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Our ref: 12575233-LTR-3

February 02, 2024

Mr. Brian Rath  
Environmental Engineer Senior  
Solid Waste and Contaminated Sites Section  
MidAmerican Energy Company  
502 E. 9<sup>th</sup> Street  
Des Moines, Iowa 50319

2023 IDNR Template Tables  
Louisa Generating Station West Monofill  
Muscatine, Iowa  
Permit 70-SDP-16-04P

Dear Brian,

As recently discussed, GHD has prepared Table 7 and Table 9 using the general format provided in the Iowa Department of Natural Resources' (IDNR's) *Annual Water Quality Report Template for Non-Municipal Landfills*. Table 7 and Table 9, provided in Attachment 1, are modified as approved in your January 31, 2024 email to Kevin Armstrong of GHD and Josh Love of MidAmerican Energy Company. Additionally, in Attachment 2, the 2023 groundwater monitoring results are compared to the Maximum Contaminant Level (MCL) or Health Advisory Lifetime (HAL) as described in 567 Iowa Administrative Code Chapter 103, paragraph 103.1(4)d.

Attachment 3 provides a crosswalk table to reference the items provided in the Annual Groundwater Monitoring and Corrective Action Report prepared under the Federal CCR rule with the IDNR's *Annual Water Quality Report Template for Non-Municipal Landfills*.

If you have any questions regarding these tables, please contact Kevin Armstrong.

Sincerely,

A handwritten signature in black ink that reads "Kevin G. Armstrong".

**Kevin Armstrong**  
Science Leader  
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KA/mg/LTR-3

A handwritten signature in black ink that reads "Michael Alowitz".

**Michael J. Alowitz, P.E.**  
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Encl.

Copy to: Jamie Murphy, MidAmerican Energy Company  
Josh Love, MidAmerican Energy Company

# Attachments

# **Attachment 1**

**IDNR Template Table 7 and Table 9**

Table 7

**Summary of Ongoing and Newly Identified Control Limit Exceedances  
2023 Annual Water Quality Report  
Louisa Generating Station - West Monofill  
Permit No. 70-SDP-16-04P**

<b>Well</b>	<b>Constituent</b>	<b>Units</b>	<b>Most recent result</b>	<b>Background Standard</b>	<b>Groundwater Protection Standard 40 CFR §257.95(h)</b>
MW-18A	pH, lab	s.u.	6.8 J	7.53 - 8.29	None
MW-20A	pH, lab	s.u.	7.0 J	7.53 - 8.29	None
	Sulfate	mg/L	67.7	63.6	None
	Thallium	mg/L	0.0104 J-	0.00100 U	0.002
MW-21	None	--	None	None	None
MW-22	pH, lab	s.u.	7.0 J / 7.0 J	7.53 - 8.29	None
	Chromium	mg/L	0.0235 / 0.0233	0.0153	0.1
	Molybdenum	mg/L	0.0360 / 0.0356	0.00200 U	0.1

Comments:

None.

Table 9

Historic Control Limit & GWPS Exceedances  
 2023 Annual Water Quality Report  
 Louisa Generating Station - West Monofill  
 Permit No. 70-SDP-16-04P

Key: gray =CL; black =GWPS		March	June	September	March	September	November	March	September	March	September
Well	Constituent	2020	2020	2020	2021	2021	2021	2022	2022	2023	2023
MW-03 (Background)	pH, lab		ns				ns				
	Arsenic		ns	na			ns				
	Cadmium		ns	na			ns				
	Cobalt		ns	na			ns				
	Lead		ns				ns				
	Molybdenum		ns				ns				
	Radium-226 & 228		ns				ns				
	Thallium		ns	na			ns				
MW-04 (Background)	Boron		ns				ns				
	Chloride		ns				ns				
	Selenium		ns				ns				
MW-17R	Sulfate		ns				ns				
	Radium-226 & 228		ns				ns				
MW-18A	pH, lab		na				ns				
	Sulfate						ns				
	Selenium		na				ns				
MW-20A	Chloride		na				ns				
	pH, lab						ns				
	Sulfate		na				ns				
	Total Dissolved Solids (TDS)		na				ns				
	Arsenic		na	na			ns				
	Barium		na				ns				
	Beryllium		na	na			ns				
	Cadmium		na	na			ns				
	Cobalt		na	na			ns				
	Lead		na				ns				
	Molybdenum		na				ns				
	Radium-226 & 228		na				ns				
	Selenium		na				ns				
	Thallium		na	na			ns				
MW-21	Calcium		ns				ns				
	Chloride		ns				ns				
	pH, lab		ns				ns				
	Sulfate		ns				ns				
	Barium		ns				ns				
	Radium-226 & 228		ns				ns				
MW-22	Boron										
	Chloride		na				na				
	pH, lab		na				na				
	Sulfate						na				
	Chromium						na				
	Molybdenum						na				
	Radium-226 & 228		na				na				
	Selenium						na				

Comments:

Groundwater Protection Standard (GWPS) established under 40 CFR §257.95(h).

ns - No sample collected during this sampling event.

na - Constituent not analyzed.

