2019 Annual Groundwater Monitoring Report

DTE Electric Company
Monroe Power Plant Fly Ash Basin and Vertical Extension Landfill
Coal Combustion Residual Unit

January 2020

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7955 East Dunbar Road
Monroe, Michigan

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Prepared For
DTE Electric Company

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Executive Summary

On April 17, 2015, the United States Environmental Protection Agency (USEPA) published the final rule for the regulation and management of Coal Combustion Residuals (CCR) under the Resource Conservation and Recovery Act (RCRA) (the CCR Rule), as amended July 30, 2018. The CCR Rule, which became effective on October 19, 2015 (amendment effective August 29, 2018), applies to the DTE Electric Company (DTE Electric) Monroe Power Plant (MONPP) Coal Combustion Residual Fly Ash Basin and Vertical Extension Landfill (FAB & VEL) CCR unit. Pursuant to the CCR Rule, no later than January 31, 2018, and annually thereafter, the owner or operator of a CCR unit must prepare an annual groundwater monitoring and corrective action report for the CCR unit documenting the status of groundwater monitoring and corrective action for the preceding year in accordance with §257.90(e). On behalf of DTE Electric, TRC Engineers Michigan, Inc., the engineering entity of TRC Environmental Corporation (TRC), has prepared this Annual Groundwater Monitoring Report for calendar year 2019 activities at the MONPP FAB & VEL CCR unit.

The semiannual detection monitoring events for 2019 were completed in March and September 2019 and included sampling and analyzing groundwater within the groundwater monitoring system for the indicator parameters listed in Appendix III to the CCR Rule. As part of the statistical evaluation, the data collected during detection monitoring events are evaluated to identify statistically significant increases (SSIs) in detection monitoring parameters to determine if concentrations in detection monitoring well samples exceed background levels. Detection monitoring data that has been collected and evaluated in 2019 are presented in this report.

SSIs for Appendix III constituents were confirmed for total dissolved solids (TDS) in September 2019 in one or more downgradient wells during the September 2019 monitoring event. TRC performed an alternate source demonstration (ASD) and determined the observation of TDS above background was a result of natural variability in groundwater quality and not attributable to the MONPP FAB & VEL CCR unit. Therefore, no SSIs were recorded that were not addressed by an ASD for the 2019 monitoring period and detection monitoring will be continued at the MONPP FAB & VEL CCR unit in accordance with §257.94. In addition, based on the artesian conditions, the low permeability of the underlying natural soils, and the calculated time of travel for groundwater to flow vertically from the MONPP FAB & VEL to the uppermost aquifer, it is not possible for the uppermost aquifer to have been affected by CCR from FAB & VEL operations that began in 1975. Also, due to limitations on CCR Rule implementation timelines, the background data sets are of relatively short duration for capturing the occurrence of natural temporal changes in the aquifer.

Section 1
Introduction

1.1 Program Summary

On April 17, 2015, the United States Environmental Protection Agency (USEPA) published the final rule for the regulation and management of Coal Combustion Residuals (CCR) under the Resource Conservation and Recovery Act (RCRA) (the CCR Rule), as amended July 30, 2018. The CCR Rule, which became effective on October 19, 2015 (amendment effective August 29, 2018), applies to the DTE Electric Company (DTE Electric) Monroe Power Plant (MONPP) Coal Combustion Residual Fly Ash Basin and Vertical Extension Landfill (FAB & VEL) CCR unit. Pursuant to the CCR Rule, no later than January 31, 2018, and annually thereafter, the owner or operator of a CCR unit must prepare an annual groundwater monitoring and corrective action report for the CCR unit documenting the status of groundwater monitoring and corrective action for the preceding year in accordance with §257.90(e). On behalf of DTE Electric, TRC Engineers Michigan, Inc., the engineering entity of TRC Environmental Corporation (TRC), has prepared this Annual Groundwater Monitoring Report for calendar year 2019 activities at the MONPP FAB & VEL CCR unit (2019 Annual Report).

In the January 31, 2018 *Annual Groundwater Monitoring Report for the Monroe Power Plant Fly Ash Basin CCR* Unit, covering calendar year 2017 activities (2017 Annual Report), DTE Electric reported that the pH observed within groundwater at one or more downgradient wells was outside background limits. Based on the results of the resampling, the pH was within the prediction limits and no statistically significant increase (SSI) or decrease exists for pH in accordance with the Stats. Therefore, DTE Electric continued detection monitoring at the MONPP FAB & VEL CCR unit pursuant to §257.94 of the CCR Rule. No potential SSIs were noted in the 2018 semiannual detection monitoring events (TRC, January 2019).

This 2019 Annual Report presents the monitoring results and the statistical evaluation of the detection monitoring parameters (Appendix III to Part 257 of the CCR Rule) for the March and September 2019 semiannual groundwater monitoring events for the MONPP FAB & VEL CCR unit. Detection monitoring for these events continued to be performed in accordance with the *CCR Groundwater Monitoring and Quality Assurance Project Plan – DTE Electric Company Monroe Power Plant Coal Combustion Residual Fly Ash Basin* (QAPP) (TRC, August 2016; revised March 2017) and statistically evaluated per the Stats Plan. As part of the statistical evaluation, the data collected during detection monitoring events are evaluated to identify SSIs of detection monitoring parameters compared to background levels.

1.2 Site Overview

The MONPP FAB & VEL is located about one mile southwest of the MONPP in Section 16, Township 7 South, Range 9 East at 7955 East Dunbar Road, Monroe, Monroe County, Michigan (Figure 1). The MONPP FAB & VEL is bounded by Dunbar Road and Plum Creek to the north and northeast, Interstate 75 to the northwest, a 200-acre peninsula into Lake Erie to the east and southeast, Lake Erie to the south, and a large open field to the southwest (Figure 2).

The property has been used continuously for the operation of the MONPP FAB & VEL since approximately 1975 and is constructed over a natural clay-rich soil base. The MONPP FAB & VEL and landfill is a Type III solid waste disposal facility owned by DTE Electric, which currently accepts coal ash from DTE Electric's MONPP. The MONPP FAB & VEL is operated in accordance with Michigan Part 115 of the Natural Resources and Environmental Protection Act (NREPA), PA 451 of 1994, as amended, and the current operating license number 9579.

1.3 Geology/Hydrogeology

The MONPP FAB & VEL CCR unit is located within 200 feet southwest of Plum Creek and immediately north of Lake Erie. The MONPP FAB & VEL CCR unit uppermost aquifer consists of saturated limestone present beneath at least 37 feet and up to 53.5 feet of thick contiguous silty clay-rich soil that serves as a natural confining hydraulic barrier that isolates the underlying uppermost aquifer. The limestone bedrock aquifer is artesian in every location except MW-16-01, where the static water level was approximately 1 to 2 feet below ground surface (ft bgs).

Potentiometric groundwater elevation data from 2016 through 2019 suggest that there is horizontal groundwater flow potential within the upper aquifer unit generally to the northeast towards Plum Creek. The average hydraulic gradient to the northeast is on the order of 0.002 foot/foot along the eastern part of the MONPP FAB & VEL to 0.004 to 0.005 foot/foot in the center and northwestern part of the FAB & VEL, with an overall mean of 0.004 foot/foot.

The surface water elevation within the FAB & VEL raised surface impoundment is at least 5 to more than 30 feet above the potentiometric surface elevations in the uppermost aquifer limestone, and more than 60 feet above the base of the underlying clay-rich confining unit that isolates groundwater within the limestone aquifer. Therefore, flow potential from the CCR unit to the surrounding area would be radially outward from the FAB & VEL. However, there is no hydraulic communication between the uppermost aquifer and the FAB & VEL due to the continuous silty clay-rich confining unit beneath the MONPP FAB & VEL. Based on the artesian conditions, the low permeability of the underlying natural soils, and the calculated time of travel for groundwater to flow vertically from the FAB & VEL to the uppermost aquifer, it is

not possible for the uppermost aquifer to have been affected by CCR from FAB & VEL operations that began in 1975.

The MONPP FAB & VEL CCR unit uses intrawell statistical methods because the saturated unit being monitored is isolated by a laterally contiguous silty clay unit which significantly impedes vertical groundwater flow thus preventing the monitored saturated zone from potentially being affected by CCR. In addition, the flow potential of liquid within the FAB & VEL is radially outward relative to the uppermost aquifer due to the elevation water is maintained within the FAB & VEL CCR unit. Based on these hydrogeologic conditions, intrawell statistical approaches are likely a more appropriate method to evaluate groundwater data statistically. Consequently, intrawell statistical tests are being used during detection monitoring as outlined in the Stats Plan.

Section 2
Groundwater Monitoring

2.1 Monitoring Well Network

A groundwater monitoring system has been established for the MONPP FAB & VEL CCR unit as detailed in the *Groundwater Monitoring System Summary Report – Monroe Power Plant Coal Combustion Residual Fly Ash Basin* (GWMS Report) (TRC, October 2017). The detection monitoring well network for the MONPP FAB & VEL CCR unit currently consists of seven monitoring wells that are screened in the uppermost aquifer. The monitoring well locations are shown on Figure 2.

As discussed in the Stats Plan, intrawell statistical methods for MONPP FAB & VEL were selected based on the geology and hydrogeology at the Site (primarily the presence of clay/hydraulic barrier and the hydraulic separation between the CCR unit and underlying uppermost aquifer), in addition to other supporting lines of evidence that the aquifer is unaffected by the CCR unit (such as the consistency in concentrations of water quality data). An intrawell statistical approach requires that each of the downgradient wells doubles as a background and compliance well, where data from each individual well during a detection monitoring event is compared to a statistical limit developed using the background dataset from that same well. Monitoring wells MW-16-01 through MW-16-07 are located around the perimeter of the MONPP FAB & VEL and provide data on both background and downgradient groundwater quality that has not been affected by the CCR unit (total of seven background/downgradient monitoring wells).

Site construction activities damaged the top of the MW-16-05 casing prior to the September 2019 semiannual monitoring event, therefore no static water level was collected during the 2019 second semiannual detection monitoring event. However, a representative groundwater sample was able to be collected in the September 2019 semiannual detection monitoring event from the artesian monitoring well MW-16-05. The well casing was subsequently repaired in late 2019 and the top of casing elevation was resurveyed.

2.2 Semiannual Groundwater Monitoring

The semiannual monitoring parameters for the detection groundwater monitoring program were selected per the CCR Rule's Appendix III to Part 257 – Constituents for Detection Monitoring. The Appendix III indicator parameters consist of boron, calcium, chloride, fluoride, pH (field reading), sulfate, and total dissolved solids (TDS) and were analyzed in accordance with the sampling and analysis plan included within the QAPP. In addition to pH, the collected field

parameters included dissolved oxygen, oxidation reduction potential, specific conductivity, temperature, and turbidity.

