

**City Water, Light & Power  
Coal Combustion Residuals Surface Impoundments**

**Annual Groundwater Monitoring and  
Corrective Action Report  
Year Ending December 31, 2018**

**January 2019**



*Prepared for:*  
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# 1. INTRODUCTION

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In accordance with 40 CFR 257.90(e), provided herein is the Annual Groundwater Monitoring and Corrective Action Report for year ending December 31, 2018.

City Water, Light and Power (CWLP) owns and operates two (2) existing coal combustion residual (CCR) surface impoundments. The CWLP CCR surface impoundments are located north and east of the former Lakeside Power Generating Station and Dallman Power Generating Station in the Eastern ½ of Section 12, Township 15 North, Range 5 West, in Springfield, Illinois (see Figure 1). These CCR surface impoundments are identified as the Lakeside Ash Pond and the Dallman Ash Pond (see Figure 2).

The former Lakeside Power Generating Station and Dallman Power Generating Station are situated on the northwestern bank of Lake Springfield in Springfield, Illinois. The Lakeside Ash Pond is immediately north of Spaulding Dam at the northern end of Lake Springfield. The Dallman Ash Pond is immediately northwest of the Lakeside Ash Pond. Placed into service prior to 1958, the Lakeside Ash Pond is primarily a diked embankment. The Lakeside Ash Pond consists of four separate ponds (i.e., three lime softening ponds and a settling pond) totaling approximately 35.0 acres. The Lakeside Ash Pond ceased receiving ash in 2009. The Dallman Ash Pond was placed into service in approximately 1976 and is also a diked embankment. The Dallman Ash Pond is approximately 34.5 acres. Fly ash and bottom ash are sluiced to the Dallman Ash Pond with raw lake water.

## 2. GROUNDWATER MONITORING PROGRAM

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As required by §257.90(b), CWLP prepared and placed into the facility record a Groundwater Monitoring Program for the CCR surface impoundments in October 2017. Due to a potential integrity issue at Well AW-3, the well was replaced and the new well implemented in the monitor well system prior to the sampling event in May, 2018. Replacement of the well occurred to ensure compliance with §257.51(c).

The Groundwater Monitoring Program was revised to address the well replacement, placed in the site record and uploaded to the CWLP website. A Groundwater Monitoring System Certification was provided for the revised Groundwater Monitoring Program, also placed in the site record and uploaded to the aforementioned website. The current monitoring network includes two upgradient wells (wells AP-4 and AP-5) and four downgradient wells (AP-1, AP-2, AP-3, and RW-3). The well locations are depicted in Figure 2.

The following sections of the report address the annual groundwater monitoring and corrective action report requirements outlined in 40 CFR 257.90(e).

## 3. 40 CFR 257.90(e): KEY ACTIONS, PROBLEMS ENCOUNTERED, AND KEY ACTIVITIES FOR 2019

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### 3.1 Key Actions

The following items identify key actions that occurred in 2018 specifically related to the Groundwater Monitoring Program.

### **3.1.1 Assessment Monitoring Notification**

The first sampling event of detection monitoring occurred in November, 2017. In accordance with 40 CFR 257.95, an Assessment Monitoring Program was implemented in February 2018 in response to the statistically significant increase (SSI) over background levels for 40 CFR Part 257 Appendix III parameters boron, calcium, chloride, pH, sulfate, and total dissolved solids (TDS). Pursuant to §257.95(b), the Assessment Monitoring Program requires groundwater monitoring for all constituents listed in Appendix III and Appendix IV be monitored until detection monitoring resumes. Notification that an Assessment Monitoring Program had been established occurred in February, 2018.

### **3.1.2 Assessment Monitoring Sampling**

Assessment monitoring sampling, including parameters from both Appendix III and Appendix IV Lists, were analyzed for all wells in May, 2018.

### **3.1.3 Assessment Monitoring Verification Sampling**

The May assessment monitoring sampling event resulted in an exceedence of the background concentration of arsenic in well RW-3. All wells were resampled in July, 2018 for the Appendix III and IV List parameters.

### **3.1.4 Statistically Significant Increase Notification**

The July, 2018 assessment monitoring verification sampling resulted in the confirmed exceedence of arsenic at well RW-3. Notification of the SSI was provided later that month.

### **3.1.5 Establishment of Groundwater Protection Standards**

Pursuant to (§257.95(d)(2)), groundwater protection standards were established for the detected Appendix IV parameters in July, 2018.