# **Attachment 2**

## **MCL/HAL Comparison Table**

**2023 Monitoring Analytical Results Summary**  
**MidAmerican Energy Company**  
**Louisa Generating Station West Monofill - Muscatine, Iowa**

Sample Location:				MW-03	MW-03	MW-04	MW-04	MW-17R	MW-17R	MW-18A	MW-18A	
Sample ID:				MW3-GW-0323	MW03-GW-0923	MW4-GW-0323	MW04-GW-0923	MW17R-GW-0323	MW17R-GW-0923	MW18A-GW-0323	MW18A-GW-0923	
Sample Date:	MCL <sup>a</sup>	HAL <sup>b</sup>	SDWR <sup>c</sup>	03/08/2023	09/27/2023	03/08/2023	09/26/2023	03/08/2023	09/26/2023	03/07/2023	09/27/2023	
Parameters	Units											
<b>Appendix III</b>												
Boron	mg/L	--	6	--	0.100 U	0.100 U	0.164	0.556	0.100 U	0.100 U	0.162	0.245
Calcium	mg/L	--	--	--	22.2	22.7	43.1	56.3	33.0	36.4	31.4	34.9
Chloride	mg/L	--	--	250	5.00 U	5.00 U	5.00 U	12.7	5.00 U	5.00 U	5.00 U	6.52
Fluoride	mg/L	4.0	--	2.0	0.500 U	1.00 U	0.500 U	1.00 U	0.500 U	1.00 U	0.500 U	1.00 U
pH, lab	s.u.	--	--	6.5 - 8.5	8.3 J	8.1 J	8.0 J	7.7 J	8.2 J	8.0 J	7.1 J	6.8 J
Sulfate	mg/L	--	--	250	5.28	5.48	7.09	38	11.4	11.2	53.0	48.9
Total dissolved solids (TDS)	mg/L	--	--	500	104	114	218	252	164	148	222	204
<b>Appendix IV</b>												
Antimony	mg/L	0.006	0.006	--	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U
Arsenic	mg/L	0.01	--	--	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U
Barium	mg/L	2.0	--	--	0.0139	0.0141	0.0412	0.0553	0.0286	0.0296	0.0283	0.0332
Beryllium	mg/L	0.004	--	--	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U
Cadmium	mg/L	0.005	0.005	--	0.000100 U	0.000200 U	0.000100 U	0.000200 U	0.000100 U	0.000200 U	0.000100 U	0.000200 U
Chromium	mg/L	0.1	--	--	0.00500 U	0.00500 U	0.00500 U	0.00958	0.00500 U	0.00500 U	0.00543	0.0089
Cobalt	mg/L	--	--	--	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U
Lead	mg/L	0.015 <sup>d</sup>	--	--	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U
Lithium	mg/L	--	--	--	0.0100 U	0.0100 U	0.0100 U	0.0100 U	0.0100 U	0.0100 U	0.0100 U	0.0100 U
Mercury	mg/L	0.002	0.002	--	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U
Molybdenum	mg/L	--	0.04	--	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U
Radium-226 & 228	pCi/L	5	--	--	0.128 U	0.184 U	0.389 U	0.404 U	0.272 U	0.411 U	0.0230 U	0.189 U
Selenium	mg/L	0.05	0.05	--	0.00500 U	0.00500 U	0.00500 U	0.00502	0.00500 U	0.00500 U	0.00500 U	0.00608
Thallium	mg/L	0.002	--	--	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U

**2023 Monitoring Analytical Results Summary**  
**MidAmerican Energy Company**  
**Louisa Generating Station West Monofill - Muscatine, Iowa**

Sample Location:	MW-20A	MW-20A	MW-21	MW-21	MW-22	MW-22	MW-22	MW-22	
Sample ID:	MW20A-GW-0323	MW20A-GW-0923	MW21-GW-0323	MW21-GW-0923	MW22-GW-0323	DP02-GW-0323	MW22-GW-0923	DP02-GW-0923	
Sample Date:	03/08/2023	09/26/2023	03/07/2023	09/26/2023	03/08/2023	03/08/2023 Duplicate	09/26/2023	09/26/2023 Duplicate	
Parameters	Units								
<b>Appendix III</b>									
Boron	mg/L	0.190	0.259	0.100 U	0.100 U	0.289	0.290	0.408	0.405
Calcium	mg/L	38.0	37	70.1	61.6	34.1	32.1	29.7	30.3
Chloride	mg/L	12.9	9.89	13.1	5.3	13.5	13.5	9.3	9.45
Fluoride	mg/L	0.500 U	1.00 U	0.500 U	1.00 U	0.500 U	0.500 U	1.00 U	1.00 U
pH, lab	s.u.	7.5 J	7.0 J	7.5 J	7.6 J	7.3 J	7.2 J	7.0 J	7.0 J
Sulfate	mg/L	120	67.7	52.4	20.5	62.2	62.2	44.4	44.5
Total dissolved solids (TDS)	mg/L	390	270	384	240	256	292	196	218
<b>Appendix IV</b>									
Antimony	mg/L	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U
Arsenic	mg/L	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U
Barium	mg/L	0.0491	0.0406	0.0730	0.0542	0.0246	0.0239	0.0244	0.0244
Beryllium	mg/L	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U
Cadmium	mg/L	0.000100 U	0.000200 U	0.000100 U	0.000200 U	0.000100 U	0.000100 U	0.000200 U	0.000200 U
Chromium	mg/L	0.00500 U	0.00500 U	0.00500 U	0.00500 U	0.0320	0.0306	0.0235	0.0233
Cobalt	mg/L	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U
Lead	mg/L	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U
Lithium	mg/L	0.0100 U	0.0100 U	0.0100 U	0.0100 U	0.0100 U	0.0100 U	0.0100 U	0.0100 U
Mercury	mg/L	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U
Molybdenum	mg/L	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.0272	0.0263	0.0356	0.036
Radium-226 & 228	pCi/L	0.0193 U	0.253 U	0.118 U	0.944	0.656	0.443 U	0.401 U	0.425 U
Selenium	mg/L	0.00500 U	0.00500 U	0.00500 U	0.00500 U	0.00616	0.00546	0.00500 U	0.00500 U
Thallium	mg/L	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U