2.2.1 Data Summary

The first semiannual groundwater detection monitoring event for 2019 was performed during March 25 to March 26, 2019 by TRC personnel and samples were analyzed by Eurofins TestAmerica in accordance with the QAPP. Static water elevation data were collected at all seven monitoring well locations. Groundwater samples were collected from the seven detection monitoring wells for the Appendix III indicator parameters and field parameters. A summary of the groundwater data collected during the March 2019 event is provided on Table 1 (static groundwater elevation data), Table 2 (field data), and Table 3 (analytical results).

The second semiannual groundwater detection monitoring event for 2019 was performed on September 23 and September 25, 2019 by TRC personnel and samples were analyzed by Eurofins TestAmerica in accordance with the QAPP. Static water elevation data were collected at all seven monitoring well locations. Groundwater samples were collected from the seven detection monitoring wells for the Appendix III indicator parameters and field parameters. A summary of the groundwater data collected during the September 2019 event is provided on Table 1 (static groundwater elevation data), Table 2 (field data), and Table 4 (analytical results).

2.2.2 Data Quality Review

Data from each round were evaluated for completeness, overall quality and usability, method-specified sample holding times, precision and accuracy, and potential sample contamination. The data were found to be complete and usable for the purposes of the CCR monitoring program. Data quality reviews are summarized in Appendix B.

2.2.3 Groundwater Flow Rate and Direction

Groundwater elevation data collected during the March and September 2019 sampling events continue to show that groundwater within the uppermost aquifer generally flows to the northeast across the Site. Groundwater potentiometric surface elevations measured across the Site during the March and September 2019 sampling events are provided on Table 1 and were used to construct the groundwater potentiometric surface maps shown on Figure 3 and Figure 4, respectively.

The groundwater flow rate and direction is consistent with previous monitoring events. The average groundwater hydraulic gradient throughout the Site during both 2019 monitoring events is approximately 0.004 ft/ft with an average seepage velocity of 0.2

ft/day (70 ft/year), using the average hydraulic conductivity of 5 ft/day (TRC, 2017) and an assumed effective porosity of 0.1.

The general flow rate and direction from both events are similar to that identified in previous monitoring rounds and continues to demonstrate that the downgradient wells are appropriately positioned to detect the presence of Appendix III parameters that could potentially migrate from the MONPP FAB & VEL CCR unit.

Section 3
Statistical Evaluation

3.1 Establishing Background Limits

Per the Stats Plan, background limits were established for the Appendix III indicator parameters following the collection of at least eight background monitoring events using data collected from each of the seven established detection monitoring wells (MW-16-01 through MW-16-07). The statistical evaluation of the background data is presented in the 2017 Annual Report. The Appendix III background limits for each monitoring well will be used throughout the detection monitoring period to determine whether groundwater has been impacted from the MONPP FAB & VEL CCR unit by comparing concentrations in the detection monitoring wells to their respective background limits for each Appendix III indicator parameter.

3.2 Data Comparison to Background Limits – First 2019 Semiannual Event (March 2019)

The concentrations of the indicator parameters in each of the detection monitoring wells (MW-16-01 through MW-16-07) were compared to their respective statistical background limits calculated from the background data collected from each individual well (i.e., monitoring data from MW-16-01 is compared to the background limit developed using the background dataset from MW-16-01, and so forth).

The comparisons for the March 2019 detection monitoring event are presented on Table 3. The statistical evaluation of the March 2019 Appendix III indicator parameters shows all of the results are below their respective background limits and, therefore, there are no SSIs over background.

3.3 Data Comparison to Background Limits – Second 2019 Semiannual Event (September 2019)

The data comparisons for the September 2019 groundwater monitoring event are presented on Table 4. Based on the statistical evaluation of the September 2019 Appendix III indicator parameters a resample of the following was collected in accordance with the Stats Plan:

- Total Dissolved Solids at MW-16-03 and MW-16-04.

3.4 Verification Resampling for the Second 2019 Semiannual Event

Verification resampling is performed per the Stats Plan and the *USEPA's Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* (Unified Guidance, USEPA, 2009) to achieve performance standards as specified by §257.93(g) in the CCR rules. Per the

Stats Plan, if there is an exceedance of a prediction limit for one or more of the parameters, the well(s) of concern will be resampled within 30 days of the completion of the initial statistical analysis. Constituents that have been addressed through an alternative source demonstration (ASD) will not be analyzed for verification purposes.

Verification resampling was conducted on November 6, 2019, by TRC personnel. Groundwater samples were collected for TDS at monitoring wells MW-16-03 and MW-16-04 in accordance with the QAPP. A summary of the groundwater data collected during the verification resampling event is provided on Table 4. The associated data quality review is included in Appendix A.

The November 2019 verification sampling confirmed the SSI for TDS at monitoring well MW-16-04. TRC reviewed the data and determined that TDS is a result of natural variability in groundwater quality and not attributable to the MONPP FAB & VEL CCR unit as presented in the *Alternate Source Demonstration: 2019 Second Semiannual Detection Monitoring Sampling Event for the Monroe Power Plant Coal Combustion Residual Fly Ash Basin and Vertical Extent Landfill, Monroe, Michigan*, dated January 30, 2020 (January 2020 ASD) (Appendix B).

The MW-16-03 TDS verification results were within the prediction limits and no SSI exists from the September 2019 event for this parameter in accordance with the Stats Plan and the Unified Guidance. As no SSIs were found that were not addressed within an ASD, detection monitoring will be continued at the MONPP FAB & VEL CCR unit in accordance with §257.94 of the CCR Rule.

Section 4
Conclusions and Recommendations

Potential SSIs over background limits were noted for one Appendix III constituent in two downgradient wells during the September 2019 monitoring event. These potential SSIs were either not statistically significant (i.e. verification resampling did not confirm the exceedance) or were addressed through an ASD that demonstrated the observed concentrations were a result of natural variability in groundwater quality and not attributable to the MONPP FAB & VEL CCR unit. Therefore, no SSIs were recorded that were not addressed by an ASD for the 2019 monitoring period and detection monitoring will be continued at the MONPP FAB & VEL in accordance with §257.94.

In addition, as discussed above, and in the GWMS Report, based on the artesian conditions, the low permeability of the underlying natural soils, and the calculated time of travel for groundwater to flow vertically from the MONPP FAB & VEL to the uppermost aquifer, it is not possible for the uppermost aquifer to have been affected by CCR from FAB & VEL operations that began in 1975. Also, due to limitations on CCR Rule implementation timelines, the background data sets are of relatively short duration for capturing the occurrence of natural temporal changes in the aquifer.

No corrective actions were performed in 2019. The next semiannual monitoring event at the MONPP FAB & VEL CCR unit is scheduled for the second calendar quarter of 2020.

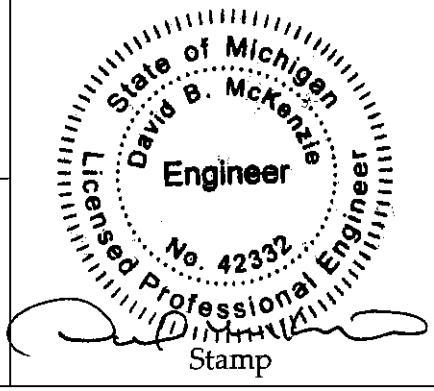
Section 5
Groundwater Monitoring Report Certification

The U.S. EPA's Disposal of Coal Combustion Residuals from Electric Utilities Final Rule Title 40 CFR Part 257 §257.90(e) requires that the owner or operator of an existing CCR unit prepare an annual groundwater monitoring and corrective action report.

Annual Groundwater Monitoring Report Certification
Monroe Power Plant Fly Ash Basin and Vertical Extension Landfill
Monroe, Michigan

CERTIFICATION

I hereby certify that the annual groundwater and corrective action report presented within this document for the MONPP FAB & VEL CCR unit has been prepared to meet the requirements of Title 40 CFR §257.90(e) of the Federal CCR Rule. This document is accurate and has been prepared in accordance with good engineering practices, including the consideration of applicable industry standards, and with the requirements of Title 40 CFR §257.90(e).

Name: David B. McKenzie, P.E.	Expiration Date: October 31, 2021	 Stamp
Company: TRC Engineers Michigan, Inc.	Date: January 30, 2020	

Section 6
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USEPA. April 2018. Barnes Johnson (Office of Resource Conservation and Recovery) to James Roewer (c/o Edison Electric Institute) and Douglas Green, Margaret Fawal (Venable LLP). Re: Coal Combustion Residuals Rule Groundwater Monitoring Requirements. April 30, 2018. United States Environmental Protection Agency, Washington, D.C. 20460. Office of Solid Waste and Emergency Response, now the Office of Land and Emergency Management.

Tables

Table 1
Summary of Groundwater Elevation Data – March and September 2019
Monroe Power Plant FAB and VEL – RCRA CCR Monitoring Program
Monroe, Michigan

Well ID	MW-16-01		MW-16-02		MW-16-03		MW-16-04		MW-16-05		MW-16-06		MW-16-07	
Date Installed	2/17/2016		2/18/2016		2/16/2016		2/15/2016		4/13/2016		4/13/2016		4/14/2016	
TOC Elevation	581.74		581.81		579.95		585.54		583.25		581.94		578.40	
Geologic Unit of Screened Interval	Silt/Limestone Interface		Silt/Limestone Interface		Sand & Silty Clay Limestone Interface		Silty Sand and Gravel		Limestone		Gravel and Cobbles		Silt/Limestone Interface	
Screened Interval Elevation	530.9 to 525.9		526.4 to 521.4		540.3 to 535.3		541.6 to 536.6		540.5 to 535.5		534.2 to 529.2		540.4 to 535.4	
Unit	ft BTOC	ft	ft BTOC	ft	ft BTOC	ft	ft BTOC	ft	ft BTOC	ft	ft BTOC	ft	ft BTOC	ft
Measurement Date	Depth to Water	GW Elevation	Depth to Water	GW Elevation	Depth to Water	GW Elevation	Depth to Water	GW Elevation	Depth to Water	GW Elevation	Depth to Water	GW Elevation	Depth to Water	GW Elevation
3/25/2019	4.45	577.29	-3.20	585.01	-10.00	589.95	-15.30	600.84	-12.70	595.95	-0.90	582.84	-7.30	585.70
9/23/2019	4.74	577.00	-2.05	583.86	-10.50	590.45	-15.00	600.54	NM	--	-0.10	582.04	-6.10	584.50

Notes:

Negative depth to water measurement indicates artesian conditions, actual measured water level is above the top of casing.