### **3.1.6 Alternate Source Demonstration Evaluation**

Subsequent to verification of the SSI of arsenic in well RW-3, an alternate source demonstration evaluation was conducted pursuant to §257.95(g)(3)(ii), from September to October 2018. The evaluation included advancement of three borings in the immediate vicinity of RW-3. Soils samples were obtained at multiple depths within the borings and analyzed for four indicator parameters. Additionally, discreet groundwater samples were collected from each boring at a depth consistent with the screened interval of RW-3. The soils and groundwater analyses were conducted to evaluate whether arsenic was naturally occurring in the geologic deposits, as is typical in unconsolidated deposits within Illinois. Additionally, trace CCR material had been detected in at least one subsurface boring on the hydraulically downgradient periphery of the permitted CCR landfill, which is in close proximity to RW-3. This occurred within the shallow stratigraphy at the toe of the peripheral berm, requiring the replacement of the permitted landfill monitoring point, which was approved by the Illinois EPA via permit modification. The areas directly adjacent to the containment berms contain backfill material of varying thickness, placed as part of the berm construction. It is within this backfill material that the trace CCR material was encountered. It was suspected that the trace CCR material may affect the quality of groundwater

at RW-3. The evaluation indicated arsenic in the vicinity of RW-3 was not the result of naturally occurring minerals within the local deposits, or the result of CCR material contained within the peripheral berm.

### **3.1.7 Assessment Monitoring Investigation**

Pursuant to §257.95(g)(1), an investigation to characterize the nature and extent of arsenic concentrations exceeding the background concentration at RW-3 has been devised and is ongoing. The field investigation is scheduled for early 2019.

## **3.2 Problems Encountered**

All activities which occurred in 2018 are discussed in Section 3.1 above. No problems were encountered.

## **3.3 Key Activities for Upcoming Year (2019)**

The following key activities are anticipated to occur in 2019:

- Completion of the assessment monitoring investigation (§257.95(g)(1))
- Assessment of corrective action measures (§257.96)
- Selection of remedy, including the preliminary and final design of the corrective action (§257.97), and
- Implementation of corrective action program (§257.98) [The scheduling of implementation will be dependent upon many factors and could vary significantly.]

## **4. 40 CFR 257.90(e)(1) – (5)**

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Additional requirements for the Annual Groundwater Monitoring and Corrective Action Report are detailed in 40 CFR 257.90(e)(1)-(5). Each of the requirements is reproduced below along with the response.

- (1) A map, aerial image, or diagram showing the CCR unit and all background (or upgradient) and downgradient monitoring wells, to include the well identification numbers that are part of the groundwater monitoring program for the CCR unit.

*A map of the key features required above is provided as Figure 2 to this annual report.*

- (2) Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken.

*Well RW-3 replaced AW-3 in the monitoring program, beginning in April, 2018. No new monitoring wells were installed during 2018 as part of the monitoring program.*

- (3) All data collected as part of the detection or assessment monitoring programs in 2018.

*Detection monitoring data collected for the period January 1, 2018 through December 31, 2018 is provided in Table 1. The table includes the sample dates and identifies the Appendix III and Appendix IV parameters.*

- (4) Discussion of any transition between monitoring programs including the dates of the transition and the identification of the constituent(s) that necessitated the initiation of assessment monitoring.

*In accordance with §257.95 an Assessment Monitoring Program was implemented in February 2018 in response to the statistically significant increase (SSI) over background levels for 40 CFR Part 257, Appendix III.*

- (5) Other information required to be included in the annual report as specified in §§257.90 through 257.98.

- a. Alternative monitoring frequency certification in accordance with §§257.94(d)(3) and 257.95(c)(3).

*No alternative monitoring frequency has been implemented at this time. Therefore; no certification is required.*

- b. Any alternate source demonstration completed in response to any statistically significant increases completed during the previous year in accordance with §257.94(e)(2) and §257.95(g)(3)(ii).

*An alternate source demonstration evaluation was conducted in 2018 as described in Section 3.1.6.*

- c. Assessment of corrective measures completed during the previous year in accordance with §257.96(a).

*No assessment of corrective measures was completed during 2018.*

## **5. CONCLUSION**

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This annual groundwater monitoring and corrective action report has been provided in accordance with §257.90(e). The annual report for monitoring year 2019 will be provided by January 31, 2020.