Notes:

- <sup>a</sup> Maximum contaminant level (MCL) established under 40 CFR 257.95(h)(1).
  - <sup>b</sup> Drink Water Health Advisories - Life-time established in the 2018 Edition of the Drinking Water Standards and Health Advisories (EPA 822-F-18-001).
  - <sup>c</sup> Secondary Drinking Water Regulation.
  - <sup>d</sup> Action level for lead (treatment technique).
- 1.00 Value exceeds the MCL, or HAL where MCL not established.
- J - Estimated concentration.
  - U - Not detected at the associated reporting limit.
  - J- - Estimated concentration, result may be biased low
  - J+ - Estimated concentration, result may be biased high.



# **Attachment 3**

**IDNR Template to AGWMCAR Cross  
Reference Table**

IDNR Template to AGWMCAR Cross Reference Table

Louisa Generating Station - West Monofill  
Permit No. 70-SDP-16-04P

Annual Water Quality Report Template for Non-Municipal Landfills	Annual Groundwater Monitoring and Corrective Action Report	Notes
Table 1 Monitoring Program Summary	Table 2.1 Groundwater Monitoring Well Network	Lists all wells in monitoring network.
	Table 2.6 Summary of Groundwater Monitoring Events	Lists total number of samples from monitoring programs since December 2015.
	Table 4.3 Inter-Well Comparisons for Monitoring Data vs. Upgradient Background Prediction Limits	Compares current reporting period's groundwater data to the prediction limit value (control limit).
	Section 1 Introduction	States the current monitoring program.
	Section 2.1 Groundwater Monitoring Network	Describes the aquifer characteristics.
	Section 6.3 Recommendations	Provides recommended changes, if any, to the monitoring network.
Table 2 Monitoring Program Implementation Schedule	Table 2.6 Summary of Groundwater Monitoring Events	Provides summary of all sampling events since December 2015.
Table 3 Monitoring Well Maintenance and Performance Reevaluation Schedule	Section 2.2 Monitoring Well Inspection	States the frequency of total depth measurements (annually).
Table 4 Monitoring Well Maintenance and Performance Summary	Table 2.2 Well Construction Details	Provides well coordinates and elevations for TOC, original total depth, ground surface, top of screen, and bottom of screen.
	Table 2.3 Monitoring Well Screen Occlusion Evaluation	Provides TOC elevation, original total depth below TOC, screen length, annual total depth measurements, and percent of screen occluded.
	Table 3.1 Groundwater Elevation Summary	Provides all groundwater elevation data, past elevations through elevations during the current reporting period.
Table 5 Background Summary	Table 4.3 Inter-Well Comparisons for Monitoring Data vs. Upgradient Background Prediction Limits	Provides the prediction limit value (background level).
Table 6 Summary of Well/Detected Constituent Pairs With No Immediately Preceding Control Limit Exceedances	Table 4.3 Inter-Well Comparisons for Monitoring Data vs. Upgradient Background Prediction Limits	Compares current reporting period's groundwater data to the prediction limit value (control limit).
Table 7 Summary of Ongoing and Newly Identified Control Limit Exceedances	--	Table 7 is provided to IDNR.
Table 8 Analytical Data Summary	Table 4.1 Baseline Period Groundwater Monitoring Data	Provides all groundwater analytical data from the baseline period at the CCR Monofill.
	Table 4.2 Monitoring Analytical Results Summary	Provides all groundwater analytical data for the current reporting period at the CCR Monofill.
Table 9 Historic Control Limit & GWPS Exceedances	--	Table 9 is provided to IDNR.
Table 10 Groundwater Quality Assessment Plan Trend Analysis	Section 4 Groundwater Monitoring	Section 4 discusses trends in groundwater data, during baseline monitoring and current reporting period.
Table 11 Leachate Management Summary	NA	Not applicable since the West Monofill does not have a Leachate Collection System.
Table 12 Gas Monitoring Summary	NA	Not applicable since the West Monofill holds CCR and does not generate gas.