Elevations are reported in feet relative to the North American Vertical Datum of 1988.

ft BTOC - feet below top of casing

NM = Not measured. The top of casing of monitoring well MW-16-05 was damaged at the time of sampling.

FAB - Fly Ash Basin.

VEL - Vertical Extension Landfill.

Table 2
Summary of Field Parameters – March and September 2019
Monroe Power Plant FAB and VEL – RCRA CCR Monitoring Program
Monroe, Michigan

Sample Location	Sample Date	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	pH (SU)	Specific Conductivity (umhos/cm)	Temperature (deg C)	Turbidity (NTU)
MW-16-01	3/26/2019	0.52	89.7	7.1	1,637	9.21	5.07
	9/23/2019	0.39	69.0	7.2	1,891	15.10	2.90
MW-16-02	3/25/2019	0.07	60.8	7.1	1,698	10.61	37.9
	9/23/2019	0.20	63.3	7.2	1,850	12.89	3.12
MW-16-03	3/25/2019	0.46	179.8	6.7	190	11.08	9.61
	9/23/2019	0.17	58.5	7.1	1,913	13.49	4.26
MW-16-04	3/25/2019	0.08	71.2	7.0	1,683	11.11	4.11
	9/23/2019	0.17	23.0	7.2	1,781	12.73	2.90
MW-16-05	3/25/2019	0.07	51.8	6.9	1,682	11.69	6.40
	9/25/2019	0.09	34.2	7.0	1,729	12.34	22.2
MW-16-06	3/25/2019	0.46	45.2	7.0	1,692	11.08	16.9
	9/23/2019	0.16	76.6	7.1	1,884	14.39	4.02
MW-16-07	3/26/2019	1.36	9.3	7.1	1,713	11.73	4.90
	9/23/2019	0.11	73.3	7.2	1,789	13.40	2.08

Notes:

mg/L - milligrams per liter.

mV - milliVolt.

SU - standard unit.

umhos/cm - micro-mhos per centimeter.

deg C - degrees celcius.

NTU - nephelometric turbidity units.

FAB - Fly Ash Basin

VEL - Vertical Extension Landfill.

Table 3
Comparison of Appendix III Parameter Results to Background Limits – March 2019
Monroe Power Plant FAB and VEL – RCRA CCR Monitoring Program
Monroe, Michigan

Sample Location:		MW-16-01		MW-16-02		MW-16-03		MW-16-04		MW-16-05		MW-16-06		MW-16-07	
Sample Date:		3/26/2019	PL	3/25/2019	PL	3/25/2019	PL	3/25/2019	PL	3/25/2019	PL	3/25/2019	PL	3/26/2019	PL
Constituent	Unit	Data		Data		Data		Data		Data		Data		Data	
Appendix III															
Boron	ug/L	270	310	420	470	460	510	170	210	230	280	350	400	210	280
Calcium	ug/L	390,000	450,000	400,000	430,000	400,000	490,000	510,000	610,000	400,000	440,000	400,000	420,000	400,000	440,000
Chloride	mg/L	10	14	13	15	18	20	33	39	11	12	12	12	7.8	13
Fluoride	mg/L	1.7	2.1	1.5	1.8	1.5	1.8	0.95	1.1	1.5	1.7	1.5	1.8	1.5	1.8
pH, Field	SU	7.1	6.3 - 9.0	7.1	6.9 - 7.3	6.7	6.7 - 7.3	7.0	7.0 - 7.5	6.9	6.6 - 7.7	7.0	7.0 - 7.3	7.1	6.9 - 7.4
Sulfate	mg/L	1,400	1,500	1,500	1,700	1,600	1,700	1,400	1,500	1,500	1,600	1,500	1,600	1,400	1,600
Total Dissolved Solids	mg/L	2,200	2,200	2,200	2,300	2,200	2,300	2,100	2,200	2,200	2,200	2,100	2,300	2,100	2,200

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

All metals were analyzed as total unless otherwise specified.

Bold font indicates an exceedance of the Prediction Limit (PL).

FAB - Fly Ash Basin.

VEL - Vertical Extension Landfill.

Table 4
Comparison of Appendix III Parameter Results to Background Limits – September 2019 and November 2019
Monroe Power Plant FAB and VEL – RCRA CCR Monitoring Program
Monroe, Michigan

Sample Location:		MW-16-01		MW-16-02		MW-16-03			MW-16-04			MW-16-05		MW-16-06		MW-16-07	
Sample Date:		9/23/2019	PL	9/23/2019	PL	9/23/2019	11/6/2019	PL	9/23/2019	11/6/2019[1]	PL	9/25/2019	PL	9/23/2019	PL	9/23/2019	PL
Constituent	Unit	Data		Data		Data			Data			Data		Data		Data	
Appendix III																	
Boron	ug/L	250	310	380	470	440	--	510	160	--	210	220	280	310	400	190	280
Calcium	ug/L	400,000	450,000	380,000	430,000	410,000	--	490,000	520,000	--	610,000	370,000	440,000	380,000	420,000	390,000	440,000
Chloride	mg/L	9.9	14	13	15	18	--	20	32	--	39	11	12	11	12	7.5	13
Fluoride	mg/L	1.7	2.1	1.5	1.8	1.5	--	1.8	0.95	--	1.1	1.4	1.7	1.5	1.8	1.4	1.8
pH, Field	SU	7.2	6.3 - 9.0	7.2	6.9 - 7.3	7.1	7.2	6.7 - 7.3	7.2	7.2	7.0 - 7.5	7.0	6.6 - 7.7	7.1	7.0 - 7.3	7.2	6.9 - 7.4
Sulfate	mg/L	1,500	1,500	1,600	1,700	1,600	--	1,700	1,400	--	1,500	1,400	1,600	1,500	1,600	1,500	1,600
Total Dissolved Solids	mg/L	2,200	2,200	2,200	2,300	**2,500**	2,300	2,300	**2,300**	**2,300**[2]	2,200	2,100	2,200	2,300	2,300	2,100	2,200

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

-- - not analyzed.

FAB - Fly Ash Basin.

VEL - Vertical Extension Landfill.

All metals were analyzed as total unless otherwise specified.

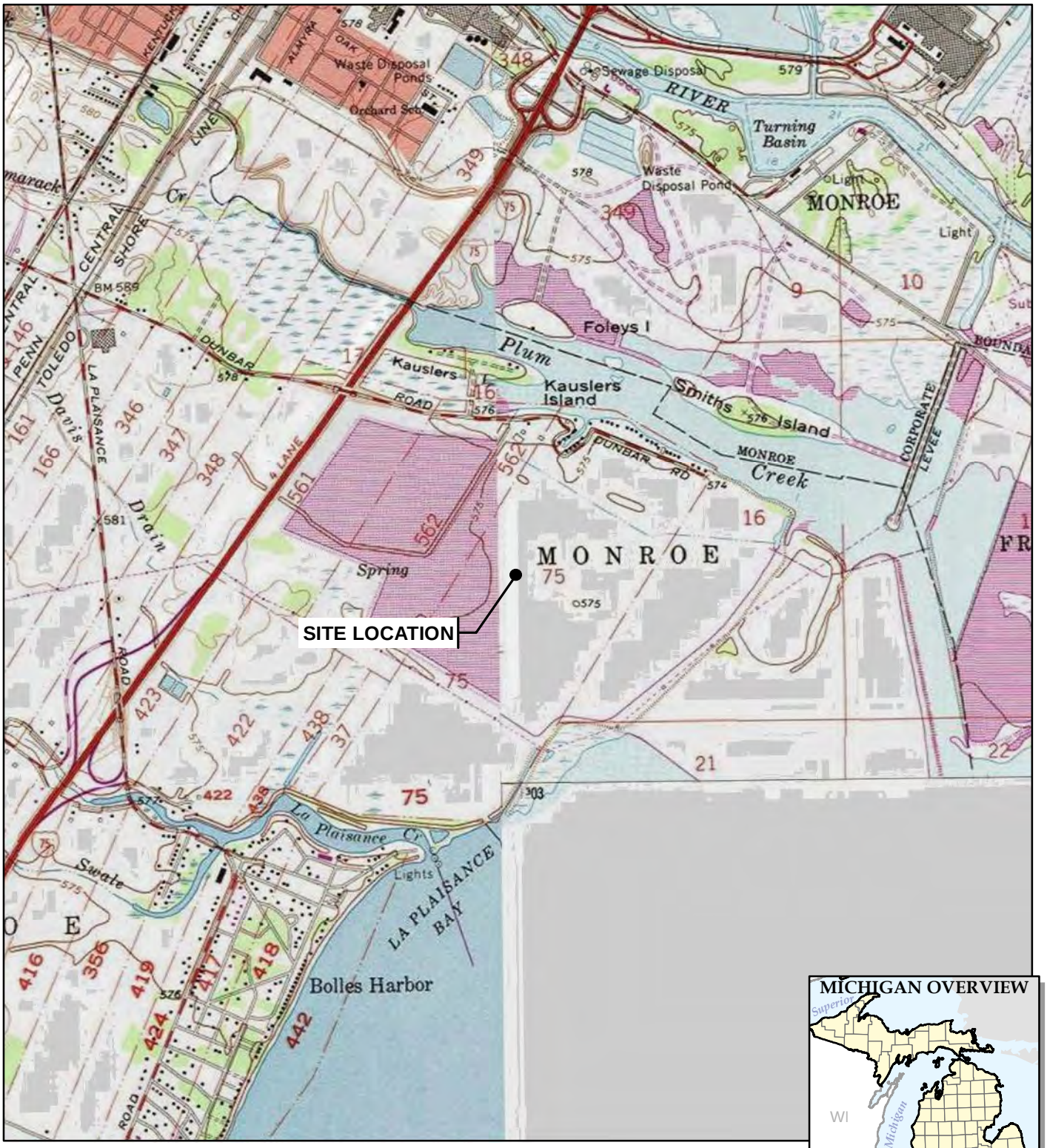
Bold font indicates an exceedance of the Prediction Limit (PL).

RESULT Shading and bold font indicates a confirmed exceedance of the Prediction Limit (PL).

(1) - Results shown for verification sampling performed on 11/6/2019.

(2) - New successful alternative source demonstration was completed following confirmation of the intial statistically significant exceedance.

Figures



BASE MAP FROM USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE SERIES.