## FIGURES

# TABLE



**TABLE 1**  
**City Water, Light and Power**  
**Power Plant Ash Impoundment**  
**2018 Groundwater Sampling Results**

Well	Parameter	Units	Background AP-4 & AP-5	5/4/2018	7/9/2018
<b>Appendix III</b>					Resample
AP-1	Boron, total	mg/l	0.787	15.8	19.1
AP-2	Boron, total	mg/l	0.787	2.94	3.63
AP-3	Boron, total	mg/l	0.787	18.5	18.8
AP-4	Boron, total	mg/l	0.787	0.117	0.128
AP-5	Boron, total	mg/l	0.787	0.0616	0.0585
AW-3/RW-3	Boron, total	mg/l	0.787	0.188	0.203
AP-1	Calcium, total	mg/l	176.63	190	223
AP-2	Calcium, total	mg/l	176.63	216	262
AP-3	Calcium, total	mg/l	176.63	145	158
AP-4	Calcium, total	mg/l	176.63	121	123
AP-5	Calcium, total	mg/l	176.63	99.7	101
AW-3/RW-3	Calcium, total	mg/l	176.63	69.7	78.9
AP-1	Chloride, total	mg/l	24.2	45.4	51.7
AP-2	Chloride, total	mg/l	24.2	41.6	47
AP-3	Chloride, total	mg/l	24.2	38.4	36.7
AP-4	Chloride, total	mg/l	24.2	12	12.2
AP-5	Chloride, total	mg/l	24.2	< 5	< 5
AW-3/RW-3	Chloride, total	mg/l	24.2	28.8	29.8
AP-1	Fluoride, total	mg/l	0.62	< 0.5	< 0.5
AP-2	Fluoride, total	mg/l	0.62	< 0.5	< 0.5
AP-3	Fluoride, total	mg/l	0.62	< 0.5	< 0.5
AP-4	Fluoride, total	mg/l	0.62	< 0.5	< 0.5
AP-5	Fluoride, total	mg/l	0.62	< 0.5	< 0.5
AW-3/RW-3	Fluoride, total	mg/l	0.62	< 0.5	0.54
AP-1	pH (field)	units	6.76-7.63	6.65	6.71
AP-2	pH (field)	units	6.76-7.63	6.62	6.52
AP-3	pH (field)	units	6.76-7.63	6.77	6.61
AP-4	pH (field)	units	6.76-7.63	7.17	7
AP-5	pH (field)	units	6.76-7.63	7.23	7.05
AW-3/RW-3	pH (field)	units	6.76-7.63	7.41	6.82
AP-1	Sulfate, total	mg/l	84.5	573	674
AP-2	Sulfate, total	mg/l	84.5	467	656
AP-3	Sulfate, total	mg/l	84.5	355	401
AP-4	Sulfate, total	mg/l	84.5	< 5	< 5
AP-5	Sulfate, total	mg/l	84.5	66.8	61.7
AW-3/RW-3	Sulfate, total	mg/l	84.5	23.7	7.81
AP-1	Total Dissolved Solids	mg/l	597.94	1300	1520
AP-2	Total Dissolved Solids	mg/l	597.94	1170	1650
AP-3	Total Dissolved Solids	mg/l	597.94	894	778
AP-4	Total Dissolved Solids	mg/l	597.94	482	500
AP-5	Total Dissolved Solids	mg/l	597.94	404	482
AW-3/RW-3	Total Dissolved Solids	mg/l	597.94	400	482
<b>Appendix IV</b>					
AP-1	Antimony, total	mg/l	0.016	< <b>0.025</b>	< <b>0.025</b>
AP-2	Antimony, total	mg/l	0.016	< <b>0.025</b>	< <b>0.025</b>
AP-3	Antimony, total	mg/l	0.016	< <b>0.025</b>	< <b>0.025</b>
AP-4	Antimony, total	mg/l	0.016	< <b>0.025</b>	< <b>0.025</b>
AP-5	Antimony, total	mg/l	0.016	< <b>0.025</b>	< <b>0.025</b>
AW-3/RW-3	Antimony, total	mg/l	0.016	< <b>0.025</b>	< <b>0.025</b>
AP-1	Arsenic, total	mg/l	0.0724	< 0.025	< 0.025
AP-2	Arsenic, total	mg/l	0.0724	< 0.025	< 0.025
AP-3	Arsenic, total	mg/l	0.0724	< 0.025	< 0.025
AP-4	Arsenic, total	mg/l	0.0724	< 0.025	< 0.025
AP-5	Arsenic, total	mg/l	0.0724	< 0.025	< 0.025
AW-3/RW-3	Arsenic, total	mg/l	0.0724	0.0826	0.136
AP-1	Barium, total	mg/l	5.24	0.0611	0.662
AP-2	Barium, total	mg/l	5.24	0.264	0.109
AP-3	Barium, total	mg/l	5.24	0.0999	0.122
AP-4	Barium, total	mg/l	5.24	0.356	0.359
AP-5	Barium, total	mg/l	5.24	0.0956	0.106
AW-3/RW-3	Barium, total	mg/l	5.24	0.182	0.226
AP-1	Beryllium, total	mg/l	0.0164	< 0.0025	< 0.0025
AP-2	Beryllium, total	mg/l	0.0164	< 0.0025	< 0.0025

