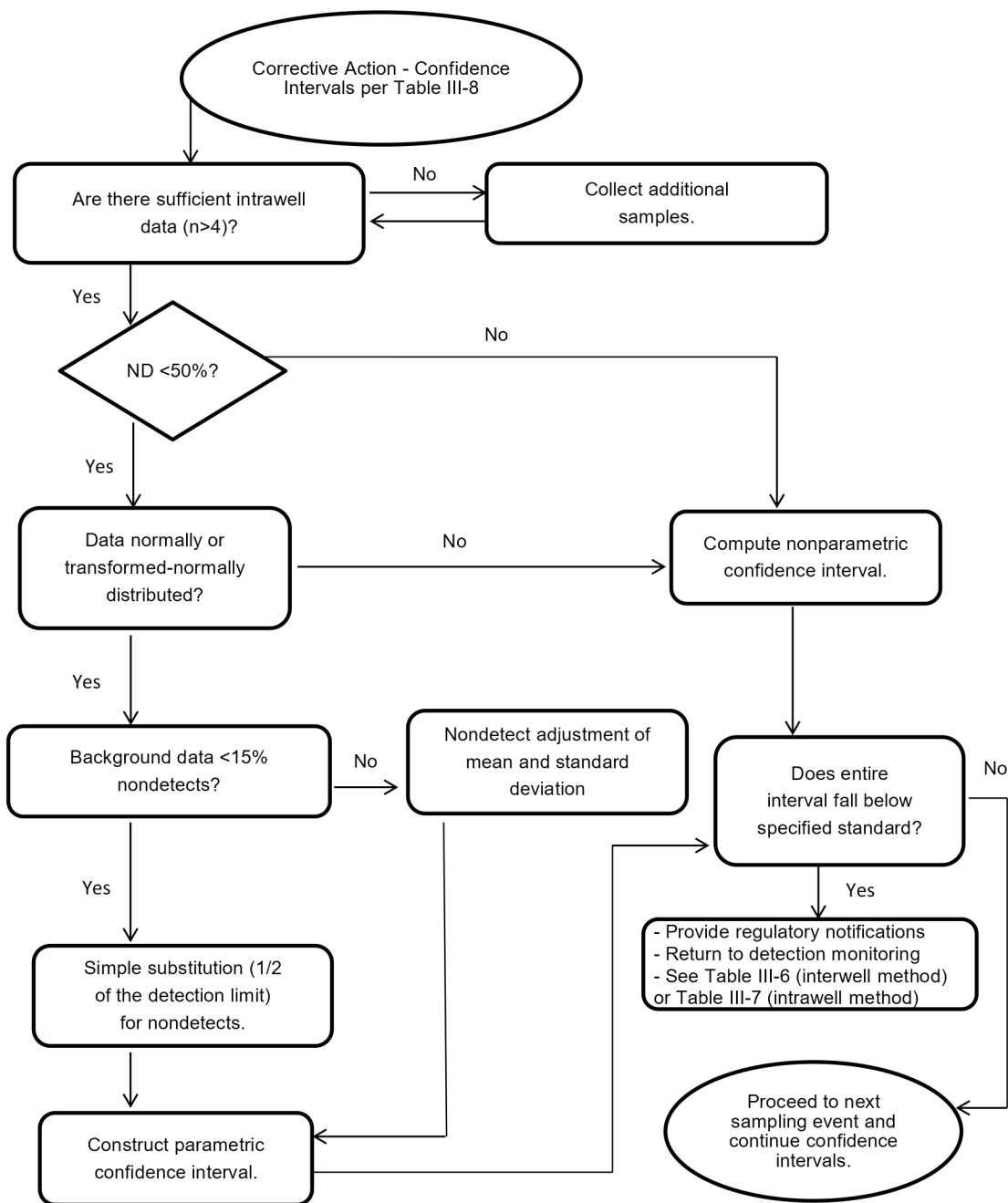


Table III-9: Methodology for Corrective Action

From: *Groundwater Monitoring System and Sampling and Analysis Program, CCR Landfill* (HR Green, May 2017).