N

1 " = 2,000 '
1:24,000

0 2,000 4,000
FEET

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PROJECT:

DTE ELECTRIC COMPANY
MONROE POWER PLANT
FLY ASH BASIN AND VERTICAL EXTENSION LANDFILL
7955 EAST DUNBAR ROAD
MONROE, MICHIGAN

TITLE:

SITE LOCATION MAP

DRAWN BY:	S.MAJOR
CHECKED BY:	B. YELEN
APPROVED BY:	V. BUENING
DATE:	JANUARY 2020
PROJ. NO.:	320511.0001
FILE:	320511-0001-008SLM-MPP-Fig01.mxd

FIGURE 1

E:\DTE\CCR_Sites\2017_265996\320511-0001-008SLM-MPP-Fig01.mxd -- Saved By: MVAPHIADIS on 1/28/2020, 11:58:35 AM

LEGEND

- MONITORING WELLS
- APPROXIMATE BOUNDARY OF FLY ASH
- APPROXIMATE BOUNDARY OF VERTICAL EXTENSION LANDFILL

NOTES

1. BASE MAP IMAGERY FROM GOOGLE EARTH PRO, 2018.
2. WELL LOCATIONS SURVEYED BY BMJ ENGINEERS AND SURVEYORS INC. IN MARCH AND MAY 2016.

N

0 600 1,200 Feet

1 " = 600 '

1:7,200

PROJECT:
DTE ELECTRIC COMPANY
MONROE POWER PLANT
FLY ASH BASIN AND VERTICAL EXTENSION LANDFILL
7955 EAST DUNBAR ROAD
MONROE, MICHIGAN

TITLE:
MONITORING NETWORK AND SITE PLAN

DRAWN BY:	M. VAPHIADIS	PROJ NO.:	320511.0001
CHECKED BY:	J. KRENZ		
APPROVED BY:	V. BUENING		
DATE:	JANUARY 2020		

FIGURE 2

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FILE NO.: 320511-0001-017-MPP-Fig02.mxd

Plot Date: 1/28/2020, 11:41:53 AM by MVAPHIADIS -- LAYOUT: ANSI B (11"x17")
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Coordinate System: NAD 1983 UTM Zone 17N (Meter)
Map Rotation: 0

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Path: E:\DTE\CCR_Sites\2017_265996\320511-0001-018-MPP-Fig03.mxd

Coordinate System: NAD 1983 UTM Zone 17N (Meter)
Map Rotation: 0

LEGEND

- MONITORING WELL
- APPROXIMATE BOUNDARY OF FLY ASH BASIN
- APPROXIMATE BOUNDARY OF VERTICAL EXTENSION LANDFILL
- POTENTIOMETRIC SURFACE CONTOUR LINE (5-FT INTERVAL,DASHED WHERE INFERRED)
- (582.84) STATIC WATER ELEVATION IN FEET (NAVD, 1988)

NOTES

1. BASE MAP IMAGERY FROM GOOGLE & PARTNERS GOOGLE EARTH PRO, 04/2018.
2. WELL LOCATIONS SURVEYED BY BMJ ENGINEERS AND SURVEYORS INC. IN MARCH AND MAY 2016.
3. GROUNDWATER ELEVATIONS DISPLAYED IN FEET RELATIVE TO NORTH AMERICAN VERTICAL DATUM OF 1988

N

0 600 1,200 Feet

1 " = 600 '
1:7,200

PROJECT:
DTE ELECTRIC COMPANY
MONROE POWER PLANT
FLY ASH BASIN AND VERTICAL EXTENSION LANDFILL
7955 EAST DUNBAR ROAD
MONROE, MICHIGAN

TITLE:
POTENTIOMETRIC SURFACE MAP MARCH 2019

DRAWN BY:	M. VAPHIADIS	PROJ NO.:	320511.0001
CHECKED BY:	J. KRENZ		
APPROVED BY:	V. BUENING		**FIGURE 3**
DATE:	JANUARY 2020		

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FILE NO.: 320511-0001-018-MPP-Fig03.mxd

LEGEND

- MONITORING WELL
- APPROXIMATE BOUNDARY OF FLY ASH BASIN
- APPROXIMATE BOUNDARY OF VERTICAL EXTENSION LANDFILL
- POTENTIOMETRIC SURFACE CONTOUR LINE (5-FT INTERVAL,DASHED WHERE INFERRED)
- (582.69) STATIC WATER ELEVATION IN FEET (NAVD, 1988)

NOTES

1. BASE MAP IMAGERY FROM GOOGLE EARTH PRO, 2018.
2. WELL LOCATIONS SURVEYED BY BMJ ENGINEERS AND SURVEYORS INC. IN MARCH AND MAY 2016.
3. GROUNDWATER ELEVATIONS DISPLAYED IN FEET RELATIVE TO NORTH AMERICAN VERTICAL DATUM OF 1988.
4. NM = NOT MEASURED; MW-16-05 WAS DAMAGED AT THE TIME OF SAMPLING.

N

0 600 1,200 Feet

1 " = 600 '

1:7,200

PROJECT:
DTE ELECTRIC COMPANY
MONROE POWER PLANT
FLY ASH BASIN AND VERTICAL EXTENSION LANDFILL
7955 EAST DUNBAR ROAD
MONROE, MICHIGAN

TITLE:
POTENTIOMETRIC SURFACE MAP
SEPTEMBER 2019

DRAWN BY:	M. VAPHIADIS	PROJ NO.:	320511.0001
CHECKED BY:	J. KRENZ		
APPROVED BY:	V. BUENING		**FIGURE 4**
DATE:	JANUARY 2020		

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FILE NO.: 320511-0001-019-MPP-Fig04.mxd

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Coordinate System: NAD 1983 UTM Zone 17N (Meter)
Map Rotation: 0

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Appendix A
Alternate Source Demonstration

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Technical Memorandum

Date: January 30, 2020

To: Christopher P. Scieszka
DTE Electric Company

From: Graham Crockford, TRC
David McKenzie, TRC

Project No.: 320511.0001.0000 Phase 001, Task 001

Subject: Alternate Source Demonstration: 2019 Second Semiannual Detection Monitoring Sampling Event Monroe Power Plant Coal Combustion Residual Fly Ash Basin and Vertical Extension Landfill, Monroe, Michigan

Introduction

On April 17, 2015, the United States Environmental Protection Agency (USEPA) published the final rule for the regulation and management of Coal Combustion Residuals (CCR) under the Resource Conservation and Recovery Act (RCRA) (the CCR Rule). The CCR Rule, which became effective on October 19, 2015, applies to the DTE Electric Company (DTE Electric) Monroe Power Plant (MONPP) Coal Combustion Residual Fly Ash Basin and Vertical Extent Landfill (FAB & VEL) CCR unit.

TRC Engineers Michigan, Inc. (TRC) conducted the second semiannual 2019 detection groundwater monitoring event for the MONPP FAB & VEL CCR unit on behalf of DTE Electric on September 23 and 25, 2019 in accordance with the *CCR Groundwater Monitoring and Quality Assurance Project Plan – DTE Electric Company Monroe Power Plant Fly Ash Basin* (QAPP) (TRC, August 2016; revised March 2017). . The semiannual groundwater monitoring event included the statistical evaluation of the detection monitoring parameters (Appendix III to Part 257 of the CCR Rule) for the MONPP FAB & VEL CCR unit. This event was the fifth detection monitoring event performed to comply with §257.94. As part of the statistical evaluation, the data collected during detection monitoring events are evaluated to identify statistically significant increases (SSIs) in detection monitoring parameters to determine if concentrations in detection monitoring well samples exceed background levels. The statistical analysis was performed pursuant to §257.93(f) and (g), and in accordance with the Groundwater Statistical Evaluation Plan (Stats Plan) (TRC, 2017).

The statistical evaluation of the September 2019 Appendix III indicator parameters showed potential SSIs over background for:

- Total Dissolved Solids (TDS) at MW-16-03 and MW-16-04

Verification sampling conducted in November 2019 only confirmed the SSI for TDS at MW-16-04. All other Appendix III constituents were within the statistical background limits. In accordance with §257.94(e)(2), DTE Electric may demonstrate that a source other than the CCR unit caused the SSI or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. This Alternate Source Demonstration (ASD) has been prepared to address the potential SSIs identified in the September 2019 detection monitoring event.

Background

The MONPP is located in Monroe in Monroe County, Michigan. The MONPP FAB & VEL is bounded by Dunbar Road and Plum Creek to the north and northeast, Interstate 75 to the northwest, a 200-acre peninsula into Lake Erie to the east and southeast, Lake Erie to the south and a large open field to the southwest. The property has been used continuously for the operation of the MONPP FAB & VEL since approximately 1975 and is constructed over a natural clay-rich soil base. The MONPP FAB & VEL is a Type III solid waste disposal facility owned by DTE Electric, which currently accepts coal ash from DTE Electric's MONPP. The MONPP FAB & VEL is operated in accordance with Michigan Part 115 of the Natural Resources and Environmental Protection Act (NREPA), PA 451 of 1994, as amended, and the current operating license number 9579.

The MONPP FAB & VEL CCR unit uppermost aquifer consists of saturated limestone present beneath at least 37 feet and up to 53.5 feet of thick contiguous silty clay-rich soil that serves as a natural confining hydraulic barrier that isolates the underlying uppermost aquifer. The limestone bedrock aquifer is artesian in every location except MW-16-01, where the static water level was approximately 1 to 2 feet below ground surface (bgs).

The detection monitoring well network for the MONPP FAB & VEL CCR unit currently consists of seven monitoring wells that are screened in the uppermost aquifer. The MONPP FAB & VEL CCR unit uses intrawell statistical methods because the saturated unit being monitored is isolated by a laterally contiguous silty clay unit which significantly impedes vertical groundwater flow thus preventing the monitored saturated zone from potentially being affected by CCR. In addition, the flow potential of liquid within the FAB is radially outward relative to the uppermost aquifer due to the elevation that water is maintained within the FAB CCR unit. Based on these hydrogeologic conditions, intrawell statistical tests are used during detection monitoring as outlined in the Stats Plan.

Alternate Source Demonstration

Verification resampling was performed as recommended per the Stats Plan and the USEPA's Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance (Unified

Guidance, USEPA, 2009) to achieve performance standards as specified by §257.93(g) in the CCR rules. Per the Stats Plan, if there is an exceedance of a prediction limit for one or more of the parameters, the well(s) of concern will be resampled within 30 days of the completion of the initial statistical analysis. Only those constituents that initially exceed their statistical limit (i.e., have no previously recorded SSIs) will be analyzed for verification purposes. As such, verification resampling was conducted on November 6, 2019, by TRC personnel. Groundwater samples were collected for TDS at monitoring wells MW-16-03 and MW-16-04 in accordance with the Quality Assurance Project Plan (TRC, August 2016; Revised March 2017). A summary of the groundwater data collected during the verification resampling event is provided on Table 1. The associated data quality review is included in Attachment A.