**TABLE 1**  
**City Water, Light and Power**  
**Power Plant Ash Impoundment**  
**2018 Groundwater Sampling Results**

Well	Parameter	Units	Background AP-4 & AP-5	5/4/2018	7/9/2018
AP-3	Beryllium, total	mg/l	0.0164	< 0.0025	< 0.0025
AP-4	Beryllium, total	mg/l	0.0164	< 0.0025	< 0.0025
AP-5	Beryllium, total	mg/l	0.0164	< 0.0025	< 0.0025
AW-3/RW-3	Beryllium, total	mg/l	0.0164	< 0.0025	< 0.0025
AP-1	Cadmium, total	mg/l	0.0128	< 0.0025	< 0.0025
AP-2	Cadmium, total	mg/l	0.0128	< 0.0025	< 0.0025
AP-3	Cadmium, total	mg/l	0.0128	< 0.0025	< 0.0025
AP-4	Cadmium, total	mg/l	0.0128	< 0.0025	< 0.0025
AP-5	Cadmium, total	mg/l	0.0128	< 0.0025	< 0.0025
AW-3/RW-3	Cadmium, total	mg/l	0.0128	< 0.0025	< 0.0025
AP-1	Chromium, total	mg/l	0.811	< 0.025	< 0.025
AP-2	Chromium, total	mg/l	0.811	< 0.025	< 0.025
AP-3	Chromium, total	mg/l	0.811	< 0.025	< 0.025
AP-4	Chromium, total	mg/l	0.811	< 0.025	< 0.025
AP-5	Chromium, total	mg/l	0.811	< 0.025	< 0.025
AW-3/RW-3	Chromium, total	mg/l	0.811	< 0.025	< 0.025
AP-1	Cobalt, total	mg/l	0.297	< 0.025	< 0.025
AP-2	Cobalt, total	mg/l	0.297	< 0.025	< 0.025
AP-3	Cobalt, total	mg/l	0.297	< 0.025	< 0.025
AP-4	Cobalt, total	mg/l	0.297	< 0.025	< 0.025
AP-5	Cobalt, total	mg/l	0.297	< 0.025	< 0.025
AW-3/RW-3	Cobalt, total	mg/l	0.297	< 0.025	< 0.025
AP-1	Lead, total	mg/l	0.638	< 0.025	< 0.025
AP-2	Lead, total	mg/l	0.638	< 0.025	< 0.025
AP-3	Lead, total	mg/l	0.638	< 0.025	< 0.025
AP-4	Lead, total	mg/l	0.638	< 0.025	< 0.025
AP-5	Lead, total	mg/l	0.638	< 0.025	< 0.025
AW-3/RW-3	Lead, total	mg/l	0.638	< 0.025	< 0.025
AP-1	Lithium	mg/l	0.05	0.00912	0.0142
AP-2	Lithium	mg/l	0.05	0.00725	0.00762
AP-3	Lithium	mg/l	0.05	0.006	0.00675
AP-4	Lithium	mg/l	0.05	0.00712	0.00775
AP-5	Lithium	mg/l	0.05	0.0125	0.0131
AW-3/RW-3	Lithium	mg/l	0.05	0.0119	0.0315
AP-1	Mercury, total	mg/l	0.0008	< 0.0005	< 0.0005
AP-2	Mercury, total	mg/l	0.0008	< 0.0005	< 0.0005
AP-3	Mercury, total	mg/l	0.0008	< 0.0005	< 0.0005
AP-4	Mercury, total	mg/l	0.0008	< 0.0005	< 0.0005
AP-5	Mercury, total	mg/l	0.0008	< 0.0005	< 0.0005
AW-3/RW-3	Mercury, total	mg/l	0.0008	< 0.0005	< 0.0005
AP-1	Molybdenum	mg/l	0.025	< 0.025	< 0.025
AP-2	Molybdenum	mg/l	0.025	< 0.025	< 0.025
AP-3	Molybdenum	mg/l	0.025	< 0.025	< 0.025
AP-4	Molybdenum	mg/l	0.025	< 0.025	< 0.025
AP-5	Molybdenum	mg/l	0.025	< 0.025	< 0.025
AW-3/RW-3	Molybdenum	mg/l	0.025	< 0.025	< 0.025
AP-1	Radium-226	pCi/l	7.1	1	0.96
AP-2	Radium-226	pCi/l	7.1	0.75	0.7
AP-3	Radium-226	pCi/l	7.1	0.95	0.34
AP-4	Radium-226	pCi/l	7.1	0.88	0.96
AP-5	Radium-226	pCi/l	7.1	0.93	0.78
AW-3/RW-3	Radium-226	pCi/l	7.1	0.49	0.96
AP-1	Radium-228	pCi/l	5.1	3.1	1
AP-2	Radium-228	pCi/l	5.1	1.4	0.65
AP-3	Radium-228	pCi/l	5.1	0.88	< 0.81
AP-4	Radium-228	pCi/l	5.1	< 0.62	1.4
AP-5	Radium-228	pCi/l	5.1	< 0.68	0.85
AW-3/RW-3	Radium-228	pCi/l	5.1	2	2.2
AP-1	Radium-226 + Radium-228	pCi/l	Note 2	4.1	1.96
AP-2	Radium-226 + Radium-228	pCi/l	Note 2	2.15	1.35
AP-3	Radium-226 + Radium-228	pCi/l	Note 2	1.83	1.15
AP-4	Radium-226 + Radium-228	pCi/l	Note 2	1.5	2.36
AP-5	Radium-226 + Radium-228	pCi/l	Note 2	1.61	1.63
AW-3/RW-3	Radium-226 + Radium-228	pCi/l	Note 2	2.49	3.16