The TDS verification result for MW-16-03 are within the prediction limits; consequently, the initial SSI from the September 2019 event is not confirmed. Therefore, in accordance with the Stats Plan and the Unified Guidance, the initial exceedance at MW-16-03 is not statistically significant and no SSI will be recorded for this well during the September 2019 monitoring event. However, the verification resampling confirmed the TDS exceedance at MW-16-04 during the November 2019 verification sampling event. The following discussion presents the ASD for the confirmed prediction limit exceedance at MW-16-04.

TDS at MW-16-04: The SSI of TDS at MW-16-04, shown graphically as data points greater than the prediction limit in Figure 3, are likely the result of natural spatial variability in groundwater quality at the site and not the result of a release from the MONPP FAB & VEL CCR unit. Multiple lines of evidence are provided in support of this conclusion and are as follows:

- **Insufficient background sampling timeline to account for long-term trends** – Variability in TDS concentrations observed in the groundwater at MONPP FAB during the background sampling events provides evidence of the heterogeneity of this constituent in groundwater. The short duration of the background sampling events limits the ability of the statistical analysis to capture the natural temporal trends in the groundwater quality at the MONPP FAB & VEL. This is a limitation of the CCR Rule implementation timeline.
- **Lack of similar increase in other indicator parameters** – The lack of SSIs for any other parameters within the same monitoring well, and across the other wells within the monitoring well network, also suggests a source other than CCR leachate for the observed TDS SSI at this location.
- **Time of travel analysis** – The clay formation immediately beneath the MONPP FAB & VEL CCR unit provides a natural geologic barrier to migration of CCR constituents to the underlying aquifer. The vertical extent of the clay layer beneath the CCR unit is shown in Figures 5 and 6 as cross-sections. Figure 4 shows the cross-section locations in plan view. Conservatively calculating a time of travel for liquid from the base of the MONPP FAB & VEL CCR unit through a minimum of 23 feet of silty clay, to the underlying upper aquifer, yields approximately 308 years of travel time (TRC, October 2017). The MONPP FAB & VEL CCR unit began accepting coal ash in

approximately 1975, so, based on this analysis, there is no potential for indicator parameters to have migrated to the upper aquifer.

Conclusions and Recommendations

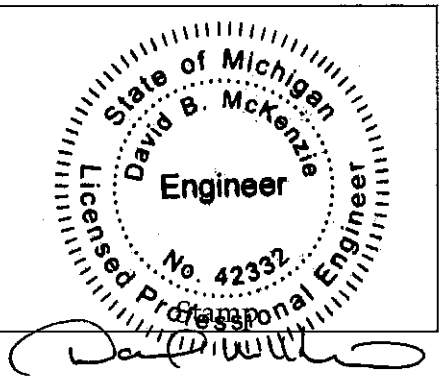
The information provided in this report serves as the ASD for the DTE Electric MONPP FAB & VEL CCR unit. This report was prepared in accordance with 40 CFR 257.94(e)(2) of the CCR Rule, and demonstrates that the TDS SSI detected at MW-16-04 during the second semiannual detection monitoring event performed in 2019 is not due to a release of CCR leachate into the groundwater. In addition, based on the results of the verification resampling, the initial exceedance for TDS at monitoring well MW-16-03is not statistically significant. Therefore, no SSIs are recorded for this fifth detection monitoring event.

In addition, as discussed in the Annual Report, based on the artesian conditions, the low permeability of the underlying natural soils, and the calculated time of travel for groundwater to flow vertically from the MONPP FAB to the uppermost aquifer, it is not possible for the uppermost aquifer to have been affected by CCR from FAB operations that began in 1975. Due to limitations on CCR Rule implementation timelines, the background data sets are of relatively short duration for capturing the occurrence of natural temporal changes in the aquifer.

Since no confirmed SSIs over background limits that were not addressed with an ASD were identified for any of the Appendix III parameters during the September 2019 monitoring event, DTE Electric will continue with the detection monitoring program at MONPP FAB & VEL CCR unit. The next semiannual monitoring event is scheduled for the second calendar quarter of 2020.

Certification Statement

I hereby certify that the alternative source demonstration presented within this document for the MONPP FAB & VEL CCR unit has been prepared to meet the requirements of Title 40 CFR §257.94(e) 2 of the Federal CCR Rule. This document is accurate and has been prepared in accordance with good engineering practices, including the consideration of applicable industry standards, and with the requirements of Title 40 CFR §257.94(e) 2.

Name: David B. McKenzie, P.E.	Expiration Date: October 31, 2021	
Company: TRC Engineers Michigan, Inc.	Date: January 30, 2020	Stamp

References

TRC Environmental Corporation. August 2016; Revised March 2017. CCR Groundwater Monitoring and Quality Assurance Project Plan – DTE Electric Company Monroe Power Plant Coal Combustion Residual Fly Ash Basin, 7955 East Dunbar Road, Monroe, Michigan. Prepared for DTE Electric Company.

TRC Environmental Corporation. October 2017. Groundwater Monitoring System Summary Report –Monroe Power Plant Coal Combustion Residual Fly Ash Basin, 7955 East Dunbar Road, Monroe, Michigan. Prepared for DTE Electric Company.

TRC Environmental Corporation. October 2017. Groundwater Statistical Evaluation Plan – Monroe Power Plant Coal Combustion Residual Fly Ash Basin, 7955 East Dunbar Road, Monroe, Michigan. Prepared for DTE Electric Company.

TRC Environmental Corporation. January 2018. Annual Groundwater Monitoring Report – Monroe Power Plant Coal Combustion Residual Fly Ash Basin, 7955 East Dunbar Road, Monroe, Michigan. Prepared for DTE Electric Company.

TRC Environmental Corporation. January 2019. 2018 Annual Groundwater Monitoring Report – Monroe Power Plant Coal Combustion Residual Fly Ash Basin, 7955 East Dunbar Road, Monroe, Michigan. Prepared for DTE Electric Company.

USEPA. 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA facilities, Unified Guidance. Office of Conservation and Recovery. EPA 530/R-09-007.

Attachments

Table 1. Comparison of Verification Sampling Results to Background Limits

Figure 1. Site Location Map
Figure 2. Monitoring Network and Site Plan
Figure 3. MW-16-04 Total Dissolved Solids Timer Series Plot
Figure 4. Cross Section Location Map
Figure 5. Generalized Geologic Cross-Section A-A′
Figure 6. Generalized Geologic Cross-Section B-B′

Attachment A. Data Quality Review

Table 1

Table 1
Comparison of Verification Sampling Results to Background Limits
Monroe Power Plant Fly Ash Basin and Vertical Extension Landfill – RCRA CCR Monitoring Program
Monroe, Michigan

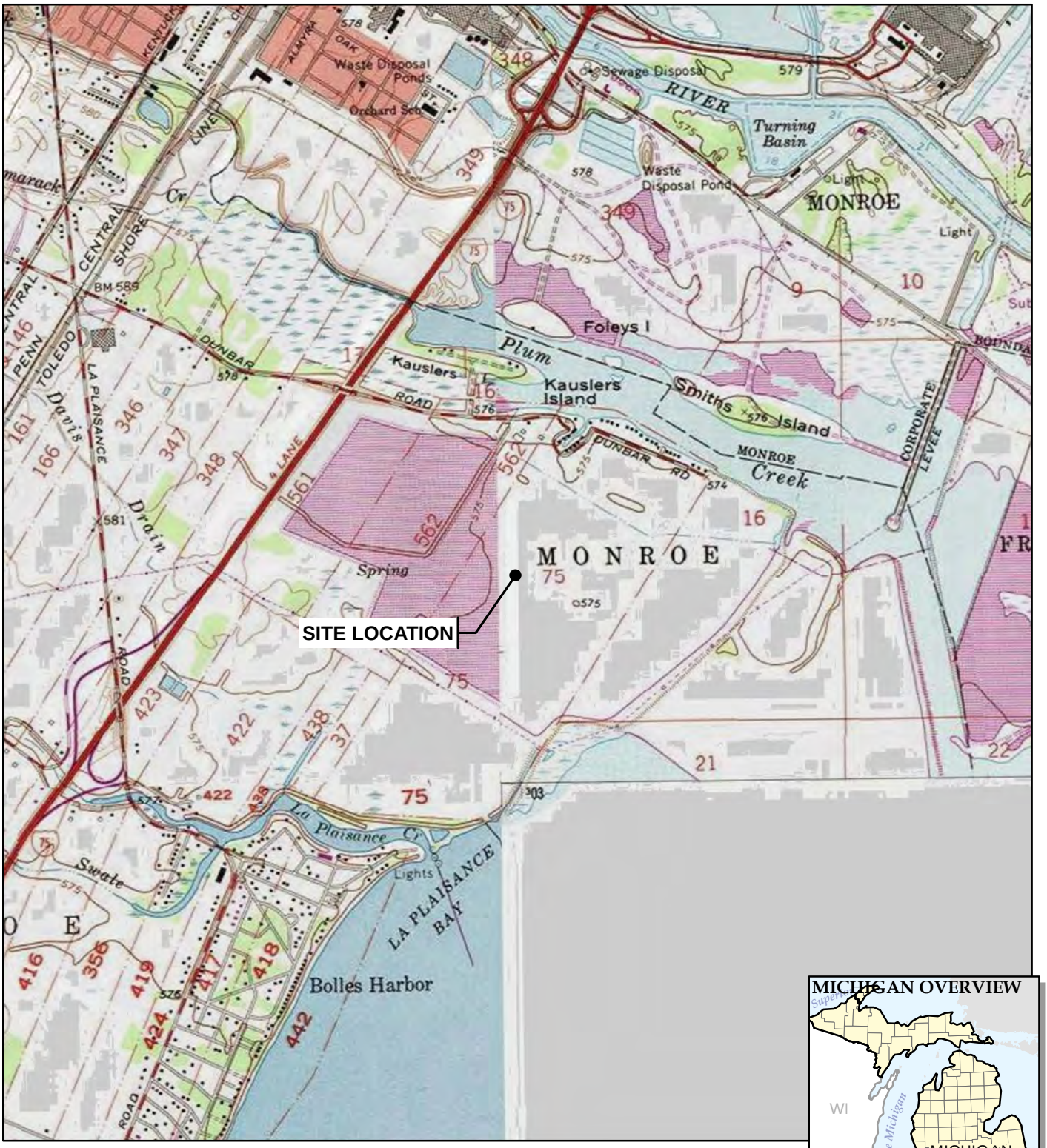
Sample Location:		MW-16-03		MW-16-04	
Sample Date:		11/6/2019		11/6/2019	
Constituent	Unit	Data	PL	Data	PL
Appendix III					
Total Dissolved Solids	mg/L	2,300	2,300	**2,300**	2,200

Notes:

mg/L - milligrams per liter

RESULT Shading and bold font indicates a confirmed exceedance of the Prediction Limits (PL).

Figures



BASE MAP FROM USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE SERIES.

N

1 " = 2,000 '
1:24,000

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7955 EAST DUNBAR ROAD
MONROE, MICHIGAN

TITLE:
SITE LOCATION MAP

DRAWN BY:	S.MAJOR
CHECKED BY:	
APPROVED BY:	
DATE:	OCTOBER 2019
PROJ. NO.:	320511.0001
FILE:	320511-0001-007SLM.mxd

FIGURE 1

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LEGEND

- MONITORING WELLS
- APPROXIMATE BOUNDARY OF FLY ASH
- APPROXIMATE BOUNDARY OF VERTICAL EXTENSION LANDFILL

NOTES

1. BASE MAP IMAGERY FROM GOOGLE EARTH PRO, 2018.
2. WELL LOCATIONS SURVEYED BY BMJ ENGINEERS AND SURVEYORS INC. IN MARCH AND MAY 2016.

N

0 600 1,200 Feet

1 " = 600 '

1:7,200

PROJECT:
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MONROE POWER PLANT
FLY ASH BASIN AND VERTICAL EXTENSION LANDFILL
7955 EAST DUNBAR ROAD
MONROE, MICHIGAN

TITLE:
MONITORING NETWORK AND SITE PLAN

DRAWN BY:	M. VAPHIADIS	PROJ NO.:	320511.0001
CHECKED BY:	J. KRENZ		
APPROVED BY:	V. BUENING		
DATE:	JANUARY 2020		

FIGURE 2

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Coordinate System: NAD 1983 UTM Zone 17N (Meter)
Map Rotation: 0

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FIGURE 3

MW-16-04 TOTAL DISSOLVED SOLIDS TIME SERIES PLOT

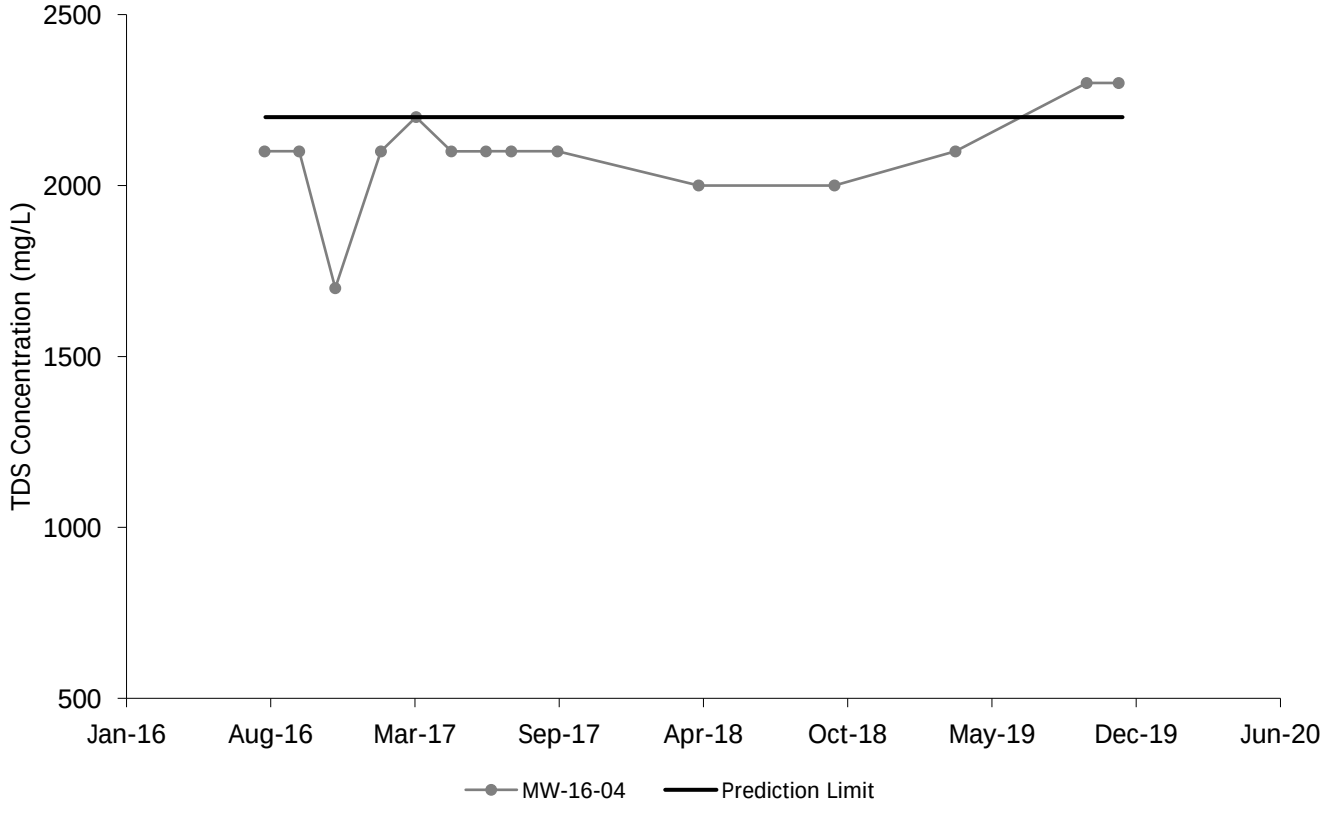
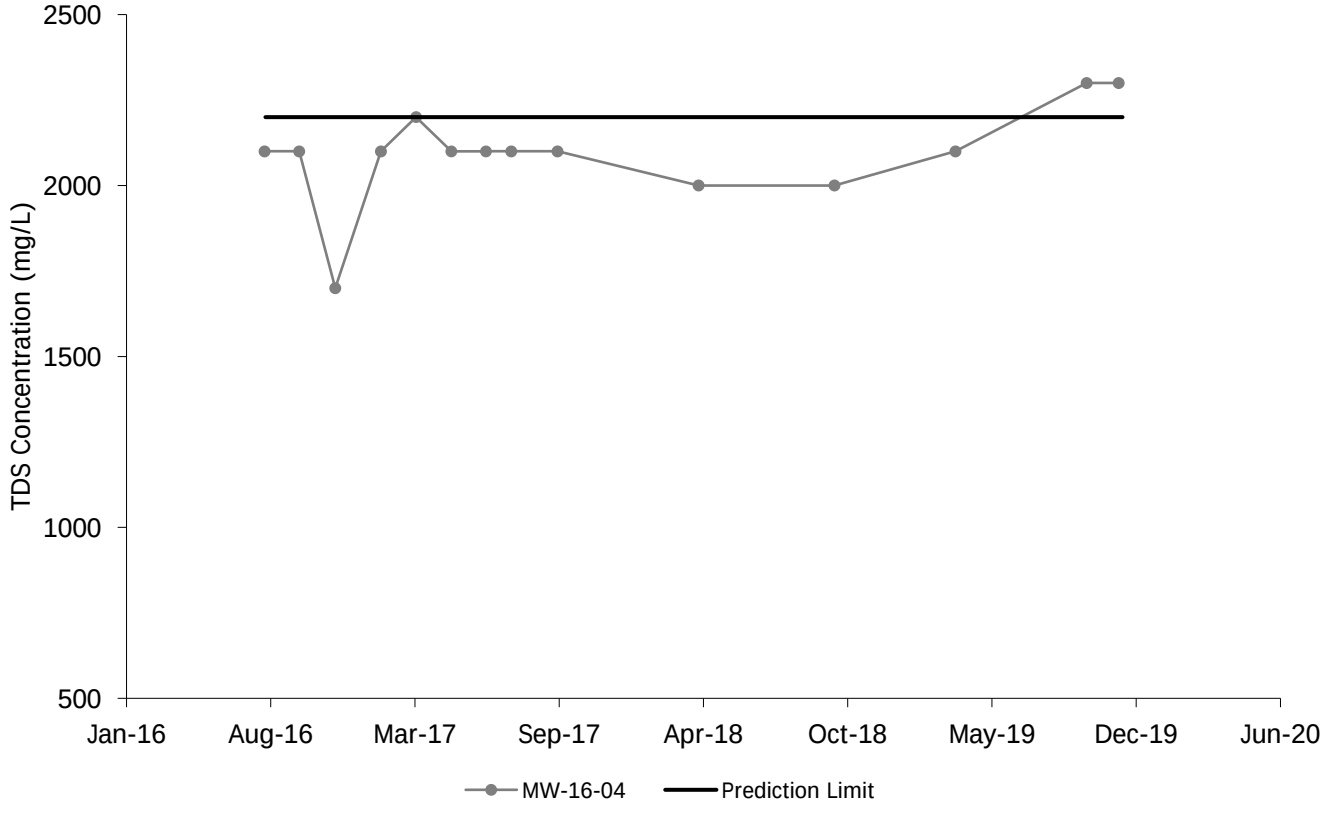


FIGURE 3

MW-16-04 TOTAL DISSOLVED SOLIDS TIME SERIES PLOT



LEGEND

- MONITORING WELLS
- APPROXIMATE BOUNDARY OF FLY ASH BASIN
- CROSS SECTIONS

NOTES

1. BASE MAP IMAGERY FROM GOOGLE & PARTNERS GOOGLE EARTH PRO, 2018.
2. WELL LOCATIONS SURVEYED BY BMJ ENGINEERS AND SURVEYORS INC. IN MARCH AND MAY 2016.