**TABLE 1**  
**City Water, Light and Power**  
**Power Plant Ash Impoundment**  
**2018 Groundwater Sampling Results**

Well	Parameter	Units	Background AP-4 & AP-5	5/4/2018	7/9/2018
AP-1	Selenium, total	mg/l	0.0079	< 0.025	< 0.025
AP-2	Selenium, total	mg/l	0.0079	< 0.025	< 0.025
AP-3	Selenium, total	mg/l	0.0079	< 0.025	< 0.025
AP-4	Selenium, total	mg/l	0.0079	< 0.025	< 0.025
AP-5	Selenium, total	mg/l	0.0079	< 0.025	< 0.025
AW-3/RW-3	Selenium, total	mg/l	0.0079	< 0.025	< 0.025
AP-1	Thallium, total	mg/l	0.00556	< <b><i>0.025</i></b>	< <b><i>0.025</i></b>
AP-2	Thallium, total	mg/l	0.00556	< <b><i>0.025</i></b>	< <b><i>0.025</i></b>
AP-3	Thallium, total	mg/l	0.00556	< <b><i>0.025</i></b>	< <b><i>0.025</i></b>
AP-4	Thallium, total	mg/l	0.00556	< <b><i>0.025</i></b>	< <b><i>0.025</i></b>
AP-5	Thallium, total	mg/l	0.00556	< <b><i>0.025</i></b>	< <b><i>0.025</i></b>
AW-3/RW-3	Thallium, total	mg/l	0.00556	< <b><i>0.025</i></b>	< <b><i>0.025</i></b>

Notes:

1. A bold and italicized value indicates that the reporting limits was higher than the comparison value.
2. The 40 CFR 257 list requires Radium-226 and Radium-228 combined. The established MCL is for the combined parameters. However, these parameters require two separate analysis and have been reported separately by the analytical laboratory. The sum of the values has been provided and compared to the MCL. Background values have been calculated for the individual parameters.
3. Well AW-3 was replaced by well RW-3 prior to the May 2018 monitoring event.