N

0 600 1,200 Feet

1 " = 600 '

1:7,200

PROJECT:

DTE ELECTRIC COMPANY
MONROE POWER PLANT FLY ASH BASIN
7955 EAST DUNBAR ROAD
MONROE, MICHIGAN

TITLE:

CROSS SECTION LOCATOR MAP

DRAWN BY:	M. VAPHIADIS	PROJ NO.:	320511.0001
CHECKED BY:	B. YELEN		
APPROVED BY:	V. BUENING		**FIGURE 4**
DATE:	JANUARY 2020		

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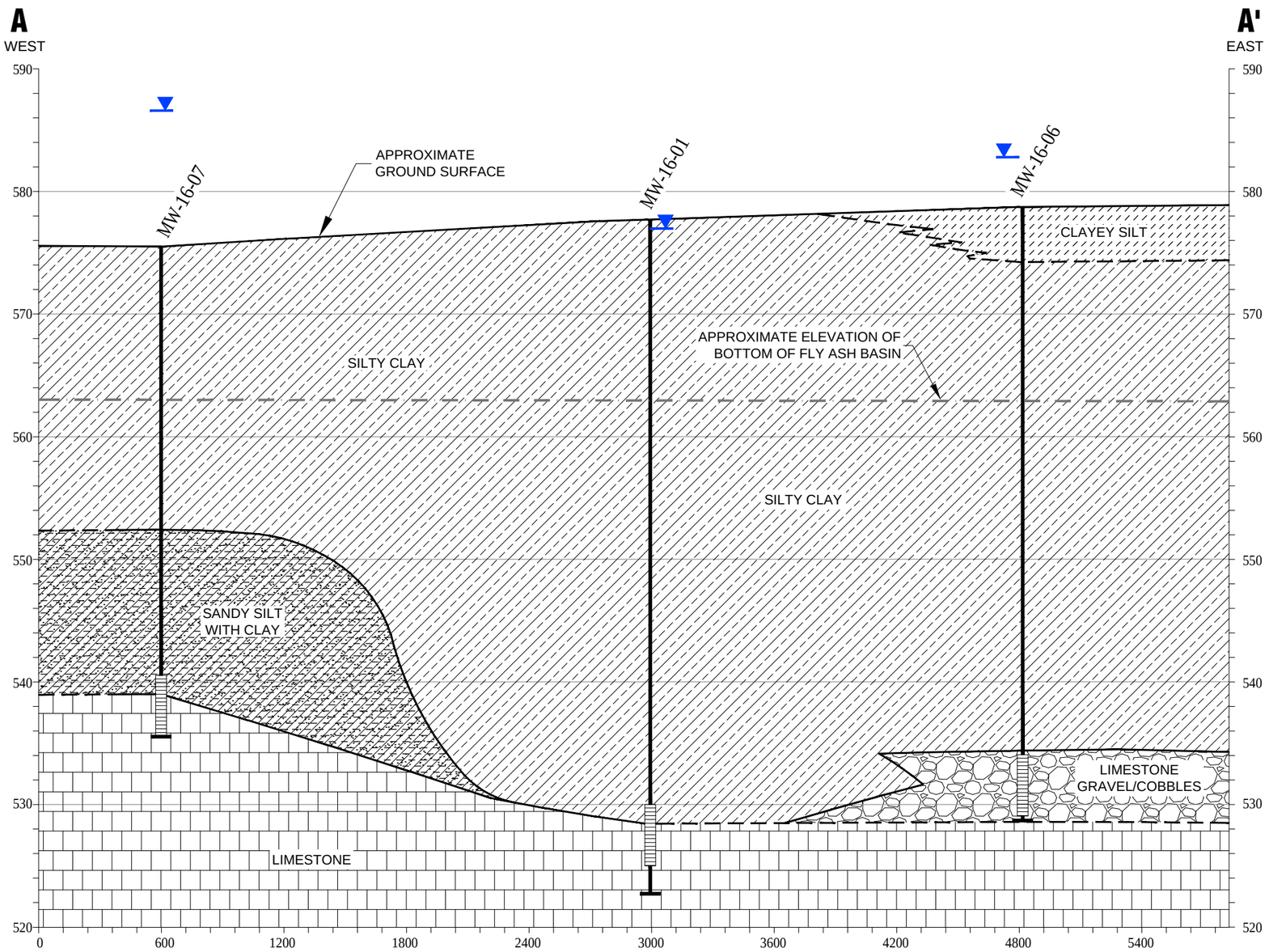
GENERALIZED GEOLOGIC CROSS-SECTION A-A'



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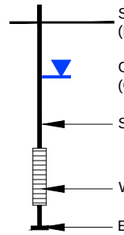

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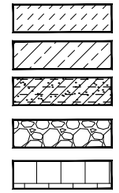

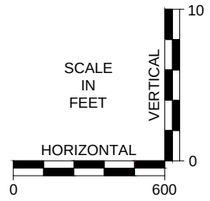

PROJECT:
DTE ELECTRIC COMPANY
MONROE POWER PLANT
FLY ASH BASIN AND VERTICAL EXTENSION LANDFILL
MONROE, MICHIGAN

TITLE:
GENERALIZED GEOLOGIC CROSS-SECTION A-A'

DRAWN BY:	D.STEHLE	PROJ NO.:	320511.0001.01.01
CHECKED BY:	S.HOLMSTROM		
APPROVED BY:	V.BUENING		**FIGURE 5**
DATE:	JANUARY 2020		

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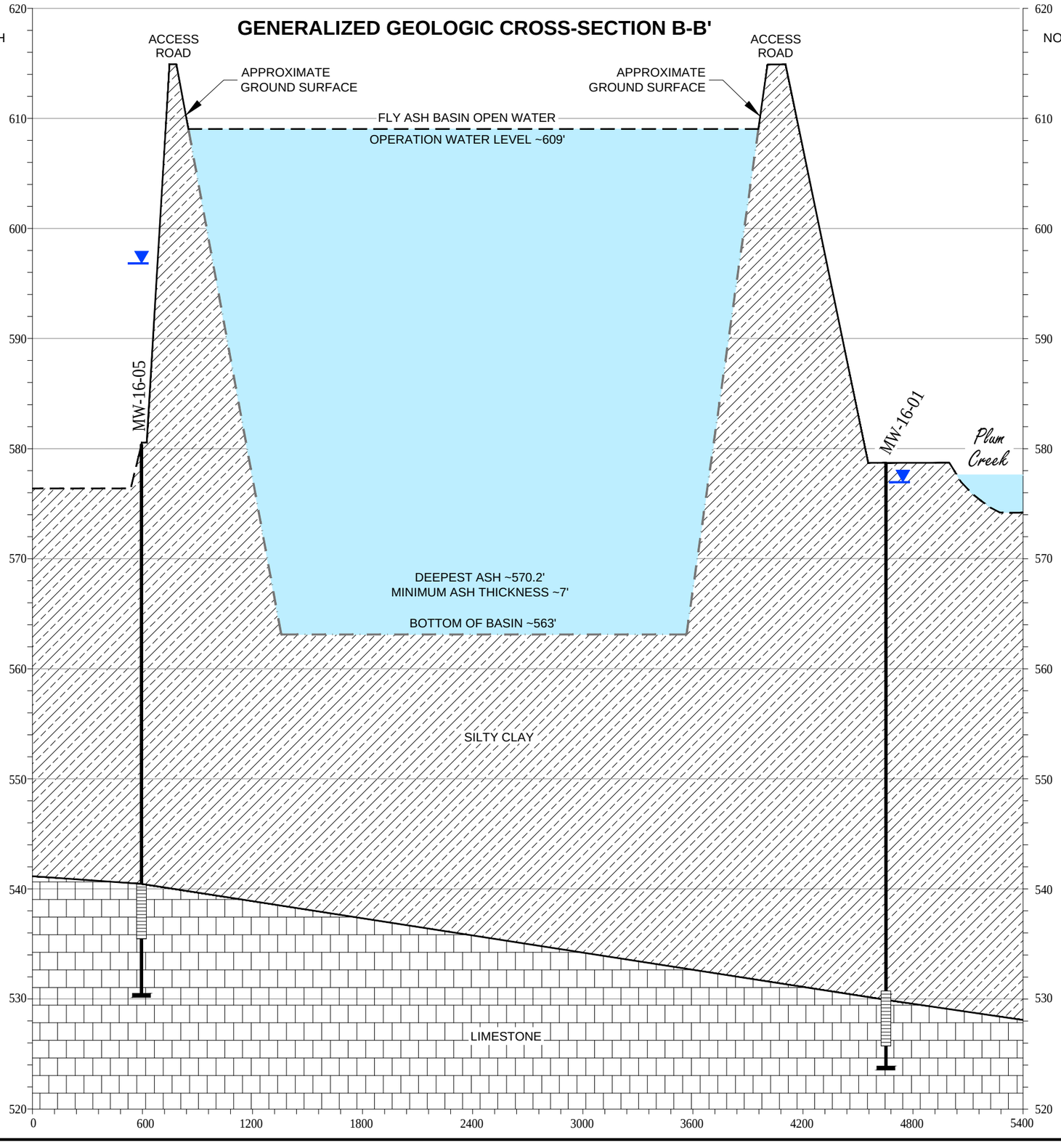
FILE NO.: 320511.0001.01.01.05-06 ASD.dwg

GENERALIZED GEOLOGIC CROSS-SECTION B-B'

B
SOUTH

B'
NORTH



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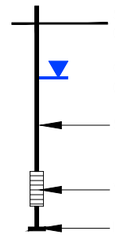

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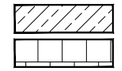

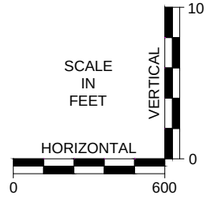

PROJECT:
DTE ELECTRIC COMPANY
MONROE POWER PLANT
FLY ASH BASIN AND VERTICAL EXTENSION LANDFILL
MONROE, MICHIGAN

TITLE:
GENERALIZED GEOLOGIC CROSS-SECTION B-B'

DRAWN BY:	D.STEHLE	PROJ NO.:	320511.0001.01.01
CHECKED BY:	S.HOLMSTROM		**FIGURE 6**
APPROVED BY:	V.BUENING		
DATE:	JANUARY 2020		

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FILE NO.: 320511.0001.01.01.05-06 ASD.dwg

Attachment A

Laboratory Data Quality Review
Groundwater Monitoring Event November 2019 (Verification Sampling)
DTE Electric Company Monroe Power Plant Fly Ash Basin and Vertical Extension Landfill (DTE MONPP FAB & VEL)

Groundwater samples were collected by TRC for the November 2019 verification sampling event. Samples were analyzed for anions, total metals, and total dissolved solids by Test America Laboratories, Inc. (Test America), located in North Canton, Ohio. The laboratory analytical results are reported in laboratory report 240-121974-1.

During the November 2019 verification sampling event, a groundwater sample was collected from each of the following wells on November 6, 2019:

- MW-16-03
- MW-16-04

Each sample was analyzed for the following constituents:

Analyte Group	Method
Total Dissolved Solids	SM 2540C

TRC reviewed the laboratory data to assess data usability. The following sections summarize the data review procedure and the results of the review.

Data Quality Review Procedure

The analytical data were reviewed using the USEPA National Functional Guidelines for Inorganic Superfund Data Review (USEPA, 2017). The following items were included in the evaluation of the data:

- Sample receipt, as noted in the cover page or case narrative;
- Technical holding times for analyses;
- Reporting limits (RLs) compared to project-required RLs;
- Data for method blanks and equipment blanks. Method blanks are used to assess potential contamination arising from laboratory sample preparation and/or analytical procedures. Equipment blanks are used to assess potential contamination arising from field procedures;
- Data for laboratory control samples (LCSs). The LCSs are used to assess the accuracy of the analytical method using a clean matrix;

- Data for matrix spike and matrix spike duplicate samples (MS.MSDs). The MS/MSDs are used to assess the accuracy and precision of the analytical method using a sample from the dataset;
- Data for laboratory duplicates. The laboratory duplicates are used to assess the precision of the analytical method using a sample from the dataset;
- Data for blind field duplicates. Field duplicate samples are used to assess variability introduced by the sampling and analytical processes; and
- Overall usability of the data.

This data usability report addresses the following items:

- Usability of the data if quality control (QC) results suggest potential problems with all or some of the data;
- Actions regarding specific QC criteria exceedances.

Review Summary

The data quality objectives and laboratory completeness goals for the project were met, and the data are usable for their intended purpose. A summary of the data quality review, including non-conformances and issues identified in this evaluation are noted below.

- Appendix III constituents will be utilized for the purposes of a detection monitoring program.
- Data are usable for the purposes of the detection monitoring program.

QA/QC Sample Summary:

- Target analytes were not detected in the method blanks.
- LCS recoveries for all target analytes were within laboratory control limits.
- MS/MSD analyses were not performed on a sample from the data set.
- DUP-01 corresponds with MW-16-04; RPDs between the parent and duplicate sample were within the QC limits.

Appendix B
Data Quality Reviews

Laboratory Data Quality Review
Groundwater Monitoring Event March 2019 (Detection Monitoring)
DTE Electric Company Monroe Power Plant Fly Ash Basin and Vertical Extension Landfill (DTE MONPP FAB & VEL)

Groundwater samples were collected by TRC for the March 2019 sampling event. Samples were analyzed for anions, total metals, and total dissolved solids by Test America Laboratories, Inc. (Test America), located in North Canton, Ohio. The laboratory analytical results are reported in laboratory report 240-110058-1.

During the March 2019 sampling event, a groundwater sample was collected from each of the following wells:

- MW-16-01
- MW-16-02
- MW-16-03
- MW-16-04
- MW-16-05
- MW-16-06
- MW-16-07

Each sample was analyzed for the following constituents:

Analyte Group	Method
Anions (Chloride, Fluoride, Sulfate)	SW846 9056A
Total Boron	SW846 3005A/6010B
Total Calcium	SW846 3005A/6020
Total Dissolved Solids	SM 2540C

TRC reviewed the laboratory data to assess data usability. The following sections summarize the data review procedure and the results of the review.

Data Quality Review Procedure

The analytical data were reviewed using the USEPA National Functional Guidelines for Inorganic Superfund Data Review (USEPA, 2017). The following items were included in the evaluation of the data:

- Sample receipt, as noted in the cover page or case narrative;
- Technical holding times for analyses;
- Reporting limits (RLs) compared to project-required RLs;
- Data for method blanks and equipment blanks. Method blanks are used to assess potential contamination arising from laboratory sample preparation and/or analytical procedures. Equipment blanks are used to assess potential contamination arising from field procedures;

- Data for laboratory control samples (LCSs). The LCSs are used to assess the accuracy of the analytical method using a clean matrix;
- Data for matrix spike and matrix spike duplicate samples (MS.MSDs), if applicable. The MS/MSDs are used to assess the accuracy and precision of the analytical method using a sample from the dataset;
- Data for laboratory duplicates, if applicable. The laboratory duplicates are used to assess the precision of the analytical method using a sample from the dataset;
- Data for blind field duplicates. Field duplicate samples are used to assess variability introduced by the sampling and analytical processes; and
- Overall usability of the data.

This data usability report addresses the following items:

- Usability of the data if quality control (QC) results suggest potential problems with all or some of the data;
- Actions regarding specific QC criteria exceedances.

Review Summary

The data quality objectives and laboratory completeness goals for the project were met, and the data are usable for their intended purpose. A summary of the data quality review, including non-conformances and issues identified in this evaluation are noted below.

- Appendix III constituents will be utilized for the purposes of a detection monitoring program.
- Data are usable for the purposes of the detection monitoring program.

QA/QC Sample Summary:

- The holding time for TDS for sample MW-16-01 exceeded the 7-day holding time criteria by approximately 3 hours. This result is estimated and may be biased low.
- An equipment blank was not included with this data set per the project QAPP.
- Target analytes were not detected in the method blanks.
- LCS recoveries for all target analytes were within laboratory control limits.
- Sample Dup-01 corresponds with sample MW-16-03; relative percent differences (RPDs) between the parent and duplicate sample were within the QC limits.
- MS/MSD analyses were not performed for boron, calcium, and anions in this SDG, however MS/MSD alaysis were performed on other client samples in the batch in accordance with the labs QA/QC program at a rate of 1 per 20 samples

- Laboratory duplicate analyses were performed on sample MW-16-06 for TDS; the RPDs were within the acceptance limits.

Laboratory Data Quality Review
Groundwater Monitoring Event September 2019 (Detection Monitoring)
DTE Electric Company Monroe Power Plant Fly Ash Basin and Vertical Extension Landfill (DTE MONPP FAB & VEL)

Groundwater samples were collected by TRC for the September 2019 sampling event. Samples were analyzed for anions, total boron, total calcium, and total dissolved solids by Eurofins-Test America Laboratories, Inc. (Eurofins-TA), located in North Canton, Ohio. The laboratory analytical results are reported in laboratory reports 240-119636-1 and 240-119702-1.

During the September 2019 sampling event, a groundwater sample was collected from each of the following wells:

- MW-16-01
- MW-16-02
- MW-16-03
- MW-16-04
- MW-16-05
- MW-16-06
- MW-16-07

Each sample was analyzed for the following constituents:

Analyte Group	Method
Anions (Chloride, Fluoride, Sulfate)	SW846 9056A
Total Boron	SW846 3005A/6010B
Total Calcium	SW846 3005A/6020
Total Dissolved Solids	SM 2540C

TRC reviewed the laboratory data to assess data usability. The following sections summarize the data review procedure and the results of the review.

Data Quality Review Procedure

The analytical data were reviewed using the USEPA National Functional Guidelines for Inorganic Superfund Data Review (USEPA, 2017). The following items were included in the evaluation of the data:

- Sample receipt, as noted in the cover page or case narrative;
- Technical holding times for analyses;
- Reporting limits (RLs) compared to project-required RLs;
- Data for method blanks and equipment blanks, where applicable. Method blanks are used to assess potential contamination arising from laboratory sample preparation and/or

analytical procedures. Equipment blanks are used to assess potential contamination arising from field procedures;

- Data for laboratory control samples (LCSs). The LCSs are used to assess the accuracy of the analytical method using a clean matrix;
- Data for matrix spike and matrix spike duplicate samples (MS/MSDs), where applicable. The MS/MSDs are used to assess the accuracy and precision of the analytical method using a sample from the dataset;
- Data for laboratory duplicates, where applicable. The laboratory duplicates are used to assess the precision of the analytical method using a sample from the dataset;
- Data for blind field duplicates. Field duplicate samples are used to assess variability introduced by the sampling and analytical processes; and
- Overall usability of the data.

This data usability report addresses the following items:

- Usability of the data if quality control (QC) results suggest potential problems with all or some of the data;
- Actions regarding specific QC criteria exceedances.

Review Summary

The data quality objectives and laboratory completeness goals for the project were met, and the data are usable for their intended purpose. A summary of the data quality review, including non-conformances and issues identified in this evaluation are noted below.

- Appendix III constituents will be utilized for the purposes of a detection monitoring program.
- Data are usable for the purposes of the detection monitoring program.

QA/QC Sample Summary:

- The holding time for TDS for samples MW-16-02, MW-16-03, and MW-16-04 exceeded the 7-day holding time criteria by approximately 20 minutes, one hour, and one hour and 30 minutes, respectively. These results should be considered estimated and may be biased low as noted in the attached table.
- Target analytes were not detected in the method blanks.
- LCS recoveries for all target analytes were within laboratory control limits.
- MS/MSD analyses were not performed for anions, boron, and calcium. Per the project QAPP, MS/MSD analyses are required for these analyses at a frequency of 1 per 20 samples.

- Laboratory duplicate analysis was not performed for TDS. Per the project QAPP, laboratory duplicate analyses are required for TDS at a frequency of 1 per 20 samples.
- Dup-01 corresponds with MW-16-02; relative percent differences (RPDs) between the parent and duplicate sample were within the QC limits.

Laboratory Data Quality Review
Groundwater Monitoring Event November 2019 (Verification Sampling)
DTE Electric Company Monroe Power Plant Fly Ash Basin and Vertical Extension Landfill (DTE MONPP FAB & VEL)

Groundwater samples were collected by TRC for the November 2019 verification sampling event. Samples were analyzed for anions, total metals, and total dissolved solids by Test America Laboratories, Inc. (Test America), located in North Canton, Ohio. The laboratory analytical results are reported in laboratory report 240-121974-1.

During the November 2019 verification sampling event, a groundwater sample was collected from each of the following wells on November 6, 2019:

- MW-16-03
- MW-16-04

Each sample was analyzed for the following constituents:

Analyte Group	Method
Total Dissolved Solids	SM 2540C

TRC reviewed the laboratory data to assess data usability. The following sections summarize the data review procedure and the results of the review.

Data Quality Review Procedure

The analytical data were reviewed using the USEPA National Functional Guidelines for Inorganic Superfund Data Review (USEPA, 2017). The following items were included in the evaluation of the data:

- Sample receipt, as noted in the cover page or case narrative;
- Technical holding times for analyses;
- Reporting limits (RLs) compared to project-required RLs;
- Data for method blanks and equipment blanks. Method blanks are used to assess potential contamination arising from laboratory sample preparation and/or analytical procedures. Equipment blanks are used to assess potential contamination arising from field procedures;
- Data for laboratory control samples (LCSs). The LCSs are used to assess the accuracy of the analytical method using a clean matrix;

- Data for matrix spike and matrix spike duplicate samples (MS.MSDs). The MS/MSDs are used to assess the accuracy and precision of the analytical method using a sample from the dataset;
- Data for laboratory duplicates. The laboratory duplicates are used to assess the precision of the analytical method using a sample from the dataset;
- Data for blind field duplicates. Field duplicate samples are used to assess variability introduced by the sampling and analytical processes; and
- Overall usability of the data.

This data usability report addresses the following items:

- Usability of the data if quality control (QC) results suggest potential problems with all or some of the data;
- Actions regarding specific QC criteria exceedances.

Review Summary

The data quality objectives and laboratory completeness goals for the project were met, and the data are usable for their intended purpose. A summary of the data quality review, including non-conformances and issues identified in this evaluation are noted below.

- Appendix III constituents will be utilized for the purposes of a detection monitoring program.
- Data are usable for the purposes of the detection monitoring program.

QA/QC Sample Summary:

- Target analytes were not detected in the method blanks.
- LCS recoveries for all target analytes were within laboratory control limits.
- MS/MSD analyses were not performed on a sample from the data set.
- DUP-01 corresponds with MW-16-04; RPDs between the parent and duplicate sample were within the QC limits.